The Land Manager's Guide to the Birds of the South

Land Manager's Guide to the Birds of the South

by
Paul B. Hamel

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Forested habitats and their suitability for bird species in the South are described. For each species, a summary of biological knowledge regarding status, distribution, and habitat requirements is presented. General and specific habitat requirements for each species are given in the form of habitat relationship matrices. This information is designed to be used by land managers as a guide for evaluating and prescribing land management practices.

Keywords: Birds; habitat relationships; forest management.

Cover: Golden-winged warbler by Isidor Jeklin for the Cornell Laboratory of Ornithology.

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PREFACE

The current work is a revision of *Bird-Habitat Relationships on Southeastern Forest Lands*, co-authored with Harry E. LeGrand, Jr., Michael R. Lennartz, and Sidney A. Gauthreaux, Jr. It was fashioned from that work and a subsequent unpublished report I prepared for the Southern Region of the Forest Service in 1983. Unfortunately, it has not been possible to do extensive field work or to review the growing body of literature on bird habitat relationships in the South during the preparation of this work. Instead, this has been primarily a project of compiling data on the distribution of these species in states not included in the earlier work and preparing more recent maps. A new chapter on forest fragmentation is also included. This work is offered in the hope that it will assist land managers of all stripes to meet their objectives and provide habitat for the full range of wildlife species in the process. Such a task is nowhere near as easy as is that of preparing a work like this one. My hat is off to those who undertake the stewardship of the dwindling supply of our natural resources.

The bottom line: I take full responsibility for everything in these pages and regret all errors of omission and commission.

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To the current edition: This work was supported by a cooperative agreement between the U. S. Forest Service Southern Region and the Southeastern Heritage Task Force of the Nature Conservancy. I am indebted to Joe Jacob and Laura Mason of the Nature Conservancy for patient and speedy assistance with the work. Mike Hamby and Bob Walker of the Forest Service Southern Region Geometronics unit handled digitization of the range maps. Chris Frye and the Southern Region Management Systems Possumwerks gang assisted with map file conversion. Donna Bayless did some of the particularly tedious proofreading.

I am especially grateful to Jim Fenwood of the Forest Service, who has undertaken the difficult tasks of shepherding the manuscript through the editorial process and preparation of camera-ready copy. He has been patient with my sometimes eccentric behavior.

Sam Droege of the U.S. Fish and Wildlife Service Breeding Bird Survey was extremely helpful in providing data from that project on which the maps of breeding distribution are based. Celina Solomon helped with the preparation of the manuscript. I thank each of these individuals for their help. I thank Doug James, Harry LeGrand, Joe Neal, Chuck Nicholson, and Brainerd Palmer-Ball for their willingness to review the maps.

I acknowledge the spirit of inquiry and curiosity of my co-authors of the first edition. Without the firm ground they provided in the first work, this revision would have been unthinkable.

To the first edition: This work was supported by cooperative agreements between the U. S. Forest Service and the Clemson University Department of Zoology. We owe much to Jerry Verner for discussion and stimulation that led to the development of our matrix presentation format. Earlier drafts of the manuscript have benefited from review by Danny Bystrak, Andy Clewell, Dick Conner, Noel Cost, Dick DeGraaf, Jim Dickson, John Fussell, Bob Hooper, Fran James, Syd Johnson, Jim Karr, Joe McClure, Ray Sheffield, Henry Stevenson, Paul Sykes, and Noel Wamer. We appreciate their comments and have accepted most of their suggestions. For those cases in which we incorrectly overruled them, as well as those where we did so correctly, we accept full responsibility.

We especially acknowledge those dedicated individuals who conducted Breeding Bird Censuses and Winter Bird Population Studies. The late Wendell P. Smith, who conducted no fewer than 125 censuses on several plots near his North Wilkesboro, NC, home between 1954 and 1977, deserves particular mention.

Chris Oliver typed the Narrative Species Accounts from an often cryptic original longhand draft. Anna Ross gave valuable assistance with proofreading and organization of the tables. Bob Biesterfeldt and Mel Weiland effectively shepherded the manuscript through editing and preparation of camera copy, respectively.

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Chapter I. INTRODUCTION

Legal-Historical Background

Forests cover approximately 70% of the landscape in the South. In addition to providing valuable supplies of wood, fiber, and fuel, they provide invaluable or indispensable habitats for several hundred species of native vertebrates. Foresters, wildlife biologists, and other land resource managers have long accepted as a truism the statement that "forest management is wildlife management". Any management activity that alters the structure and composition of forest vegetation vitally alters wildlife habitats and associated wildlife communities and populations. Whether these habitat alterations result in good or bad wildlife management, however, depends on the forest manager's foresight and ability to consider (and plan for) wildlife requirements when scheduling habitat manipulations. In the not too distant past, wildlife management was synonymous with game management and the forest manager's job was relatively simple. Scheduling forest management treatments required consideration of the needs of only a handful of game birds and mammals. Legislative action over the past two decades, however, has significantly increased the public forest manager's responsibilities toward wildlife, especially on federal lands.

The National Environmental Policy Act of 1969 requires that the environmental impacts of any federally funded land management program be examined and evaluated. The Endangered Species Act of 1973 mandates protection and management of endangered and threatened species on Federal lands, and prohibits any adverse impacts on critical habitats. And the National Forest Management Act of 1976 has been interpreted as directing national forest managers to protect biological diversity and maintain viable populations of all native plants and animals. The result of these statutory regulations is that all animals, not just game animals, have been recognized as renewable forest resources. Consequently, managers of national forests have been directed to incorporate the habitat requirements of all native, forest-dwelling animals into their land management plans.

Planning for the entire forest wildlife community is a formidable task. One need only consider that vertebrates alone on the national forests in a single state may number several hundred species; the Southern Region of the USDA Forest Service encompasses 13 states stretching from Texas and Florida to Virginia and Kentucky (and the Commonwealth of Puerto Rico, not covered by this publication, as well).

Effective planning for such a vast array of wildlife habitats and species is a presumptive illusion unless managers are equipped with a comprehensive, accessible data base outlining the life histories and habitat requirements of all species. No such data base currently exists for southern forest habitats. Adequate information exists, however, in the literature, and in the notes, files, and experience of knowledgeable biologists to make portions of such a data base a reality. The need is to review all available sources of information, extract and compile the relevant facts on life histories and habitat requirements, and synthesize the diverse data into a form usable by the forest wildlife manager.

This book represents a beginning step toward such a synthesis. It is a comprehensive summary of the life histories and habitat associations of all bird species that breed, winter, or both in forest habitats in the South. It is limited in scope, taxonomically to the birds, and geographically to the 13 Southern states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, eastern Oklahoma, South Carolina, Tennessee, eastern Texas, and Virginia. I hope that this will provide the impetus and direction for a truly complete atlas of wildlife habitat relationships for all wildlife taxa across southern forest habitats. Long-term plans are for such an atlas to be made available both in printed form and as part of a computerized geographic information system.

Purpose

The purpose of the present work is to provide forest land managers with a comprehensive data base on the life histories and habitat associations of southern forest birds. Specifically, I have attempted to:

1. Provide specific, detailed information on habitats and their suitability for individual bird species. This information will help forest managers to assess effects of potential land management decisions on birds.

2. Provide a regional avifaunal work summarizing biological information about the states in the Forest Service Southern Region.

Ecological Perspective

The basic assumptions of this work are that (a) each bird species is adapted to certain successional conditions of certain forest vegetation types, and that (b) where those conditions are present within the species' range the birds will be too. A corollary assumption is that habitat conditions required by species can be produced by purposeful management actions. These assumptions seem reasonable, but require further elaboration and verification.

Forest habitats are continuously distributed across the southern landscape. Numerous studies, of which Whittaker (1967) is a classic illustration, have documented that tree species are distributed independently of each other across environmental gradients. However, naturalists have proposed forest or vegetation type classifications (e.g. Braun 1964) in order to discuss, to research, or to manage these continuous communities. The discrete categories of vegetation classifications are, at best, only approximations of the variability of the ecosystems they characterize. At the same time, communication about wildlife habitat relationships and integration of wildlife and timber management is facilitated substantially by such classifications.

Our success in relating birds to vegetation types and successional stages depends upon the accuracy of our assumptions. Our model, that bird distribution is determined primarily by habitat selection based upon certain key habitat elements, is reasonable but unproven. If such a model is reasonably accurate, and if the requisite habitat elements can be associated with vegetation types, then the habitat-relationships approach presented here will be adequate (Shugart et al. 1978).

Experience in game management demonstrates that specific habitat elements can be produced by purposeful manipulations. Our knowledge of habitat requirements is the major limiting factor in such management. If our model of habitat associations is accurate then habitat management will work. Where knowledge of habitat requirements is weak or lacking, however, the anticipated effects of management are less certain.

Present knowledge of habitat requirements for most bird species is based upon field observations rather than controlled studies of requisite habitat elements. Numerous species occupy many forest types, indicating that species habitat requirements may have little direct association with vegetation type categories. While uncertainties inherent in linking requirements to discrete habitat categories must be acknowledged, they need not be feared. Where appropriate, habitat relationships described in terms of vegetation types must be abandoned in favor of approaches more precisely tuned to the biology of particular species.

Management Overview of Vegetation Types and Successional Stages

Vegetation types and their successional stages form the organizational basis of this work. I have adopted type categories that are meaningful to understanding the distribution of avian communities in the South. These vegetation types do not coincide precisely with any standard forest classification scheme. Introductory remarks to each vegetation type define the equivalency relationships between these vegetation types and those recognized by the National Forest Systems (NFS; USDA 1979), the Society of American Foresters (SAF; Eyre 1980), and the Forest Service Renewable Resources Inventory and Evaluation (RRE; McClure 1979, Cost 1979).

I recognize 4 successional stages based upon vegetation physiognomy. These 4 physiognomic stages can be related to specific stand ages only imprecisely. Numerous factors peculiar to individual sites and their surroundings inject enormous variation into attempts to define successional stages by age alone. In my opinion, the most important features for habitat selection by birds are physiognomic ones, not ages; I have adopted successional stages defined in that fashion.

Expected Uses of This Work

This work is an information retrieval source for 2 primary applications. First, and primarily, this book is designed for forest land managers involved with planning silvicultural manipulations of forest stands. It is intended to aid the manager both in prescribing treatments aimed at improving avian habitats and in assessing and ameliorating the impacts of other management activities on bird communities. Second, given the acknowledged imprecision of much of the available data on avian habitat associations, I offer it as a working hypothesis for ornithologists and as a challenge to stimulate research on avian habitat requirements.

Land Management Applications

At the local or ranger district level, the work can be used to prescribe habitat improvements for birds and to infer consequences to bird populations of alternative management practices. This use is applicable to project planning during preparation of compartment prescriptions. The matrices can be used to determine anticipated consequences to the avifauna whenever the effects of a silvicultural treatment can be expressed as changes in forest stands, such as alterations in species composition, canopy cover, or understory density. On a larger scale, such as forest planning, the work can be used to estimate the effects on bird communities of alternative management prescriptions in larger management units defined by vegetation composition and structure. Projections made with the matrices can be extended over the time frame involved in the planning process. At the state or regional level, the work forms the basis for evaluating the efficacy of established or proposed wildlife management policies. (Indeed, the species list in Appendix B is my estimate of the breeding and wintering avifauna of forest habitats of the 13 states in the South.)

Ornithological and Ecological Applications

Two specific applications of this work to present ornithological and ecological study exist. First, the habitat matrices constitute hypotheses of bird community structure in the Southeast. Second, the review of the published census literature identifies areas in which new quantitative data are needed.

Ornithologists and ecologists recognize that vegetation structure and composition are powerful predictors of the composition and richness of bird communities (e.g. MacArthur 1972, Cyr and Cyr 1979, Beedy 1981, Holmes and Robinson 1981). I have extended that recognition into the assumption that structure and composition of vegetative habitats are a sufficient set of factors to predict accurately the bird communities of homogeneous patches of forest such as stands of 8-20 ha (20-50 acres). The vegetation type matrices are constructed on that basis. In so doing I have given only passing consideration to interspecific interactions as determinants of observed communities in spite of an extensive literature dealing with them (Cody 1974, Cody and Diamond 1975, but see also Wiens 1977). The species-habitat matrices are thus hypotheses of bird communities; hypotheses constructed from an initial assumption that adaptation to the vegetative environment influences community structure more than competitive processes. Careful

empirical tests of these hypotheses will reveal the extent to which the assumption is reasonable.

Whether this assumption is reasonable or unreasonable, comparisons of extant breeding and winter bird communities with predicted communities will be valuable. Results of such studies can be used to improve our understanding of the composition of avian communities. Similarly, this information is vitally important to implement and improve habitat management for avian communities in the South. Failures of the predictions are the raw material for the development of more successful models of avian community structure. Extensive gaps exist in our knowledge of avian communities in the South and of the species that compose those communities. Identified gaps provide an outline of valuable future research needs in avian ecology and nongame management in the South.

Limitations

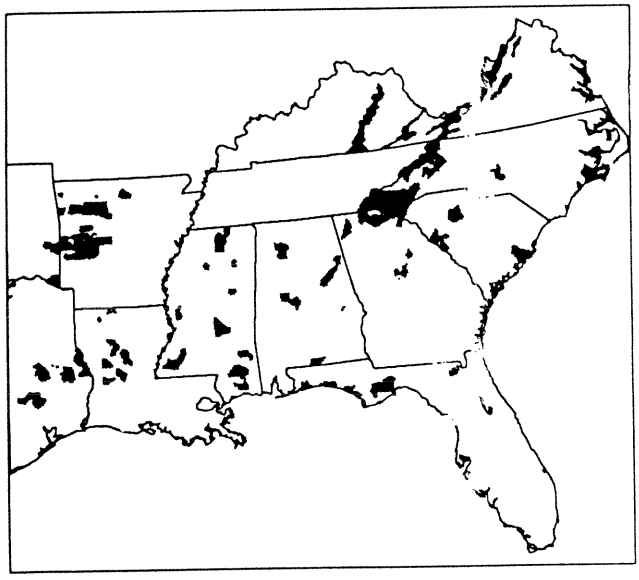
This work is 1 in a series, produced independently by different workers, to supply management information on nongame species in different areas of the United States (Thomas 1979, Verner and Boss 1980, DeGraaf et al. 1980, U. S. Forest Service Rocky Mountain Region 1981, Evans and Kirkman 1981). Like the others, this is a review of relevant information about the life histories and habitat requirements of the included species. Information relating bird species to forested habitats constitutes a summary of literature and of professional judgments. As such, these lists are hypotheses subject to empirical verification. All the limitations addressed in the symposium on avian censusing (Ralph and Scott 1981) and by Verner (1985) apply to the published censuses utilized in this work. These include observer variability (Eagles and Tobias 1978); peculiarities of specific plots; nonstandard reporting of vegetative characteristics; single year samples; uneven coverage of different habitat types; uncertainties of field techniques, data analyses, and data summarization (Robbins 1978); as well as other factors such as the landscape context in which a particular stand is located.

Biological attributes of certain species render them difficult to interpret. Problem species include those whose home ranges are larger than usual forest stands (many raptors, turkeys, crows, some woodpeckers, and all wading birds); nocturnal species (such as owls and nightjars); aerial feeders (including swifts and swallows); all winter species, especially erratically occurring "winter finches" and flocking frugivores (such as American Robins and Cedar Waxwings); and all species that occur at low densities, such as below 1 bird or pair per 40 ha (100 acres).

I stress the great importance of testing these data by monitoring and censusing avian communities in forest stands, and then using the results of those tests to improve the data. The ultimate value of hypothesized, estimated, or predicted community composition lies in the ability to attach a measure of error to the prediction. Confident estimation of error rates for these hypothesized densities awaits considerably more study. Data of unknown precision, such as these, when accepted as facts rather than as hypotheses, can lead to bad management decisions as easily as to good ones. This work is a starting point.

Chapter II.
USE OF THIS MANUAL

This work treats the bird species that regularly breed, winter, or both in forest habitats in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, eastern Oklahoma, South Carolina, Tennessee, eastern Texas, and Virginia as shown below (shaded areas denote national forests.)



Species that migrate through the region but neither breed nor winter here are excluded. Species that do not utilize forests or forest successional habitats have been omitted, with the exception of species occurring in the Everglades and coastal Louisiana marshes. Thus, a number of waterbirds, especially waterfowl, shorebirds, and gulls and terns, are omitted from this survey. These birds are, for the most part, associated with ponds, marshes, mudflats, and other wetland habitats. On the other hand, most members of the orders Pelecaniformes and Ciconiiformes are discussed, because they usually nest in shrubs or trees, even though they forage in aquatic, often nonforested, habitats. A few species with urban habitats, such as Rock Dove, European Starling, and House Sparrow, are included, because they frequently perch in trees, and they forage in early successional stages of forest habitats. European Starlings frequently nest in trees and roost in forests or thickets in the winter.

In summary, the work includes all land birds that breed or winter regularly in forest habitats of the South; I exclude only a small number of recently introduced species that are poorly established. Most of these latter species occur only in subtropical Florida.

Organization

Data on these bird species are presented in an integrated fashion that involves 3 separate, cross-referenced methods: species-habitat matrices, narrative species accounts, and special appendices. Additional, specific instructions for using the information provided are given in introductory remarks to the separate sections. The present chapter outlines each of the sections and presents general strategies for using the work to predict bird communities, to plan management activities for birds, and to evaluate management alternatives.

Qualitative Bird-Habitat Association Matrices

For each of 23 vegetation types, a habitat association matrix shows how bird species commonly use stands of that type. The bird-habitat matrices are similar to those designed by Verner and Boss (1980) for the presentation of data on bird-habitat associations of the Sierra Nevada in California. Vegetation type designations are based on those presented by several sources (e.g., Shelford 1963, Braun 1964), but they do not correspond to any single scheme. A vegetation type classification suits this purpose better than a forest type classification. Forest type classifications are typically based solely on commercially important tree species. Vegetation

type categories utilizing major plant associations, topography, and geography better capture the rich variation in forest habitats. In general, birds seem to select habitats primarily on the basis of physical structure of vegetation as well as topography, rather than on the presence of single tree species. Obviously, however, composition is important as well, as indicated in the names of certain species, e.g. Pine Warbler, Sedge Wren.

The vegetation types chosen for this study include essentially all of the major types found in the 13 states of the South. Everglades is included because it covers a large portion of southern Florida and is considered a distinct vegetation type by all authorities. In several cases it became necessary to designate types not generally recognized by most authorities in order to include "mixed" forests, especially forests with a combination of pine and hardwood overstory trees. Many bird species utilize such forests to a greater extent than either pure coniferous or pure deciduous forests. However, it must be borne in mind that both forest type and vegetation type designations are arbitrary concepts rather than discrete entities. Consequently, any use of forest type or vegetation type masks some important natural variation. I persist in using these conceptual categories to facilitate practical handling of an enormous mass of data and to integrate information on bird habitats into the same conceptual framework used by forest managers in their forest resource inventories and planning.

The matrices do not contain all habitats present in the South. (A habitat is a single successional stage column in a matrix, representing a range of age classes of similar physiognomy within a single vegetation type.) The habitats in a matrix consist only of seral stages of major forest vegetation types. Habitats associated with urban, suburban, and agricultural land uses, as well as wetlands such as marshes, reservoirs, and oceanic habitats, are not treated. Inclusion of these additional types would have increased greatly the number of matrices and the excluded habitats would be of little concern to the forest land manager, for whom the work is primarily intended.

The seral stages of the vegetation types are similar to those used by Verner and Boss (1980) and DeGraaf et al. (1980). The 4 classes are grass/forb, shrub/seedling, sapling/poletimber, and sawtimber. Too few data exist to permit treatment of distinct canopy coverage classes in the older age classes or distinct understory volume classes, or to recognize separate classes of other important habitat variables. Not all of the vegetation types exhibit all 4 seral stages. For example, the Everglades type exists only in the grass/forb stage.

Each bird species included in the study is listed in the matrices for those vegetation types used by individuals of that species. A few species, mainly those of urban habitats and agricultural areas, utilize none of the habitats extensively. For many species, optimal habitats are not present in any of these vegetation types, and only suitable or marginal habitats are indicated. Data presented in the matrices were derived from examination of all relevant literature plus accumulated field experience where literature sources were inadequate or lacking (Hamel et al. 1982). In some cases, especially for birds found primarily in Florida where Hamel et al. (1982) had limited field experience, decisions on habitat use were based almost solely on the literature. Frequently used references were Sprunt (1954), Ogden (1969), Robertson and Kushlan (1974), and Kale (1978).

Treatment of each type involves: (A) definition of the type; (B) equivalence relations between our vegetation type and the U. S. Forest Service National Forest Systems (NFS; USDA 1979), Society of American Foresters (SAF; Eyre 1980), and USFS Renewable Resource Evaluation (RRE; McClure 1979, Cost 1979) types; (C) pertinent physiographic and other considerations about the type; (D) important bird-habitat interactions in the type; (E) a summary of the published censuses and other literature on birds in the type; (F) lists of characteristic and restricted species in the type; and (G) the matrix of seasonal bird-habitat associations for the type. Each matrix includes a list of breeding and wintering birds associated with the type, and suitability ratings of each successional stage habitat (grass/forb, shrub/seedling, sapling/poletimber, and sawtimber) of the type for each bird species. Discussion of each of these elements of a treatment is presented in the introductory remarks to Chapter III.

Presented for each bird species in each matrix are columns of information on utilization of various habitat elements, and on specific habitat requirements. These additional columns of information will be useful to the worker in evaluating the potential of specific stands in the type as habitats for individual bird species.

Qualitative data presented in the matrices reflect general faunal accounts of the species, and, wherever possible, published census information from the South. Because few published data are available for much of the region, I have relied on accumulated field experience where published information is lacking.

Quantitative estimates of the breeding and winter densities of bird species of the South were obtained primarily from 2 programs of the National Audubon Society, the Breeding Bird Census (BBC; Hall 1964), begun in 1936, and the Winter Bird Populations Study (WBPS; Kolb 1965), initiated in 1948. In concept, both programs are plot studies. The BBC utilizes a spot-mapping approach to density estimation (Intl. Bird Census Comm. 1970), while the WBPS uses mean numbers of individuals/trip as its data. Studies are published in the *Journal of Field Ornithology* at the present time. Formerly they were published in *American Birds* and its predecessor, *Audubon Field Notes*, and include an account of the habitat as well as a list of bird species with abundance estimates standardized to birds/40 ha (100 acres).

All studies made in the 5 southeastern states (Virginia,

North Carolina, South Carolina, Florida, and Georgia) that appeared in either publication since establishment of *Audubon Field Notes* in 1947 until 1979 were included in the sample. I referred to selected studies from among the 28 published in 1981, but was unable to include these in the analyses. Several studies made in aquatic or marine habitats were also excluded from analysis.

From each account the following data were extracted:

State,
latitude and longitude,
plot size,
elevation,
vegetation type as defined for the matrix herein,
successional stage as defined for the matrix herein,
bird species, and
bird abundance standardized to birds/40 ha (100 acres).

Rare species are recorded in the BBC and WBPS as "+" to signify an abundance of less than 1 territory or individual on the plot and as "V" for species that visited the plot but did not breed or winter there. I adopted 2 conventions to express these low abundances quantitatively for our presentation. First, visiting species (V) were uniformly accorded an abundance of 0.1 individuals or pairs/40 ha. Second, species recorded as "+" were assigned abundances of 1 individual or pair/40 ha for plots < 20 ha in size, and 0.5 individuals or pairs/40 ha for larger plots. Furthermore, I usually rounded larger abundance figures to the nearest integer.

This quantitative census literature is the most comprehensive source of abundance data on birds in the Southeast. It is, nevertheless, subject to a variety of errors, some of which restrict the usefulness of the data for present purposes. The symposium on bird censusing (Ralph and Scott 1981) presents detailed criticism of the spot-mapping technique. All sources of error identified there may affect results reported in this quantitative literature. Additional uncertainty affects the utility of the censuses. Published habitat descriptions, particularly in the first 25 years of these programs, were qualitative narratives lacking specific numerical data. Hence, assignments of plots to vegetation types and particularly to successional stages is subject to an unknown amount of error. I have chosen to ignore this source of error for the most part. However, where published results differed widely from other literature and field experience (as the 51 pairs/40 ha of Field Sparrows reported from a sawtimber plot in oak-hickory vegetation in Virginia), I have used the other literature and our experience in preference to the published censuses.

Organization of Narrative Species Accounts

The narrative species accounts closely follow the formats of Verner and Boss (1980) and DeGraaf et al. (1980), so that the treatments will be comparable. The purpose of the narratives is to provide both quantitative and qualitative information on the biology and habitat requirements of the species. Where a species has been given legal protection in addition to that provided by the Migratory Bird Treaty Act, a section on legal status lists the federal and/or state designation for species and subspecies. State natural heritage programs that track the species are listed in this section as well. The section also mentions those cases in which the bird was listed by Tate (1981) on the National Audubon Society's Blue List of species whose populations are thought to be declining. When a species has been designated as sensitive by the Regional Forester, national forests where this listing applies are noted.

The abundance status of each species is also listed, with information on arrival and departure dates and elevation of occurrence. Comments on habitats, habitat requirements, sample densities, reproduction, food habits, and foraging-nesting guild are intended to provide insight into the biology of each species. This information is presented in order to assist the manager in prescribing treatments of forest habitats to benefit birds. A range map, showing both breeding and wintering ranges, is provided for each species. The maps will assist in interpretation of lists of occurrence by state and physiographic province as these relate to actual range boundaries. The references listed provide access to accounts of species in generally available faunal works.

The majority of the data entered in the narratives is a composite of information taken from several sources. Breeding and food habits data are taken primarily from Bent (1926-1958; Bent and Austin 1968a, 1968b, 1968c) and Ehrlich et al. (1988). The following also were helpful in providing breeding data: Palmer (1962), Reilly (1968), Robbins and Bystrak (1977), and Larner (1979). Data for preparing the range maps and status sections were obtained from Sprunt (1954), Burleigh (1958), Pearson et al. (1959), Ogden (1969), Sprunt and Chamberlain (1970), Robertson and Kushlan (1974), Denton (1977), and Larner (1979), Root (1988), the Breeding Bird Survey (Sam Droege, pers. comm.), as well as Christmas Bird Count and other data found in *American Birds*.

In summary, these accounts are designed to give the reader some general information on the status and biology of each species, with habitat descriptions supplementing the habitat data provided in the matrices. Further explanation of the categories is provided in the introductory remarks to Chapter IV.

Organization of Appendices

I have reorganized some of the information presented in the vegetation type and narrative species accounts into a set of 12 appendices. These are intended as cross-referenced summaries of information frequently sought by managers, which they would otherwise have to extract repeatedly from data dispersed in the vegetation type treatments and narrative species accounts. Pertinent comments about each appendix, including questions each is designed to answer, are provided in introductory remarks to the appendices.

Basic Use of This Work

Preparing a Bird List

The most basic use of this work is for preparing a bird list for a plot or forest stand in a particular location. All uses of the work for inventory or management will require at least one such bird list. In order to accomplish this, the following steps are required:

A. Specifying the characteristics of the stand or forest property in terms of:
   1. Geographic location
      (a) state
      (b) physiographic province, see Figure 1.
   2. Vegetation type, in NFS, SAF, RRE, or this scheme. NFS and SAF types can be translated into ours by use of Appendices K and L.
   3. Successional stage, as grass/forb, shrub/seedling, sapling/poletimber, or sawtimber.
   4. Particular features of the site, such as closed vs. open canopy, presence and size of snags, rock outcrops, earth banks, permanent or temporary water, and other features.
   5. Size of the plot. Appendix I lists species with potential area sensitivity that may require forested areas of certain minimal sizes.

B. Referring to the appropriate vegetation type matrix to identify the pool of species most likely associated with the site:
   1. Locate the appropriate vegetation type in the manual;
   2. identify the appropriate successional stage column in the table for that vegetation type;
   3. list the species with entries for the appropriate season in that column;
   4. screen the list
      (a) omit those species not occurring in the state and physiographic province of the plot;
      (b) further eliminate those species whose substrate utilization or specific requirements include features not present on the site.

C. At this point a probable bird list has been developed for the plot. It may be used without further modification as an estimate of species that are likely to use the plot.

Successful management depends upon the precision with which the effects of management activities on bird populations can be assessed. Bird communities in forest stands can be predicted and monitored at 3 levels of precision. Presence-absence information is the simplest and least informative level of precision. If a land manager wants to know whether or not his management program is providing habitat for a bird species, or whether or not their property has potential to harbor certain species, presence-absence information is satisfactory.

More specific prediction can also be done, on two levels, (A) a semi-quantitative and (B) a quantitative one.

A. The semi-quantitative level involves the suitability ratings presented for different successional stage habitats of each vegetation type for each bird species. If a land manager wants to know whether or not their management program is providing better quality habitats for a bird species, then they must be able to rate the relative suitabilities of different habitat conditions available before and after the treatments are conducted. Semi-quantitative predictions can be made as follows: entries in the successional stage columns of each matrix are listed on an ordinal scale of relative suitability, as marginal ("M"), suitable ("S"), or optimal ("O") habitat for the species. In general, birds for whom a habitat is optimal are more likely to be present than those for whom it is suitable. Birds for whom the habitat is marginal may or may not be present (Hamel et al. 1988). Birds with large body sizes or large home ranges are less likely to occur in a habitat of a given suitability than are species whose body sizes or home ranges are small.

B. Quantitative predictions can be derived from suitability ratings in any of several ways, depending upon the assumptions the user wishes to make about the relationship of suitability rating to actual density. If a land manager has developed specific production goals in terms of populations of a species, then they require quantitative information on the density of the species before and after management activities are performed. I suggest 2 alternative methods for converting suitability ratings to estimated densities, involving (1) the average recorded density on plots in the South or (2) the maximum average density recorded on plots in a single habitat in the South.

Estimated density figures can be calculated from these average density figures and the habitat suitability ratings in a number of ways. Preliminary attempts to predict density on the basis of habitat suitability ratings and validate those predictions against published censuses have been encouraging (LeGrand and Hamel 1980, Hamel et al. 1986, Hamel et al. 1988); however, until extensive field testing is conducted, the results are nothing more than educated guesses. In any case, the methods work best with those territorial species whose home ranges are small relative to the size of a forest stand (ca. 8-20 ha); they work poorly or not at all with non-territorial species and those with large home ranges. Thus, densities of most passerines and woodpeckers can be predicted more accurately than can herons and egrets, hawks, Pileated Woodpeckers, crows, and nocturnal species such as owls and caprimulgids.

Many conversion functions are possible. It is the user's responsibility to choose an appropriate one. Because each of the suggested methods depends upon an average of several or many censuses, predictions made with these techniques will not generate suggested densities in optimal habitats that are as large as the largest published from the Southeast. They can thus be considered conservative techniques in this sense. Contrariwise, as averages overestimate low values, these techniques may overestimate the lowest densities recorded. I encourage users to test these data rationally, and to apply them prudently.

Predicting Effects of a Management Treatment

Often the manager's purpose in predicting bird lists will be to allow assessment of effects that proposed management activities are likely to have on the associated avifauna. The ability to anticipate impacts on birds provides the manager with the foresight to impose restrictions or mitigating actions to ameliorate any probable adverse impacts. Evaluating effects of alternative management treatments on the avifauna involves the following steps:

A. The possible treatment and its effects on the vegetation of a stand must be specified in terms compatible with the vegetation data presented in the matrices. Anticipated treatment effects might include type conversions, shifts in successional stages, or other alterations to vegetation structure or specific habitat components.

B. A pre-treatment list must be developed, as above, to reflect the expected bird community of the stand before treatment.

C. Second, a post-treatment list must be developed, as above, to reflect the expected bird community of the stand after treatment.

D. A comparison of the 2 lists will reveal those birds likely to benefit and those likely to be adversely impacted by the treatment.

E. These effects can potentially be quantified in terms not only of presence of individual species but also in terms of relative abundance.

F. The final results of the analysis constitute a crude community level assessment of the potential effects of the treatment.

Assessing effects of alternative management treatments primarily involves relating the effects of the proposed treatments to habitat elements listed in the matrices. Once the effects are specified in this way, preparing a bird list that reflects the anticipated treatment is a straightforward process of referring to the matrices. For example, a manager may wish to examine and compare the effects of controlled burning, of clearcutting, or of type conversion on the avifauna of a stand.

Each of these treatments constitutes a change in one or more vegetative habitat elements in that stand. Controlled burning involves selective removal of leaf litter, herbaceous groundcover, and woody understory vegetation, without impacting the overstory. Thus, species dependent upon the understory and midstory will be negatively impacted and those dependent upon the overstory likely will be unaffected. In the matrix, the pre- and post-treatment lists will both come from the same successional stage column; the post-treatment list will not include species dependent upon the removed understory, leaf litter,and herbaceous cover. Clearcutting involves a change in successional stage from sawtimber to grass-forb, and the bird lists are prepared from the different columns in the same matrix.

Modifications to the post-treatment list can be made depending upon how specific habitat elements, such as slash piles and windrows, are treated during site preparation after the cut. Finally, type conversion involves a change from one vegetation type to another, and the effects of such a management alternative can be found by comparing the relevant list from the initial vegetation type with that from the final vegetation type. Many other alternative treatments can be evaluated by describing their effects upon specific habitat elements and using combinations of matrix columns to determine which birds will be affected by the proposed management activities. Users must keep in mind that this is a summary document, based upon hypotheses of habitat relationships, and that projections of species changes as a result of management activity are projections only, and considerable testing must be done before the accuracy of these projections can be indicated.

Prescribing Habitat Management for Selected or Featured Species

Developing management programs to benefit selected species or selected groups of species is a process similar to that of assessing the effects of alternative management activities. In this situation, however, instead of determining which birds will be affected by which management practices, the emphasis is placed upon finding specific management practices that will benefit the selected species.

Species may be selected for management for many reasons, such as their sensitivity to specific disturbances, legal status, glamour, aesthetics, recreational or economic value, desirability to birdwatchers, or other reasons. Once a species is selected, development of a management program for it begins with the narrative species account and associated reference material, matrix entries, and appendices, in which data are presented on the specific requirements of the species. The manager can, using this information, choose specific management practices that enhance the development of those habitat elements required by the birds. For example, management programs designed to increase populations of cavity nesters, such as Pileated Woodpeckers, require the provision of sufficient quantities of snags of the proper size. Given this information, the manager can choose an appropriate method to provide the requisite snags.

Sources of Error in Predicting Bird Lists and Assessing the Effects of Alternative Silvicultural Prescriptions

Sources of error exist at every step in using the manual to predict the composition of bird communities. First, because of gaps in the published literature, the initial suitability ratings are not entirely accurate; changes in these will result in potentially large changes in densities computed from them. The ratings are likely to vary most where species use similar habitats to differing degrees in different locations. Likewise, the history of a particular stand can have a strong bearing on the avifauna found there. Stands on poor, eroded sites cannot be expected to support plant or animal communities as rich as stands that have not been subject to such past abuse. Presence or absence of species in an otherwise suitable habitat may also be affected by the size of the patch of forest in which the habitat is located (C.S. Robbins 1979, Robbins et al. 1989).

Second, mean densities derived from published censuses may not adequately reflect densities achieved by the birds in nature. For example, the high average breeding density for Northern Parulas (44 pairs/40 ha) is only 30% of the highest density recorded in the South, and less than 50% of that routinely recorded in censuses in old-growth bottomland hardwood stands in Congaree Swamp National Monument in South Carolina (Hamel 1989). The reasons for this discrepancy are inherent in the variability and unevenness of coverage in published censuses.

Third, possible conversion functions relating suitability ratings to predicted densities are not thoroughly tested, thus they can be expected to add further uncertainties. Finally, combining predicted densities for pre- and post-treatment conditions magnifies any existing errors.

Because of the various sources of error in data presented in this manual, the manager must use caution and sound professional judgment in developing predictions and interpretations from them. In spite of the problems noted above, these data are the most comprehensive available for the South. The wildlife resource is certainly best served when the manager applies the best information available rather than decrying the lack of or imprecision of data and doing nothing at all. By applying and testing the principles and data at hand we will be able to improve our efforts and our precision in the future.

Chapter III
RELATIONSHIPS OF BIRDS TO VEGETATION TYPES

Introduction

This chapter presents matrices showing associations of birds to habitat for the 23 vegetation types recognized in this manual. Each matrix is preceded by a short narrative account. Each account presents the definition of the type, includes pertinent remarks on the physiographic or other features associated with the type that are important to birds, and identifies the type with corresponding SAF and NFS forest types. Each account further lists relevant BBC or WBPS data from the type published in 1947-1979; presents lists of species that are characteristic of or restricted to the type; and, where available, lists useful references to birds in the type.

The matrices can also be found as Lotus 1,2,3 and Excel spreadsheets, and as delimited text files on a floppy diskette which accompanies this book. Instructions for using the spreadsheets are included with the diskette.

Exhaustive lists of literature bearing only vaguely on bird-habitat associations in the types are not presented. Instead, only the most important reviews dealing specifically with bird-habitat associations and management of birds in the type are included. Such pertinent literature is scarce or nonexistent, pointing out areas in which research, often extensive research, is necessary. Much of the available information resulted from several recent workshops conducted to compile existing material and outline future research needs (Smith 1975; DeGraaf 1978a, 1978b; DeGraaf and Evans 1979; DeGraaf and Tilghman 1980).

The sequence of the vegetation types generally reflects a geographic and physiographic gradient from Everglades marsh in the lowlands of southern Florida to spruce-fir forest in the highlands of North Carolina and Virginia. The vegetation types are:

1. Everglades,
2. Tropical hardwoods,
3. Mangroves,
4. Pine savanna,
5. Southern scrub oak,
6. Sand pine-southern scrub oak,
7. Longleaf pine-scrub oak,
8. Sandhills longleaf pine,
9. Southern mixed mesic hardwoods,
10. Bay swamp-pocosin,
11. Pond pine pocosin,
12. Longleaf pine-slash pine
13. Oak-gum-cypress,
14. Live oak maritime,
15. Elm-ash-cottonwood
16. Loblolly pine-shortleaf pine,
17. Virginia pine-pitch pine,
18. Mixed pine-hardwood,
19. Oak-hickory,
20. White pine-hemlock,
21. Cove hardwoods,
22. Maple-beech-birch, and
23. Spruce-fir.

Accounts are grouped, to the extent practicable, with accounts of vegetation types likely to occur in the same physiographic region. Each group is followed by a matrix which lists the birds that occur in each type. Each entry includes information about the suitability of successional stages of the type, substrate utilization patterns, and specific habitat requirements of the birds. Each species that occurs in a particular vegetation type has a row in the matrix for that vegetation type for each season (breeding, or wintering, or both) in which it occurs in that type. Entries in the rows of the matrices are grouped into 4 categories, reading left to right across a matrix: (A) seasonal occurrence; (B) suitability of successional stages of that vegetation type; (C) utilization of various canopy layer substrates of a forest; and (D) specific habitat requirements. Three of these categories (A), (C), and (D) pertain specifically to the bird species, *independently* of the vegetation type. The fourth category, (D), indicates the suitability of each of 4 successional stages of the vegetation type for each species. The distinction between the bird species dependent categories (A,C, and D) and the bird-habitat association category, (B), is important, because the information presented in categories (A), (C), or (D) may not apply in the same way in all vegetation types.

Thus, some combinations of columns may provide contradictory or inaccurate information; it is the user's responsibility to recognize this possibility. At the present time, insufficient data exist to permit indication of differential use of substrates, key habitat requirements, and successional stages of habitats in different parts of the South. The narrative species accounts provide general information on relative abundance of the species in different physiographic regions.

Geographic and seasonal occurrence

The first column of each matrix lists the seasons (Breeding-B, or Winter-W) in which a species occurs in the South. A final column in this section, "Local Area," is provided for the user to mark species known to occur in his or her local area.

Successional stages

For each of 4 successional stage habitats of each vegetation type I present a suitability rating for each species in each season of occurrence in that vegetation type. The stages are (1)grass/forb, (2)shrub/seedling, (3)sapling/poletimber, and (4)sawtimber. Four levels of suitability of the different successional stages of a vegetation type are possible for each species in each season of occurrence. The levels are "O"optimal habitat, "S"suitable habitat, and "M"marginal habitat; blank columns indicate unsuitable habitats in which the species is unlikely to occur. Optimal habitats are those in which the species occurs in highest frequency, greatest numbers, or both. Similarly, suboptimal and marginal habitats are those in which the species occurs in successively lower numbers and frequency.

Substrate utilization

Here are listed, in simplified form, those portions of the forest environment utilized by each species for various life activities. The main objective in this presentation has been to associate the species with the various canopy levels they use, rather than to identify all recognizable behavioral categories. Thus, the reader will understand that such disparate activities as singing, roosting, sleeping, and preening have been combined under the general rubric of "perching." The data presented in these columns of the matrices were derived from the species accounts from which the narratives were prepared. Appendix D groups the species by this information, and by that in the guild accounts, into nesting, foraging, and dietary guilds.

Specific requirements

Here are presented those habitat elements in Southern forests requiring particular attention from managers along with species likely to be affected by manipulation of those elements. Because these elements are of particular importance, I further group the species associated with most of these elements into separate appendices devoted specifically to single elements. Some of the information presented here is common knowledge, such as the species requiring earth banks, rock outcrops, and slash piles or windrows. Other information is reasonably well supported by a combination of literature and field experience, such as the species utilizing aquatic habitats or snags (Scott et al. 1977, Evans and Conner 1979). Requirements for differing canopy densities, grassy forest openings, and particularly for large sawtimber trees, are more conjectural, because too few data exist for the South. Research into old-growth associations in the South is desperately needed, for known virgin stands are scarce and not all types are represented. I have included only those species in the list of species of large sawtimber trees where the authors of Hamel et al. (1982) agreed that a species achieved greater density and frequency of occurrence in stands of such trees. Other species not listed may achieve greater abundance in old-growth stands as well.

Vegetation Type Accounts

Everglades (EVER)

This nonforested vegetation type that has no SAF or NFS counterpart is included because it is an extensive, nonmarine environment that occupies a substantial part of southern Florida. Everglades are biologically important as the primary habitat for numerous aquatic and marsh inhabiting birds. For purposes of this work, the coastal wetlands of the northern Gulf Coast in Lousiana are considered equivalent to this type.

Only the grass/forb stage habitat is included in the matrix. I assume, in the characterizations, that some scattered trees and shrubs are present as perching sites, but that these are not aggregated into hammocks of forest stand proportions (ca. 20-50 acres, 8-20 ha).

One BBC and 1 WBPS have been published for this type from the Southeast 1947-1979.

Characteristic of this vegetation type are Least Bitterns, American Bitterns (W), Northern Harriers (W), King Rails, Common Yellowthroats, and Red-winged Blackbirds.

Restricted primarily to this type are Snail Kites.

Many common species of the type are treated in Sprunt et al. (1978). Wade et al. (1980) discuss this and other south Florida vegetation types. Sykes and Hunter (1978) present some information on habitat use by birds in modified Everglades habitats.

Tropical Hardwoods (TROP)

This vegetation type includes forests of central and southern Florida in which various species of mostly tropical broadleaf evergreen trees, singly or in combination, constitute a plurality of the stocking. These forests are rarely, if ever, flooded. No NFS equivalent exists. The type is the same as SAF type 105, tropical hardwoods; and RRE type 95, other tropical.

No BBC or WBPS was reported from this type in 1947-1979.

Characteristic bird species of this vegetation type are White-crowned Pigeons (B), Yellow-billed Cuckoos (B), Great Crested Flycatchers (W), Gray Catbirds (W), White-eyed Vireos, Black-whiskered Vireos (B), Prairie Warblers (W), Palm Warblers (W), and Northern Cardinals.

Black-whiskered Vireos (B) are *restricted* to this type.

Wade et al. (1980) discuss this and other south Florida vegetation types.

Mangroves (MANG)

This vegetation type includes forests, primarily in southern Florida, in which red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia nitida*), or white mangrove (*Laguncularia racemosa*), singly or in combination, constitute a plurality of the stocking. There is no NFS equivalent. It is equivalent to SAF type 106, mangrove; and to RRE type 93, mangrove. The type is most closely associated with brackish and saltwater environments. As such it provides important nesting substrates for numerous aquatic species such as Magnificent Frigatebirds and many waders.

No BBC or WBPS was done in this type in the Southeast 1947-1979.

Characteristic of this vegetation type are Tricolored Herons (B), White Ibises (B), Gray Kingbirds (B), Fish Crows, Black-whiskered Vireos (B), Prairie Warblers (W), and Red-winged Blackbirds.

Restricted to this type are Magnificent Frigatebirds (B), Reddish Egrets (B), Roseate Spoonbills (B), Mangrove Cuckoos, and Black-whiskered Vireos (B).

Wade et al. (1980) discuss this and other south Florida vegetation types.

Common Name	BW[a]	Local	Habitat Suitability by Vegetation Type and Successional Stage												Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Pied-billed Grebe	B		M														N					F		
	W		M																			FB		
Brown Pelican	B							M	M			O	S		N		N	N				S		
	W																							
Double-crested Cormorant	B								M	M			S							N	NDT NOC	A	F	
	W																							
Olivaceous Cormorant	B											M	M				N	N	NP	NP	PDT	A	A	
	W																		P	P	PDT	A	A	
Anhinga	B							M	M	M		M	S					NP	NP	NP		FB		
	W		M															P	P	P		FB		
Magnificent Frigatebird	B											S	O					NP				S		
	W																							
American Bittern	B		M														*					A		
	W		O														*					A		
Least Bittern	B		S														*					FB		
	W		S														*					FB		
Great Blue Heron	B							M	M	S		M	O		F		F			NP	NDT PDT	A	F	
	W		O												F		F			P	PDT	A	F	
Great Egret	B							S	S	S		S	O		F		F	NP	NP	NP		A	F	
	W		O												F		F	P	P	P		A	F	
Snowy Egret	B							S	S	S		S	O		F		F	NP		NP		A	F	
	W		O												F		F	P		P		A	F	
Little Blue Heron	B							S	S	M		S	S		F		F	*		NP		A	F	
	W		O												F		F	*		P		A	F	
Tricolored Heron	B							S	S	M		S	O		F		F	NP		NP		A		
	W		O												F		F	P		P		A		
Reddish Egret	B							M	S	M		S	O		F		F	NP		NP		SB		
	W		M												F		F	P		P		SB		
Cattle Egret	B							S	S	M		M	O		F		F	NP		NP		F		
	W		M												F		F	P		P		F		
Green-backed Heron	B							S	S	S		O	O		F		F	*	NP	NP	FSW	A	F	
	W		O												F		F	*	P	P	FSW	A	F	
Black-crowned Night Heron	B							S	S	M		S	O				F	NP		NP		A	F	
	W		O														F	P		P		A	F	
Yellow-crowned Night Heron	B							M	M	M		S	S		F				NP	NP		A	F	
	W		S												F				P	P		A	F	

(a) B - Breeding
W - Wintering

(b) Specific Requirements Code Key

First Letter
N - Nests
P - Perches
F - Forages
* - All Requirements

2nd and 3rd Letters
DT - Dead Trees
BT - Big Trees
CC - Closed Canopy
OC - Open Canopy
GO - Grassy Openings
DL - Downed Logs
RP - Rocky Places
EB - Earth Banks
LC - Living Cavity Tree

15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
35 - 35 cm Min. Snags
46 - 46 cm Min. Snags

(c) Water Codes
A - All
F - Fresh
B. - Brackish
S - Sal

Common Name	BW[a]	Local	Habitat Suitability by Vegetation Type and Successional Stage												Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
White Ibis	B							S	S	M		S	O		F		F	NP	NP	NP		A		
	W		O												F		F		P	P		A		
Glossy Ibis	B							S	S	M		S	O		F		F	NP	NP	NP		A		
	W		O												F		F		P	P		A		
White-faced Ibis	B											M	M					N	NP	NP		FB	FB	
	W																		P	P		FB	FB	
Roseate Spoonbill	B							S	S	M		M	O					N	N	NP		SB		
	W		M																	P		SB		
Wood Stork	B							M	S	S		M	S					NP	NP	NP		A		
	W		O																	P		A		
Mallard	B																							
	W		M														FP					FB	F	
Black Vulture	B							M	S	S					F	F	F	F		*				
	W						M	M	S	S					F	F	F	F		*				
Turkey Vulture	B							S	O	O					F	F	F	F		*				
	W						M	S	S	O					F	F	F	F		*				
Osprey	B		S						M	S			S							NP	NDT PDT NBT PBT N46 P46	A	F	
	W		S						M	S			S							P	PDT PBT P46	A	F	
American Swallow-tailed Kite	B									M					F		F	F	F	NP	NBT PBT	F	F	
	W																							
Black-shouldered Kite	B														F		F	N		N				
	W														F		F							
Snail Kite	B		O														*					F		
	W		O														*					F		
Bald Eagle	B		M							M			M							NP	PDT NBT PBT P46	A	F	
	W		M						M	S			M							P	PDT PBT P46	A	F	
Northern Harrier	B																							
	W		O				M								F		*							
Sharp-shinned Hawk	B														F	F	F	F	F	*	NCC			
	W								S	S			M		F	F	F	F	F	*				
Cooper's Hawk	B														F	F	F	F	F	*	NCC			
	W								S	S			M		F	F	F	F	F	*				
Red-shouldered Hawk	B								M	S			M		F		F	F		*		F	F	55
	W		M				S	M	S	S		M	M		F		F	F		*		F	F	
Broad-winged Hawk	B														F	F	F	F		*				Yes
	W								S	O			M		F	F	F	F		*				

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			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Short-tailed Hawk	B								S	S			O		F		F	F		*				
	W								O	O			O		F		F	F		*				
Swainson's Hawk	B																							
	W						M								F		F							
Red-tailed Hawk	B									M					F		F			*	PDT			
	W						M	M	M	M					F		F			*	PDT			
American Kestrel	B														F		F			*	*DT F15 *35 NLC			
	W		M				O	S	M	M					F		F			*	FDT F15			
Merlin	B																							
	W		M				S	M	M	M		M	M		F		F							
Peregrine Falcon	B														F		F			F	PDT NRP PRP			
	W		M				S	M	M	M		M	M		F		F			F	PDT PRP			
Wild Turkey	B								M	M					F	*	*		P	P	FGO			
	W							M	M	M					F	*	*		P	P	FGO			
Northern Bobwhite	B						M	M							F		*				*GO			
	W						M	M							F		*				*GO			
Yellow Rail	B																							
	W		S												F		*					A		
Black Rail	B																							
	W		M												F		*					A		
King Rail	B		O												F		*					FB		
	W		O												F		*					FB		
Virginia Rail	B																							
	W		M												F		*					FB		
Sora	B																							
	W		O												F		*					F		
Purple Gallinule	B		M														*					F		
	W		M														*					F		
Common Moorhen	B		M														*					F		
	W		M														*					F		
American Coot	B																							
	W		M														*					FB		
Limpkin	B		S												F		*	N				F	F	
	W		S												F		*					F	F	
Sandhill Crane	B		M				M										*					F		
	W		M				M										*					F		

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46 - 46 cm Min. Snags

(c) Water Codes
A - All
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Common Name	BW[a]	Local	Habitat Suitability by Vegetation Type and Successional Stage												Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Common Snipe	B																							
	W		S												F		F					FB	F	
American Woodcock	B														F	*	F					F		
	W								M	M					F	*	F					F		
White-crowned Pigeon	B							S	O	M		S	O					N	*	*				
	W							S	O	M		S	O						*	*				
Mourning Dove	B							S	S	M					F		F		NP	NP				
	W						S	S	S	M					F		F		P	P				
Common Ground-Dove	B							S	S	M					F		*	N						
	W						S	S	S	M					F		*	*						
Yellow-billed Cuckoo	B								O	O			S					N	*	*				Yes
	W																							
Mangrove Cuckoo	B							M	O	S		M	O					*	*	*				
	W							M	O	S		M	O					*	*	*				
Smooth-billed Ani	B							M	M	M		M	S		F		F	*						
	W						M	M	M	M		M	S		F		F	*						
Common Barn-Owl	B		M				M	M							F		F	P		P	N46 NLC NRP			
	W		S				O	S							F		F	P		P	P46 PLC PRP			
Eastern Screech-Owl	B								M	S					F	F	F	F	*	*	NDT N35 NLC			
	W								M	S					F	F	F	F	*	*	PDT P35 PLC			
Great Horned Owl	B									M					F	F	F	F	F	*				None
	W								M	M					F	F	F	F	F	*				None
Burrowing Owl	B														*		*							
	W														*		*							
Barred Owl	B									S					F	F	F	F	F	*	NDT NLC	F	F	None
	W									S					F	F	F	F	F	*	PDT PLC	F	F	None
Short-eared Owl	B																							
	W		M												F		*							
Common Nighthawk	B						M	M	M	M					N						NRP			
	W																							
Chuck-will's-widow	B								M	M						N								
	W								S	O						P								
Whip-poor-will	B															N								Yes
	W								S	S						P								
Ruby-throated Hummingbird	B																	*	*	*				Yes
	W							S	O	O		M	M					*	*	*				

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			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Belted Kingfisher	B		M						M	M			M					P	P		PDT F15 FSW NEB	A	F	
	W		M						M	M			M					P	P		PDT F15 FSW	A	F	
Red-bellied Woodpecker	B								M	S			S							*	*DT N35 NLC			1
	W								M	S			S							*	*DT P35 PLC			
Yellow-bellied Sapsucker	B																	F	F	*	*DT N25 N25 NLC			
	W								M	M			M					F	F	*	*25 *LC			
Downy Woodpecker	B								M	M								*	*	*	*DT *15 *LC			
	W								M	M								*	*	*	*DT *15 *LC			
Hairy Woodpecker	B								M	M									*	*	*DT *25 *LC			18
	W								M	M									*	*	*DT *25 *LC			
Northern Flicker	B								M	M					F		F			*	*DT *OC N35 N35 NLC			
	W								S	S					F		F			*	*DT			
Pileated Woodpecker	B									S			M						F	*	*DT *BT *CC *46 NLC FDL			##
	W									S			M						F	*	*DT *BT *CC *46 PLC FDL			
Least Flycatcher	B																		*	*	*OC			
	W							O	S	M									*	*	*OC			
Eastern Phoebe	B																	*	*		*OC NRP			
	W						S	S	S	M		M	M		F		F	*						
Vermilion Flycatcher	B																							
	W														F		F	*	*	*	*DT *OC	F		
Ash-throated Flycatcher	B																							
	W							M	M	M		M	M					*	*		*OC			
Great Crested Flycatcher	B								M	S			M						F	*	NDT N25 NLC			1
	W								M	O			M						F	*	PDT			
Brown-crested Flycatcher	B																							
	W							M	M	M								*	*	*				
Western Kingbird	B																							
	W						S								F		F	*		*	FDT F15			
Eastern Kingbird	B																							
	W																F			*	FDT *OC F15			
Gray Kingbird	B																							
	W							S	O	M		S	O					*	*	*	FDT F15			
Scissor-tailed Flycatcher	B														F		F	*	*	*	*DT *OC			
	W						S	M	M	M					F		F	*	*	*	*DT *OC			
Purple Martin	B		M				M					M									NDT N25 NLC			
	W																							

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			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Tree Swallow	B								M	M					F	F	F	F	*	*	NDT N15	FB	F	
	W		O				O	O	S	M		O	S					*					FB	F	
Northern Rough-winged Swallow	B																							
	W		S				M	M	M	M		M	M									FB	F	
Blue Jay	B								M	S					F	F	F	F	*	*				Yes
	W							M	M	S					F	F	F	F	*	*				
American Crow	B								M	S					F		F			*	NCC			
	W						S	M	M	S					F		F			*	PCC			
Fish Crow	B		S					M	M	M		S	O		F		F	*		*		A	F	
	W		S				M	M	M	M		S	O		F		F			*		A	F	
Tufted Titmouse	B								M	M								F	*	*	NDT N15			2
	W							M	M	M								F	*	*				
Carolina Wren	B							S	O	O		M	M		*	*	*	*	*		N15 NLC *SW NRP			
	W							S	O	O		M	M		*	*	*	*	*		*SW			
House Wren	B																F	*						
	W						M	O	M	M		M					F	*			*SW			
Sedge Wren	B																							
	W		S												F		*	*						
Marsh Wren	B																*					A		
	W		M														*					A		
Ruby-crowned Kinglet	B																							
	W							M	S	S		M	S					*	*	*				
Blue-gray Gnatcatcher	B								M	M								*	*	*				37
	W							M	O	O		M	M					*	*	*				
Hermit Thrush	B															*	F	P	P	P	*CC			
	W								S	S						*	F	*	*		*CC			
American Robin	B														F		F	N	N	NP	*GO			
	W							M	M	S		M	M		F		F	*	*	*				
Gray Catbird	B																	*	P					
	W							O	O	S		S	S				*	*						
Northern Mockingbird	B						M	M									F	*			*OC			
	W						M	M									F	*	*		*OC			
Cedar Waxwing	B																	*	*	*	*OC			
	W							M	M	M		M	M					*	*	*	*OC			
European Starling	B														F		F				NDT N25 NLC NRP			
	W						M	M	M	M					F		F	F	F	F				

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			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
White-eyed Vireo	B		S					O	S	M		S	M				F	*	P					
	W		S					O	S	M		O	S				F	*						
Solitary Vireo	B																	N	*	*				Yes
	W								M	S			M						*	*				
Yellow-throated Vireo	B																		F	*				Yes
	W								M	O									F	*				
Black-whiskered Vireo	B								O	O			O					N	*	*				
	W																							
Orange-crowned Warbler	B																							
	W						M	O	S	M		M	M				*	*	*		*SW			
Northern Parula	B																		*	*				##
	W								M	O			M						*	*				
Yellow Warbler	B							M				O	O					*						
	W							S	S			O	S					*						
Magnolia Warbler	B																	*	*	*				
	W								S	O			M					*	*	*				Yes?
Cape May Warbler	B																							
	W								S	O			M				*	*	*	*				
Black-throated Blue Warbler	B																	*	*	F	PDT *CC			##
	W								S	O			M			F		*	*	*				
Yellow-rumped (Myrtle) Warbler	B																							
	W							M	M	M		O	O		*	*	*	*	*	*				
Black-throated Green Warbler	B												M						F	*	*CC			Yes
	W								S	O									F	*				
Yellow-throated Warbler	B																			*	FDT *BT			Yes
	W								M	S			M							*	FDT *BT			
Prairie Warbler	B											S					F	*						
	W							O	O	S		S	S				*	*						
Palm Warbler	B																							
	W		M				S	O	M			S	M		*		*	*						
Black-and-white Warbler	B															N	N		F	F	*CC			##
	W								S	O			M						F	*				
American Redstart	B																	*	*	FP				
	W								O	S			O					*	*	*				Yes
Worm-eating Warbler	B															*	F	*	P		*CC			##
	W								O	O						*?	*?	*	*					

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			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Ovenbird	B														*	*		P	P					15
	W								O	O					*	*								
Northern Waterthrush	B														*			P	P			F		##
	W							S	S	M		O	O		*							F	F	
Common Yellowthroat	B		O				M	S				S					*	*						
	W		O				S	O				S					*	*						
Yellow-breasted Chat	B																	*			PDT			
	W							O	M			S	M					*						
Summer Tanager	B								M	M									*	*				##
	W																							
Northern Cardinal	B							S	O	O			M			*	*	*	F	F				
	W							O	O	O			M			*	*	*						
Indigo Bunting	B																*	*	P	P	*OC			
	W						S	O	S	M		M	M				*	*						
Painted Bunting	B											M	M				*	*	P					
	W							O	O			M	M				*	*						
Dickcissel	B																*	P						
	W						M	M									*	*						
Rufous-sided Towhee	B							S	S	M		M	M			F	*	*	P	P				
	W							S	S	M		M	M			F	*	*						
Rufous-crowned Sparrow	B														FP		*	*	P		*OC *RP			
	W														FP		*	*	P		*OC *RP			
Chipping Sparrow	B														F		*	*	*	*				
	W						M	M	M	M					F		*	*	*	*	*OC			
Clay-colored Sparrow	B																							
	W														F		F	*			*OC			
Field Sparrow	B																*	*						
	W						M	M									*	*						
Lark Sparrow	B														F		*	*	P		*OC *GO *RP			
	W						M	M							F		F	*			*OC *GO			
Savannah Sparrow	B																*							
	W		M				S										*							
Grasshopper Sparrow	B																*							Yes
	W		M				S										*							
Sharp-tailed Sparrow	B																							
	W		M												*		*					SB		

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			EVER				TROP				MANG													
			1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Seaside Sparrow	B		M												*		*					SB		
	W		M												*		*					SB		
Song Sparrow	B																*	*						
	W		M									M					*	*						
Lincoln's Sparrow	B																							
	W						M	M									*	*				F		
Swamp Sparrow	B																							
	W		S									M					*					FB		
Red-winged Blackbird	B		O				S	S				O	S				*	*	P	P				
	W		O				S	O	S	S		O	S				*	P	P	P				
Eastern Meadowlark	B		S				M										*							Yes?
	W		S				M										*							Yes?
Boat-tailed Grackle	B		O												F		*	N	N	N		A		
	W		O												F		*	P	P	P		A		
Common Grackle	B														F		F	N	NP	NP				
	W											M	M		F		*	P	P	P				
Brown-headed Cowbird	B														F		F				NDT *OC N15			
	W							M	M	M					F		*	P	P	P				
Northern (Baltimore) Oriole	B																		F	*	*OC			
	W								M	S								*	F	*	*OC			
American Goldfinch	B																*	*	P	P				
	W						S	S	S	S		M	M		F		F	F	*	*				

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Pine Savanna (PSAV)

A pine savanna is a "forest" of widely scattered trees in which longleaf pine, slash pine, or south Florida slash pine, singly or in combination, compose a plurality of the stocking. The type is most prominent in central and southern Florida, in a physiographic situation such as marl flats and forest prairies (RRE Physiographic Class 37). Basal areas are low, about 10-20 ft^2/acre (0.2-5 m^2/ha). The savanna physiognomy, combining trees with grassland, is primarily responsible for the birds associated with this type.

The type has no specific SAF or RRE type designation. NFS type 98, undrained flatwoods, is an approximation. The NFS Compartment Prescription Fieldbook (USDA 1979) indicates that such areas may be designated as nonstocked within one of the management types.

No BBC was conducted in this type in the Southeast 1947-1979. A single plot was censused during 9 WBPS.

Characteristic of this vegetation type are Crested Caracaras, American Kestrels (W), Common Bobwhites, Sandhill Cranes, Burrowing Owls, Eastern Bluebirds, Pine Warblers, Eastern Meadowlarks, Rufous-sided Towhees, and Bachman's Sparrows.

Restricted to this type are Black-shouldered Kites, Crested Caracaras, and Sandhill Cranes.

Southern Scrub Oak (SOSO)

This type comprises forests of sandy, upland topography in which various species of scrub oaks (*Quercus* sp.) make up at least 75 percent of the stocking. This type is the same as NFS types 57, scrub oak; and 49, bear oak-southern scrub oaks-yellow pine (in part). It corresponds to SAF type 72, southern scrub oak; and to RRE type 57, southern scrub oak.

Four censuses have been published from this type, all from Florida; 2 BBC and 2 WBPS were conducted on shrub-seedling plots.

Characteristic of this vegetation type are Northern Bobwhites, Common Ground-Doves, Scrub Jays, Carolina Wrens, and Rufous-sided Towhees.

Scrub Jays are *restricted* to the type.

Sand Pine-Southern Scrub Oak (SPSO)

This vegetation type consists of forests of sandy, upland topography in which sand pine (*Pinus clausa*) and scrub oaks (any of several *Quercus* sp.) each constitute at least 25 percent of the stocking. The type corresponds to NFS types 34, sand pine; 19, sand pine-hardwood; and 49, bear oak-southern scrub oaks-yellow pine (where the yellow pine is sand pine). It is equivalent to SAF type 69, sand pine; and to RRE type 34, sand pine.

Published censuses consist of one BBC and one WBPS, both made in poletimber stands in Florida.

Characteristic of this vegetation type are Common Ground-Doves, Scrub Jays, and Rufous-sided Towhees.

Scrub Jays are *restricted* to this type.

Longleaf Pine-Scrub Oak (LLSO)

These are forests of sandy, upland topography in which longleaf pine (*Pinus palustris*) and scrub oaks (any of several *Quercus* sp.) each make up at least 25 percent of the stocking. The type corresponds to NFS type 21, longleaf pine, with extensive scrub oak understory; and to NFS type 49, bear oak-southern scrub oaks-yellow pine (where yellow pine is longleaf pine). It is equivalent to SAF type 71, longleaf pine-scrub oak; and to RRE type 21, longleaf pine, with extensive scrub oak understory.

Nine censuses have been published from this type. Six BBC were conducted on 2 sapling/poletimber plots in Florida, and a single sapling/poletimber plot in that state was censused during one winter. A sawtimber plot in North Carolina was censused during 2 winters.

Characteristic of this vegetation type are Pine Warblers and Rufous-sided Towhees.

No species are *restricted* to this type.

Sandhills Longleaf Pine (SHLL)

These are forests of sandy, upland topography in which longleaf pine composes a majority of the stocking, and where hardwoods make up less than 25 percent of the stocking. The type corresponds to NFS type 21, longleaf pine (in part). It is equivalent to SAF type 70, longleaf pine (in part); and to RRE type 21, longleaf pine (in part). In each case the combination of the longleaf pine and physiographic condition, such as sandhills (RRE Physiographic Class 14) or sand dunes and sand ridges (RRE Physiographic Class 12) characterizes the type.

No BBC or WBPS was conducted in this type in the Southeast in 1947-1979.

Characteristic of this vegetation type are Red-cockaded Woodpeckers, Brown-headed Nuthatches, and Pine Warblers.

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			PSAV				SOSO				SPSO				LLSO				SHLL												
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
American Bittern	B		M																						*					A		
	W		S																						*					A		
Least Bittern	B		M																						*					FB		
	W		M																						*					FB		
Great Blue Heron	B																						F		F			NP	NDT PDT	A	F	
	W		M	M	M	M																	F		F			P	PDT	A	F	
Great Egret	B																						F		F	NP	NP	NP		A	F	
	W		M																				F		F	P	P	P		A	F	
Snowy Egret	B																						F		F	NP		NP		A	F	
	W		M																				F		F	P		P		A	F	
Little Blue Heron	B																						F		F	*		NP		A	F	
	W		M																				F		F	*		P		A	F	
Tricolored Heron	B																						F		F	NP		NP		A		
	W		M																				F		F	P		P		A		
Cattle Egret	B																						F		F	NP		NP		F		
	W		S	M	M	M																	F		F	P		P		F		
Greenbacked Heron	B																						F		F	*	NP	NP		A	F	
	W																						F		F	*	P	P		A	F	
Blackcrowned Night Heron	B																								F	NP		NP		A	F	
	W		M																						F	P		P		A	F	
Yellowcrowned Night Heron	B																						F				NP	NP		A	F	
	W																						F				P	P		A	F	
White Ibis	B																						F		F	NP	NP	NP		A		
	W		M																				F		F		P	P		A		
Glossy Ibis	B																						F		F	NP	NP	NP		A		
	W		M																				F		F		P	P		A		
Wood Stork	B																									NP	NP	NP		A		
	W		M																									P		A		
Black Vulture	B			S	O	O		S	O			M	S			M	S	S		M	M	M	F	F	F	F		*			
	W		M	S	O	O	M	S	O		M	M	S		M	M	S	S	M	M	M	M	F	F	F	F		*			
Turkey Vulture	B			S	O	O		S	O			M	S			M	S	S		M	M	M	F	F	F	F		*			
	W		M	S	O	O	M	S	O		M	M	S		M	M	S	S	M	M	M	M	F	F	F	F		*			
Osprey	B				M	S																						NP	NDT PDT NBT PBT N46 P46	A	F	
	W				M	S																						P	PDT PBT P46	A	F	
American Swallowtailed Kite	B					S																	F		F	F	F	NP	NBT PBT	F	F	
	W																															

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25 - 25 cm Min. Snags
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			PSAV				SOSO				SPSO				LLSO				SHLL													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Blackshouldered Kite	B		O	S	S	M	S	M	M		M	M	M										F		F	N		N				
	W		O	S	S	M	S	M	M		M	M	M										F		F							
Snail Kite	B		S	S	M	M																			*					F		
	W		S	S	M	M																			*					F		
Bald Eagle	B					S																						NP	PDT NBT PBT P46	A	F	
	W				M	S																						P	PDT PBT P46	A	F	
Northern Harrier	B																															
	W		M	M	M	M	M				M				M				M				F		*							
Sharpshinned Hawk	B																						F	F	F	F	F	*	NCC			
	W								S				M				M	M			M	M	F	F	F	F	F	*				
Cooper's Hawk	B								M														F	F	F	F	F	*	NCC			
	W								S				M				M	M			M	M	F	F	F	F	F	*				
Redshouldered Hawk	B				M	M																	F		F	F		*		F	F	550
	W		S	M	S	S																	F		F	F		*		F	F	
Shorttailed Hawk	B				M	M																	F		F	F		*				
	W																						F		F	F		*				
Redtailed Hawk	B				M	M																	F		F			*	PDT			
	W		M	M	M	M	M	M	M		M	M	M		M	M	M	M	M	M	M	M	F		F			*	PDT			
Crested Caracara	B		O	S	S	M	M																F		F	N			*OC			
	W		O	S	S	M	M																F		F				*OC			
American Kestrel	B		S	S	S	S	M				M												F		F			*	*DT F15 *35 NLC			
	W		O	O	O	O	S	M			S	M			S	M			S	M			F		F			*	FDT F15			
Merlin	B																															
	W		M	M	M	M																	F		F							
Peregrine Falcon	B																						F		F			F	PDT F15 NRP PRP			
	W		M	M	M	M																	F		F			F	PDT PRP			
Black Francolin	B		M																				F		*				*OC			
	W		M																				F		FP				FOC POC			
Wild Turkey	B				M	M							M				M	M			S	S	F	*	*		P	P	FGO			
	W			M	M	M						M	M			S	S	S			S	S	F	*	*		P	P	FGO			
Northern Bobwhite	B		M	O	O	O	M	S			M	S	M		S	S	S	S	S	S	S	S	F		*				*GO			
	W		M	O	O	O	M	S			M	S	M		S	S	S	S	S	S	S	S	F		*				*GO			
King Rail	B		M																				F		*					FB		
	W		M																				F		*					FB		
Limpkin	B		M	M	M	M																	F		*	N				F	F	
	W		M	M	M	M																	F		*					F	F	

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			PSAV				SOSO				SPSO				LLSO				SHLL													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Sandhill Crane	B		O	S	M	M																			*					F		
	W		S	S	M	M																			*					F		
Killdeer	B		M	M	M	M																	*		*							
	W		M	M	M	M																	*		*							
Rock Dove	B		M				M				M				M				M				F		F				NRP			
	W		M				M				M				M				M				F		F				PRP			
Whitecrowned Pigeon	B							M	M																	N	*	*				
	W							M	M																		*	*				
Whitewinged Dove	B																						F		F		NP	P				
	W		M	M	M	M																	F		F	FP	P	P				
Mourning Dove	B			S	S	M		O	O			S	S		M	S	S	M	M	S	S	S	F		F		NP	NP				
	W		S	S	S	M	S	S	S		S	S	S		M	S	S	M	S	S	S	S	F		F		P	P				
Common GroundDove	B			M	M	M		O	S			O	S			S	S	M		M	M	M	F		*	N						
	W		M	M	M	M	O	O	S		O	O	S		S	S	S	M	M	M	M	M	F		*	*						
Yellowbilled Cuckoo	B								M																	N	*	*				Yes
	W																															
Greater Roadrunner	B		M	S	M	M	M	S	S						M	S	S	S					F		F	*	*	N	*OC			
	W		M	S	M	M	M	S	S						M	S	S	S					F		F	FP	FP		FOC POC			
Smoothbilled Ani	B							M	M														F		F	*						
	W						M	M	M														F		F	*						
Groovebilled Ani	B																						F		F	*			*OC			
	W		M	M																			F		F	FP			FOC POC			
Common BarnOwl	B		S	M	M	M	S	M			M	M			M	M			M	M			F		F	P		P	N46 NLC NRP			
	W		S	M	M	M	S	M			M	M			M	M			M	M			F		F	P		P	P46 PLC PRP			
Eastern ScreechOwl	B				M	S			M				M				M	S			M	S	F	F	F	F	*	*	NDT NLC			
	W				M	S			M				M				M	S			M	S	F	F	F	F	*	*	PDT PLC			
Great Horned Owl	B					S												M				S	F	F	F	F	F	*			None
	W				M	S											M	M			M	S	F	F	F	F	F	*			None
Burrowing Owl	B		O				S				M				M								*		*							
	W		O				S				M				M								*		*							
Shorteared Owl	B																															
	W		M	M																			F		*							
Common Nighthawk	B		M	M	M	M	S	O	S		S	O	S		S	S	M	M	S	S	M	M	N									
	W																															
Chuckwill'swidow	B								M				S				M	S			M	M		N								
	W								S				S				M	M						P								

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			PSAV				SOSO				SPSO				LLSO				SHLL													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Whippoorwill	B																							N							Yes
	W								M				M				M	M						P							
Rubythroated Hummingbird	B							M	M			M	M			M	M	M								*	*	*				Yes
	W							S	S			M	M													*	*	*				
Redheaded Woodpecker	B				M	S			M				M				M	S			M	O			F				*DT *OC N35			
	W				M	S			M				M				M	M			M	S			F	F	F	*	*DT			
Redbellied Woodpecker	B				M	M			M				M				M	S			M	S						*	*DT N35 NLC			1
	W				M	M			M				M				M	S			M	S						*	*DT P35 PLC			
Yellowbellied Sapsucker	B																									F	F	*	*DT N25 NLC			
	W				M	M			S				M				M	M			M	M				F	F	*	*25 *LC			
Downy Woodpecker	B				M	M			M				M				M	M			M	M				*	*	*	*DT *15 *LC			
	W				M	M			M				M				M	M			M	M				*	*	*	*DT *15 *LC			
Hairy Woodpecker	B								M				M				M	M			M	M					*	*	*DT *25 *LC			18
	W								M				M				M	M			M	M					*	*	*DT *25 *LC			
Redcockaded Woodpecker	B				M	S							M				M	S			M	O					F	F	*BT *LC			
	W				M	S							M				M	S			M	O					F	F	*BT *LC			
Northern Flicker	B				M	S			M				M				M	M			M	M	F		F			*	*DT *OC N35 NLC			
	W				S	S			M				M				M	M			M	M	F		F			*	*DT			
Eastern WoodPewee	B				M	M			M				M				M	S			M	O					F	*	FDT F15			
	W																															
Least Flycatcher	B																										*	*	*OC			
	W							M	M			M	M														*	*	*OC			
Eastern Phoebe	B																									*	*		*OC NRP			
	W		M	S	M	M	M	M	M		M	M	M		M	M	M	M	M	M	M	M	F		F	*						
Vermilion Flycatcher	B																															
	W			S	S	M																	F		F	*	*	*	*DT *OC	F		
Ashthroated Flycatcher	B																										*	*	*OC			
	W																															
Great Crested Flycatcher	B				M	M			M				M				M	S			M	S					F	*	NDT N25 NLC			1
	W								M																		F	*	PDT			
Browncrested Flycatcher	B																															
	W																										*	*	*			
Western Kingbird	B																															
	W																						F		F	*		*	FDT F15			
Eastern Kingbird	B																															
	W		M	M	M	M																			F			*	FDT *OC F15			

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			PSAV				SOSO				SPSO				LLSO				SHLL													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Scissortailed Flycatcher	B		S	S	S	S	S	S	M						S	M	M						F		F	*	*	*	*DT *OC			
	W		S	S	S	S																	F		F	*	*	*	*DT *OC			
Purple Martin	B		M				M				M				M				M										NDT N25 NLC			
	W																															
Tree Swallow	B																												NDT N15			
	W		M	M	M	M																				*				FB	F	
Barn Swallow	B														M				M											FB	F	
	W																												NRP			
Blue Jay	B								S				S				M	S			M	S	F	F	F	F	*	*				
	W							M	S			M	S			M	M	S		M	M	S	F	F	F	F	*	*				Yes
Scrub Jay	B							S	O			M	S			M	S									*						
	W							S	O			M	S			M	S									*						
American Crow	B								M				M				M	M			M	M	F		F			*	NCC			
	W						S	M	M		S	M	M		S	M	M	M	S	M	M	M	F		F			*	PCC			
Fish Crow	B							M	S			M	M										F		F	*		*		A	F	
	W						M	M	S		M	M	M										F		F			*		A	F	
Carolina Chickadee	B								M				M				M	S			M	S				F	*	*	NDT N15 P15 NLC PLC			
	W							M	M			M	M			M	M	S		M	M	S				F	*	*	PDT P15 PLC			
Tufted Titmouse	B								S				M				M	M			M	M				F	*	*	NDT N15			
	W							M	S			M	M			M	M	M		M	M	M				F	*	*				2
Redbreasted Nuthatch	B																										*	*	NDT N15			
	W															M	M	M		M	S	S					*	*				
Whitebreasted Nuthatch	B																											*	*DT *BT NLC			
	W																											*	*DT			8
Brownheaded Nuthatch	B				M	S							S				S	O			S	O					*	*	NDT N15 NLC			
	W			M	M	S						M	S			M	S	O		M	S	O					*	*				
Brown Creeper	B																										*	*				
	W				M	M			M				M				S	S			S	S					*	*	N25 NLC			Yes
Carolina Wren	B							S	O			M	S			M	S	S		M	M	M	*	*	*	*	*		*SW N15 NLC NRP			
	W							S	O			M	S			M	S	S		M	M	M	*	*	*	*	*		*SW			
Bewick's Wren	B																								*	*			*SW N15 NLC NRP			
	W							M																	*	*			*SW			
House Wren	B																								F	*			N15			
	W		M	S	S	S	M	O	S		M	S	M		M	S	M	M	M	M	M	M			F	*			*SW			
Sedge Wren	B																															
	W		M	M	M	M																	F		*	*						

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			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Marsh Wren	B																								*					A		
	W		M	M																					*					A		
Goldencrowned Kinglet	B																										F	*	*CC			
	W																M	M		M	S	S				F	F	*				
Rubycrowned Kinglet	B																															
	W			M	M	M		M	S			M	S			M	S	S		M	S	S				*	*	*				
Bluegray Gnatcatcher	B								M																	*	*	*				37
	W							M	S			M	S			M	M	M								*	*	*				
Eastern Bluebird	B		O	S	O	O	S	M	S		S	M	S		S	M	S	S	S	M	S	S	F		F			*	NDT PDT *OC N15 P15			
	W		O	S	O	O	S	M	S		S	M	S		S	M	S	S	S	M	S	S	F		F			*	PDT *OC P15			
Hermit Thrush	B																							*	F	P	P	P	*CC			
	W								M				M				M	M						*	F	*	*		*CC			
American Robin	B																						F		F	N	N	NP	*GO			
	W							M	M														F		F	*	*	*				
Gray Catbird	B																									*	P					
	W							S	S			M	M			M	M	M							*	*						
Northern Mockingbird	B		M	M	M	M	M	M	M		M	M	M		M	M	M	M							F	*			*OC			
	W		M	M	M	M	M	M	M		M	M	M		M	M	M	M							F	*	*		*OC			
Brown Thrasher	B			M	M	M		O	M			S	M			S	M	M					F	F	F	*	P	P				
	W			S	M	M		O	S			O	S			S	M	M					*	*	*	*						
Cedar Waxwing	B																									*	*	*	*OC			
	W							M	M																	*	*	*	*OC			
Loggerhead Shrike	B		S	M	S	S																	F		F	N						
	W		S	M	S	S																	F		F	P						
Whiteeyed Vireo	B							S	M			M	M			M	M	M							F	*	P					
	W							O	S			M	M			M	M	M							F	*						
Bell's Vireo	B						M	S	S																F	*	*		*OC			
	W																															
Solitary Vireo	B																M	M								N	*	*				Yes
	W								S				S				M	S			M	M					*	*				
Yellowthroated Vireo	B																	M									F	*				Yes
	W																										F	*				
Redeyed Vireo	B																	M									*	*				7
	W																															
Blackwhiskered Vireo	B																									N	*	*				
	W																															

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OC - Open Canopy

GO - Grassy Openings
DL - Downed Logs
RP - Rocky Places
EB - Earth Banks
LC - Living Cavity Tree

15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
35 - 35 cm Min. Snags
46 - 46 cm Min. Snags

(c) Water Codes
A - All
F - Fresh
B. - Brackish
S - Salt

Common Name	BW[a]	Local	Habitat Suitability by Vegetation Type and Successional Stage																				Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			PSAV				SOSO				SPSO				LLSO				SHLL													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Orangecrowned Warbler	B																															
	W						M	S	M		M	M	M		M	M	M	M							*	*	*		*SW			
Northern Parula	B																															
	W								M																		*	*				###
Yellow Warbler	B																															
	W							M																		*						
Yellowrumped (Myrtle) Warbler	B																															
	W			M	M	M		S	S			S	S			S	S	S		M	M	M	*	*	*	*	*	*			
Blackthroated Green Warbler	B																															
	W																										F	*	*CC			Yes
Yellowthroated Warbler	B																															
	W								M				M				M	S			M	M						*	FDT *DT			Yes
Pine Warbler	B				M	S							S				M	O			M	O					F	*	FDT *DT			
	W				S	S							S				S	O			S	O			F		F	*				Yes
Prairie Warbler	B															S				M					F	*						
	W			S	S	M		O	O			S	S			M	M	M		M	M	M			*	*						
Palm Warbler	B																															
	W	M	S	M			S	O	M		S	O	M		M	S	M		M	M	M		*		*	*						
Blackandwhite Warbler	B																															
	W								M				M				M	M						N	N		F	F				550
Ovenbird	B																															
	W								S														*	*		P	P					15
Common Yellowthroat	B	M	M					M				M				M									*	*						
	W	S	S				M	S			M	M			M	M									*	*						
Yellowbreasted Chat	B															M										*						
	W							O	M			S	M			M	M									*			PDT			
Summer Tanager	B				M	M			M				M				M	O			M	S						*	*			
	W																															100
Northern Cardinal	B		M	M	M			S	S			M	M			M	S	S		M	M	M		*	*	*	F	F			
	W		M	M	M			S	S			M	M			S	S	S		M	M	M		*	*	*					
Blue Grosbeak	B							S				M													*	*						
	W																								*	*						
Indigo Bunting	B							M	M							M	M	M							*	*	P	P				
	W						S	O	S		M	M	M												*	*			*OC			
Painted Bunting	B							M	S																*	*	P					
	W							O	O			M	M												*	*						

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First Letter
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			PSAV				SOSO				SPSO				LLSO				SHLL													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Dickcissel	B																								*	P						
	W						M	M																	*	*						
Greentailed Towhee	B																															
	W		M	M	M	M	M	M	M						M	M	M	M					F	F	F	*	*					
Rufoussided Towhee	B			M	M	M		O	O			O	O			O	O	S		S	S	M		F	*	*	P	P				
	W			M	M	M		O	O			O	O			O	O	S		O	O	S		F	*	*						
Bachman's Sparrow	B			O	O	O						M	M			M	S	S		M	S	S			*	*	P	P	*OC			
	W		O	O	O	O	M				M	M	M		M	M	M	M	M	M	M	M			*							
Rufouscrowned Sparrow	B						S	M															FP		*	*	P		*OC *RP			
	W						S	M															FP		*	*	P		*OC *RP			
Chipping Sparrow	B																M	M			M	M	F		*	*	*	*	*OC			
	W		S	S	S	S	S	M	M		S	M	M		S	M	M	S	S	M	M	S	F		*	*	*	*	*OC			
Claycolored Sparrow	B																															
	W						M	M							M	M							F		F	*			*OC			
Field Sparrow	B															M				M					*	*						
	W		M	M			S	M			S	M			S	M			S	M					*	*						
Vesper Sparrow	B																						*		*	P						
	W		M	M	M	M	M				M				S				S				*		*							
Lark Sparrow	B		M	M			O	S	M														F		*	*	P		*OC *GO *RP			
	W		M	M			S	S	M						S	S							F		F	*			*OC *GO			
Lark Bunting	B																															
	W		M				M																F		*							
Savannah Sparrow	B																								*							
	W		S	M	M	M	M				M				M				M						*							
Grasshopper Sparrow	B		S	M	M	M																			*							Yes
	W		O	S	S	S	M				M				M				M						*							
Henslow's Sparrow	B																								*					FB		
	W		O	M	S	O																			*							
Le Conte's Sparrow	B																															
	W		M	M	M	M									M				M						*							
Fox Sparrow	B																															
	W															M	M	M		M	M	M		F		*	*					
Song Sparrow	B																								*	*						
	W		M	M	M	M																			*	*						
Lincoln's Sparrow	B																															
	W		M	M	M	M																			*	*				F		

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			PSAV				SOSO				SPSO				LLSO				SHLL													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Swamp Sparrow	B																															
	W		M	M	M	M																			*					FB		
Whitethroated Sparrow	B																															
	W						M	M	M		M	M	M		M	M	M	M	M	M	M	M		F	F	*	*	*				
Whitecrowned Sparrow	B																															
	W		M	M			M	M															F		*	*						
Harris' Sparrow	B																															
	W						M	M	M														F	F	F	*	*	P				
Smith's Longspur	B																															
	W						M																F		*							
Chestnutcollared Longspur	B																															
	W						M																F		*							
Darkeyed Junco	B																						N	F	*	*	P	P				
	W														M	M	S	S	M	M	S	S	F	F	*	*	*					
Redwinged Blackbird	B		S	S	S	S	M				M				M				M						*	*	P	P				
	W		M	M	M	M	M				M				M				M						*	P	P	P				
Eastern Meadowlark	B		O	M	M	M	M				M				M										*							Yes?
	W		O	M	M	M	M				M				M										*							Yes?
Western Meadowlark	B																								*							
	W		M				M								M										*							
Yellowheaded Blackbird	B																															
	W		M		M																		F		F		P	P				
Greattailed Grackle	B		M	M																			F		*	*	*	P	*OC			
	W		M	M																			F		F	*	*	P	*OC			
Boattailed Grackle	B																						F		*	N	N	N		A		
	W																						F		*	P	P	P		A		
Common Grackle	B				S	S							M				M	M			M	M	F		F	N	NP	NP				
	W							M	M														F		*	P	P	P				
Bronzed Cowbird	B		M	M	M	M																	F		F	N	N	N	*OC			
	W		M																				F		F				*OC			
Brownheaded Cowbird	B						M	M	M		M	M	M		M	M	M	M	M	M	M	M	F		F				NDT *OC N15			
	W							M	M														F		*	P	P	P				
Orchard Oriole	B						M		M		M		M		M		M	M								*	*	*	*OC			
	W																															
Spotbreasted Oriole	B					M																					F	*	*OC			
	W					M																					F	*	*OC			

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			PSAV				SOSO				SPSO				LLSO				SHLL													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Purple Finch	B																										*	*				
	W																M	M			M	M				*	*	*				
Red Crossbill	B																										F	*				
	W																M	M			M	M					*	*				
Pine Siskin	B																								F	F	*	*				
	W															M	M	M		M	M	M	F		*	*	*	*				
American Goldfinch	B																								*	*	P	P				
	W		M	M	M	M	M	M	M		M	M	M		M	M	M	M	M	M	M	M	F		F	F	*	*				
Evening Grosbeak	B																															
	W																M	M			M	M	F			*	*	*				
House Sparrow	B		M				M				M				M				M				F		F							
	W		M				M				M				M				M				F		F							

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Southern Mixed Mesic Hardwoods (SMMH)

These are forests along stream banks or bluffs in southern Georgia and northern Florida where beech (*Fagus grandifolia*) or southern magnolia (*Magnolia grandiflora*), singly or in combination, constitute a plurality of the stocking. It is equivalent to NFS type 69, beech-magnolia. The type has no strict analog among 1980 SAF types, although the 1954 SAF type 90, beech-magnolia, is comparable (Soc. Amer. Foresters 1954). No RRE type corresponds to it, although it may be classed as RRE type 50, oak-hickory, on bluffs (RRE Physiographic Class 23) or rolling uplands (RRE Physiographic Class 22).

No BBC or WBPS was conducted in this type in the Southeast in 1947-1979. Engstrom (1981) conducted a Breeding Bird Census in an undisturbed sawtimber stand in Florida in 1980.

Characteristic of this vegetation type are Pileated Woodpeckers, Red-bellied Woodpeckers, Great Crested Flycatchers (B), Blue Jays, Tufted Titmice, Carolina Wrens, Hermit Thrushes (W), and Northern Cardinals.

No species are *restricted* to the type.

Bay Swamp-Pocosin (BSPO)

These are forests of boggy, poorly drained soils in which various species of broadleaf evergreen "bay" trees, singly or in combination, compose a plurality of the stocking. The primary species are blackgum or swamp tupelo (*Nyssa sylvatica* var. *biflora*), red bay (*Persea borbonia*), sweet bay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), fetterbush (*Lyonia lucida*), gallberry (*Ilex* sp.), and the semi-evergreen titi (*Cyrilla racemiflora*). The type is equivalent to NFS type 68, sweet-bay-swamp tupelo-red maple and possibly 99, brush species, where the species is titi. It is the source of the hardwood component of NFS types 14, slash pine-hardwood (in part); and 18, pond pine-hardwood. This type corresponds to SAF types 85, slash pine hardwood (in part); 104, sweet-bay-swamp tupelo-red bay; and 74, cabbage palmetto (in part). The analogous RRE designation is type 60, oak-gum-cypress in physiographic conditions such as bays and wet pocosins (RRE Physiographic Class 36), small drains (RRE Physiographic Class 33), and possibly cypress strands (RRE Physiographic Class 32) and cypress ponds (RRE Physiographic Class 34).

Four censuses have been conducted in the type in the Southeast during 1947-1979, a single WBPS in a poletimber stand in Georgia, and BBC on 3 grass/forb plots in South Carolina.

Characteristic of this vegetation type are Red-bellied Woodpeckers, Winter Wrens (W), Carolina Wrens, American Robins (W), Hermit Thrushes (W), Yellow-rumped Warblers (W), White-throated Sparrows (W), and Fox Sparrows (W).

No species are *restricted* to this type.

Richardson (1981) presents information on pocosin habitats.

Pond Pine Pocosin (PPPO)

These are forests of boggy, poorly drained soils in which pond pine (*Pinus serotina*) makes up a majority of the stocking. The type corresponds to NFS types 36, pond pine; 18, pond pine-hardwood (in part); 40, hardwood-pond pine (in part); and probably 66, Atlantic white-cedar. It is equivalent to SAF type 98, pond pine; and probably includes sites supporting type 97, Atlantic white-cedar. It is equivalent to RRE type 36, pond pine. I have little experience with the birds of Atlantic white-cedar stands. Inclusion of the type here reflects Braun's (1964:290) treatment of it as a bog forest successional to bay swamp pocosin vegetation.

No BBC or WBPS was conducted in this type in the Southeast in 1947-1979. Terwilliger (1981a, 1981b) conducted two BBC in sawtimber Atlantic white-cedar stands in the Dismal Swamp in 1980, 1 in North Carolina and the other in Virginia. Prairie Warblers were the most numerous birds on both plots.

Characteristic of this vegetation type are Carolina Chickadees and Carolina Wrens.

No species are *restricted* to the type.

Richardson (1981) presents information on pocosin habitats.

Longleaf Pine-Slash Pine (LLSL)

These are forests of moist, flat topography in which longleaf pine or slash pine (*Pinus elliottii*), singly or in combination, compose a plurality of the stocking. This type, growing on flatwoods and dry pocosins, corresponds to NFS types 21, longleaf pine; 22, slash pine; and 14, slash pine-hardwood (in part). It is equivalent to SAF types 70, longleaf pine; 83, longleaf pine-slash pine; 84, slash pine; 111, south Florida slash pine; and 85, slash pine-hardwood (in part). It is equivalent to RRE types 21, longleaf pine; and 22, slash pine.

Sixteen censuses from this type have been published (Table 1).

Characteristic of this vegetation type are Red-headed Woodpeckers (B), Red-cockaded Woodpeckers, Brown-headed Nuthatches, Eastern Bluebirds, Pine Warblers, and Bachman's Sparrows.

Restricted to this type are Red-cockaded Woodpeckers and Henslow's Sparrows (W).

Wood and Niles (1978) present introductory information on management of nongame wildlife in this type. Dickson et al. (1980) summarize information from three censuses in this type.

Table 1. Published BBC and WBPS from longleaf pine-slash pine in the Southeast in 1947-1979

State	Season	Successional stage		
		Grass/forb	Sapling/ poletimber	Sawtimber
Florida	Breeding	0	0	1(1)
	Wintering	1 (2)	0	1(4)
Georgia	Breeding	0	2(2)	4(7)
	Wintering	0	1(1)	0

[a] Entries are listed as "Plots (Years censused)."

Oak-Gum-Cypress (OGCY)

This type consists of bottomland or swamp forests in which water tupelo (*Nyssa aquatica*), blackgum, sweetgum (*Liquidambar styraciflua*), oaks, or cypress (*Taxodium* sp.), singly or in combination, compose a plurality of the stocking. The type contains a number of NFS and SAF types (Table 2), and coincides with the RRE designation 60, oak-gum-cypress.

Major development of oak-gum-cypress vegetation is along the floodplains of large Coastal Plain rivers throughout the South; the type also occurs in headwater swamps in the Outer Coastal Plain. Some stands are intermediate between this type and either the elm-ash-cottonwood type or the bay swamp pocosin type or upland hardwoods of the oak-hickory type. The status of such stands is determined by substrate conditions and by whether the water in the stands is flowing or standing. Where floodwaters frequently flow through the stands, conditions between oak-gum-cypress and elm-ash-cottonwood prevail; where floodwaters stand for prolonged periods and flow little, conditions between oak gum-cypress and bay swamp-pocosin can occur.

The most important variable in the type, extent and duration of flooding, has profound and predictable effects not only on the vegetation but also on the bird communities. For example, birds that commonly utilize understory vegetation and the ground are not found on the wetter sites in this type. Prothonotary Warblers are confined to those wetter sites.

Twelve censuses have been published from this type in the Southeast 1947-1979 (Table 3).

Characteristic of this vegetation type are Red-shouldered Hawks, Yellow-billed Cuckoos (B), Barred Owls, Pileated Woodpeckers, Red-bellied Woodpeckers, Red-headed Woodpeckers (esp. W), Acadian Flycatchers (B), Tufted Titmice, Blue -gray Gnatcatchers (B), Prothonotary Warblers (B), Northern Parulas (B), Yellow-rumped Warblers (W), Yellow-throated Warblers (B), and Rusty Blackbirds (W).

Restricted to this type are Swallow-tailed Kites (B), Mississippi Kites (B), and Bachman's Warblers (B).

Management of birds in bottomland habitats has been treated by Dickson (1978), Dickson and Noble (1978), Burdick et al. (1988), Hamel (in press), and Hamel and Ford (unpubl. data). Dickson et al. (1980) summarize 7 censuses from this type.

Table 2. SAF and NFS forest types included in oak-gum-cypress.

NFS number	SAF number	SAF or NFS name
-	82	loblolly pine-hardwood (in part)
-	88	willow oak-water oak-diamondleaf oak
61	91	swamp chestnut oak-cherrybark oak
-	92	sweetgum-willow oak
65	96	overcup oak-water hickory
23	100	pondcypress
24	101	baldcypress
-	102	baldcypress-tupelo
-	103	water tupelo-swamp tupelo
46	-	bottomland hardwood-yellow pine (in part)
62	-	sweetgum-Nuttall oak-willow oak
64	-	laurel oak-willow oak
67	-	bald cypress-water tupelo
68	-	sweetbay-swamp tupelo-red maple (in part)

Table 3. Published BBC and WBPS from oak-gum-cypress in the Southeast in 1947-1979.

State	Season	Successional stage[a]	
		Sapling/ poletimber	Sawtimber
Florida	Breeding	1 (2)	0
	Winter	1 (1)	0
Georgia	Breeding	1 (1	0
South Carolina	Breeding	2 (2)	1 (1)
North Carolina	Breeding	0	2 (4)
Virginia	Breeding	0	1 (1)

[a] Entries are listed as "Plots (Years censused)."

Common Name	Local Use	BW[a]	Habitat Suitability by Vegetation Type and Successional Stage																		Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			SMMH				BSPO				PPPO				LLSL				OGCY											
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Double-crested Cormorant		B																			M	O						N	NOC NDT	A	F	
		W																														
Olivaceous Cormorant		B					M	M	S	S									M	M	S	S			N	N	NP	NP	PDT	A	A	
		W																									P	P	PDT	A	A	
Anhinga		B																	M	M	M	O				NP	NP	NP		FB		
		W																	M	M	M	O				P	P	P		FB		
Great Blue Heron		B						M	M	S												O	F		F			NP	PDT NDT	A	F	
		W																	M	M	M	M	F		F			P	PDT	A	F	
Great Egret		B		M	M	M		M	S	S									S	S	O	O	F		F	NP	NP	NP		A	F	
		W					M				M												F		F	P	P	P		A	F	
Snowy Egret		B						M	S	M									S	S	O	S	F		F	NP		NP		A	F	
		W					M				M												F		F	P		P		A	F	
Little Blue Heron		B		M	M	M		M	S	M									S	S	O	S	F		F	*		NP		A	F	
		W					M				M												F		F	*		P		A	F	
Tricolored Heron		B						M	S	M									S	S	S	S	F		F	NP		NP		A		
		W					M				M												F		F	P		P		A		
Cattle Egret		B		M	M	M		M	S	M									S	S	O	S	F		F	NP		NP		F		
		W																					F		P		P			F		
Green-backed Heron		B		M	M	M		S	S	M									M	O	O	S	F		F	*	NP	NP	FSW	A	F	
		W																					F		F	*	P	P	FSW	A	F	
Black-crowned Night Heron		B		M	M	M		M	S	M									S	S	S	S			F	NP		NP		A	F	
		W					M				M														F	P		P		A	F	
Yellow-crowned Night Heron		B		M	M	M		M	S	S										M	O	O	F				NP	NP		A	F	
		W					M				M												F				P	P		A	F	
White Ibis		B		M	M	M		M	S	S									M	S	O	S	F		F	NP	NP	NP		A		
		W					M				M												F		F		P	P		A		
Glossy Ibis		B						M	M	M									M	S	S	M	F		F	NP	NP	NP		A		
		W					M				M												F		F		P	P		A		
White-faced Ibis		B																	M	M	S	M				N	NP	NP		FB	FB	
		W					M	M	S	M									M								P	P		FB	FB	

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2nd and 3rd Letters
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15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
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46 - 46 cm Min. Snags

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Common Name	Local Use	BW[a]	Habitat Suitability by Vegetation Type and Successional Stage																		Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			SMMH				BSPO				PPPO				LLSL				OGCY												
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Wood Stork		B						M	M	M									M	M	S	O				NP	NP	NP		A		
		W					M																					P		A		
Wood Duck		B																		M	O	O							N46 NLC NDT	F	F	
		W																		M	O	O								F	F	
Mallard		B																														
		W					M	M	M	M									S	M	M	S			FP					FB	F	
Hooded Merganser		B																	M	M	O	O							N46 NLC NDT	F		
		W																	M	M	M	M								F		
Black Vulture		B		M	S	S		S	O	O		M	M	M		M	M	M	M	M	O	O	F	F	F	F		*				
		W	M	M	M	M	M	S	O	O	M	M	M	M	M	M	M	M	M	M	O	O	F	F	F	F		*				
Turkey Vulture		B		M	S	S		M	S	S		M	M	M		M	S	S	M	M	O	O	F	F	F	F		*				
		W	M	M	M	M	M	M	S	S	M	M	M	M	M	M	S	S	M	M	O	O	F	F	F	F		*				
Osprey		B							M	S			M	M				M			M	O						NP	NBT PBT N46 P46 NDT PDT	A	F	
		W							M	S											M	O						P	PBT P46 PDT	A	F	
American Swallow-tailed Kite		B				M				M								M				O	F		F	F	F	NP	NBT PBT	F	F	
		W																														
Black-shouldered Kite		B													M	M	M	M					F		F	N		N				
		W													M	M	M	M					F		F							
Mississippi Kite		B				S				M												S						NP		F	F	Yes
		W																														
Bald Eagle		B																M				O						NP	NBT PBT P46 PDT	A	F	
		W																			M	S						P	PBT P46	A	F	
Northern Harrier		B																														
		W	M				M				M				M				S				F		*							
Sharp-shinned Hawk		B																					F	F	F	F	F	*	NCC			
		W			S	S			S	S			S	S			M	M			M	M	F	F	F	F	F	*				
Cooper's Hawk		B			M	M			M	M											M	M	F	F	F	F	F	*	NCC			
		W			S	S			S	S			S	S			M	M			M	M	F	F	F	F	F	*				
Northern Goshawk		B																														
		W																								F	FP	FP	FGO			

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			SMMH				BSPO				PPPO				LLSL				OGCY													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Red-shouldered Hawk		B			M	S			M	O							M	M			M	O	F		F	F		*		F	F	550
		W	S	M	S	S	S	M	S	O	M	M			M	M	M	M	M	M	S	O	F		F	F		*		F	F	
Broad-winged Hawk		B				S				M													F	F	F	F		*				Yes
		W																					F	F	F	F		*				
Short-tailed Hawk		B			M	M			M	M											S	O	F		F	F		*				
		W																			S	S	F		F	F		*				
Red-tailed Hawk		B				S				M													F		F			*	PDT			
		W	S	M	M	S	M	M	M	M	M	M	M	M	M	M	M	M	M				F		F			*	PDT			
Ferruginous Hawk		B																														
		W																					FP		FP				PDT			Yes
Rough-legged Hawk		B																														
		W																	M				F		F							Yes
Golden Eagle		B																					F		F				NSW			
		W																					F		F				PSW			
American Kestrel		B													M								F		F			*	F15 *35 NLC *DT			
		W	M	M			M	M			M	M			M	M	M	M					F		F			*	F15 FDT			
Peregrine Falcon		B																					F		F			F	NSW PSW FDT			
		W																					F		F			F	PSW FDT			
Black Francolin		B													M				M				F		*				*OC			
		W													M				M				F		FP				FOC POC			
Wild Turkey		B			M	S			M	M							M	S		M	M	S	F	*	*		P	P	FGO			
		W		M	S	O		M	M	M						M	M	S			M	S	F	*	*		P	P	FGO			
Northern Bobwhite		B	M	M							M				S	S	M	S					F		*				*GO			
		W	M	M							M				S	S	M	S					F		*				*GO			
Yellow Rail		B																														
		W																	M				F		*					A		
Black Rail		B																														
		W																	M				F		*					A		
King Rail		B																	M				F		*					FB		
		W																	M				F		*					FB		

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			SMMH				BSPO				PPPO				LLSL				OGCY													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Virginia Rail		B																														
		W																	M				F		*				FB			
Sora		B																														
		W																	M				F		*				F			
Purple Gallinule		B																	M	M	M	M			*				F			
		W																	M	M	M	M			*				F			
Common Moorhen		B																	M	M	M	M			*				F			
		W																	M	M	M	M			*				F			
Limpkin		B					S	S	S	S									O	O	O	O	F		*	N			F	F		
		W					S	S	S	S									O	O	O	O	F		*				F	F		
Sandhill Crane		B													M										*				F			
		W													M										*				F			
Killdeer		B																	M				*		*							
		W																	M				*		*							
Common Snipe		B																														
		W																	S	M			F		F				FB	F		
American Woodcock		B			M	M			M	M										M	M	S	F	*	F				F			
		W	M	M	S	S		M	O	O		M	M	M	M	M	M	M		M	O	O	F	*	F				F			
Rock Dove		B	M												M								F		F				NRP			
		W	M												M								F		F				PRP			
White-winged Dove		B																					F		F		NP	P				
		W																					F		F	FP	P	P				
Mourning Dove		B		S	S	M		M	M	M		M	M	M	M	S	S	S	M	M	M	M	F		F		NP	NP				
		W	S	S	S	M	M	M	M	M	M	M	M	M	S	M	S	S	M	M	M	M	F		F		P	P				
Yellow-billed Cuckoo		B			S	S			O	O											O	O				N	*	*				Yes
		W																														
Greater Roadrunner		B													M	M	M	M					F		F	*	*	N	*OC			
		W													M	M	M	M					F		F	FP	FP		FOC POC			
Groove-billed Ani		B																					F		F	*			*OC			
		W													M	M			M				F		F	FP			FOC POC			

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			SMMH				BSPO				PPPO				LLSL				OGCY													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Common Barn-Owl		B	M	M			S	M			S	M			S	M							F		F	P		P	N46 NLC NRP N46			
		W	M	M			S	M			S	M			S	M							F		F	P		P	P46 PLC PRP			
Eastern Screech-Owl		B			M	O			M	S			M	M			M	S			M	S	F	F	F	F	*	*	N35 NLC NDT			
		W			M	O			M	S			M	M			M	S			M	S	F	F	F	F	*	*	P35 PLC PDT			
Great Horned Owl		B				S				M				M				S				M	F	F	F	F	F	*				None
		W			M	S			M	M			M	M			M	S			M	M	F	F	F	F	F	*				None
Barred Owl		B			M	O				S											S	O	F	F	F	F	F	*	NBT NLC	F	F	None
		W			M	O				S											S	O	F	F	F	F	F	*	PBT PLC	F	F	None
Long-eared Owl		B																					F	F	F	F	*	*				
		W																					F	F	F	F	*	*				
Short-eared Owl		B																														
		W					M	M			M	M			M				M				F		*							
Common Nighthawk		B													M	M	M	M					N						NRP			
		W																														
Chuck-will's-widow		B		M	M	S			M	S			M	M			M	M						N								
		W							S	S														P								
Whip-poor-will		B							M	M			M	M										N								Yes
		W			M	M			S	S											M	M		P								
Chimney Swift		B				M																M							N35 NLC			
		W																														
Ruby-throated Hummingbird		B		S	S	S		S	S	S		M	M	M		M				M	S	S				*	*	*				Yes
		W						M	M	M									M	M	M	M				*	*	*				
Black-chinned Hummingbird		B																														
		W																								F	*	*				
Rufous Hummingbird		B																														
		W						S	M	M										S	M	M				F	*	*				
Belted Kingfisher		B			M	M															M	S				P	P		F15 FSW NEB PDT	A	F	
		W			M	M															M	S				P	P		F15 FSW PDT	A	F	
Red-headed Woodpecker		B							M	M			S	S			M	O			M	S			F				*OC N35 *DT			
		W			M	M			M	S							M	S			S	O			F	F	F	*	*DT			

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			SMMH				BSPO				PPPO				LLSL				OGCY													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Red-bellied Woodpecker		B			M	O			M	O			M	M			M	S			M	O						*	N35 NLC *DT			1
		W			M	O			M	O			M	M			M	S			M	O						*	P35 PLC *DT			
Yellow-bellied Sapsucker		B																								F	F	*	N25 NLC *DT			
		W			S	O			M	M			M	M			M	M			M	S				F	F	*	*25 *LC			
Downy Woodpecker		B			S	O			M	S			M	M			M	M		M	S	O				*	*	*	*15 *LC *DT			
		W			S	O			M	S			M	M			M	M		M	S	O				*	*	*	*15 *LC *DT			
Hairy Woodpecker		B			M	O			M	S			M	M			M	S			M	O					*	*	*25 *LC *DT			
		W			M	O			M	S			M	M			M	S			M	O					*	*	*25 *LC *DT			18
Red-cockaded Woodpecker		B											M	M			M	O									F	F	*BT *LC			
		W											M	M			S	O									F	F	*BT *LC			
Northern Flicker		B			M	S			M	M			M	M			M	S			M	M	F		F			*	*OC N35 NLC *DT			
		W			M	S			S	S			S	S			M	S	M	M	S	S	F		F			*	*DT			
Pileated Woodpecker		B			M	O				S				M			M	M			M	O					F	*	*BT *CC *46 NLC FDL *DT			405
		W			M	O				S				M			M	M			M	O					F	*	*BT *CC *46 PLC FDL *DT			
Eastern Wood-Pewee		B			M	O			M	S			M	M			M	O		M	M	M					F	*	F15 FDT			
		W																														
Acadian Flycatcher		B			M	O			M	S											O	O					*	*	*CC F15 FDT	F	F	37
		W																														
Willow Flycatcher		B																								*				F	F	
		W																														
Least Flycatcher		B																									*	*	*OC			
		W																									*	*	*OC			
Eastern Phoebe		B																			M	M				*	*		*OC NRP			
		W	S	O	S	M	S	S	S	M	M	M	M	M	M	M	M	M	S	O	S	S	F		F	*						
Vermilion Flycatcher		B																														
		W						S	S	M										S	S	M	F		F	*	*	*	*OC *DT	F		
Ash-throated Flycatcher		B																														
		W																								*	*		*OC			
Great Crested Flycatcher		B			M	O			M	S			M	S			M	S		M	S	O					F	*	N25 NLC NDT			1
		W							M	S							M	M			M	M					F	*	PDT			

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Eastern Kingbird		B													M	M	M	M							F			*	*OC F15 FDT			
		W																														
Gray Kingbird		B																								*	*	*	F15 FDT			
		W																														
Scissor-tailed Flycatcher		B																					F		F	*	*	*	*OC *DT			
		W													S	M	M	M					F		F	*	*	*	*OC *DT			
Horned Lark		B																	M				*		*							
		W																	M				*		*							
Purple Martin		B	M				M				M				M				M										N25 NLC NDT			
		W																														
Tree Swallow		B																			M	M							N15 NDT	FB	F	
		W					S	S	M	M	M	M	M	M					M	M	M	M				*				FB	F	
Barn Swallow		B					M				M				M				M										NRP			
		W																														
Blue Jay		B			M	O			M	S			M	S			M	S			M	M	F	F	F	F	*	*				Yes
		W		M	S	O		M	M	S		M	M	S		M	M	S		M	M	M	F	F	F	F	*	*				
Scrub Jay		B																								*						
		W																								*						
American Crow		B			M	S			M	M			M	M			M	M			M	M	F		F			*	NCC			
		W	S	M	M	S	S	M	M	M	S	M	M	M	S	M	M	M	S	M	M	M	F		F			*	PCC			
Fish Crow		B		M	M	M		M	S	S		M	S	S			M	M			M	M	F		F	*		*		A	F	
		W	M	M	M	M	S	M	S	S	S	M	S	S	M	M	M	M	S	M	M	M	F		F			*		A	F	
Carolina Chickadee		B			M	S			M	S			S	O			M	S			M	S				F	*	*	N15 P15 NLC PLC NDT			
		W		M	M	S		M	M	S		M	S	O		M	M	S		M	M	S				F	*	*	P15 PLC PDT			
Tufted Titmouse		B			S	O			M	S			M	M			M	M			S	O				F	*	*	N15 NDT			2
		W		M	S	O		M	M	S		M	M	M		M	M	M		M	S	O				F	*	*				
Red-breasted Nuthatch		B																									*	*	N15 NDT			
		W										M	M	M		M	S	S									*	*				
White-breasted Nuthatch		B			M	S			M	M							M	M			M	S						*	NLC *DT			8
		W			M	S			M	M							M	M			M	S						*	*DT			

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46 - 46 cm Min. Snags

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A - All
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Common Name	Local Use	BW[a]	Habitat Suitability by Vegetation Type and Successional Stage																				Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			SMMH				BSPO				PPPO				LLSL				OGCY													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Brown-headed Nuthatch		B											M	S			S	O									*	*	N15 NLC NDT			
		W										M	M	S		M	S	O									*	*				
Brown Creeper		B																									*	*	N25 NLC			Yes
		W			M	M			M	M			M	M			S	S			S	S					*	*				
Carolina Wren		B		S	O	O		S	O	O		S	O	O		M	M	M		M	O	O	*	*	*	*	*		N15 NLC *SW NRP			
		W		S	O	O		S	O	O		S	O	O		M	M	M		M	O	O	*	*	*	*	*		*SW			
House Wren		B																							F	*			N15			
		W	M	M			M	S			S	O	S	S	M	S	S	S	M	M					F	*			*SW			
Winter Wren		B																					*	*	F	F	P	P	*CC *SW			
		W			S	S			O	O			S	S							O	O	*	*	F	F			*SW			
Sedge Wren		B																														
		W					M				M				M	M	M	M	M				F		*	*						
Marsh Wren		B																	M						*					A		
		W																	M						*					A		
Golden-crowned Kinglet		B																									F	*	*CC			
		W			M	M							M	M		M	S	S			M	S				F	F	*				
Ruby-crowned Kinglet		B																														
		W		S	S	S		S	S	S		S	S	S		S	S	S		M	S	O				*	*	*				
Blue-gray Gnatcatcher		B			M	O			M	O							M	M			M	O				*	*	*				37
		W		M	S	S		M	O	O		M	M	M					M	M	M	M				*	*	*				
Eastern Bluebird		B													S	M	S	S					F		F			*	*OC N15 P15 NDT PDT			
		W													S	S	S	S					F		F			*	P15 PDT			
Hermit Thrush		B																						*	F	P	P	P	*CC			
		W			O	O			O	O			S	S			M	M			S	S		*	F	*	*		*CC			
Wood Thrush		B			S	O			M	M											M	O		F	F	*	P		*CC			3
		W																														
American Robin		B																					F		F	N	N	NP	*GO			
		W		M	M	S		S	O	O		M	M	S					M	M	S	O	F		F	*	*	*				
Gray Catbird		B		S	S	M		S	S	M		M	M	M						S	S	M				*	P					
		W		S	S	M		O	O	S		O	O	S						S	S	M			*	*						

(a) B - Breeding
W - Wintering

(b) Specific Requirements Code Key

First Letter
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F - Forages
* - All Requirements

2nd and 3rd Letters
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			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Northern Mockingbird		B	M	M																					F	*			*OC			
		W	M	M																					F	*	*		*OC			
Brown Thrasher		B		O	M	M		M	M	M		M	M	M		M	M	M		S			F	F	F	*	P	P				
		W		O	M	M		M	M	M		M	M	M		M	M	M		S	S	S	*	*	*	*						
Water Pipit		B																														
		W																	S				*		*							
Sprague's Pipit		B																														
		W													M								*		*							
Cedar Waxwing		B																								*	*	*	*OC			
		W		M	S	S		M	O	O										M	M	M				*	*	*	*OC			
European Starling		B																					F		F							
		W		M	M	M		M	S	S		M	M	M						M	S	S	F		F	F	F	F	N25 NLC NRP NDT			
White-eyed Vireo		B		S	M	M		O	S	M		S	M	M						S	S	M			F	*	P					
		W		M	M	M		O	S	M		M	M	M						S	M	M			F	*						
Bell's Vireo		B																		M					F	*	*		*OC			
		W																														
Solitary Vireo		B																								N	*	*				
		W			M	S			S	O			M	M			M	S			M	M					*	*				Yes
Yellow-throated Vireo		B				S				M												S					F	*				
		W																									F	*				Yes
Warbling Vireo		B																										*	*OC			
		W																														
Red-eyed Vireo		B			S	O			M	S											M	O					*	*				
		W																														7
Bachman's Warbler		B						M	M	S			M	M						S	S	O			F	*	P	P	*OC			
		W																														
Orange-crowned Warbler		B																														
		W	M	M	M	M	M	O	S	M	M	M	M	M					M	S	S	S			*	*	*		*SW			
Northern Parula		B			M	S				S											S	O					*	*				
		W																			S	O					*	*				1300

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			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Yellow-rumped (Myrtle) Warbler		B																														
		W		S	S	S		O	O	O		S	S	S		M	M	M		S	O	O	*	*	*	*	*	*				
Black-throated Gray Warbler		B																														
		W							M	M											M	M				F	*	*				
Black-throated Green Warbler		B							M	M			S	S							M	O					F	*	*CC			Yes
		W																									F	*				
Yellow-throated Warbler		B			M	S			M	S			M	M			M	M			M	O						*	*BT FDT			Yes
		W			M	M			M	S			M	M			M	O			M	M						*	*BT FDT			
Pine Warbler		B											M	M		M	M	O									F	*				Yes
		W											M	M			S	O							F		F	*				
Prairie Warbler		B		S				O				S				M	M	M		M					F	*						
		W						S	S	S		M	M	M		M	M	M		M	M	M			*	*						
Palm Warbler		B																														
		W	M	M	M		M	S	M		M	M	M		M	M	M						*		*	*						
Cerulean Warbler		B																				S						*	*BT *CC			1750
		W																														
Black-and-white Warbler		B			M	M			M	M											M	M		N	N		F	F	*CC			550
		W			M	S			S	O			M	M							S	O					F	*				
American Redstart		B			S	S															S	S				*	*	FP				Yes
		W																			M	M				*	*	*	*DT			
Prothonotary Warbler		B			M	M			M	S			M	M							S	O				*	*		N15	F	F	Yes
		W																														
Worm-eating Warbler		B			M	M			M	M											M	S		*	F	*	P		*CC			370
		W																						*?	*?	*	*					
Swainson's Warbler		B			M	S			S	O			M	M							S	O	F	F	F	*	P					Yes
		W																														
Ovenbird		B							M	M											M	M	*	*		P	P					15
		W			M	S			O	O			M	M							O	O	*	*								
Northern Waterthrush		B																					*			P	P			F		500
		W						M	M	M										S	S	M	*							F	F	

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			SMMH				BSPO				PPPO				LLSL				OGCY												
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Louisiana Waterthrush		B				S																M	*			P	P		*RP		F	875
		W																														
Kentucky Warbler		B				M				M											M	O	F	F	*	*	P					45
		W																														
Common Yellowthroat		B		M			M	O			S	S	M	M	M	S	M	M	S	O	M	M			*	*						
		W	M	M			S	O			M	S	M	M	M	M			M	M					*	*						
Hooded Warbler		B			M	S			M	S											M	O				*	FP					Yes
		W																														
Wilson's Warbler		B																														
		W					S	S	M										S	S	M				F	*	*					
Yellow-breasted Chat		B										M	O			M				S						*			PDT			
		W						M																		*						
Summer Tanager		B			M	O			M	M							M	S			M	M					*	*				100
		W																														
Northern Cardinal		B		S	O	O		M	S	S		M	M	M		M	M	M	M	S	S	S		*	*	*	F	F				
		W		S	S	S		S	S	S		M	M	M		M	M	M	M	S	S	S		*	*	*						
Blue Grosbeak		B		S				S											M	M					*	*						
		W																							*	*						
Indigo Bunting		B		S	M	M		M	M	M						S	M	M	M	M	M	S			*	*	P	P	*OC			
		W						M	M	M										M					*	*						
Painted Bunting		B		M	M			M	M											M	M				*	*	P					
		W						M	M											M	M				*	*						
Dickcissel		B																	M						*	P						
		W																							*	*						
Green-tailed Towhee		B																														
		W													M	M	M	M					F	F	F	*	*					
Rufous-sided Towhee		B		O	O	S		S	S	M		S	S	M		O	O	S		M	M	M		F	*	*	P	P				
		W		O	M	M		S	S	M		S	S	M		O	O	S		M	M	M		F	*	*						
Bachman's Sparrow		B													O	M	O	O							*	*	P	P	*OC			
		W													O	M	O	O							*							

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American Tree Sparrow		B																														
		W																							*	*						
Chipping Sparrow		B															M	M					F		*	*	*	*	*OC			
		W	M	M											M	M	M	M					F		*	*	*	*	*OC			
Clay-colored Sparrow		B																														
		W																					F		F	*			*OC			
Field Sparrow		B														S									*	*						
		W	S	M											S	S									*	*						
Vesper Sparrow		B																					*		*	P						
		W	M																				*		*							
Lark Sparrow		B																					F		*	*	P		*OC *GO *RP			
		W													M	M							F		F	*			*OC *GO			
Savannah Sparrow		B																							*							
		W	M				M				M				M				S						*							
Grasshopper Sparrow		B																							*							
		W	M				M				M				S	M			M						*							Yes
Henslow's Sparrow		B																							*					FB		
		W	M				M				M				O	M	S	O							*							
Le Conte's Sparrow		B																														
		W					M				M				O				M						*							
Fox Sparrow		B																														
		W		M	S	S		M	S	O		M	S	S		M	M	M	M	M	M			F		*	*						
Song Sparrow		B																							*	*						
		W	S	M			S	M			S	M			M	M			M	M					*	*						
Lincoln's Sparrow		B																														
		W	M	M			M	M			M	M			M	M	M	M	M	M					*	*				F		
Swamp Sparrow		B																														
		W					M	M			M	M			M				S	M					*					FB		
White-throated Sparrow		B																														
		W	M	M	S	S	M	S	S	O	M	M	M	M	M	M	M	M	M	M	S	O		F	F	*	*	*				

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Dark-eyed Junco		B																					N	F	*	*	P	P				
		W	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	S					F	F	*	*	*					
Red-winged Blackbird		B	M				O	O	M		S	S	M		M				O	O					*	*	P	P				
		W	M	M	M	M	O	O	S	M	S	S	M	M	M				Q	Q	S	M			*	P	P	P				
Eastern Meadowlark		B	M												M	M			M						*							Yes?
		W	M												M	M			M						*							Yes?
Western Meadowlark		B																							*							
		W													M										*							
Rusty Blackbird		B																														
		W	M	M	M	M	M	M	S	O	M	M	M	M					M	M	S	O	F		F	P	P	P				
Great-tailed Grackle		B																	S	S			F		*	*	*	P	*OC			
		W																	S	S			F		F	*	*	P	*OC			
Boat-tailed Grackle		B					M	M	M	M									M	M	M	M	F		*	N	N	N		A		
		W					M	M	M	M									M	M	M	M	F		*	P	P	P		A		
Common Grackle		B											M	M			M	M		S			F		F	N	NP	NP				
		W		M	S	S		M	S	S		M	S	S					M	M	S	S	F		*	P	P	P				
Bronzed Cowbird		B																	M	M	M	M	F		F	N	N	N	*OC			
		W																	M				F		F				*OC			
Brown-headed Cowbird		B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	F		F				*OC N15 NDT			
		W		M	M	M		M	S	S		M	M	M					M	M	M	M	F		*	P	P	P				
Spot-breasted Oriole		B																M									F	*	*OC			
		W																M									F	*	*OC			
Purple Finch		B																									*	*				
		W			M	M			M	S			M	M			M	M			M	S				*	*	*				
Red Crossbill		B																									F	*				
		W															M	M									*	*				
White-winged Crossbill		B																														
		W																									*	*				
Common Redpoll		B																														
		W																					F		*	*	*		*OC			

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Pine Siskin		B																							F	F	*	*				
		W		M	M	M		M	M	M		M	M	M		M	M	M		S	S	S	F		*	*	*	*				
American Goldfinch		B																							*	*	P	P				
		W	S	S	S	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	S	F		F	F	*	*				
Evening Grosbeak		B																														
		W							M	M			M	M			M	M					F			*	*	*				
House Sparrow		B	M												M								F		F							
		W	M												M								F		F							

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- S - Salt

Live Oak Maritime (LOMA)

These are forests in which live oak (*Quercus virginiana*) makes up at least 50 percent of the stocking. The type is best developed in areas under the influence of salt spray and maritime breezes along the Atlantic and Gulf coasts and on barrier islands. The type has no precise NFS, SAF, or RRE equivalent; such stands would probably be classed as oak hammocks (NFS type 77) or oak-hickory (RRE type 50) growing on sand dunes and sand ridges (RRE Physiographic Class 12). Cabbage palmetto (*Sabal palmetto*) is a frequent component of stands of this type; SAF type 74, cabbage palmetto, is an associated type common in peninsular Florida. Likewise, SAF type 73, southern redcedar, is an associated forest type.

This type is important as nesting habitat for many birds that feed in aquatic habitats. The winter avifauna of live oak maritime forests is also very diverse. Look for accidental insectivorous and nectarivorous species here in winter.

Eleven BBC and WBPS have been published from this type in the Southeast in 1947-1979 (Table 4).

Characteristic of this vegetation type are Great Crested Flycatchers (B), Fish Crows, Carolina Wrens, Ruby-crowned Kinglets (W), Solitary Vireos (W), Northern Parulas (B), Yellow-rumped Warblers (W), Yellow-throated Warblers, Boat tailed Grackles, Northern Cardinals, Rufous-sided Towhees, and Fox Sparrows (W).

No species are *restricted* to the type.

Table 4. Published BBC and WBPS from live oak maritime in the Southeast in 1947-1979.

State	Season	Successional stage[a]		
		Shrub/ seedling	Sapling/ poletimber	Sawtimber
Florida	Breeding	0	2(3)	0
	Winter	1 (1)	2 (2)	0
South Carolina	Breeding	0	0	1 (1)
	Winter	0	0	1 (3)
North Carolina	Breeding	0	0	1 (1)

[a] Entries are listed as "Plots (Years censused)."

Elm-Ash-Cottonwood (EACO)

These are bottomland forests in which elm (*Ulmus* sp.), ash (*Fraxinus* sp.), or cottonwood (*Populus deltoides* or *P. heterophylla*), singly or in combination, compose a plurality of the stocking. The type corresponds to a number of NFS and SAF types (Table 5), and to RRE type 70, elm-ash-cottonwood.

In the South, this type reaches its greatest development in the batture lands of the Mississippi River and its tributaries. In the Coastal Plain, elm ash-cottonwood vegetation occurs as riverfront hardwoods, as the pioneer plant community on new land in river meanders, and as the early successional community to oak-gum-cypress on abandoned farmland. It also occurs in the bottomlands of streams outside the Coastal Plain.

The considerations pointed out for the effects of water levels on the avifauna of oak-gum-cypress forests apply also to the birds of elm-ash cottonwood stands.

Seventy-two BBC and WBPS have been published from the type in the Southeast in 1947-1979 (Table 6). The vast majority of these were conducted by Wendell P. Smith on plots along the Yadkin River near North Wilkesboro, North Carolina.

Characteristic of this vegetation type are Wild Turkeys, American Woodcocks, Yellow-billed Cuckoos (B), Pileated Woodpeckers, Red-bellied Woodpeckers, Acadian Flycatchers (B), Carolina Wrens, American Robins (W), Blue gray Gnatcatchers (B), Yellow-rumped Warblers (W), Kentucky Warblers (B), Hooded Warblers (B), American Redstarts (B), and White-throated Sparrows (W).

Restricted to this type are Mississippi Kites (B) and Bachman's Warblers (B).

Samson (1979) presents introductory information on management of birds in this type.

Table 5. SAF and NFS forest types equivalent to elm-ash-cottonwood.

NFS number	SAF number	SAF or NFS name
71	39	black ash-American elm-red maple
50	57	yellow-poplar (except in Mountains)
72	61	river birch-sycamore
76	62	silver maple-American elm
73	63	cottonwood
-	65	pin oak-sweetgum
58	87	sweetgum-yellow-poplar (except in Mountains)
63	93	sugarberry-American elm-green ash
-	94	sycamore-sweetgum-American elm
-	95	black willow
-	108	red maple (in part)
74	-	willow
75	-	sycamore-pecan-American elm
82	-	black walnut

Table 6. Published BBC and WBPS from elm-ash-cottonwood in the Southeast in 1947-1979.

State	Season	Successional stage[a]		
		Grass/forb or shrub/ seedling	Sapling/ poletimber	Sawtimber
North Carolina	Breeding	4(19)	1(18)[b]	0
	Winter	4(29)	0	0
Virginia	Breeding	0	0	2(3)
	Winter	0	0	1(3)

[a] Entries are listed as "Plots (Years censused)."

[b] A 6.3 acre (2.5 ha) sapling stand surrounded by agricultural fields.

Loblolly Pine-Shortleaf Pine (LBSH)

These are forests in which loblolly pine (*Pinus taeda*) or shortleaf pine (*P. echinata*), singly or in combination, constitute a plurality of the stocking. The type corresponds to NFS and RRE types 31, loblolly pine; 32, shortleaf pine; 35, eastern redcedar; and 37, spruce pine. Equivalent SAF types are 46, eastern redcedar; 75, shortleaf pine; 80, loblolly pine-shortleaf pine; and 81, loblolly pine. The type occurs in a wide variety of topographic conditions across most of the physiographic regions of the South outside of Florida. In unmanaged conditions the type is successional to an array of hardwood types, from and mesic and hydric types, such as bay swamp-pocosin, elm-ash-cottonwood, and oak-gum cypress, to upland types, such as oak-hickory. Mature sawtimber stands very often have a substantial hardwood component appropriate to the successional sequence on the site. Thus, the avifauna of older stands includes species typical of hardwood stands in those geographic and physiographic locations. Frequently, mature stands typed as loblolly pine or shortleaf pine in management prescriptions appear to be mixed pine-hardwood stands. Such stands have complements of birds typical of mixed pine-hardwood stands. Users of this matrix must consider those facts when estimating bird communities in this type.

Inclusion of the eastern redcedar stands in this type is warranted, for the most part. Bird communities are similar in redcedar and pine stands. Several important exceptions must be noted, however. Red-cockaded Woodpeckers, Brown-headed Nuthatches, Yellow-throated Warblers, Pine Warblers, and Red Crossbills will be very rarely found in redcedar and mixed redcedar-hardwood stands.

Timber management for pine is often quite intensive in this type. Certain silvicultural practices, such as regular controlled burning and herbicide injection of hardwoods, produce stands of essentially pure pine. The bird communities of these pine stands are very different from those in stands with a mixture of pine and hardwood. Users of the matrix must consider the actual stand composition when assessing bird communities in this type.

Twelve BBC and WBPS conducted in this type in the Southeast were published in 1947-1979 (Table 7).

Characteristic of this vegetation type are Eastern Wood-Pewees (B), Carolina Chickadees, Red-breasted Nuthatches (W), Brown-headed Nuthatches, Brown Creepers (W), Golden-crowned Kinglets (W), Ruby-crowned Kinglets (W), Pine Warblers, and Dark-eyed Juncos (W).

No species are *restricted* to the type.

Meyers and Johnson (1978) analyze bird-habitat relationships in this type. Dickson et al. (1980) summarize 16 censuses from this type.

Table 7. Published Breeding Bird Censuses and Winter Bird Population Studies from loblolly pine-shortleaf pine in the Southeast in 1947-1979.

State	Season	Successional stage[a]			
		Grass/ forb	Shrub/ seedling	Sapling/ pole-timber	Saw-timber
Georgia	Breeding	1(1)	0	2(2)	0
	Winter	1(1)	0	0	0
South Carolina	Winter	1(1)	0	0	0
North Carolina	Breeding	0	1(1)	1(1)	3(3)
	Winter	0	1(1)	1(1)	0

[a] Entries are listed as "Plots (Years censused)."

Virginia Pine-Pitch Pine (VPPT)

These are forests in which Virginia pine (*Pinus virginiana*) or pitch pine (*P. rigida*), singly or in combination, make up a plurality of the stocking; less than 25 percent of the stocking is hardwoods. The type corresponds to SAF types 45, pitch pine; and 79, Virginia pine. NFS and RRE types, 33, Virginia pine; 38, pitch pine; and 39, Table Mountain pine are equivalent. Stands in the type usually grow on upland sites under severe conditions, e.g. high elevation, southern exposure, poor soils, or xeric situations. This type is successional to upland hardwoods. Comments made above with respect to succession in loblolly pine-shortleaf pine apply here as well.

Eight censuses from this type in the Southeast were published in 1947-1979. One poletimber stand in Virginia was censused during 7 winters; a shrub/seedling stand in Virginia was censused in 1 winter.

Characteristic of this vegetation type are Red-breasted Nuthatches (W) and Golden-crowned Kinglets (W).

No species are *restricted* to this type.

Capen (1979) presents information on bird-habitat associations in this type.

Mixed Pine-Hardwood (MPHW)

These are forests in which hardwoods (usually oaks) and pines (usually loblolly pine or shortleaf pine) each constitute at least 25 percent of the stocking. The type corresponds to NFS types 11, eastern redcedar-hardwood; 12, shortleaf pine-oak; 13, loblolly pine-hardwood (in part, see below); 15, pitch pine-oak; 16 Virginia pine-oak; 20, Table Mountain pine-oak (in part, see below); 43, oak-eastern redcedar; 44, southern red oak-yellow pine; 45, chestnut oak-scarlet oak-yellow pine; 46, bottomland hardwood-yellow pine (in part, see below); 47, white oak-black oak-yellow pine; 48, northern red oak-hickory-yellow pine; and 49, bear oak-southern scrub oak-yellow pine (in which the oak is bear oak). Equivalent SAF types are 76, shortleaf pine-oak; 78, Virginia pine-oak (in part, see below); and 82, loblolly pine-hardwood (in part, see below).

Many stands classed as pine in management prescriptions have sufficient stocking of hardwoods to support bird communities typical of mixed pine-hardwood stands. Our treatment of mixed pine-hardwood focuses on stands in which the pine is loblolly pine, shortleaf pine, or, to a lesser extent, Virginia pine. Thus, the treatment involves all mixed pine-hardwood stands in the Piedmont, lower Mountains, Appalachian Plateau, Ozark Highlands, and Interior Low Plateau physiographic provinces. Mixed pine-hardwood stands on upland sites in the Coastal Plain are covered by this treatment as well. Mixed pine-hardwood stands in Coastal Plain bottomlands are better treated as bottomland hardwood stands (oak-gum-cypress, elm-ash-cottonwood, or bay swamp-pocosin types) with appropriate addition of bird species typical of loblolly pine stands. In mixed stands containing Virginia pine, the expected species pool is virtually the same as for mixed loblolly pine-hardwood or shortleaf pine-hardwood; however, stated suitability ratings for these mixed types may be uniformly too high for the poorer Virginia pine sites. Stands of hardwood and pitch pine or Table Mountain pine are best treated as combinations of Virginia pine-pitch pine and the appropriate hardwood type.

Inclusion of the eastern redcedar stands in this type is warranted, for the most part. Bird communities are similar in redcedar and pine stands. Several important exceptions must be noted, however. Red-cockaded Woodpeckers, Brown-headed Nuthatches, Yellow-throated Warblers, Pine Warblers, and Red Crossbills will be very rarely found in redcedar and mixed redcedar-hardwood stands.

Eighty-three censuses made in this type in the Southeast were published in 1947-1979 (Table 8).

Characteristic of this vegetation type are Chuck-will's-widows (B), Whip poor-wills (B), Great Crested Flycatchers (B), Eastern Wood-Pewees (B), Blue Jays, Carolina Chickadees, Tufted Titmice, Brown Creepers (W), Hermit Thrushes (W), Ruby-crowned Kinglets (W), Yellow-rumped Warblers (W), Summer Tanagers (B), Northern Cardinals, Dark-eyed Juncos (W), and Fox Sparrows (W).

No species are *restricted* to this type.

Evans (1978) treats bird-habitat associations in this type. Dickson et al. (1980) summarize four censuses from this type. Kerlinger and Doremus (1981) studied birds in mixed pitch pine-hardwood stands.

Table 8. Published BBC and WBPS from mixed pine-hardwood in the Southeast in 1947-1979.

State	Season	Successional stage[a]			
		Grass-forb	Shrub/ seedling	Sapling/ pole-timber	Saw-timber
Georgia	Breeding	0	0	0	1(11)
	Winter	0	0	0	1(10)
North Carolina	Breeding	1(2)	3(5)	2(5)	1(23)
	Winter	0	0	0	1(23)
Virginia	Winter	1(1)	1(2)	0	1(2)

[a] Entries are listed as "Plots (Years censused)."

Common Name	BW[a]	Local Use	Habitat Suitability by Vegetation Type and Successional Stage																				Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			LOMA				EACO				LBSH				VPPT				MPHW													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Brown Pelican	B		M	M																			N		N	N				S		
	W																															
Double-crested Cormorant	B								M	M																		N	NDT NOC	A	F	
	W																															
Olivaceous Cormorant	B		M	M	S	S																			N	N	NP	NP	PDT	A	A	
	W																										P	P	PDT	A	A	
Anhinga	B						M	M	M	M																NP	NP	NP		FB		
	W						M	M	M	M																P	P	P		FB		
Great Blue Heron	B			M	M	S				S													F		F			NP	NDT PDT	A	F	
	W						M	M	M	M													F		F			P	PDT	A	F	
Great Egret	B			S	O	O	M	M	S	S													F		F	NP	NP	NP		A	F	
	W																						F		F	P	P	P		A	F	
Snowy Egret	B			S	O	S	M	M	M	M													F		F	NP		NP		A	F	
	W																						F		F	P		P		A	F	
Little Blue Heron	B			S	O	S	S	S	S	S													F		F	*		NP		A	F	
	W																						F		F	*		P		A	F	
Tricolored Heron	B			S	O	S	M	M	M	M													F		F	NP		NP		A		
	W																						F		F	P		P		A		
Cattle Egret	B			S	O	S	S	S	S	S													F		F	NP		NP		F		
	W																						F		F	P		P		F		
Green-backed Heron	B			S	S	S		O	S	M													F		F	*	NP	NP	FSW	A	F	
	W																						F		F	*	P	P	FSW	A	F	
Black-crowned Night Heron	B			S	O	S	M	M	M	M															F	NP		NP		A	F	
	W																								F	P		P		A	F	
Yellow-crowned Night Heron	B			S	S	S	M	M	S	S													F				NP	NP		A	F	
	W																						F				P	P		A	F	
White Ibis	B			S	O	S	M	S	S	S													F		F	NP	NP	NP		A		
	W																						F		F		P	P		A		
Glossy Ibis	B			S	O	S	M	M	M	M													F		F	NP	NP	NP		A		
	W																						F		F		P	P		A		
White-faced Ibis	B		M	M	S	S																				N	NP	NP		FB	FB	
	W		M																							P	P		FB	FB	
Wood Stork	B			M	M	M																				NP	NP	NP		A		
	W																											P		A		
Wood Duck	B							M	S	S																			NDT N46 NLC	F	F	
	W							M	S	S																				F	F	

(a) B - Breeding
W - Wintering

(b) Specific Requirements Code Key

First Letter
- N - Nests
- P - Perches
- F - Forages
- * - All Requirements

2nd and 3rd Letters
- DT - Dead Trees
- BT - Big Trees
- CC - Closed Canopy
- OC - Open Canopy
- GO - Grassy Openings
- DL - Downed Logs
- RP - Rocky Places
- EB - Earth Banks
- LC - Living Cavity Tree
- 15 - 15 cm Min. Snags
- 25 - 25 cm Min. Snags
- 35 - 35 cm Min. Snags
- 46 - 46 cm Min. Snags

(c) Water Codes
- A - All
- F - Fresh
- B. - Brackish
- S - Salt

Common Name	BW[a]	Local Use	Habitat Suitability by Vegetation Type and Successional Stage																		Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			LOMA				EACO				LBSH				VPPT				MPHW											
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Mallard	B																														
	W						S	M	M	M															FP					FB	F	
Hooded Merganser	B						M	M	M	M																					
	W						M	M	M	M																			NDT N46 NLC	F		
																														F		
Black Vulture	B			M	M	M	M	M	S	S		M	S	S						M	O	O	F	F	F	F		*			
	W		M	M	M	M	M	M	S	S	M	M	M	M					M	M	S	S	F	F	F	F		*			
Turkey Vulture	B			M	M	M	M	M	S	S		M	S	S		M	M	M		M	O	O	F	F	F	F		*			
	W		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	S	F	F	F	F		*			
Osprey	B				M	M			M	M			M	M														NP	NDT PDT NBT PBT N46 P46	A	F	
	W				M	M			M	M																		P	PDT PBT P46	A	F	
American Swallow-tailed Kite	B									S												M	F		F	F	F	NP	NBT PBT	F	F	
	W																															
Black-shouldered Kite	B																						F		F	N		N			
	W																						F		F						
Mississippi Kite	B									O				M								M						NP		F	F	Yes
	W																															
Bald Eagle	B									M				S								M						NP	PDT NDT PDT P46	A	F	
	W								M	M			M	M							M	M						P	PDT PBT P46	A	F	
Northern Harrier	B																															
	W		S				S				M				M				S				F		*							
Sharp-shinned Hawk	B																M	M			M	O	F	F	F	F	F	*	NCC			
	W				O	O			S	S			S	S			M	M			O	O	F	F	F	F	F	*				
Cooper's Hawk	B								M	M			M	M			M	M			M	O	F	F	F	F	F	*	NCC			
	W				M	M			S	S			S	S			M	M			O	O	F	F	F	F	F	*				
Northern Goshawk	B																															
	W								M	M							M	M			M	S				F	FP	FP	FGO			
Red-shouldered Hawk	B				M	M			M	O													F		F	F		*		F	F	550
	W		M	M	M	M	M	M	S	O													F		F	F		*		F	F	
Broad-winged Hawk	B																					S	F	F	F	F		*				Yes
	W																						F	F	F	F		*				
Short-tailed Hawk	B								M	M													F		F	F		*				
	W								M	M													F		F	F		*				
Red-tailed Hawk	B					M				M				M								O	F		F			*	PDT			
	W		M	M	M	M	M	M	M	M	S	M	M	S	M	M	M	M	S	M	S	O	F		F			*	PDT			
Ferruginous Hawk	B																															
	W		M				M				M								M				FP		FP				PDT			Yes

(a) B - Breeding
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(b) Specific Requirements Code Key

First Letter
N - Nests
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2nd and 3rd Letters
DT - Dead Trees
BT - Big Trees
CC - Closed Canopy
OC - Open Canopy

GO - Grassy Openings
DL - Downed Logs
RP - Rocky Places
EB - Earth Banks
LC - Living Cavity Tree

15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
35 - 35 cm Min. Snags
46 - 46 cm Min. Snags

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt

Common Name	BW[a]	Local Use	Habitat Suitability by Vegetation Type and Successional Stage																		Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			LOMA				EACO				LBSH				VPPT				MPHW												
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Rough-legged Hawk	B																														
	W		M								M								S				F		F						Yes
Golden Eagle	B																						F		F				NSW			
	W																		M				F		F				PSW			
American Kestrel	B										S				M				S				F		F			*	*DT F15 *35 NLC			
	W		O	S	M	M					O	M			M	M			O	M			F		F			*	FDT F15			
Merlin	B																														
	W		S	M	M	M																	F		F							
Peregrine Falcon	B																						F		F			F	PDT NRP PRP			
	W		S	M	M	M																	F		F			F	PDT PRP			
Black Francolin	B										M								M				F		*				*OC			
	W										M								M				F		FP				FOC POC			
Ring-necked Pheasant	B		M								M				M				S				F		*							
	W		M								M				M				S				F		*							
Ruffed Grouse	B															M	M	M		M	S	M	F	*	*	F	P					
	W															M	M	S		M	S	S	F	*	*	F	P					
Wild Turkey	B				M	S							M	S							M	S	F	*	*		P	P	FGO			
	W			S	S	S						M	M	S						M	S	S	F	*	*		P	P	FGO			
Northern Bobwhite	B		M	M							O	O	M	S	S	M	M	M	S	O	M	M	F		*				*GO			
	W		M	M							S	S	M	S	S	M	M	M	O	O	M	M	F		*				*GO			
Yellow Rail	B																														
	W						M																F		*					A		
Black Rail	B																														
	W						M																F		*					A		
Clapper Rail	B		M																				F		*							
	W		M																				F		*							
King Rail	B						M																F		*					FB		
	W						M																F		*					FB		
Virginia Rail	B																														
	W						M																F		*					FB		
Sora	B																														
	W						M																F		*					F		
Purple Gallinule	B																								*					F		
	W																								*					F		
Common Moorhen	B																								*					F		
	W																								*					F		

(a) B - Breeding
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(b) Specific Requirements Code Key

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15 - 15 cm Min. Snags
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- A - All
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- S - Salt

Common Name	BW[a]	Local Use	Habitat Suitability by Vegetation Type and Successional Stage																		Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			LOMA				EACO				LBSH				VPPT				MPHW											
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Limpkin	B																						F		*	N				F	F	
	W																						F		*					F	F	
Sandhill Crane	B																								*					F		
	W																								*					F		
Killdeer	B						M				M												*		*							
	W						M				M												*		*							
Upland Sandpiper	B										M				M				O						*					FB	F	Yes
	W																															
Common Snipe	B																															
	W						S	M															F		F					FB	F	
American Woodcock	B								S	O											M	S	F	*	F					F		
	W			M	S	S		S	O	O	M	M	M	M					M	M	M	S	F	*	F					F		
Rock Dove	B		M				M				M				M				M				F		F							
	W		M				M				M				M				M				F		F				NRP			
																													PRP			
White-winged Dove	B			M	M																		F		F		NP	P				
	W		M	M	M																		F		F	FP	P	P				
Mourning Dove	B			S	S	S	S	S	S	S	M	S	S	M		M	M	M	S	O	O	S	F		F		NP	NP				
	W		S	S	S	S	S	S	S	S	O	S	S	S	M	M	M	M	S	S	S	S	F		F		P	P				
Common Ground-Dove	B			O	S	M					O	M								M			F		*	N						
	W		O	O	S	M					S	M							M	M			F		*	*						
Black-billed Cuckoo	B								M	M											M	M				N	*	*				Yes
	W																															
Yellow-billed Cuckoo	B				S	S			O	O											M	M				N	*	*				Yes
	W																															
Greater Roadrunner	B						M	S	M	M	M	S	M	M					M	S	M	M	F		F	*	*	N	*OC			
	W						M	S	M	M	M	S	M	M					M	S	M	M	F		F	FP	FP		FOC POC			
Groove-billed Ani	B																						F		F	*			*OC			
	W		M	M			M	M			M	M							M	M			F		F	FP			FOC POC			
Common Barn-Owl	B		S	M							O	M			M	M			O	M			F		F	P		P	N46 NLC NRP			
	W		O	M							O	M			M	M			O	M			F		F	P		P	P46 9LC PRP			
Eastern Screech-Owl	B				M	S			M	S			M	O			M	M			M	O	F	F	F	F	*	*	N35 PLC NDT			
	W				M	S			M	S			M	O			M	M			M	O	F	F	F	F	*	*	P35 PLC PDT			
Great Horned Owl	B					S				M				O				M				O	F	F	F	F	F	*				None
	W				M	S			M	M			M	O			M	M			M	O	F	F	F	F	F	*				None
Snowy Owl	B																															
	W		M				M				M				M				M				FP		FP				PDT			

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			LOMA				EACO				LBSH				VPPT				MPHW													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Barred Owl	B								S	O													F	F	F	F	F	*	NBT NLC	F	F	None
	W								S	O													F	F	F	F	F	*	PBT PLC	F	F	None
Long-eared Owl	B																M	M			M	S	F	F	F	F	*	*				
	W											S	O	S		M	S	M		M	M	M	F	F	F	F	*	*				
Short-eared Owl	B																															
	W		S	M			M				M								M				F		*							
Northern Saw-whet Owl	B																						F	F	F	F	*	*	NDT N15 NLC			
	W											S	O	M		S	S	M		M	M	M	F	F	F	F	*	*	PDT P15 PLC			
Common Nighthawk	B		M	M	M	M																	N						NRP			
	W																															
Chuck-will's-widow	B				S	S							S	O							S	O		N								
	W				M	M							M	M							S	S		P								
Whip-poor-will	B								M	M			S	S			S	S			S	O		N								Yes
	W				S	O			M	M			S	S							S	O		P								
Chimney Swift	B									M																			N35 NLC			
	W																															
Buff-bellied Hummingbird	B																															
	W			M	M	M																				F	*	*				
Ruby-throated Hummingbird	B			M	S	S		S	O	O										M	M	M				*	*	*				Yes
	W																									*	*	*				
Black-chinned Hummingbird	B																															
	W			M	M	M																				F	*	*				
Rufous Hummingbird	B																															
	W			S	M	M																				F	*	*				
Belted Kingfisher	B				M	M			M	S																P	P		PDT F15 FSW NEB	A	F	
	W				M	M			M	S																P	P		PDT F15 FSW	A	F	
Red-headed Woodpecker	B				M	M			M	M			M	M							M	M			F				*DT *OC N35			
	W				M	M			S	O			M	M							M	M			F	F	F	*	*DT			
Red-bellied Woodpecker	B				M	S			M	O			M	M							M	S						*	*DT N35 NLC			1
	W				M	S			M	O			M	M							M	S						*	*DT P35 PLC			
Yellow-bellied Sapsucker	B																									F	F	*	*DT N25 NLC			
	W				M	M			M	S			M	S			M	M			S	O				F	F	*	*25 *LC			
Downy Woodpecker	B				M	S			S	O			M	S			M	M			S	O				*	*	*	*15 *LC *DT			
	W				M	S			S	O			M	S			M	M			S	O				*	*	*	*15 *LC *DT			
Hairy Woodpecker	B				M	M			M	O			M	M			M	M			M	S					*	*	*25 *LC *DT			18
	W				M	M			M	O			M	M			M	M			M	S					*	*	*25 *LC *DT			

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			LOMA				EACO				LBSH				VPPT				MPHW													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Red-cockaded Woodpecker	B												M	S				M			M	M					F	F	*BT *LC			
	W												S	O			M	M			M	M					F	F	*BT *LC			
Northern (Yellow-shafted) Flicker	B				M	M	M	M	M	M			M	M			M	M			M	S	F		F			*	*DT *GO N35 NLC			
	W				M	S	M	M	M	S	M	M	S	S			M	M	M	M	M	S	F		F			*				
Pileated Woodpecker	B					M			M	O			M	M							M	S					F	*	*DT *BT *CC *46 NLC FDL			405
	W					M			M	O			M	M			M	M			M	S					F	*	*DT *BT *CC			
Eastern Wood-Pewee	B				M	M		M	M	S		M	M	O			M	M			M	O					F	*	FDT F15			
	W																															
Acadian Flycatcher	B								O	O											M	M					*	*	FDT *OC F15	F	F	37
	W																															
Willow Flycatcher	B							S																		*				F	F	
	W																															
Least Flycatcher	B								M	M					M		M	M									*	*	*OC			
	W																										*	*	*OC			
Eastern Phoebe	B								M	S																*	*		*OC NSW			
	W		S	O	S	M	S	O	S	S	S	S	S	M	M	M	M	M	S	S	S	M	F		F	*						
Vermilion Flycatcher	B																															
	W			S	S	M		S	S	M													F		F	*	*	*	*DT *OC	F		
Ash-throated Flycatcher	B																															
	W			M	M	M																				*	*		*OC			
Great Crested Flycatcher	B				M	O			M	S		M	M	S			M	M			M	O					F	*	N25 NLC			1
	W				M	M																					F	*	PDT			
Brown-crested Flycatcher	B																															
	W			M	M	M																				*	*	*				
Eastern Kingbird	B		M								M								M						F			*	FDT *OC F15			
	W																															
Gray Kingbird	B			M	S	M																				*	*	*	FDT F15			
	W																															
Scissor-tailed Flycatcher	B						S	S	M	M	S	S	M	M					S	S	M	M	F		F	*	*	*	FDT *OC			
	W		S	M	M	M																	F		F	*	*	*	*DT *OC			
Horned Lark	B						M				M				M				M				*		*							
	W						M				M				M				M				*		*							
Purple Martin	B		M				M				M				M				M										NDT N25 NLC			
	W																															
Tree Swallow	B						M	M	M	M																			NDT N15	FB	F	
	W		S	S	M	M																				*				FB	F	

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			LOMA				EACO				LBSH				VPPT				MPHW													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Bank Swallow	B																		M										NEB	FB	F	
	W																															
Cliff Swallow	B						M				M				M				M										NRP			
	W																															
Barn Swallow	B		M				M				M				M				M										NRP			
	W																															
Blue Jay	B				M	S			M	M			M	S			M	M			M	O	F	F	F	F	*	*				Yes
	W			M	M	S		M	M	M		M	M	S		M	M	M		M	S	O	F	F	F	F	*	*				
Scrub Jay	B			M	S																					*						
	W			M	S																					*						
American Crow	B				M	M			M	M			M	O			M	S			S	O	F		F			*	NCC			
	W	S	M	M	M	M	M	M	M	M	S	M	M	O	S	M	M	S	S	M	S	O	F		F			*	POC			
Fish Crow	B			S	O	O			M	M			M	O							M	S	F		F	*		*		A	F	
	W	O	S	O	O	M	M	M	M	S	M	M	S						S	M	M	S	F		F			*		A	F	
Common Raven	B															M	M	M		M	M	M	F		F			P	NRP			
	W														M	M	M	M	M	M	M	M	F		F			P				
Black-capped Chickadee	B																				M	M				F	*	*	N15 P15 NLC PLC NDT			
	W															M	M	M		M	M	M				F	*	*	P15 PLC PDT			
Carolina Chickadee	B				M	S			M	S			S	O			M	S			S	O				F	*	*	NDT N15 P15 NLC PLC			
	W		M	M	M	S		M	M	S		M	S	O		M	M	S		M	S	O				F	*	*	PDT P15 PLC			
Tufted Titmouse	B			M	M	M			M	S			M	M			M	S			S	O				F	*	*	NDT N15			2
	W		M	M	M			M	M	S		M	S	S		M	M	M		M	S	O				F	*	*				
Red-breasted Nuthatch	B																M	M				*	*						NDT N15			
	W											M	O	O		M	O	O		M	S	O					*	*				
White-breasted Nuthatch	B								M	S			M	M							M	M						*	*DT *BT NLC			8
	W								M	S			M	M							M	M						*	*DT			
Brown-headed Nuthatch	B												S	O			M	M			M	M					*	*	NDT N15 NLC			
	W											M	S	O			M	M			M	M					*	*				
Brown Creeper	B									M																	*	*	N25 NLC			Yes
	W				M	M			S	S			S	O			S	S			S	O					*	*				
Carolina Wren	B			S	O	O		M	O	O		M	S	S		M	M	M		S	O	O	*	*	*	*	*		N15 NLC *SW NRP			
	W			S	O	O		M	O	O		M	S	S		M	M	M		S	O	O	*	*	*	*	*		*SW			
Bewick's Wren	B										M	M							M						*	*			N15 NLC *SW NRP			
	W																			M					*	*			*SW			
House Wren	B																								F	*			N15			
	W	M	M				M	M			M	M							M	M					F	*			*SW			

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			LOMA				EACO				LBSH				VPPT				MPHW											
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Winter Wren	B																						*	*	F	F	P	P	*CC *LC			
	W				M	M			O	O			M	S			M	M			S	S	*	*	F	F			*SW			
Sedge Wren	B																															
	W						M																F		*	*						
Marsh Wren	B						M																		*					A		
	W						M																		*					A		
Golden-crowned Kinglet	B																										F	*	*CC			
	W			M	M	M			M	S		M	O	O		M	O	O		M	O	O				F	F	*				
Ruby-crowned Kinglet	B																															
	W			S	O	O		M	M	S		S	O	O		S	S	S		S	O	O				*	*	*				
Blue-gray Gnatcatcher	B				M	S			M	O			M	S							M	S				*	*	*				37
	W			M	O	O		M	M	M		M	S	S						M	O	O				*	*	*				
Eastern Bluebird	B										M		M	M					M		M	M	F		F			*	NDT PDT *OC N15 P15			
	W										S	M	S	S					M	M	M	M	F		F			*	PDT *OC P15			
Hermit Thrush	B																							*	F	P	P	P	*CC			
	W				S	S			O	O			S	S			M	M			O	O		*	F	*	*		*CC			
Wood Thrush	B				M	M			S	O			M	S							M	S		F	F	*	P		*CC			3
	W																															
American Robin	B											M	M	M		M	M	M		M	M	M	F		F	N	N	NP	*GO			
	W			M	M	S	M	M	S	O										M	M	M	F		F	*	*	*				
Gray Catbird	B			M	M	M		O	O	S										M	M	M				*	P					
	W			S	S	M		O	O	S										M	M	M			*	*						
Northern Mockingbird	B		M	M															M	M					F	*			*OC			
	W		M	M							M	M			M	M			M	M					F	*	*		*OC			
Brown Thrasher	B			S	M	M		S	M	M		S	M	M		S	M	M		O	M	M	F	F	F	*	P	P				
	W			S	M	M		S	M	M		S	M	M		M	M	M		O	M	M	*	*	*	*						
Water Pipit	B																															
	W						S																*		*							
Sprague's Pipit	B																															
	W						M				M								M				*		*							
Cedar Waxwing	B								M	M																*	*	*	*OC			
	W			S	S	S		M	S	S										M	M	M				*	*	*	*OC			
Loggerhead Shrike	B										M												F		F	N						
	W										M												F		F	P						
European Starling	B																		M	M	M	M	F		F				NDT N25 NLC NRP			
	W			M	M	M	M	M	S	S		M	M	M					M	M	M	M	F		F	F	F	F				

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			LOMA				EACO				LBSH				VPPT				MPHW													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
White-eyed Vireo	B			M	M	M		O	S	M															F	*	P					
	W			M	M	M	M	S	M	M															F	*						
Bell's Vireo	B						S	M											M	S	M				F	*	*		*OC			
	W																															
Solitary Vireo	B												M	S			M	M			M	S				N	*	*				Yes
	W				S	O			M	M			S	O							S	O					*	*				
Yellow-throated Vireo	B									O												M					F	*				Yes
	W																										F	*				
Warbling Vireo	B									S																		*	*OC			
	W																															
Red-eyed Vireo	B				M	M			M	S			M	M							M	S					*	*				7
	W																															
Bachman's Warbler	B							S	S	S															F	*	P	P	*OC			
	W																															
Blue-winged Warbler	B							M												M					*	*		P				
	W																															
Golden-winged Warbler	B										M									M	M				N	*	P	P				
	W																															
Orange-crowned Warbler	B																								*	*	*		*SW			
	W		M	O	S	S	M	S	S	S				M					M	M	M	M										
Northern Parula	B					O			M	O											M	S					*	*				1300
	W				M	M																					*	*				
Yellow Warbler	B							S	M																	*						
	W																									*						
Chestnut-sided Warbler	B																			S	M	M				*	*	P	*OC			Yes
	W																															
Yellow-rumped (Myrtle) Warbler	B																															
	W			O	O	O	M	S	O	O		M	S	S		M	M	M		S	O	O	*	*	*	*	*	*				
Black-throated Gray Warbler	B																															
	W				M	M																				F	*	*				
Black-throated Green Warbler	B				M	M			M	S				M			M	M			M	S					F	*	*CC			Yes
	W																										F	*				
Yellow-throated Warbler	B				M	S			M	O			M	S			M	M			M	S						*	FDT *BT			Yes
	W				M	O							M	S							M	S						*	FDT *BT			
Pine Warbler	B												M	O			M	M			M	S					F	*				Yes
	W												S	O			M	M			M	S			F		F	*				

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RP - Rocky Places
EB - Earth Banks
LC - Living Cavity Tree
15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
35 - 35 cm Min. Snags
46 - 46 cm Min. Snags

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Common Name	BW[a]	Local Use	Habitat Suitability by Vegetation Type and Successional Stage																		Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			LOMA				EACO				LBSH				VPPT				MPHW											
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Prairie Warbler	B			O	S			M				S								O					F	*						
	W			S	S	M	M	M	M	M		M	M	M						M	M	M	M			*	*						
Palm Warbler	B																															
	W		S	O	M						S	O	M		M	M	M		M	S	M		*		*	*						
Cerulean Warbler	B									S																		*	*BT *CC			1750
	W																															
Black-and-white Warbler	B								M	M											M	M		N	N		F	F	*CC			550
	W				S	O			M	S											M	S					F	*				
American Redstart	B								S	O																*	*	FP				Yes
	W								M	M																*	*	*				
Prothonotary Warbler	B								M	S																*	*		*DT N15	F	F	Yes
	W																															
Worm-eating Warbler	B								M	M											M	M		*	F	*	P		*CC			370
	W																							*?	*?	*	*					
Swainson's Warbler	B								S	S													F	F	F	*	P					Yes
	W																															
Ovenbird	B								M	M			M	M							S	O	*	*		P	P					15
	W				M	S			M	M			M	M							M	S	*	*								
Northern Waterthrush	B																						*			P	P			F		500
	W							M	M	M													*							F	F	
Louisiana Waterthrush	B									S												M	*			P	P		*RP		F	875
	W																															
Kentucky Warbler	B								M	O												M	F	F	*	*	P					45
	W																															
Common Yellowthroat	B		M	S			S	O			S	M							S	S					*	*						
	W		M	S			S	O			M	M							M	M					*	*						
Hooded Warbler	B				M	M			M	O				S							M	S				*	FP					Yes
	W																															
Wilson's Warbler	B																															
	W		S	S	M	M	M	S	M		M	M	M						M	M	M				F	*	*					
Yellow-breasted Chat	B			M				S			M	S	M						M	S						*			PDT			
	W			S				M												M						*						
Summer Tanager	B				M	S			M	M			M	S							M	O					*	*				100
	W																															
Scarlet Tanager	B									M												S					F	*	*CC			30
	W																															

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			LOMA				EACO				LBSH				VPPT				MPHW												
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Western Tanager	B																															
	W				M	M															M	M		F		*	*	*				
Northern Cardinal	B			S	O	O		S	S	S		M	S	S		M	M	M		M	S	O		*	*	*	F	F				
	W			O	O	O	M	S	S	S		S	S	S		M	M	M		O	O	O		*	*	*						
Black-headed Grosbeak	B																															
	W				M	M															M	M					*	*				
Blue Grosbeak	B						M	S			M	S							M	S					*	*						
	W																								*	*						
Indigo Bunting	B			M	M	M	M	M	M	M	M	S							M	S	M	M			*	*	P	P	*OC			
	W	M	M	M	M	M	M	M																	*	*						
Painted Bunting	B			S	O			M	M																*	*	P					
	W		S	S				M	M																*	*						
Dickcissel	B						M				M				M				M						*	P						
	W	M	M																						*	*						
Green-tailed Towhee	B																															
	W	M	M	M	M						M	M	M	M					M	M	M	M	F	F	F	*	*					
Rufous-sided Towhee	B			O	O	S		S	S	M		S	S	S		M	M	M		O	O	S		F	*	*	P	P				
	W			O	O	S		S	S	M		S	S	S		S	M	M		O	O	S		F	*	*						
Bachman's Sparrow	B										S	O	M		M	M			M	S					*	*	P	P	*OC			
	W	M									M	M							M	M					*							
American Tree Sparrow	B																															
	W										M				M				O	M					*	*						
Chipping Sparrow	B										M	M	M	S					M	M	M	M	F		*	*	*	*	*OC			
	W	M	M	M	M						S	M	M	S					M	M	M	M	F		*	*	*	*	*OC			
Clay-colored Sparrow	B																															
	W	M	M				M	M			M	M							M	M			F		F	*			*OC			
Field Sparrow	B			M				M			S	O				S			S	O					*	*						
	W	S	S				M	M			O	S			S	S			O	S					*	*						
Vesper Sparrow	B														M				M				*		*	P						
	W	M									S								S				*		*							
Lark Sparrow	B						M	M			S	S	M		S	S	M		S	S	M		F		*	*	P		*OC *GO *RP			
	W	M	S				M	M			S	S	M						S	S	M		F		F	*			*OC *GO			
Lark Bunting	B																															
	W										M								M				F		*							
Savannah Sparrow	B																		S						*							
	W	S					S				S				M				S						*							

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			LOMA				EACO				LBSH				VPPT				MPHW											
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Grasshopper Sparrow	B										O				M				O						*							
	W		M				M				O	M							O	M					*							Yes
Henslow's Sparrow	B										M				M				M						*							
	W										M								M						*					FB		
Le Conte's Sparrow	B																															
	W						M				O								O						*							
Sharp-tailed Sparrow	B		M																													
	W		M																				*		*					SB		
Seaside Sparrow	B		M																				*		*					SB		
	W		M																				*		*					SB		
Fox Sparrow	B																															
	W			M	S	S		M	M	S		M	S	O		M	M	M		M	S	O		F		*	*				
Song Sparrow	B			M				S												M					*	*						
	W		M	M			M	S			S	M			M	M			S	M					*	*						
Lincoln's Sparrow	B																															
	W						M	S																	*	*				F		
Swamp Sparrow	B																															
	W						S	S											M						*					FB		
White-throated Sparrow	B																															
	W		M	S	S	S	M	S	S	O	M	M	M	M	M	M	M	M	M	M	S	S		F	F	*	*	*				
White-crowned Sparrow	B																															
	W										M	M			M	M			S	M			F		*	*						
Harris' Sparrow	B																															
	W						M	S	S	S	M	S	M	M					M	S	M	M	F	F	F	*	*	P				
Dark-eyed Junco	B																						N	F	*	*	P	P				
	W		M	M	M	M					M	S	S	O	M	S	S	S	M	S	S	O	F	F	*	*	*					
Lapland Longspur	B																															
	W		M																				*		*							
Smith's Longspur	B																															
	W						M				M								M				F		*							
Chestnut-collared Longspur	B																															
	W										M								M				F		*							
Snow Bunting	B																															
	W		M																				*		*							
Bobolink	B																															
	W										M								M						*							

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			LOMA				EACO				LBSH				VPPT				MPHW													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Red-winged Blackbird	B		S				S	O	M		S				M				S						*	*	P	P				
	W		M				S	O	S	M	M				M				M						*	P	P	P				
Eastern Meadowlark	B		M				M				O	M			S	M			O	M					*							Yes?
	W		M				M				O	M			S	M			O	M					*							Yes?
Western Meadowlark	B						M																		*							
	W		M				M				M								M						*							
Yellow-headed Blackbird	B																															
	W		M		M	M	M		M		M		M						M		M		F		F		P	P				
Rusty Blackbird	B																															
	W						M	M	S	S											M	M	F		F	P	P	P				
Brewer's Blackbird	B																															
	W										M								M				F		F	P	P	P				
Great-tailed Grackle	B		M	S	S	S	S	M			M	M							M	M			F		*	*	*	P	*OC			
	W		M	S	S	S	S	M			M	M							M	M			F		F	*	*	P	*OC			
Boat-tailed Grackle	B		S	O	S	M	M	M	M	M													F		*	N	N	N		A		
	W		S	O	S	M	M	M	M	M													F		*	P	P	P		A		
Common Grackle	B				S	S							S	S			M	M			S	S	F		F	N	NP	NP				
	W				M	M	M	M	S	S			M	M							M	M	F		*	P	P	P				
Bronzed Cowbird	B		M	M	M	M	M	M	M	M	M	M	M	M					M	M	M	M	F		F	N	N	N	*OC			
	W		M				M				M								M				F		F				*OC			
Brown-headed Cowbird	B		M	M	M	M	S	S	S	S	M	S	S	S	M	M	M	M	M	S	S	S	F		F				*OC N15 NDT			
	W				M	M	M	M	S	S			M	M							M	M	F		*	P	P	P				
Orchard Oriole	B		M		M	M			M	M																*	*	*	*OC			
	W																															
Spot-breasted Oriole	B																										F	*	*OC			
	W																										F	*	*OC			
Northern (Baltimore) Oriole	B								M	M																	F	*	*OC			
	W																									*	F	*	*OC			
Purple Finch	B																										*	*				
	W				M	M		M	S	O			M	S			M	S			S	O				*	*	*				
House Finch	B																															
	W										M								M	M			*		*	*						
Red Crossbill	B												M	M			M	M									F	*				
	W												M	S			M	S			M	M					*	*				
White-winged Crossbill	B																															
	W																M	M									*	*				

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			LOMA				EACO				LBSH				VPPT				MPHW											
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Common Redpoll	B																															
	W						S	M			M	M			M	M			S	M			F		*	*	*	-	*OC			
Pine Siskin	B																															
	W			M	M	M		S	S	O	M	S	S	O	M	S	S	O	M	S	S	O	F		F	F	*	*				
American Goldfinch	B																															
	W		M	M	M	M	S	O	S	S	O	M	M	M	S	M	M	M	Q	S	M	M	F		F	F	P	P				
Evening Grosbeak	B																															
	W								M	M			S	O			S	S			M	O	F			*	*	*				
House Sparrow	B		M				M				M				M				M				F		F							
	W		M				M				M				M				M				F		F							

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Oak-Hickory (OKHK)

These are forests in which a plurality of the stocking comprises upland oaks and hickories (*Carya* sp.), singly or in combination, and where pines make up less than 25 percent of the stocking. Equivalent NFS types are 10, white pine-upland hardwoods (in part); 42, upland hardwoods-white pine (in part); 51, post oak-blackjack oak; 52, chestnut oak; 53, white oak-red oak-hickory; 54, white oak; 55, northern red oak; and 59, scarlet oak. The type corresponds to SAF types 20, white pine-northern red oak-red maple (in part); 40, post oak- blackjack oak; 43, bear oak; 44, chestnut oak; 50, black locust; 51, white pine -chestnut oak (in part); 52, white oak-black oak-northern red oak; 53, white oak; 55, northern red oak (in uplands); 60, chestnut oak-scarlet oak; 64, sassafras-persimmon; 88, black locust; 99, brush species (on upper slopes); and 110, black oak. RRE types 50, oak-hickory; and 52, chestnut oak are included in the type. Oak-hickory forests occur across a wide range of geographic and physiographic conditions. Bird communities of this type also vary across the South. Users of this matrix must consider this fact when estimating the bird community on a specific site.

Ninety-two censuses made in oak-hickory plots in the Southeast were published in 1947-1979 (Table 9).

Characteristic of this vegetation type are Red-bellied Woodpeckers, Hairy Woodpeckers, Downy Woodpeckers, Blue Jays, Tufted Titmice, White-breasted Nuthatches, Carolina Wrens, Wood Thrushes (B), Red-eyed Vireos (B), Ovenbirds (B), and Scarlet Tanagers (B).

No species are *restricted* to the type.

Evans (1978) and Probst (1979) treat bird-habitat associations in this type. Dickson et al. (1980) summarize 27 censuses from this type. Hamel et al. (1986), Ford and Hamel (1988) and Hamel et al. (1988) discuss bird communities and the prediction of bird communities in this type.

Table 9. Published BBC and WBPS from oak-hickory in the Southeast in 1947-1979.

State	Season	Successional stage[a]			
		Grass/ forb	Shrub-seedling	Sapling/ pole-timber	Saw-timber
Georgia	Breeding	0	1(2)	0	2(2)
North Carolina	Breeding	1(4)	0	3(9)	4(12)
	Winter	1(5)	0	0	3(5)
Virginia	Breeding	0	0	3(3)	7(22)
	Winter	4(8)	1(4)	1(1)	3(15)

[a] Entries are listed as "Plots (Years censused)."

White Pine-Hemlock (WPHM)

These are forests in which white pine (*Pinus strobus*) or hemlock (primarily *Tsuga canadensis* and rarely *T. caroliniana*), singly or in combination, compose a plurality of the stocking. Equivalent NFS types are 2, red pine; 3, white pine; 4, white pine-hemlock; 5, hemlock; 8, hemlock-hardwood (in part); 9, white pine-cove hardwoods (in part); 10, white pine-upland hardwoods (in part); 41, cove hardwoods-white pine-hemlock (in part); and 42, upland hardwoods-white pine (in part). The type corresponds to SAF types 20, white pine-northern red oak-red maple (in part); 21, eastern white pine; 22, white pine-hemlock; 23, eastern hemlock; 24, hemlock-yellow birch (in part); and 51, white pine-chestnut oak (in part). Equivalent RRE type is 4, white pine-hemlock.

Three BBC have been published from sawtimber stands in this type; a North Carolina plot was studied in 2 years and a Virginia plot was censused in 1 year.

Characteristic of this vegetation type are Solitary Vireos (B), Northern Parulas (B), Black-throated Green Warblers (B), Blackburnian Warblers (B), Canada Warblers (B), and Dark-eyed Juncos.

No species are *restricted* to the type.

Capen (1979) presents information on bird-habitat associations in this type. Dickson et al. (1980) summarize 9 censuses from this type.

Cove Hardwoods (COVE)

These are forests in which many species of hardwoods together compose a plurality of the stocking and which occur on moist, fertile, protected sites in deep hollows extending back into mountain ranges. Characteristic tree species are yellow-poplar (*Liriodendron tulipifera*), basswood (*Tilia heterophylla*), sugar maple (*Acer saccharum*), buckeye (*Aesculus octandra*), and white oak (*Quercus alba*). Equivalent NFS types are 8, hemlock-hardwood (in part); 9, white pine-cove hardwoods (in part); 41, cove hardwoods-white pine-hemlock (in part); 50, yellow-poplar (in the Mountains); 55, northern red oak; 56, yellow-poplar-white oak-northern red oak; and 99, brush species (on lower slopes in coves). The type corresponds to SAF types 26, sugar maple-basswood (in part); 28, black cherry-maple (in part); 55, northern red oak (in part); 57, yellow-poplar (in the Mountains); 58, yellow-poplar-eastern hemlock; 59, yellow-poplar-white oak-northern red oak; and 108, red maple (in the Mountains). No precise RRE equivalent exists; oak hickory (RRE type 50) or maple-beech-birch (RRE type 80) stands growing in mountain coves (RRE Physiographic Class 27) or on mountain saddles and moist slopes (RRE Physiographic Class 24) approximate the cove hardwoods designation.

Eleven BBC were done in sawtimber cove hardwoods stands in the Southeast in 1947-1979; 10 were made on a single plot in Georgia, and the remaining 1 was conducted on a North Carolina plot.

Characteristic of this vegetation type are Pileated Woodpeckers, White breasted Nuthatches, Solitary Vireos (B),

Red-eyed Vireos (B), Black-and-white Warblers (B), Black-throated Blue Warblers (B), Canada Warblers (B), Scarlet Tanagers (B), and Dark-eyed Juncos.

Cerulean Warblers are *restricted* to the type in the breeding season in the Mountains.

Hooper (1978) and Samson (1979) discuss bird-habitat associations in cove hardwood forests.

Maple-Beech-Birch (MABB)

These are forests in which sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), or yellow birch (*Betula lutea*), singly or in combination, compose a plurality of the stocking. In the South, stands of this type occur primarily at higher elevations in the Blue Ridge Mountains. Equivalent NFS types are 17, red-spruce-northern hardwoods (in part); and 81, sugar maple-beech-yellow birch. The type corresponds to SAF types 17, pin cherry; 24, hemlock-yellow birch (in part); 25, sugar maple-beech-yellow birch; 26, sugar maple-basswood (in part); 27, sugar maple; 28, black cherry-maple (in part); 30, red spruce-yellow birch (in part); 31, red spruce-sugar maple-beech (in part); and 60, beech-sugar maple. The corresponding RRE type is 80, maple-beech-birch.

No census from this type in the Southeast was published in 1947-1979.

Characteristic of this vegetation type are White-breasted Nuthatches, Veeries (B), Solitary Vireos (B), Black-throated Blue Warblers (B), Rose-breasted Grosbeaks (B), and Dark-eyed Juncos (B).

Yellow-bellied Sapsuckers are *restricted* to this type in the breeding season in the South.

Noon and Able (1978), Noon et al. (1979), and Samson (1979) present information on the avifauna of this type.

Spruce-Fir (SPFR)

These are forests in which red spruce (*Picea rubens*) or Fraser fir (*Abies fraseri*), singly or in combination, constitute a plurality of the stocking. In the South the type is confined to sites at the highest elevations (above 4500 ft, 1450 m) in the Mountains in North Carolina, Tennessee, and Virginia. Equivalent NFS types are 6, Fraser fir; 7, red spruce-Fraser fir; and 17, red spruce-northern hardwoods (in part). The type corresponds to SAF types 30, red spruce-yellow birch (in part); 31, red spruce-sugar maple-beech (in part); 32, red spruce; and 34, red spruce-Fraser fir. The corresponding RRE type is 10, spruce-fir.

Two BBC, 1 from each of 2 sawtimber stands in North Carolina, were reported from this type in 1947-1979.

Characteristic of this vegetation type are Black-capped Chickadees, Red-breasted Nuthatches (B), Brown Creepers (B), Winter Wrens (B), Golden-crowned Kinglets (B), Solitary Vireos (B), Black-throated Green Warblers (B), Blackburnian Warblers (B), and Dark-eyed Juncos.

Restricted to this type are Saw-whet Owls (B), Olive-sided Flycatchers (B), Red-breasted Nuthatches (B), Brown Creepers (B), Hermit Thrushes (B), Swainson's Thrushes (B), Golden-crowned Kinglets (B), Nashville Warblers (B), Magnolia Warblers (B), Purple Finches (B), Pine Siskins (B), and Red Crossbills (B).

Noon and Able (1978) and Crawford and Titterington (1979) discuss birds in spruce-fir forests.

Common Name	BW[a]	Local Use	Habitat Suitability by Vegetation Type and Successional Stage																				Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Black Vulture	B			M	S	S																	F	F	F	F		*				
	W		M	M	M	M																	F	F	F	F		*				
Turkey Vulture	B			M	O	O						M	M	M		M	M	M					F	F	F	F		*				
	W		M	M	M	M					M	M	M	M	M	M	M	M					F	F	F	F		*				
Northern Harrier	B																															
	W		S																				F		*							
Sharp-shinned Hawk	B				M	O			M	M			M	S			M	S					F	F	F	F	F	*	NCC			
	W				M	M			M	M			M	M									F	F	F	F	F	*				
Cooper's Hawk	B				M	O			M	M			M	S			M	S					F	F	F	F	F	*	NCC			
	W				M	M			M	M			M	M									F	F	F	F	F	*				
Northern Goshawk	B																															
	W				M	M			S	S			M	M			M	M			S	S				F	FP	FP	FGO			
Broad-winged Hawk	B					O								S				M					F	F	F	F		*				Yes
	W				M	M																	F	F	F	F		*				
Red-tailed Hawk	B					O								M				M					F		F			*	PDT			
	W		S	M	S	O			M	M	M	M	M	M	M	M	M	M					F		F			*	PDT			
Ferruginous Hawk	B																															
	W		M																				FP		FP				PDT			Yes
Rough-legged Hawk	B																															
	W		O																				F		F							Yes
Golden Eagle	B														M	M			M	M			F		F				NRP			
	W		M												S	M			O	M			F		F				PRP			
American Kestrel	B		S																				F		F			*	*DT F15 *35 NLC			
	W		O	M																			F		F			*	FDT F15			
Peregrine Falcon	B														M	M			M	M			F		F			F	PDT NRP PRP			
	W																						F		F			F	PDT PRP			
Black Francolin	B		M																				F		*				*OC			
	W		M																				F		FP				F0C POC			
Ring-necked Pheasant	B		S																				F		*							
	W		S																				F		*							
Ruffed Grouse	B			M	M	S		M	M	M	M	S	S	S		O	O	O	M	S	M	M	F	*	*	F	P					
	W			M	M	M		M	O	O	M	O	S	M		O	S	S	M	S	M	M	F	*	*	F	P					
Wild Turkey	B			M	M	S							M	S			M	S					F	*	*		P	P	FGO			
	W			M	M	S			M	M		M	M	S		M	M	M					F	*	*		P	P	FGO			
Northern Bobwhite	B		M	O							M	M											F		*				*GO			
	W		M	O							M	M											F		*				*GO			

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(b) Specific Requirements Code Key

First Letter
N - Nests
P - Perches
F - Forages
* - All Requirements

2nd and 3rd Letters
DT - Dead Trees
BT - Big Trees
CC - Closed Canopy
OC - Open Canopy
GO - Grassy Openings
DL - Downed Logs
RP - Rocky Places
EB - Earth Banks
LC - Living Cavity Tree

15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
35 - 35 cm Min. Snags
46 - 46 cm Min. Snags

(c) Water Codes
A - All
F - Fresh
B. - Brackish
S - Salt

Common Name	BW[a]	Local Use	Habitat Suitability by Vegetation Type and Successional Stage																				Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Killdeer	B		M																				*		*							
	W																						*		*							
Upland Sandpiper	B		O																						*					FB	F	Yes
	W																															
American Woodcock	B				M	S							M	M			M	M			M	M	F	*	F					F		
	W				M	S																	F	*	F					F		
Rock Dove	B		M																				F		F				NRP			
	W		M																				F		F				PRP			
Mourning Dove	B			O	O	S						M				M	M	M					F		F		NP	NP				
	W		S	S	S	S					M	M			M	M	M	M					F		F		P	P				
Black-billed Cuckoo	B				S	S							S	S			O	O								N	*	*				Yes
	W																															
Yellow-billed Cuckoo	B				S	S							M	M												N	*	*				Yes
	W																															
Greater Roadrunner	B		M	S	M	M																	F		F	*	*	N	*OC			
	W		M	S	M	M																	F		F	FP	FP		FOC POC			
Groove-billed Ani	B																						F		F	*			*OC			
	W		M	M																			F		F	FP			FOC POC			
Common Barn-Owl	B		O	M																			F		F	P		P	N46 NLC NRP			
	W		O	M																			F		F	P		P	P46 PLC PRP			
Eastern Screech-Owl	B				M	O			M	M			M	S			M	S					F	F	F	F	*	*	N35 NLC NDT			
	W				M	O			M	M			M	S			M	S					F	F	F	F	*	*	PDT P35 PLC			
Great Horned Owl	B					S				S				M									F	F	F	F	F	*				None
	W				M	S			M	S			M	M									F	F	F	F	F	*				None
Snowy Owl	B																						FP		FP				PDT			
	W		M																													
Barred Owl	B					M				M				M				M				M	F	F	F	F	F	*	NBT NLC	F	F	None
	W					M				M				M				M				M	F	F	F	F	F	*	PBT PLC	F	F	None
Long-eared Owl	B								M	O											M	M	F	F	F	F	*	*				
	W							S	O	O													F	F	F	F	*	*				
Short-eared Owl	B																						F		*							
	W		M																													
Northern Saw-whet Owl	B																				M	O	F	F	F	F	*	*	NDT N15 NLC			
	W							M	M	M										M	M	M	F	F	F	F	*	*	PDT P15 PLC			
Chuck-will's-widow	B				M	M																		N								
	W																							P								

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			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Whip-poor-will	B				S	S							M	M										N								Yes
	W																							P								
Chimney Swift	B					M				M				M				M				M							N35 NLC			
	W																															
Buff-bellied Hummingbird	B																															
	W				M	M																				F	*	*				
Ruby-throated Hummingbird	B			M	S	S						M	S	S		M	M	M								*	*	*				Yes
	W																									*	*	*				
Black-chinned Hummingbird	B																															
	W				M	M																				F	*	*				
Rufous Hummingbird	B																															
	W			M	M	M																				F	*	*				
Belted Kingfisher	B				M	M			M	M																P	P		PDT F15 FSW NEB	A	F	
	W				M	M			M	M																P	P		PDT F15 FSW	A	F	
Red-headed Woodpecker	B				M	S																			F				*DT *OC N35			
	W				M	S																			F	F	F	*	*DT			
Red-bellied Woodpecker	B				M	O																						*	*DT N35 NLC			1
	W				M	O																						*	*DT P35 PLC			
Yellow-bellied Sapsucker	B				M	M							M	M			M	O								F	F	*	*DT N25 NLC			
	W				S	O			M	M			M	M			M	M								F	F	*	*25 *LC			
Downy Woodpecker	B				S	O			M	M			M	S			M	M								*	*	*	*DT *15 *LC			
	W				S	O			M	M			M	S			M	M								*	*	*	*DT *15 *LC			
Hairy Woodpecker	B				M	O			M	S			M	S			M	O			M	S					*	*	*DT *25 *LC			18
	W				M	O			M	S			M	S			M	O			M	S					*	*	*DT *25 *LC			
Northern Flicker					M	S			M	M			M	S									F		F			*	*DT *OC N35 NLC			
	W				M	S			M	M			M	M									F		F			*	*DT			
Pileated Woodpecker	B					O				M				O				S				M					F	*	*DT *BT *CC *46 NLC FDL			405
	W				M	O				M			M	O				S				M					F	*	*DT *BT *CC *46 PLC FDL			
Olive-sided Flycatcher	B								M	M																		*	FDT F25			
	W																				M	S										
Eastern Wood-Pewee	B				M	O							M	S			M	M									F	*	FDT F15			
	W																															
Acadian Flycatcher	B				M	S			M	S			S	O													*	*	FDT *CC F15	F	F	37
	W																															
Alder Flycatcher	B															M				S						*						
	W																															

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			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Willow Flycatcher	B			M																						*				F	F	
	W																															
Yellow-bellied Flycatcher	B																				M	M		N		F						
	W																															
Least Flycatcher	B		S		M	M	M		M	M	M		M	M	S		M	M									*	*	*OC			
	W																										*	*	*OC			
Eastern Phoebe	B				M	M			M	M			M	M			M	M								*	*		*OC NSW			
	W		S	O	S	M	M	M	M	M	M	M	M	M									F		F	*						
Great Crested Flycatcher	B				M	O							M	S													F	*	N25 NLC			1
	W																										F	*	PDT			
Eastern Kingbird	B		M																						F			*	FDT *OC F15			
	W																															
Scissor-tailed Flycatcher	B		S	S	M	M																	F		F	*	*	*	*DT *OC			
	W																						F		F	*	*	*	*DT *OC			
Horned Lark	B		M				M				M				M								*		*							
	W		M				M				M				M								*		*							
Purple Martin	B		M				M				M				M														NDT N25 NLC			
	W																															
Bank Swallow	B		M																										NEB	FB	F	
	W																															
Cliff Swallow	B		M																										NRP			
	W																															
Barn Swallow	B		M				M				M				M														NRP			
	W																															
Blue Jay	B				M	O							M	S			M	M					F	F	F	F	*	*				Yes
	W			M	S	O						M	M	S		M	M	M					F	F	F	F	*	*				
American Crow	B				M	S			M	M			M	M			M	S					F		F			*	NCC			
	W		S	M	M	M	S	M	M	M	S	M	M	M	S	M	M	M					F		F			*	POC			
Common Raven	B		M	M	M	M	M	M	M	M		M	M	M	M	M	M	M	S	M	S	S	F		F			P	NRP			
	W		M	M	M	M	M	M	M	M	M	M	M	M	S	S	S	S	S	S	S	O	F		F			P				
Black-capped Chickadee	B				M	M			M	M			M	M			S	O			S	O				F	*	*	NDT N15 P15 NLC PLC			
	W			M	M	S		M	M	S		M	M	S		M	S	O		M	S	S				F	*	*	PDT P15 PLC			
Carolina Chickadee	B				M	S			M	S			M	S			M	S								F	*	*	NDT N15 P15 NLC PLC			
	W			M	M	S		M	M	S		M	M	S		M	M	S								F	*	*	PDT P15 PLC			
Tufted Titmouse	B				S	O							S	O			M	S								F	*	*	NDT N15			2
	W			M	S	O						M	S	O		M	M	S								F	*	*				

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			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Red-breasted Nuthatch	B								M	S											S	O					*	*	NDT N15			
	W							M	S	S										M	S	*						*			
White-breasted Nuthatch	B				M	O			M	M			M	O			M	O										*	*DT *BT NLC			8
	W				M	O			M	M			M	O			M	O										*	*DT			
Brown Creeper	B								M	S							M	M			M	O					*	*	N25 NLC			Yes
	W				S	S			S	S			S	S			M	M			M	M					*	*				
Carolina Wren	B			S	O	O	M	M	M	M		M	S	S		M	M	M					*	*	*	*	*		N15 NLC *SW NRP			
	W			S	O	O	M	M	M	M		M	S	S		M	M	M					*	*	*	*	*		*SW			
Bewick's Wren	B		M	M												M									*	*			N15 NLC *SW NRP			
	W			M																					*	*			*SW			
House Wren	B			M																					F	*			N15			
	W		M	M																					F	*			*SW			
Winter Wren	B								M	S			M	M			M	M			S	O	*	*	F	F	P	P	*CC *SW			
	W				S	S			S	S			S	S			M	M			S	S	*	*	F	F			*SW			
Golden-crowned Kinglet	B								M	S											S	O					F	*	*CC			
	W				M	M		M	S	S										M	S	S					F	F	*				
Ruby-crowned Kinglet	B																															
	W			S	S	S		M	M	M		M	M	M												*	*	*				
Blue-gray Gnatcatcher	B				M	S							M	M												*	*	*				37
	W																									*	*	*				
Eastern Bluebird	B		M		M	M																	F		F			*	NDT PDT *OC N15 P15			
	W		M	M	M	M																	F		F			*	PDT *OC P15			
Veery	B				M	M			M	S			M	S		S	S	O			M	S		*	*	P	P	P	*OC			50
	W																															
Swainson's Thrush	B																				S	O		F	F	*	FP	FP	*CC			
	W																															
Hermit Thrush	B																				S	O		*	F	P	P	P	*CC			
	W				S	S			M	M			M	M										*	F	*	*		*CC			
Wood Thrush	B				S	O			M	S			M	S			M	M						F	F	*	P		*CC			3
	W																															
American Robin	B			M	M	M		M	M	M						M	S	S		S	O	O	F		F	N	N	NP	*GO			
	W			M	M	M																	F		F	*	*	*				
Gray Catbird	B			M	M	M		M	M	M		S	S	S		O	O	S		S	M	M				*	P					
	W																								*	*						
Northern Mockingbird	B		M	M																					F	*			*OC			
	W		M	M																					F	*	*		*OC			

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			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Brown Thrasher	B			O	M	M		M				M				M				M			F	F	F	*	P	P				
	W			O	M	M																	*	*	*	*						
Sprague's Pipit	B																															
	W		M																				*		*							
Cedar Waxwing	B				M	M			S	O			M	M			M	M			M	S				*	*	*	*OC			
	W			M	S	S																				*	*	*	*OC			
European Starling	B		M	M	M	M																	F		F				NDT N25 NLC NRP			
	W		M	M	M	M																	F		F	F	F	F				
White-eyed Vireo	B			M																					F	*	P					
	W																								F	*						
Bell's Vireo	B		M	S	M																				F	*	*		*OC			
	W																															
Solitary Vireo	B				M	M			S	O			S	O			S	O			S	O				N	*	*				Yes
	W																										*	*				
Yellow-throated Vireo	B					S								M													F	*				Yes
	W																										F	*				
Warbling Vireo	B					M																						*	*OC			
	W																															
Red-eyed Vireo	B				S	O							S	O			M	M									*	*				7
	W																															
Blue-winged Warbler	B			O								M													*	*		P				
	W																															
Golden-winged Warbler	B			S	M							S	M			O	M								N	*	P	P				
	W																															
Nashville Warbler	B																			O	S	M			N	*	P					
	W																															
Northern Parula	B					M				O				S				S									*	*				1300
	W																										*	*				
Yellow Warbler	B			M	M							M				M										*					
	W																										*					
Chestnut-sided Warbler	B			O	M	M		M	M	M		S	M	M		O	S	M		S	M	M					*	*	P	*OC		Yes
	W																															
Magnolia Warbler	B							M	M	M										S	O	O					*	*	*			Yes?
	W																										*	*	*			
Black-throated Blue Warbler	B				M	M			S	S			S	O			S	O			S	S					*	*	F	PDT *CC		2500
	W																							F			*	*	*			

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Common Name	BW[a]	Local Use	Habitat Suitability by Vegetation Type and Successional Stage																				Substrate Utilization		Vegetation Layer				Specific Requirements[b]	Standing Water (c)	Flowing Water (c)	Min. Tract Size (ha)
			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Yellow-rumped (Myrtle) Warbler	B																															
	W			M	M	M		M	M	M		M	M	M									*	*	*	*	*	*				
Black-throated Gray Warbler	B																															
	W				M	M																				F	*	*				
Black-throated Green Warbler	B																															
	W				M	M			M	O			M	S			M	S			M	O					F	*	*CC			Yes
Blackburnian Warbler	B																															
	W					M				O				M				S				O					F	*	*BT *CC			Yes
Yellow-throated Warbler	B																															
	W				M	M			M	M																		*	FDT *BT			Yes
Prairie Warbler	B																												FDT *BT			
	W			O								M													F	*						
Palm Warbler	B																								*	*						
	W		M	M	M																		*		*	*						
Cerulean Warbler	B																															
	W					S								O				M										*	*BT *CC			1750
Black-and-white Warbler	B																															
	W				M	O							M	O			M	S						N	N		F	F				550
American Redstart	B																													*CC			
	W				M	S							M	S												*	*	FP				Yes
Worm-eating Warbler	B																															
	W				M	S			M	M			S	O										*	F	*	P		*CC			370
Swainson's Warbler	B																									*?	*?	*				
	W								M	S			S	O									F	F	F	*	P					Yes
Ovenbird	B																															
	W				S	O							S	O			M	S					*	*		P	P					15
Northern Waterthrush	B																						*	*								
	W							M	M											M	M		*			P	P			F	F	500
Louisiana Waterthrush	B																															
	W					S				M				S									*			P	P		*RP		F	875
Kentucky Warbler	B																															
	W					S								M									F	F	*	*	P					45
Mourning Warbler	B																															
	W											M				S				S					*	*						
Common Yellowthroat	B																															
	W		S	S								M				M				M					*	*						

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			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Hooded Warbler	B				M	O							M	O			M	S								*	FP				Yes
	W																														
Wilson's Warbler	B																														
	W		M	M	M																				F	*	*				
Canada Warbler	B								S	O		M	S	S		M	S	S		M	S	O	N	N	N	*					1000
	W																														
Yellow-breasted Chat	B		M	O								M				M										*			PDT		
	W			M																						*					
Summer Tanager	B				M	O							M	M													*	*			100
	W																														
Scarlet Tanager	B					O								O				S									F	*	*CC		30
	W																														
Western Tanager	B				M	M																		F		*	*	*			
	W																														
Northern Cardinal	B			S	S	S						M	M	M		M	M	M						*	*	*	F	F			
	W			M	M	M						M	M	M		M	M	M						*	*	*					
Rose-breasted Grosbeak	B				M	S			M	M			M	S			M	O			M	M				N	*	*			3
	W																														
Black-headed Grosbeak	B																														
	W				M	M																					*	*			
Blue Grosbeak	B		M	O																					*	*					
	W																								*	*					
Indigo Bunting	B		M	S	M	M						M	M	M		M	M	M								*	*	P	P	*OC		
	W																								*	*					
Dickcissel	B		O																						*	P					
	W		M	S																					*	*					
Green-tailed Towhee	B																														
	W		M	M	M	M																	F	F	F	*	*				
Rufous-sided Towhee	B			O	O	S						S	S	M		M	M	M		M					F	*	*	P	P			
	W			O	M	M						M	M	M											F	*	*					
Bachman's Sparrow	B		M	M																					*	*	P	P	*OC		
	W		M																						*						
Rufous-crowned Sparrow	B				M	M																	FP		*	*	P		*OC *RP		
	W				M	M																	FP		*	*	P		*OC *RP		
American Tree Sparrow	B																														
	W		O	M											M	M									*	*					

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			OKHK				WPHM				COVE				MABB				SPFR												
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Chipping Sparrow	B				M	M																	F		*	*	*	*	*OC			
	W		M																				F		*	*	*	*	*OC			
Clay-colored Sparrow	B																															
	W		M	M																			F		F	*			*OC			
Field Sparrow	B			O								M				M									*	*						
	W		O	S							M	M														*	*						
Vesper Sparrow	B		M												S				M				*		*	P						
	W		S																				*		*							
Lark Sparrow	B		S	S	M																		F		*	*	P		*OC *GO *RP			
	W		S	S	M																		F		F	*			*OC *GO			
Lark Bunting	B																															
	W		M																				F		*							
Savannah Sparrow	B		O																						*							
	W		S																						*							
Grasshopper Sparrow	B		O																						*							Yes
	W		O																						*							
Henslow's Sparrow	B		S																						*					FB		
	W		M																						*							
Le Conte's Sparrow	B																															
	W		S																						*							
Fox Sparrow	B																															
	W			M	M	M		M	M	M														F		*	*					
Song Sparrow	B			M								M				S				S					*	*						
	W		S	M																					*	*						
White-throated Sparrow	B																															
	W		M	M	S	S					M	M	S	S	M	M	M	M						F	F	*	*	*				
White-crowned Sparrow	B																															
	W		S	S																			F		*	*						
Harris' Sparrow	B																															
	W		M	S	M	M																	F	F	F	*	*	P				
Dark-eyed Junco	B				M	M		M	S	S			M	S		M	S	O		M	S	O	N	F	*	*	P	P				
	W		M	M	M	M	M	M	S	S	M	M	M	M	M	M	M	M	M	S	S	S	F	F	*	*	*					
Smith's Longspur	B																															
	W		M																				F		*							
Chestnut-collared Longspur	B																															
	W		M																				F		*							

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			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Snow Bunting	B																															
	W																		M				*		*							
Bobolink	B		S																						*							
	W																															
Red-winged Blackbird	B		S																						*	*	P	P				
	W		M																						*	P	P	P				
Eastern Meadowlark	B		O	M																					*							Yes?
	W		O	M																					*							Yes?
Western Meadowlark	B		M																						*							
	W		M																						*							
Yellow-headed Blackbird	B																															
	W		M		M																		F		F		P	P				
Rusty Blackbird	B																															
	W				M	M																	F		F	P	P	P				
Brewer's Blackbird	B																															
	W		M																				F		F	P	P	P				
Great-tailed Grackle	B		M	S																			F		*	*	*	P	*OC			
	W		M	S																			F		F	*	*	P	*OC			
Common Grackle	B								M	M													F		F	N	NP	NP				
	W				M	M																	F		*	P	P	P				
Bronzed Cowbird	B		M	M	M	M																	F		F	N	N	N	*OC			
	W		M																				F		F				*OC			
Brown-headed Cowbird	B		M	O	O	O					M	M	M	M	M	M	M	M					F		F				*OC N15 NBT			
	W		M		M	M																	F		*	P	P	P				
Orchard Oriole	B		M		M	M																				*	*	*	*OC			
	W																															
Northern (Baltimore) Oriole	B		M		M	M																					F	*	*OC			
	W				M	M																				*	F	*	*OC			
Purple Finch	B																				S	O					*	*				
	W				M	S			M	M			M	M			M	M			M	M				*	*	*				
House Finch	B																															
	W		M	S	M	M																	*		*	*						
Red Crossbill	B								M	S											M	O					F	*				
	W								M	S											M	O					*	*				
White-winged Crossbill	B																															
	W								M	M											M	O					*	*				

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			OKHK				WPHM				COVE				MABB				SPFR													
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Bare Soil	Leaf Litter	Herbs	Shrubs	Midstory	Overstory				
Common Redpoll	B																															
	W		S	S	M		M	M			M	S			M	S			M	M			F		*	*	*		*QC			
Pine Siskin	B																			M	S	O			F	F	*	*				
	W		M	M	M	M		M	M	S		M	M	M		M	M	M		S	S	O	F		*	*	*	*				
American Goldfinch	B			S								M				M									*	*	P	P				
	W		O	O	S	S					M	M	M	M	M	M	M	M					F		F	F	*	*				
Evening Grosbeak	B																															
	W				M	M			S	S			M	M			M	M			S	O	F			*	*	*				
House Sparrow	B		M																				F		F							
	W		M																				F		F							

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Chapter IV.
NARRATIVE SPECIES ACCOUNTS

This chapter presents brief narrative summaries of the biology of the 269 species treated in this manual, gleaned and condensed from literature and personal experience. The names of the species agree with those of the American Ornithologists Union (1983). Four letter code names for the species are those of the U. S. Fish and Wildlife Service Bird Banding Laboratory. Usually these codes involve the first 1 or 2 letters of the words in the English common name, and they are unique among North American birds. For a small number of resident game birds, no published codes exist. For these, and for a few species with morphologically distinguishable Eastern populations (e.g. Myrtle warbler), non-standard codes are indicated by "*".

As many as 11 sections may compose an individual account:

protection status,
abundance status,
primary habitats,
key habitat requirements,
sample breeding densities in the South,
sample winter densities in the South,
reproduction,
food habits,
guild,
references, and
a range map.

Protection status

This section cannot be considered an up-to-date listing; nor should it be used in lieu of official documentation from the Fish and Wildlife Service for Federal listings, from the US Forest Service for sensitive species listing, and from states for their jurisdictions. It does serve to indicate to the user those species that have, at the time of this writing (March 1990), been recognized as meriting special protective measures to maintain their populations by the Federal Government or one or more state governments. This information was compiled from the Federal Register and by direct correspondence with the resource management agencies of the states within and adjacent to the U. S. Forest Service Southern Region. For each listed species, the affected subspecies and the specific designations applied by each listing agency are indicated. Two lists are maintained in several states, an official list designated by one resource management agency, and an unofficial list maintained by the Natural Heritage Program in that state. I have included species on either of these lists.

Abundance status

The relative abundance of a given species in the South is presented, often by physiographic region or state. Abundance classes are listed only by symbols: A = abundant, VC = very common, C = common, FC = fairly common, U = uncommon, R = rare, VR = very rare. Where 2 statuses are listed together (such as FC to C), the abundance of the species tends to be intermediate between the two categories.

The arrival and departure dates list the time when a given species is expected to be seen first, or seen last, on the breeding or wintering grounds, taking geography into consideration. For example, a species that breeds over the entire South may have a spring arrival listed as "mid-April to early May." Arrival in southern Florida would be expected in mid-April, arrival in the Carolinas in late April, and arrival in northern Arkansas would be in early May. Likewise, for a fall departure listed as "late September to late October," the species would be seen last in northern Virginia in late September, and in late October in southern Florida. For species that winter in the region but do not breed, the situation is reversed. Thus, a fall arrival listed as "early October to early November" indicates that the first individuals are seen in the northern part of the wintering range typically in early October, but not until early November in the southern portion. The dates apply to the arrival and departure on the breeding and wintering grounds only, and not to points along the migration route. For example, a species that nests only in the mountains, arriving from late April to early May, might migrate through Florida in early or mid-April.

Range map

A range map showing the breeding and wintering distributions is provided for each species. The maps are based on Breeding Bird Survey (BBS) data for breeding distributions and on the work of Root (1988) for winter distributions. BBS data from 1966-1985 were summarized and smooth contours drawn for 1, 5, 10, and 30% of the highest mean count of birds/route across the South. Areas with at least 30% of

the peak value are considered High, those with at least 10% Medium, and those with at least 5% of peak value are considered Low Abundance. From the computer produced summaries, I drew the breeding distributions presented here. Winter distributions represent a similar process of interpretation, utilizing the maps of Root (1988) as the starting point.

These distributions were digitzed and stored in a geographic information system as ARC coverages for each species. Maps in this chapter were produced from these coverages. Both the digital map files and ARC coverages are available for use by managers and researchers. These range maps are the first in which relative abundance in different parts of species ranges is simultaneously presented for both breeding and winter seasons. As such, they should be of use to managers. As with so much else in this work, too, they present hypotheses rather than proven facts. Further experience and field work done with these data in mind will lead to their improvement.

Primary habitats

Many of the major vegetation types and their habitats utilized by the specie are listed. Much of this material is given in coded form in the bird-habitat association matrices in Chapter III. Material presented in narrative form here is intended to clarify or amplify that presented in the matrices.

Key habitat requirements

The essential features in the habitats where a given species occurs are presented, such as an abandoned woodpecker cavity, a dense understory layer, or a cliff ledge. Where possible, this information is included in the matrices in Chapter III to be of maximal usefulness to the manager; it is presented here to provide clarification and reinforcement of the matrix entries.

Sample breeding densities, sample winter densities

These 2 sections summarize the published BBC and WBPS relevant to the range of population densities achieved by each species in the Southeast. I present, in each account, one or more habitats (a habitat is a single successional stage of a vegetation type) representing the low mean densities recorded in 1947-1979 in the Southeast, and one or more habitats in which the high mean densities were achieved. Each listing includes notation of the mean density in the selected habitat, followed parenthetically by the number of censuses in that habitat on which the mean is based. In cases in which the same mean density was recorded from several habitats, all habitats with that mean density are listed. The values given are mean values; as such, some of the numerous sources of variability in reporting density are reduced; however, the reader must recognize these as samples, and not as absolute limits on the densities of the species. Summary statistics from the Breeding Bird Survey are included here as well.

Reproduction

This is a summary of the breeding biology of the species. The dates of the breeding season listed for each species refer only to eggs in the nests, and not to courtship, nest building, or fledging of young. The span of dates for the breeding season refers to the species as a whole and not to an individual pair of birds. In most cases, individuals of a given species in the southern portion of the range tend to breed earlier than those in the northern portion. Information on the structure and placement of the nest and the clutch size are also presented. When the structure of the nest is not described for a species, it is assumed that the nest is cup-shaped, and made of twigs, grasses, or other similar items. Although the data for the period of the breeding season are taken only from the Southeast, data on nest structure, nest placement, and clutch size were gathered in many parts of North America and are not restricted to the Southeast. There is, however, usually little difference in the breeding biology of most species in the South as compared with other parts of their breeding ranges.

Food habits

This section includes a brief summary of the food items consumed by individuals of a species, the manner of foraging, and the substrates (such as shallow water or tree foliage) on which they forage.

Guild

A brief summary of the nesting and foraging habits is expressed in a terse phrase. For most species the guild is expressed as: nesting site, foraging substrate, foraging technique, and diet. Species that do not breed in the South do not have a phrase concerning nesting. The designation of a given term (such as "gleaning" or "carnivore") is based on the predominant manner of foraging, food type, or other aspects. Where two or more classes of the same category are frequent, the word "or" is used. For example, a species whose individuals forage commonly both in tall herbaceous cover and in shrubs is listed as "herb or bush." Where individuals of a species change their diet noticeably from summer to winter, such as from primarily insects to mainly seeds, a hyphen is used to separate the summer diet from the winter diet (insectivore-granivore). For species that breed only, or winter only, in the South, the guild listed is that for the season of occurrence in the region. Definitions of all terms found in the guild section are listed in the Glossary.

References

Most of the information condensed in the narrative accounts has been drawn from general literature sources. This brief section presents a series of citations of faunal works—many state bird books as well as nationwide and regional accounts that treat the species. These works were chosen in part because of their general information, but also because of their wide availability, in the belief that each user of the present manual will have at his or her disposal at least one of them. Each citation of one of the general works includes a page reference to the account of the cited species. This provides the user with an immediately available "second opinion" of the biology of each species, against which questions raised by this treatment can be settled. In addition to the general works, other important works dealing with the general biology or management of the species are also listed.

A recent work, Degraaf, et al. 1991, became available shortly before this work went to press. It contains useful general life history and and habitat association information for most of the species covered in this book.

Pied-billed Grebe

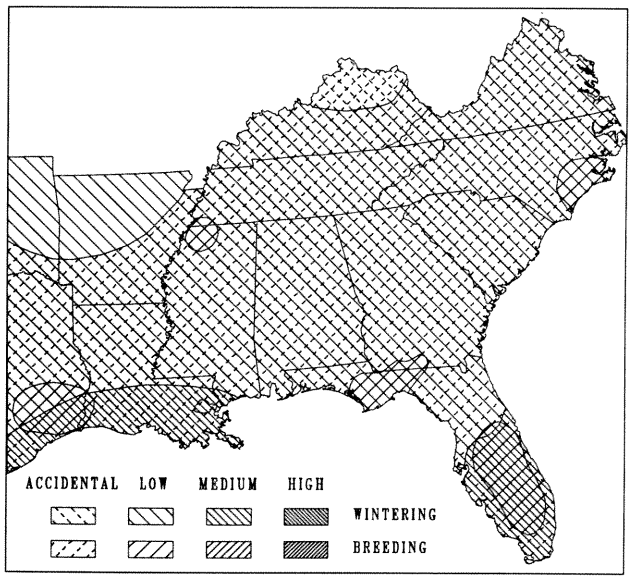
Podilymbus podiceps **PBGR**

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission. Monitored by Arkansas Natural Heritage Commission, Tennessee Natural Heritage Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— mostly U to locally FC in the Coastal Plain, but R over much of this section; VR and erratic in the Piedmont and in mountain valleys. Wintering— FC to C over most of the region, though U in the mountains.



PRIMARY HABITATS

Breeding— lakes, ponds, or impoundments, where there is emergent vegetation for hiding the nest. Wintering— lakes, ponds, impoundments, sluggish streams, bays, canals, and other open water; prefer fresh water, but frequently occur on brackish water.

KEY HABITAT REQUIREMENTS

Breeding— emergent vegetation in a body of fresh or slightly brackish water. Wintering— open body of fresh or brackish water.

SAMPLE BREEDING DENSITIES

Recorded on 29 of 888 BBS routes in the region, 1966-1985; maximum route mean 5 birds, overall mean 0.02±0.23 birds/route, total of route means 23 birds.

SAMPLE WINTER DENSITIES

1(1) grass/forb longleaf pine-slash pine, 3(1) Everglades.

REPRODUCTION

The nesting season extends from April to July, rarely to October in Florida, with the peak from mid-May to mid-June. Nests are floating masses of dead vegetation, anchored to reeds or other live vegetation in a lake or pond. Eggs usually number from 4 to 7 per clutch, with a range of 2 to 10.

FOOD HABITS

Forage by diving from the surface of a body of water and capturing aquatic insects, fish, crustaceans, and other small animals; plants are rarely eaten.

GUILD

Ground nesting, aquatic diving insectivore or carnivore.

REFERENCES

Burleigh 1958:83; DeGraaf and Rudis 1986:152; DeGraaf et al. 1980:101; Eagar and Hatcher 1982(A):103; Ehrlich et al. 1988:12; Forbush and May 1939:9; Imhof 1976:56; James and Neal 1986:74; Lowery 1974:109; Mengel 1965:155; Monroe et al. 1988:2; Oberholser 1974(I):67; Palmer 1962:104; Potter et al. 1980:42; Rappole et al. 1983:156; Robinson 1990:26; Root 1988:5; Sprunt 1954:4; Sprunt and Chamberlain 1970:54; Stewart and Robbins 1958:45; Verner and Boss 1980:95

Brown Pelican

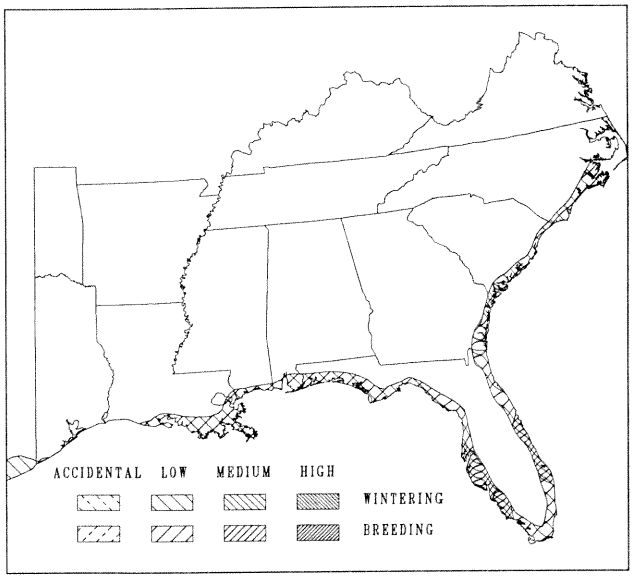
Pelicanus occidentalis **BRPE**

PROTECTION STATUS

Federally listed as Endangered. *P. o. carolinensis* state listed as Endangered in Delaware, Georgia, Louisiana, Mississippi, South Carolina, Texas, and Virginia; and as Special Concern in Alabama, Florida, and North Carolina. Monitored by Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— locally C, in colonies, north to Ocracoke Inlet, North Carolina; occur in summer over the entire coast north to Oregon Inlet, North Carolina. Wintering— C along the coast of peninsular Florida; less numerous elsewhere; U to FC along the North Carolina coast, and U in western Florida.



PRIMARY HABITATS

Nest site— generally on islands, where there are shrub thickets or dense stands of small trees; infrequently on the ground among grasses. Foraging— coastlines, inlets, bays, and the inshore ocean; always near salt water.

KEY HABITAT REQUIREMENTS

Nest site— vegetation, usually woody, along the coast; prefer islands. Foraging— shallow salt water and adjacent shores.

SAMPLE BREEDING DENSITIES

Recorded on 16 of 888 BBS routes in the region, 1966-1985; maximum route mean 45 birds, overall mean 0.22±2.41 birds/route, total of route means 191 birds.

REPRODUCTION

The season extends from December to August in Florida, and March to June northward; the peak is from mid-April to early June. Nests are built in bushes or small trees, or on the ground, invariably in colonies on islands. Three eggs are the most common clutch, but 2 are also frequent.

FOOD HABITS

Brown Pelicans plunge into a body of water, usually the ocean, from an average height of 25 feet (8 m) and capture fish below the water surface.

GUILD

Ground or bush nesting, aquatic pouncing carnivore.

REFERENCES

Burleigh 1958:89; Ehrlich et al. 1988:20; Forbush and May 1939:20; Imhof 1976:62; Kale 1978:23; James and Neal 1986:79; Lowery 1974:121; Oberholser 1974(I):80; Palmer 1962:271; Potter et al. 1980:51; Rappole et al. 1983:157; Robinson 1990:31; Root 1988:9; Sprunt and Chamberlain 1970:67; Sprunt 1954:13; Stewart and Robbins 1958:49.

Double-crested Cormorant

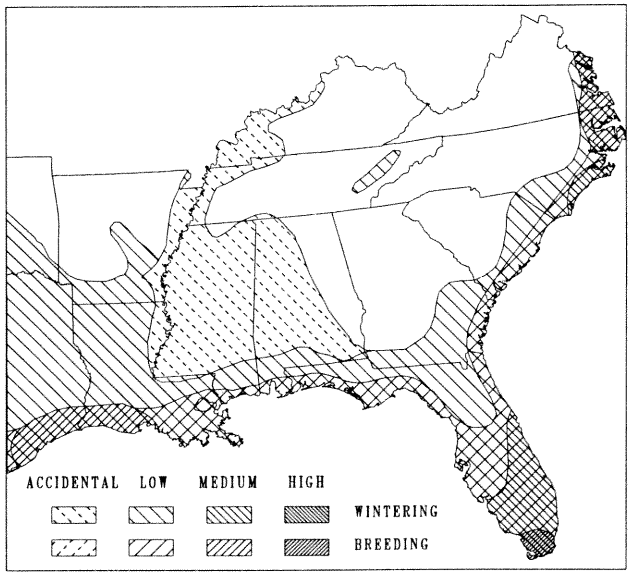
Phalacrocorax auritus DCCO

PROTECTION STATUS

State listed as Endangered in Missouri, by Kentucky Academy of Sciences and Nature Preserves Commission, as "in need of management" in Tennessee, and Significantly Rare in North Carolina. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— locally FC to C in Florida; elsewhere, breed only at isolated sites. Non-breeders occur along the entire coastline in summer. Wintering— C to A along the Atlantic and Gulf coasts, south of Cape Hatteras, North Carolina; C in inland Florida; U inland north of Florida.



PRIMARY HABITATS

Nest site— generally in swamps or scattered trees along the shore of a lake or other body of water. Foraging— mainly along the coast, such as in bays, inshore ocean, or inlets; also at large lakes inland.

SAMPLE BREEDING DENSITIES

Recorded on 54 of 888 BBS routes in the region, 1966-1985; maximum route mean 97 birds, overall mean 0.23±3.47 birds/route, total of route means 207 birds.

KEY HABITAT REQUIREMENTS

Nest site— trees in or near a large body of water, generally near fresh water. Foraging— open bodies of water, preferably salt water.

REPRODUCTION

The breeding season extends from late December to late October, but the peak is from early March to mid-June. Nests are platforms built in tall trees, usually near the edge of a lake or other body of water; mainly in colonies. The usual clutch size is 3, with 4 infrequent.

FOOD HABITS

Dive from the surface of a body of water and chase fish underwater; crustaceans are rarely taken.

GUILD

Tree nesting, aquatic diving carnivore.

REFERENCES

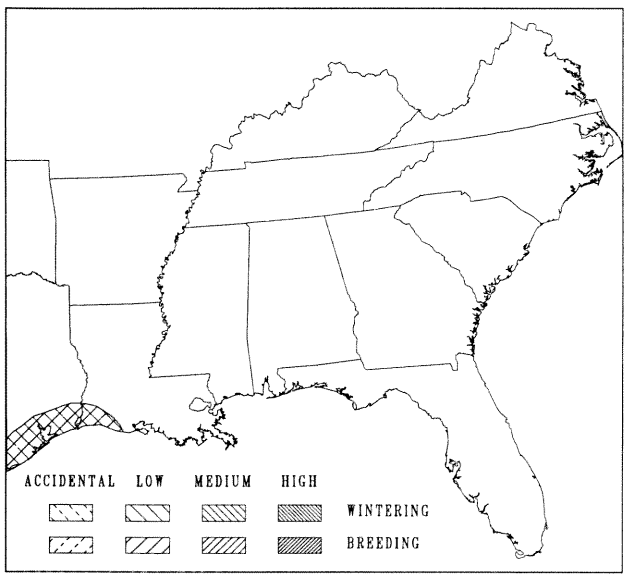
Burleigh 1958:92, 93; Eagar and Hatcher 1982(A):77; Ehrlich et al. 1988:26; Forbush and May 1939:23; Imhof 1976:65; James and Neal 1986:79; Lowery 1974:132; Mengel 1965:157; Monroe et al. 1988:4; Oberholser 1974(1):90; Palmer 1962:325; Potter et al. 1980:55; Rappole et al. 1983:157; Robinson 1990:31; Root 1988:11; Sprunt 1954:18; Sprunt and Chamberlain 1970:73; Stewart and Robbins 1958:50.

Olivaceous Cormorant

Phalacrocorax olivaceus OLCO

ABUNDANCE STATUS

Permanent Residents—Presently Fairly Common to Common, formerly Very Common, along the Gulf Coast of Texas and extreme southwestern Louisiana. Much more scarce inland, they are established at a few heronries, some of which are in woodlands. Portnoy (1981) reports 7660 breeding adults in his survey of Louisiana-Mississippi-Alabama coasts, 1976. Young birds wander widely after the nesting season. During the winter months the population may be concentrated in the southern part of the range, S of 27° N.



PRIMARY HABITATS

All seasons—Coastal swamps and marshes, occasionally inland lakes. These birds are most often associated with fresh or brackish water.

KEY HABITAT REQUIREMENTS

All seasons—The birds require water for fishing and elevated perches in trees, shrubs, or on the ground for nesting, roosting, and drying their plumage after fishing.

REPRODUCTION

Breeding has been recorded (eggs in nests) in all months except November-January. The birds lay their clutches of 3-5 eggs in flimsy nests built in a variety of sites including the ground, shrubs, and perhaps preferably, trees. They typically nest in colonies. Like some other fish-eating birds, Olivaceous Cormorants have suffered severe population declines since World War II, apparently because of eggshell thinning resulting from pesticides.

FOOD HABITS

The primary food is fish, especially *Gambusia* sp., which they capture by diving and pursuing underwater. They also eat other aquatic vertebrates and invertebrates.

GUILD

Terrestrial, bush, or tree nesting, aquatic diving or probing carnivore or insectivore.

REFERENCES

Ehrlich et al. 1988:26; Forbush and May 1939:24; Lowery 1974:134; Morrison and Slack 1977; Oberholser 1974 (I):92; Palmer 1962:340; Portnoy 1981; Rappole et al. 1983:157, 413; Root 1988:11; Sutton 1967:20.

Anhinga

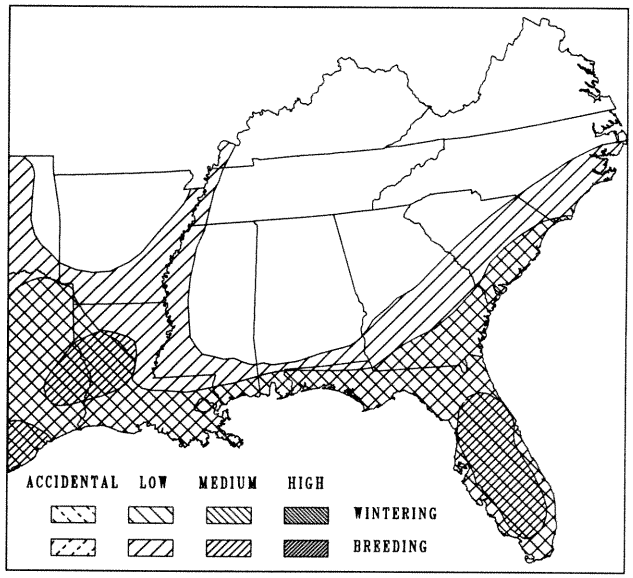
Anhinga anhinga **ANHI**

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission, "in need of management"in Tennessee, and Significantly Rare in North Carolina. Monitored by Arkansas Natural Heritage Commission, Oklahoma Natural Heritage Inventory.

ABUNDANCE STATUS

Breeding— C over most of Florida; U to locally FC elsewhere. Wintering— C in Florida; mainly U in Georgia and South Carolina; R in North Carolina.



KEY HABITAT REQUIREMENTS

All seasons— open or semi-open body of fresh or brackish water, with trees nearby for nesting, perching, or roosting.

SAMPLE BREEDING DENSITIES

1(1) Everglades. Recorded on 68 of 888 BBS routes in the South, 1966-1985; maximum route mean 18 birds, overall mean 0.13±0.86 birds/route, total of route means 112 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber oak-gum-cypress, 3(1) sapling/poletimber live oak maritime.

REPRODUCTION

The nesting season extends from December to August in Florida, with the peak in the Southeast from mid-March to mid-May. Nests are platforms, built in trees near water, often in colonies with herons and egrets. The usual clutch size is 3 or 4, with 5 infrequent.

FOOD HABITS

Anhingas dive or sink below the surface of a body of water and spear fish with their bills. Some aquatic insects, amphibians, reptiles, and crustaceans are also taken.

GUILD

Bush or tree nesting, aquatic diving carnivore.

REFERENCES

Burleigh 1958:94; Eagar and Hatcher 1982(A):61; Ehrlich et al. 1988:24; Forbush and May 1939:25; Imhof 1976:66; James and Neal 1986:81; Lowery 1974:135; Mengel 1965:158; Monroe et al. 1988:4; Oberholser 1974(1):95; Ohlendorf et al. 1979; Palmer 1962:357; Potter et al. 1980:57; Rappole et al. 1983:157; Robinson 1990:32; Root 1988:12; Sprunt and Chamberlain 1970:74; Sprunt 1954:20; Stewart and Robbins 1958:51.

Magnificent Frigatebird

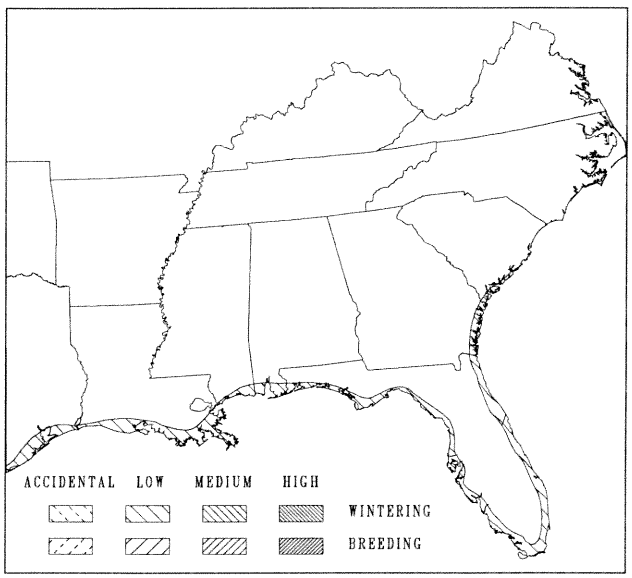
Fregata magnificens **MAFR**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

Breeding— only in the Marquesas Keys, Florida, where an average of 100 pairs have nested since 1969; widespread breeders south of the United States; non-breeders are FC to C in summer along the southern two-thirds of the Florida coast; R north of Florida in summer. Wintering— mostly U in the range, but FC in the keys.



PRIMARY HABITATS

Nest site— in mangrove thickets on islands; the only colony in Florida nests in red mangrove thickets. Foraging— inshore ocean and bays; roost in coastal thickets, particularly in mangroves.

KEY HABITAT REQUIREMENTS

Nest site— dense shrub or tree thickets on coastal islands. Foraging— coastal areas, with thickets for roosting.

REPRODUCTION

The nesting season is poorly known in Florida, but it is mainly from February to April; the young take about 6 months to completely fledge. Nests are typical ones built in mangroves on islands, in a colony. The clutch consists of a single egg.

FOOD HABITS

They forage by swooping over a body of water, usually the ocean, and taking fish from the surface. They also chase other seabirds and force them to drop prey items. Almost all foraging is done in flight.

GUILD

Bush nesting, aerial or aquatic pouncing or piratical carnivore.

REFERENCES

Burleigh 1958:96; Ehrlich et al. 1988:20; Forbush and May 1939:26; Imhof 1976:68; James and Neal 1986:82; Lowery 1974:136; Oberholser 1974(I):98; Palmer 1962:367; Potter et al. 1980:58; Robinson 1990:33; Root 1988:12; Sprunt 1954:21; Sprunt and Chamberlain 1970:76; Kale 1978:25.

American Bittern

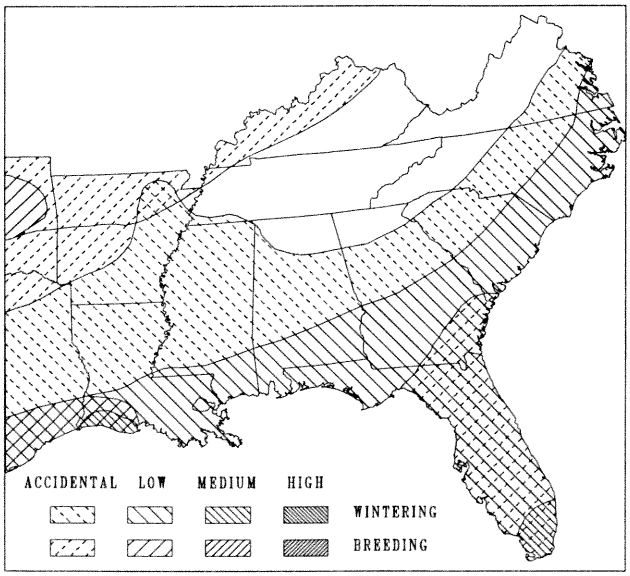
Botaurus lentiginosus **AMBI**

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission, Rare in West Virginia, and Significantly Rare in North Carolina. Blue Listed by Tate (1981). Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Tennessee Natural Heritage Program, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— mostly R to U within the range; R in coastal Virginia and North Carolina; possibly breed in South Carolina and Georgia, but not regularly. Wintering— U in coastal Virginia; U to FC in the Carolinas and Georgia near the coast, but R inland; FC over most of Florida. Majority of the population nest to the north of the region. Fall arrival— mid-September to mid-October; spring departure— late April to early May.



PRIMARY HABITATS

All seasons— mainly in extensive freshwater marshes, where the vegetation is over 3 feet (1 m) high, and especially so in the breeding season. At other seasons occur in all types of marshes, even where salty, but prefer fresh water.

KEY HABITAT REQUIREMENTS

Marshes with tall vegetation, showing a preference for fresh water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in one habitat. Recorded on 7 of 888 BBS routes in the region, 1966-1985; maximum route mean 0.7 birds, overall mean 0.002±0.03 birds/route, total of route means 1.9 birds.

SAMPLE WINTER DENSITIES

5(1) Everglades.

REPRODUCTION

The breeding season extends from early May to early July, with a peak from mid-May to mid-June. The platform nests are built in marshes, usually only a few inches above the water. The clutch size ranges from 3 to 7, with 4 or 5 usual.

FOOD HABITS

Feed in marshes, taking fish, crayfish, insects, frogs, salamanders, and other animals from shallow water, and/or marsh vegetation.

GUILD

Ground nesting, herb or aquatic gleaning or stalking carnivore.

REFERENCES

Burleigh 1958:115; DeGraaf and Rudis 1986:153; DeGraaf et al. 1980:122; Eagar and Hatcher 1982(A):29; Ehrlich et al. 1988:32; Forbush and May 1939:38; Imhof 1976:83; James and Neal 1986:83; Lowery 1974:153; Mengel 1965:170; Monroe et al. 1988:4; Oberholser 1974(I):119; Ohlendorf et al. 1979; Palmer 1962:499; Potter et al. 1980:72; Rappole et al. 1983:160; Robinson 1990:33; Root 1988:13; Sprunt 1954:38; Sprunt and Chamberlain 1970:95; Stewart and Robbins 1958:61.

Least Bittern

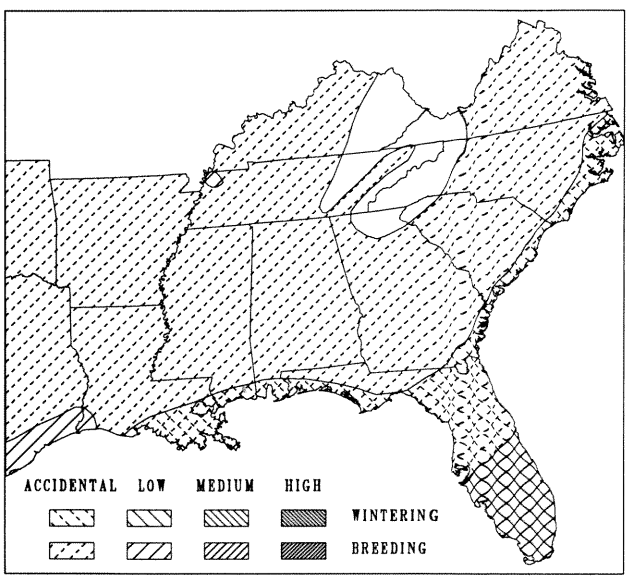
Ixobrychus exilis LEBI

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission, Rare in West Virginia and "in need of management" in Tennessee. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Florida Natural Areas Inventory, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC to C over most of Florida, and in coastal areas farther north; generally R to U, with a limited amount of habitat inland. Wintering— FC to C in a few areas of southern Florida, but mostly U. Spring arrival—early April to late April; fall departure— poorly known, but probably mid-September to mid-October.



PRIMARY HABITATS

All seasons— generally in freshwater marshes, especially where the vegetation is at least 3 feet (1 m) high; commonly in cattails (*Typha* spp.). Common in brackish marshes, but infrequent in salt marshes.

KEY HABITAT REQUIREMENTS

Marshes with tall herbaceous cover, preferably in fresh water.

SAMPLE BREEDING DENSITIES

4.5(2) grass/forb bay swamp-pocosin. Recorded on 20 of 888 BBS routes in the South, 1966-1985; maximum route mean 14 birds, overall mean 0.03±0.46 birds/route, total of route means 24 birds.

REPRODUCTION

The season extends from late March to mid-July, with the peak from late April to early June. The nests are platforms built in marshes, generally 1 to 2 feet (.3-6 m) above the water. The typical clutch size is 4 or 5, ranging from 3 to 6.

FOOD HABITS

Forage in marshes, taking small fish, frogs, tadpoles, slugs, leeches, and many other animals. Prey are taken from shallow water, mud, or marsh vegetation.

GUILD

Ground nesting, herb or aquatic gleaning carnivore.

REFERENCES

Burleigh 1958:117; DeGraaf and Rudis 1986:154; DeGraaf et al. 1980:124; Eagar and Hatcher 1982(A):53; Ehrlich et al. 1988:30; Forbush and May 1939:40; Imhof 1976:83; Kale 1978:81; James and Neal 1986:83; Lowery 1974:151; Mengel 1965:169; Monroe et al. 1988:4; Oberholser 1974(I):120; Ohlendorf et al. 1979; Palmer 1962:491; Potter et al. 1980:70; Rappole et al. 1983:160; Robinson 1990:34; Root 1988:13, 273; Sprunt and Chamberlain 1970:96; Sprunt 1954:40; Stewart and Robbins 1958:60.

Great Blue Heron

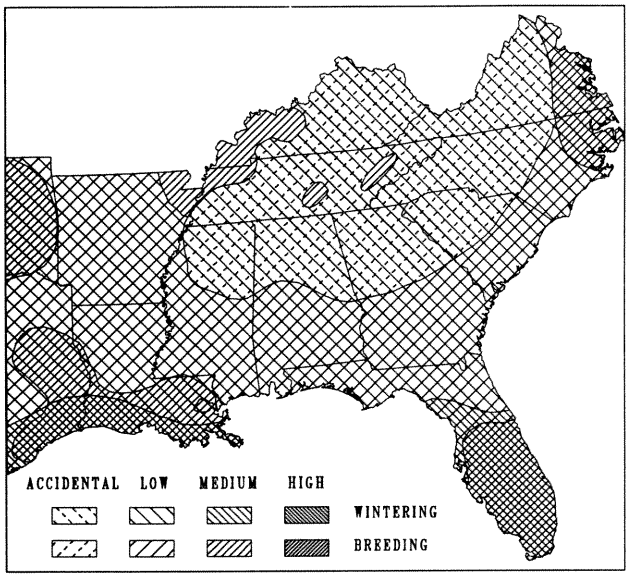
Ardea herodias **GTBH**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Sciences and Nature Preserves Commission, Tennessee listed as "in need of management." Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Florida Natural Areas Inventory ("Great White" form), Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— nest in colonies; C over much of Florida; mostly U to locally FC northward; post-season dispersal carries birds to the entire region by July. Wintering— C over most of Florida and northward along the coast; U to FC elsewhere, but R to U at higher elevations.



PRIMARY HABITATS

Nest site— in colonies in swamps or trees on the edge of a body of water; favor tall trees, and not common in thickets with other waders; mainly in fresh water areas. Foraging— mudflats, shallow water shores of ponds, lakes, and bays, and in marshes; in fresh or salt water.

KEY HABITAT REQUIREMENTS

Nest site— trees near a body of water; usually tall trees in a remote area. Foraging— shallow shores or mudflats in all salinity ranges.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 9 habitats. Recorded on 388 of 888 BBS routes in the region, 1966-1985; maximum route mean 24 birds, overall mean 0.65±1.87 birds/route, total of route means 582 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber live oak maritime, 2(1) Everglades.

REPRODUCTION

The nesting season occurs throughout the year in southern Florida, with a peak in that state in February and March. Farther north, most nesting is in April or May. Most nests are built in the canopies of tall trees in swamps or along shores of bodies of water. Clutch size 3-6, most commonly 4, eggs.

FOOD HABITS

The birds wade in shallow water and chase fish, but they also take frogs, snakes, insects, and other aquatic animals.

GUILD

Tree nesting, aquatic stalking carnivore.

REFERENCES

Burleigh 1958:97, 99; DeGraaf and Rudis 1986:155; DeGraaf et al. 1980:104; Eagar and Hatcher 1982(A):49; Ehrlich et al. 1988:42; Forbush and May 1939:27, 28; Imhof 1976:70; Kale 1978:69; James and Neal 1986:85; Lowery 1974:139; Mengel 1965:159; Meyerreicks 1960:86; Monroe et al. 1988:4; Oberholser 1974(I):100, 101; Ohlendorf et al. 1979; Palmer 1962:383-403; Potter et al. 1980:61; Robbins et al. 1986:14; Rappole et al. 1983:158; Robinson 1990:35; Root 1988:14; Sprunt 1954:23-26; Sprunt and Chamberlain 1970:78, 79; Stewart and Robbins 1958:51; Verner and Boss 1980:96.

Great Egret

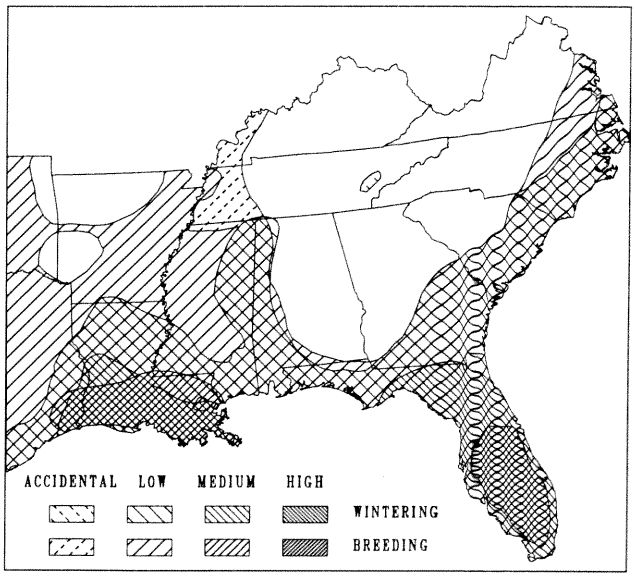
Casmerodius albus **GREG**

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission, Tennessee listed as "in need of management." Monitored by Arkansas Natural Heritage Commission, Florida Natural Areas Inventory, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C over most of the range, though local in the inner Coastal Plain. Wintering— U to FC in Virginia; FC in the Carolinas;increasing to C in Georgia and Florida, and especially so in southern Florida. Light to moderate post-breeding dispersal throughout the region from July to September.



PRIMARY HABITATS

Nest site— in thickets of trees or shrubs on coastal islands, in remote swamps, or along a lake shore in tall trees. Foraging— in shallow water of ponds, lakes, marshes, and bays, and on mudflats; favor fresh water, but commonly use salt water.

KEY HABITAT REQUIREMENTS

Nest site— trees (or rarely shrubs) near a large body of water. Foraging— shores of bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in four habitats. Recorded on 222 of 888 BBS routes in the region, 1966-1985; maximum route mean 218 birds, overall mean 1.74±11.85 birds/route, total of route means 1548 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber live oak maritime, 3(1) sapling/poletimber bay swamp-pocosin.

REPRODUCTION

The nesting season extends from late December to July, occasionally into the fall in Florida. The peak is from late March to late May. The nests are typical for waders, stick platforms built in trees, usually 20 to 40 feet (6-12 m) from the ground. The clutch size seldom is other than 3 or 4.

FOOD HABITS

Forage in shallow water, taking fish, frogs, small snakes, crayfish, and many other items.

GUILD

Tree nesting, aquatic stalking carnivore.

REFERENCES

Burleigh 1958:100; DeGraaf et al. 1980:106; Eagar and Hatcher 1982(A):65; Ehrlich et al. 1988:40; Forbush and May 1939:29; Imhof 1976:77; Kale 1978:73; James and Neal 1986:87; Lowery 1974:144; Mengel 1965:164; Monroe et al. 1988:5; Oberholser 1974(I):103; Ohlendorf et al. 1979; Palmer 1962:406; Potter et al. 1980:65; Rappole et al. 1983:159; Robinson 1990:35; Root 1988:15; Sprunt and Chamberlain 1970:81; Sprunt 1954:26; Stewart and Robbins 1958:55;

Snowy Egret

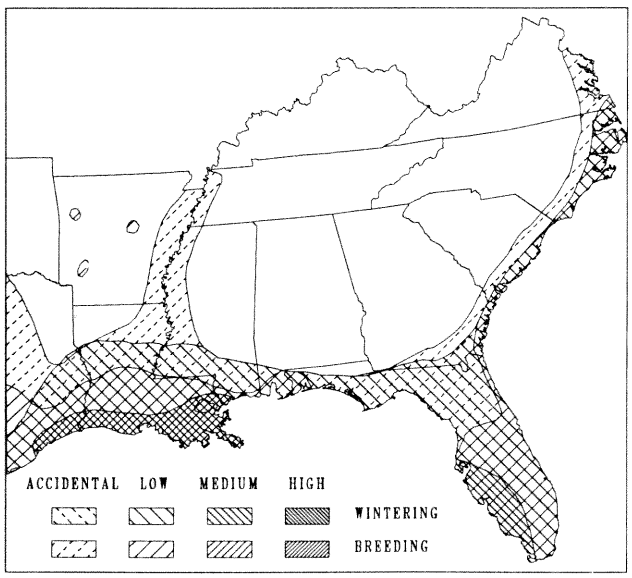
Egretta thula **SNEG**

PROTECTION STATUS

Florida listed as Special Concern. Monitored by Arkansas Natural Heritage Commission, Tennessee Natural Heritage Program, Virginia Natural Heritage Program. Forest Service sensitive, National Forests in Florida.

ABUNDANCE STATUS

Breeding— C over most of Florida, and on the coast elsewhere; R to U inland north of Florida. Wintering— U in Virginia, increasing to FC in southern North Carolina, and becoming C over most of Florida and Louisiana. Very light post-breeding dispersal to the remainder of the region, seldom reaching the mountains.



PRIMARY HABITATS

Nest site— shrub or tree thickets on islands, lake margins, or in swamps; almost always with flocks of other waders. Foraging— in shallow water of ponds, lakes, marshes, bays, and other bodies of water; prefer fresh water, but often in brackish and salt water.

KEY HABITAT REQUIREMENTS

Nest site— thickets of shrubs or trees near water. Foraging— shores of bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in two habitats. Recorded on 102 of 888 BBS routes in the region, 1966-1985; maximum route mean 77 birds, overall mean 0.51±4.35 birds/route, total of route means 455 birds.

SAMPLE WINTER DENSITIES

1(2) sawtimber live oak maritime.

REPRODUCTION

The nesting season extends from mid-January to late July, with a peak from mid-April to mid-May. The nests are placed in trees in thickets, mainly 10 to 20 feet (3-6 m) from the ground; almost always in colonies with other species of waders. The clutch size ranges from 2 to 5, with 4 most common.

FOOD HABITS

Like most waders, Snowies forage in shallow water by stalking small fish, crustaceans, frogs, aquatic insects, and other items.

GUILD

Bush or tree nesting, aquatic stalking carnivore.

REFERENCES

Burleigh 1958:102; DeGraaf et al. 1980:108; Eagar and Hatcher 1982(A):91; Ehrlich et al. 1988:40; Forbush and May 1939:30; Imhof 1976:79; James and Neal 1986:89; Kale 1978:75; Lowery 1974:147; Mengel 1965:165; Meyerreicks 1960:125; Monroe et al. 1988:5; Oberholser 1974(I):104; Ohlendorf et al. 1979; Palmer 1962:456; Potter et al. 1980:66; Rappole et al. 1983:159; Robinson 1990:36; Root 1988:16; Sprunt and Chamberlain 1970:83; Sprunt 1954:28; Stewart and Robbins 1958:56.

Little Blue Heron

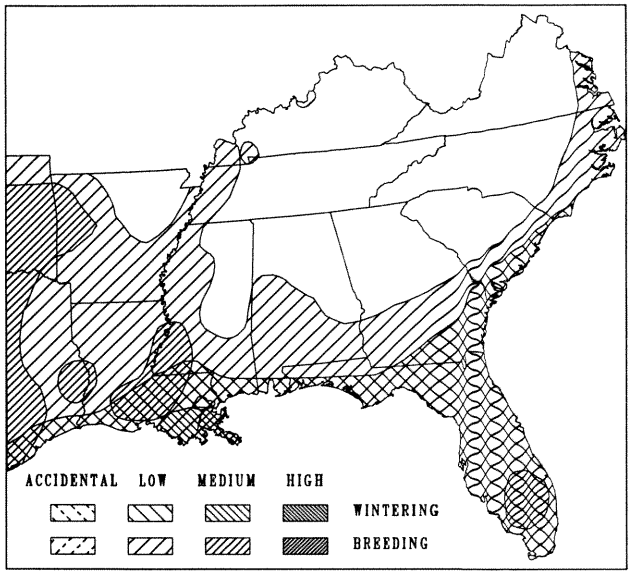
Egretta caerulea LBHE

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission, Special Concern in Florida and Alabama (unofficially). Monitored by Arkansas Natural Heritage Commission, Tennessee Natural Heritage Program, Virginia Natural Heritage Program. Forest Service sensitive, National Forests in Florida

ABUNDANCE STATUS

Breeding— in colonies; C over most of Florida, as well as along the coasts; generally U in the interior Coastal Plain north of Florida, decreasing northward. Wintering— C over most of Florida. Large scale post-breeding movements; present over most of the region in July and August.



PRIMARY HABITATS

Nest site— usually in mixed species colonies; nest in swamps, coastal forests, and especially in thickets and woods on coastal islands. Foraging— forage on mudflats and shallow water of estuaries, lakes, streams, and other bodies of water; prefer to forage in fresh water.

KEY HABITAT REQUIREMENTS

Nest site— woods or thickest near a body of water. Foraging— shorelines of bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in two habitats. Recorded on 259 of 888 BBS routes in the region, 1966-1985; maximum route mean 54 birds, overall mean 1.05±4.05 birds/route, total of route means 938 birds.

SAMPLE WINTER DENSITIES

1(2) grass/forb longleaf pine-slash pine, 1(1) Everglades.

REPRODUCTION

The nesting season extends from January to September, with the peak from early April to mid-May. The platform nests are built in shrubs or trees, generally 5 to 15 feet (2-5 m) from the ground, and near water; always in colonies. The clutch size is usually 3 to 5, rarely 6.

FOOD HABITS

Feed by wading in shallow water and taking small fish, frogs, snakes, crustaceans, and various insects; at times feed on mudflats.

GUILD

Bush or tree nesting, aquatic staiking carnivore.

REFERENCES

Burleigh 1958:107; DeGraaf et al. 1980:114; Eagar and Hatcher 1982(A):93; Ehrlich et al. 1988:36; Forbush and May 1939:33; Imhof 1976:72; Kale 1978:72; James and Neal 1986:90; Lowery 1974:140; Mengel 1965:163; Monroe et al. 1988:5; Oberholser 1974(I):110; Ohlendorf et al. 1979; Palmer 1962:428; Potter et al. 1980:63; Rappole et al. 1983:158; Robinson 1990:36; Root 1988:17; Sprunt and Chamberlain 1970:87; Sprunt 1954:33; Stewart and Robbins 1958:54.

Tricolored Heron (Louisiana Heron)

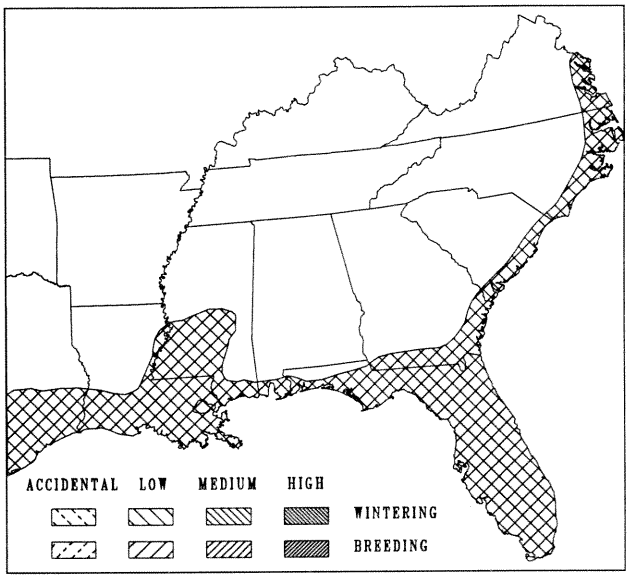
Egretta tricolor **TRHE**

PROTECTION STATUS

Florida listed as Special Concern. Monitored by Arkansas Natural Heritage Commission, Virginia Natural Heritage Program. Forest Service sensitive, National Forests in Florida.

ABUNDANCE STATUS

Breeding— C over most of Florida, and elsewhere along the coast; do not breed inland north of Florida, except at Okefenokee National Wildlife Refuge in Georgia, and casually at Eufaula Refuge in that state. Wintering— C over most of Florida, decreasing northward. Light post-breeding dispersal throughout the region, seldom reaching the mountains.



PRIMARY HABITATS

Nest site— thickets of shrubs or trees on islands or lake shores; not numerous in swamps; most common near the coast. Foraging— shallow water and mudflats, usually in salt water, such as in bays and in salt marshes.

KEY HABITAT REQUIREMENTS

Nest site— thickets near water, usually near the coast. Foraging— shores of bodies of water.

SAMPLE BREEDING DENSITIES

2(1) Everglades.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber live oak maritime, 1(1) Everglades.

REPRODUCTION

The breeding season extends from January to mid-August, with the peak from early April to early June. The nests are built in shrubs or trees, mainly in colonies with other species of waders. The clutch size is commonly 3, 4, or 5, rarely 2 or 6.

FOOD HABITS

Forage mainly in shallow salt or brackish water, taking small fish, frogs, crayfish, and numerous other items.

GUILD

Bush or tree nesting, aquatic stalking carnivore.

REFERENCES

Burleigh 1958:105; DeGraaf et al. 1980:112; Ehrlich et al. 1988:36; Forbush and May 1939:32; Imhof 1976:80; Kale 1978:77; James and Neal 1986:93; Lowery 1974:147; Oberholser 1974(I):108; Ohlendorf et al. 1979; Palmer 1962:464; Potter et al. 1980:68; Rappole et al. 1983:159; Robinson 1990:37; Root 1988:18; Sprunt and Chamberlain 1970:85; Sprunt 1954:32; Stewart and Robbins 1958:57.

Reddish Egret

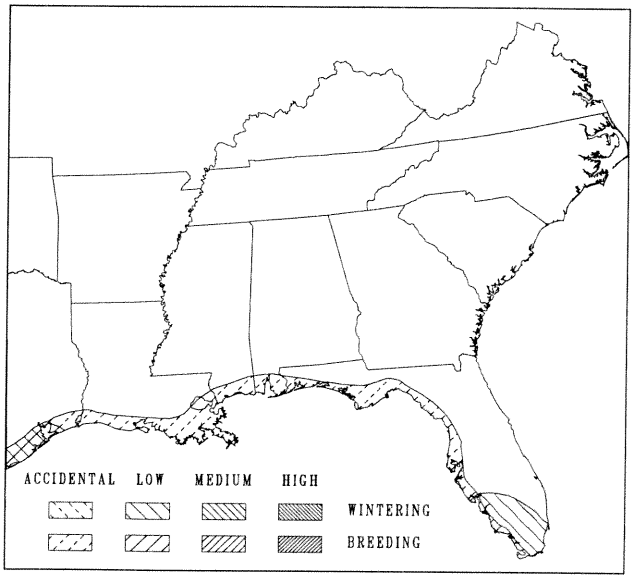
Egretta rufescens **REEG**

PROTECTION STATUS

Federally listed as category C2. State listed as Threatened in Texas, and Special Concern in Florida, and Alabama (unofficially). Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— U, perhaps locally FC, at a few sites in extreme southern Florida; a few pairs nest sparingly north to Tampa Bay. Non-breeding (since they nest mostly in winter, a "wintering" status would be inappropriate)— mainly U in extreme southern Florida at all seasons; R to U along the entire Gulf coast during most of the year; generally R along the Atlantic coast of Florida, and mainly during the warmer months.



PRIMARY HABITATS

All seasons— forage in salt water habitats; shallow bays, creeks, and shores. Nest in thickets on islands, generally in mangroves.

KEY HABITAT REQUIREMENTS

Nest site in dense thickets of small trees or shrubs on coastal islands, favoring mangroves; foraging habitats must have shallow salt water.

REPRODUCTION

The season extends from December to May, with the peak from January to March. The nests are built 5 to 15 feet (2-5 m) from the ground in dense coastal thickets, mainly in mangroves. The clutch size is generally 3 or 4, ranging from 2 to 6.

FOOD HABITS

These egrets wade in shallow salt water and stalk after small fish, frogs, tadpoles, and occasionally crustaceans.

GUILD

Bush or tree nesting, aquatic stalking carnivore.

REFERENCES

Burleigh 1958:104; Ehrlich et al. 1988:38; Forbush and May 1939:31; Imhof 1976:77; Kale 1978:51; Lowery 1974:143; Meyerreicks 1960:106; Monroe et al. 1988:6; Oberholser 1974(I):106; Ohlendorf et al. 1979; Palmer 1962:448; Potter et al. 1980:65; Rappole et al. 1983:159; Root 1988:18; Sprunt and Chamberlain 1970:84; Sprunt 1954:29.

Cattle Egret

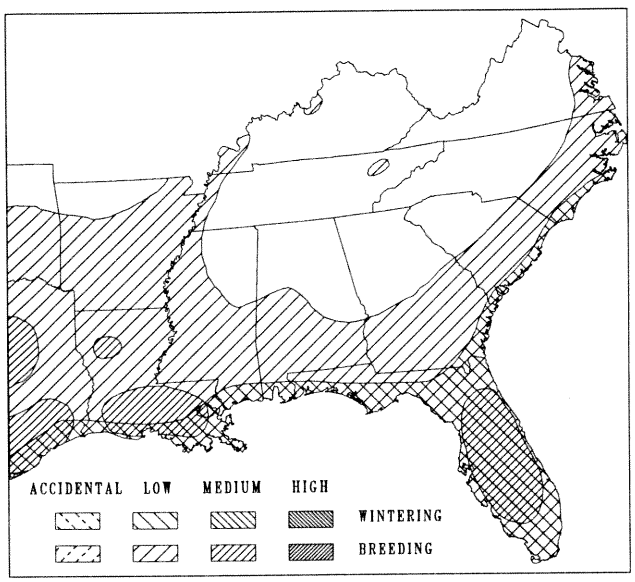
Bubulcus ibis **CAEG**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Sciences and Nature Preserves Commission. Monitored by Tennessee Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C over most of the range, though local in the inner Coastal Plain. Wintering— R in the Carolinas, increasing to C in the southern part of Florida. Cattle Egrets spread into the southeast from tropical regions in the early 1950s; their numbers rose sharply in the 1950s and 1960s. Spring arrival— mid-March to mid-April; fall departure— early October to mid-November.



PRIMARY HABITATS

Nest site— nest in thickets or swamps with other herons and egrets, frequently on coastal islands; large numbers also nest in inland swamps. Foraging— mainly in cattle pastures; also in other grassy areas, pond margins, and mudflats; seldom near tidal water.

KEY HABITAT REQUIREMENTS

Nest site— thickets or woods near water. Foraging— cattle pastures or other short grass areas.

SAMPLE BREEDING DENSITIES

Recorded on 298 of 888 BBS routes in the region, 1966-1985; maximum route mean 744 birds, overall mean 13.23±49.08 birds/route, total of route means 11,751 birds.

SAMPLE WINTER DENSITIES

0.5(2) grass/forb longleaf pine-slash pine, 2.4(8) sapling/poletimber pine savanna, 2.5(2) sawtimber longleaf pine-slash pine.

REPRODUCTION

The season extends from early April to late July, with June the most common time for egg laying. Nests are built in thickets of trees or shrubs near water, generally 5 to 15 feet (2-5 m) from the ground. The average clutch size is 4 or 5, with 3 being frequent.

FOOD HABITS

Glean insects and other small invertebrates from grass, bare ground, or from the backs of cattle. Most foraging is done in pastures and other grasslands; only infrequently near water.

GUILD

Bush or tree nesting, terrestrial gleaning insectivore.

REFERENCES

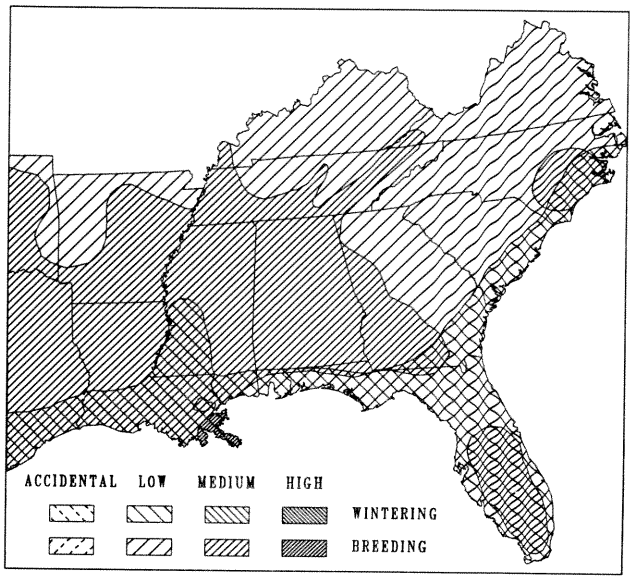
DeGraaf et al. 1980:110; Eagar and Hatcher 1982(A):87; Ehrlich et al. 1988:38; Imhof 1976:74; James and Neal 1986:93; Lowery 1974:141; Mengel 1965:164; Monroe et al. 1988:6; Oberholser 1974 (I):113; Ohlendorf et al. 1979; Palmer 1962:438; Potter et al. 1980:64; Rappole et al. 1983:158; Robbins et al. 1986:16; Robinson 1990:38; Root 1988:19; Sprunt 1954:31; Stewart and Robbins 1958:55.

Green-backed Heron (Green Heron)

Butorides striatus **GNBH**

ABUNDANCE STATUS

Breeding— C over most of the Coastal Plain; FC to C in the Piedmont; mostly U in mountains. Wintering— C in the southern half of Florida, decreasing northward; R to U north of Florida. Spring arrival— mid-March to mid-April.



PRIMARY HABITATS

Nest site— singly or in small colonies; usually near fresh water, but often near brackish or salt water; in swamps, thickets, or dense woods. Foraging— on shores, shallow water, marshes, and infrequently on mudflats; often in wooded areas, such as swamps and along creeks.

KEY HABITAT REQUIREMENTS

Nest site— moderate to dense woods or shrub thickets near a body of water. Foraging— shores of bodies of water.

SAMPLE BREEDING DENSITIES

0.6(2) sawtimber elm-ash-cottonwood, 13(1) Everglades. Recorded on 518 of 888 BBS routes in the region, 1966-1985; maximum route mean 20 birds, overall mean 1.06±1.74 birds/route, total of route means 942 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber live oak maritime, 5(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The breeding season extends from late March to late July, with a peak from mid-April to late May. The nests are built in shrubs or trees, most commonly 5 to 20 feet (2-6 m) from the ground, in a swampy place not far from water. The normal clutch size is 4 or 5, ranging from 3 to 6.

FOOD HABITS

These birds forage in shallow water, or from a stick just out of the water, stabbing at fish, reptiles, amphibians, and other aquatic animals in the water.

GUILD

Bush or tree nesting, aquatic stalking carnivore.

REFERENCES

Burleigh 1958:109; DeGraaf and Rudis 1986:156; DeGraaf et al. 1980:116; Ehrlich et al. 1988:34; Forbush and May 1939:34; Imhof 1976:71; James and Neal 1986:94; Lowery 1974:140; Mengel 1965:162; Meyerreicks 1960:3; Monroe et al. 1988:6; Oberholser 1974(I):111; Ohlendorf et al. 1979; Palmer 1962:415; Potter et al. 1980:62; Rappole et al. 1983:158; Robbins et al. 1986:16; Robinson 1990:39; Root 1988:20; Sprunt 1954:34; Sprunt and Chamberlain 1970:88; Stewart and Robbins 1958:53; Verner and Boss 1980:97.

Black-crowned Night Heron

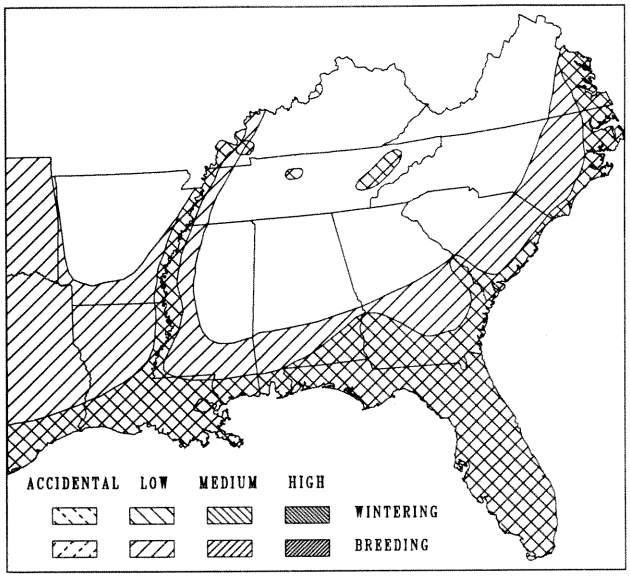
Nycticorax nycticorax **BCNH**

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission, Threatened and "in need of management" in Tennessee; and Special Concern in Alabama (unofficially). Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Florida Natural Areas Inventory, Georgia Freshwater Wetlands and Heritage Inventory Program, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C over most of Florida, and elsewhere near the coast; U inland on Coastal Plain, but casual or accidental as a breeder farther inland. Wintering— essentially the same as the breeding status, though some withdrawal southward from inland sites. Inland post-breeding dispersal is very rare; in fact, most individuals inland are migrants to and from breeding areas to the north of the region.



PRIMARY HABITATS

Nest site— dense woods or thickets, near a lake or bay. Foraging— generally nocturnal, seldom seen during the day; shallow water of marshes, bays, lakes, and ponds. Occur in both fresh and salt water.

KEY HABITAT REQUIREMENTS

Nest site— dense thickets near a body of water. Foraging— shores of bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in one habitat. Recorded on 55 of 888 BBS routes in the region, 1966-1985; maximum route mean 10 birds, overall mean 0.05±0.47 birds/route, total of route means 46 birds. BBS information was not used in preparation of the map of breeding distribution.

SAMPLE WINTER DENSITIES

1(1) sawtimber live oak maritime, 26(1) Everglades.

REPRODUCTION

The breeding season extends from mid-March to mid-June, with the peak from mid-April to mid-May. The nests are built in dense vegetation in thickets, mainly from 10 to 30 feet (3-6 m) above the ground; almost always in colonies. The usual clutch size is 3 to 5, ranging from 2 to 6.

FOOD HABITS

Forage in shallow water for fish, crustaceans, aquatic insects, frogs, and other items. They feed only at night and spend the day in dense thickets.

GUILD

Bush or tree nesting, nocturnal aquatic stalking carnivore.

REFERENCES

Burleigh 1958:111; DeGraaf and Rudis 1986:157; DeGraaf et al. 1980:118; Eagar and Hatcher 1982(A):45; Ehrlich et al. 1988:32; Forbush and May 1939:35; Imhof 1976:80; Kale 1978:78; James and Neal 1986:95; Lowery 1974:149; Mengel 1965:166; Monroe et al. 1988:6; Oberholser 1974(I):115; Ohlendorf et al. 1979; Palmer 1962:472; Potter et al. 1980:68; Rappole et al. 1983:160; Robinson 1990:39; Root 1988:21; Sprunt 1954:35; Sprunt and Chamberlain 1970:89; Stewart and Robbins 1958:58; Verner and Boss 1980:98.

Yellow-crowned Night Heron

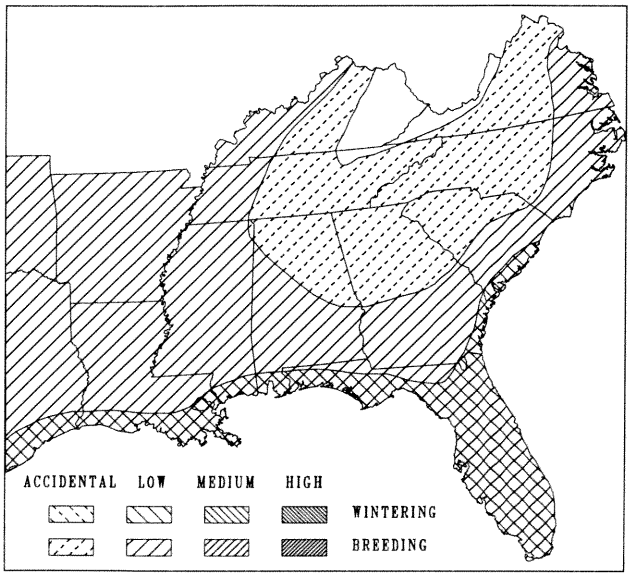
Nyctanassa violacea **YCNH**

PROTECTION STATUS

State listed as Threatened by Kentucky Academy of Sciences and Nature Preserves Commission. Monitored by Arkansas Natural Heritage Commission, Florida Natural Areas Inventory, Georgia Freshwater Wetlands and Heritage Inventory Program, Tennessee Natural Heritage Program, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC over most of Florida; mainly U elsewhere in the Outer Coastal Plain, and R in the inner Coastal Plain; VR and sporadic in the Piedmont, and in the Virginia mountains. Wintering— FC to C in southern Florida; mostly U in northern Florida; R in Georgia and South Carolina. Light post-breeding dispersal inland. Spring arrival— late March to mid-April; fall departure— October to mid-November.



PRIMARY HABITATS

Nest site— favor swamps and riverbottom forests; less numerous in coastal thickets or woods along a lake shore. Foraging— both nocturnal and diurnal; mainly use freshwater habitats; swamps, streams, marshes, lake shores, and other bodies of water; occur in wooded areas more frequently than most waders.

KEY HABITAT REQUIREMENTS

Nest site— dense woods or thickets near water, preferably in swamps. Foraging— shores of bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in two habitats. Recorded on 132 of 888 BBS routes in the region, 1966-1985; maximum route mean 29 birds, overall mean 0.18±1.37 birds/route, total of route means 164 birds. BBS information was not used in preparation of the map of breeding distribution.

REPRODUCTION

The breeding season extends from late March to mid-July, with a peak from mid-April to early May. The nests are built in shrubs or trees, mainly in a swamp. They seldom nest in large colonies. Clutch sizes are generally 3 to 5, ranging from 2 to 7.

FOOD HABITS

Feed in shallow water, and take mostly crustaceans (such as crabs); other items include fish, frogs, and insects.

GUILD

Bush or tree nesting, aquatic stalking carnivore.

REFERENCES

Burleigh 1958:113; DeGraaf and Rudis 1986:158; DeGraaf et al. 1980:120; Eagar and Hatcher 1982(A):55; Ehrlich et al. 1988:34; Forbush and May 1939:37; Imhof 1976:81; Kale 1978:79; James and Neal 1986:96; Lowery 1974:151; Mengel 1965:167; Monroe et al. 1988:6; Oberholser 1974(1):117; Ohlendorf et al. 1979; Palmer 1962:484; Potter et al. 1980:69; Rappole et al. 1983:160; Robinson 1990:40; Root 1988:22; Sprunt and Chamberlain 1970:90; Sprunt 1954:37; Stewart and Robbins 1958:59.

White Ibis

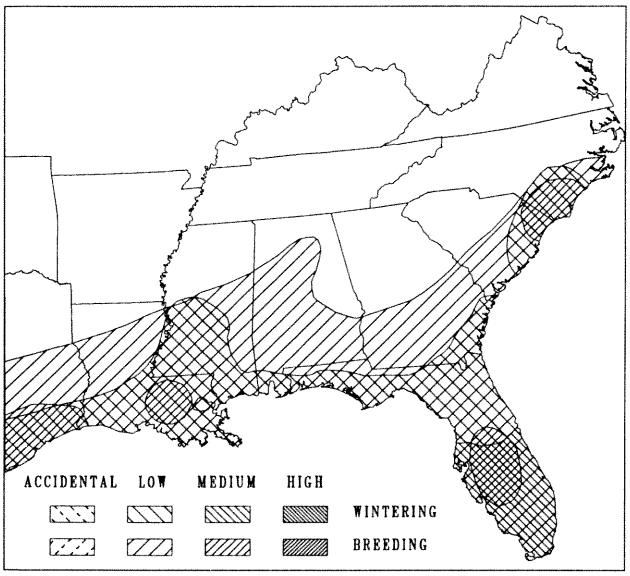
Eudocimus albus **WHIB**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C to VC over most of Florida and the coast of Georgia and South Carolina; FC to C over the remainder of the range; have nested once in Virginia. Wintering— C to VC in Florida; generally U to FC northward along the coast. Light to moderate post-breeding dispersal to most of the region, but few mountain records; mainly July and August. The population of White Ibises has increased greatly over the past several decades, especially north of Florida.



PRIMARY HABITATS

Nest site— thickets or forests near water, especially fresh water; commonly nest in swamps and bottomlands, as well as in coastal thickets. Foraging— in shallow water of bays, streams, ponds, swamps, and marshes; occur on both fresh and salt water shores.

KEY HABITAT REQUIREMENTS

Nest site— thickets of trees or shrubs near a body of water. Foraging— shores of bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in two habitats. Recorded on 110 of 888 BBS routes in the region, 1966-1985; maximum route mean 157 birds, overall mean 1.61±9.70 birds/route, total of route means 1431 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber oak-gum-cypress, 14(1) Everglades.

REPRODUCTION

Breeding season extends from January (in south Florida) to late July, with the peak from late March to mid-May. The nests are placed in trees or shrubs, usually at low or medium heights, in dense vegetation near water. Clutch size 2-5, usually 3-4.

FOOD HABITS

Forage in shallow water, on mudflats, and rarely in grassy areas, where they glean or probe. Primary food is crustaceans; fish, frogs, aquatic insects, etc., are also taken.

GUILD

Tree or bush nesting, aquatic gleaning or probing carnivore.

REFERENCES

Burleigh 1958:120; Ehrlich et al. 1988:46; Forbush and May 1939:44; Imhof 1976:89; Kale 1978:83; James and Neal 1986:97; Lowery 1974:158; Monroe et al. 1988:7; Oberholser 1974(1):128; Ohlendorf et al. 1979; Palmer 1962:522; Potter et al. 1980:75; Rappole et al. 1983:161; Robinson 1990:41; Root 1988:23; Sprunt and Chamberlain 1970:100; Sprunt 1954:45.

Glossy Ibis

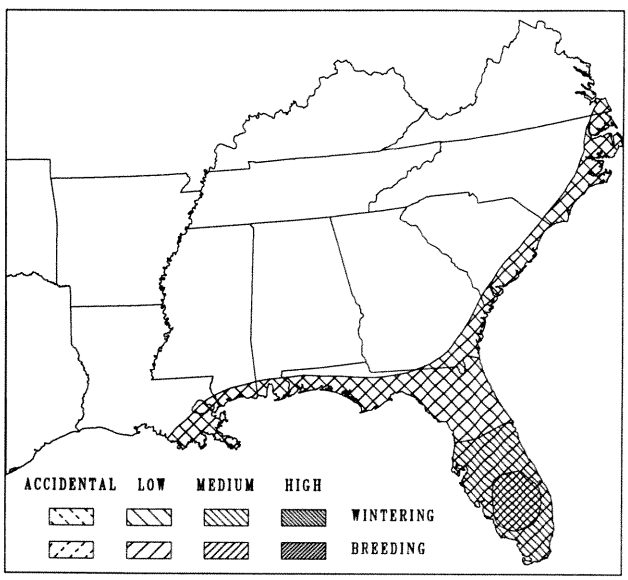
Plegadis falcinellus **GLIB**

PROTECTION STATUS

State listed as Threatened in North Carolina. Monitored by Arkansas Natural Heritage Commission, Florida Natural Areas Inventory, Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C on the coast of Virginia and northern North Carolina; decreasing southward to U to FC in Georgia; FC to C over much of Florida, though less numerous there than most other species of waders. Wintering— FC to C in much of Florida; R along the coast from Georgia to Virginia. Post-breeding dispersal is very rare inland. These birds have become much more numerous in this century, first in Florida, and within the past several decades in the northern part of the range.



PRIMARY HABITATS

Nest site— primarily thickets of small trees or shrubs near water, and commonly near the coast. Foraging— mostly in shallow water, such as ponds, pools, marshes, and estuaries, at times in grassy areas; feed in water of any salinity.

KEY HABITAT REQUIREMENTS

Nest site— thickets near a body of water. Foraging— shores of bodies of water; occasionally in grasslands.

SAMPLE BREEDING DENSITIES

Recorded on 15 of 888 BBS routes in the region, 1966-1985; maximum route mean 35 birds, overall mean 0.07±1.22 birds/route, total of route means 61 birds.

REPRODUCTION

The nesting season extends from late March to late June, with a peak from mid-April to late May. The nests are generally placed in shrubs or trees in thickets near water, and very seldom on the ground. The clutch size is usually 3 or 4.

FOOD HABITS

Forage in shallow water, on mud, or occasionally in grassy places. They glean or probe for food in mud or water, taking crayfish, aquatic insects, and other invertebrates, but relatively few fish are consumed.

GUILD

Bush or tree nesting, aquatic gleaning or probing insectivore or carnivore.

REFERENCES

Burleigh 1958:120; DeGraaf and Rudis 1986:159; Ehrlich et al. 1988:44; DeGraaf et al. 1980:126; Forbush and May 1939:42; Imhof 1976:86; Kale 1978:82; James and Neal 1986:97; Lowery 1974:156; Monroe et al. 1988:7; Oberholser 1974(I):126; Ohlendorf et al. 1979; Palmer 1962:515; Potter et al. 1980:74; Rappole et al. 1983:161; Robinson 1990:41; Root 1988:24; Sprunt and Chamberlain 1970:98; Sprunt 1954:43; Stewart and Robbins 1958:63.

White-faced Ibis

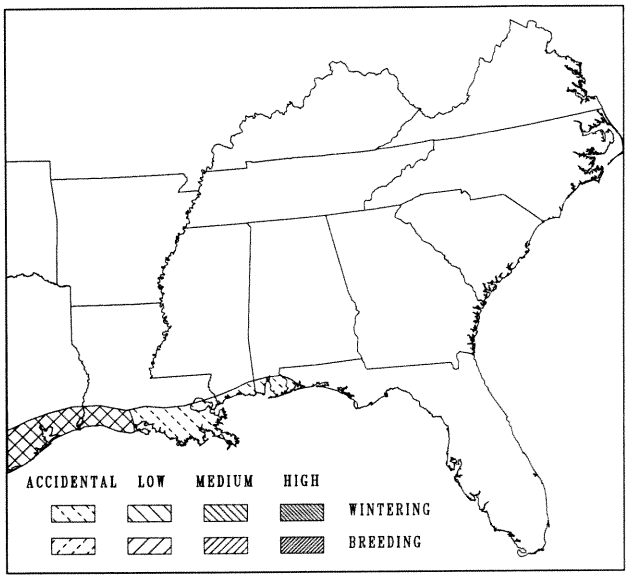
Plegadis chihi WFIB

PROTECTION STATUS

Federally listed as Category 2. State listed as Threatened in Texas.

ABUNDANCE STATUS

Permanent Residents—On the western Gulf Coast, these birds are Fairly Common but localized along the Texas coast and in southwestern Louisiana. Increasingly rare farther east in Mississippi and Alabama, they are also rarely found in inland heronries, some in wooded areas, east Texas. Portnoy (1981) reports more than 12000 of the birds in his survey of breeding colonies on the Louisiana-Mississippi-Alabama coasts, 1976. They are absent from the eastern areas in the winter. The birds were more common before the widespread use of organic pesticides in rice farming.



PRIMARY HABITATS

All seasons— White-faced Ibises utilize habitats very similar to those selected by the related Glossy Ibises (*Plegadis falcinellus*). They inhabit coastal swamps and marshes, irrigated ricefields, and other low-lying areas.

KEY HABITAT REQUIREMENTS

All seasons— Coastal swamps and marshes where the birds can forage in water ca. 6-8 in (1-2 dm) or less deep. In common with Glossy Ibises, these birds are apparently much more partial to fresh water than are White Ibises (*Eudocimus albus*).

REPRODUCTION

The birds build their solidly constructed nests of sticks and grasses in shrubs, trees or on the ground, near water, in marshes or swamps. In colonies in mangroves these birds nest more frequently in oystergrass than in the shrubs (Portnoy 1981). They frequently nest in mixed-species colonies with herons, egrets, rails, and other ibises. The clutch is 2-7, usually 3-4 eggs.

FOOD HABITS

The primary foods of White-faced Ibises are aquatic invertebrates and small vertebrate animals captured by probing into water or soft mud.

GUILD

Bush or tree nesting, aquatic gleaning or probing insectivore or carnivore.

REFERENCES

Ehrlich et al. 1988:46; Forbush and May 1939:43; Imhof 1976:87; James and Neal 1986:98; Lowery 1974:157; Monroe et al. 1988:7; Oberholser 1974 (I):127; Palmer 1962:515; Portnoy 1981; Rappole et al. 1983:161, 417; Robinson 1990:42; Root 1988:24; Sprunt 1954:44; Sutton 1967:44.

Roseate Spoonbill

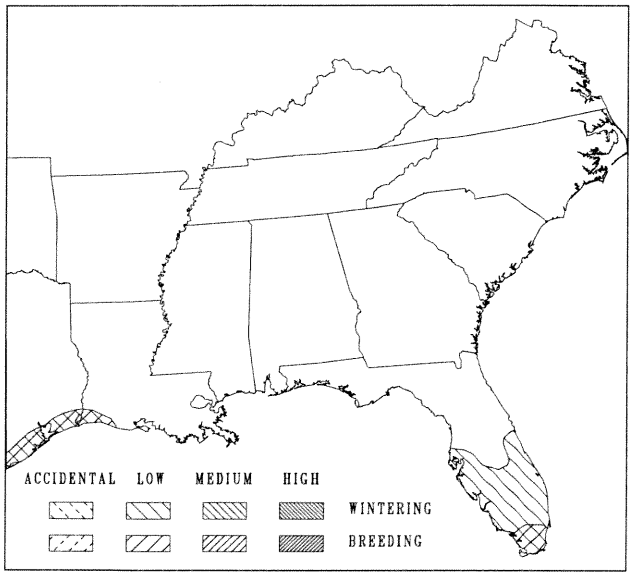
Ajaia ajaja **ROSP**

PROTECTION STATUS

Florida listed as Special Concern. Monitored by Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC in extreme southern Florida; nest in small numbers northward on the Gulf Coast to Tampa Bay. Non-breeding— occur regularly, often FC, over much of the southern half of Florida throughout the year; most numerous in coastal areas; R to VR elsewhere in Florida, with a few reaching the Georgia coast in the summer. Numbers of these birds decline greatly in Florida between 1880 and 1950, but the population is increasing steadily at the present, though still far below pre-1880 numbers.



PRIMARY HABITATS

Nest site— dense thickets of small trees along the coast, preferably on islands of mangroves. Foraging— generally in salt or brackish water; shallow water of bays, tidal creeks, ponds, and other bodies of water.

KEY HABITAT REQUIREMENTS

Nest site— thickets of small trees on coastal islands. Foraging— shallow water, generally salt or brackish water.

REPRODUCTION

Breeding season extends from November to January, peaking in mid-November to early January. The bulky, stick nests are placed in mangroves or other trees, generally within 30 feet (9 m) of the ground. Clutch size 2-5, typically 3.

FOOD HABITS

Forage in shallow water by sweeping the bill from side to side, straining or picking prey items from the water. Brackish water is favored. Prey consist primarily of small fish; some small aquatic insects, crustaceans, and a few plants are also taken.

GUILD

Bush or tree nesting, aquatic filter-feeding or gleaning insectivore or carnivore.

REFERENCES

Allen 1966; Burleigh 1958:122; Ehrlich et al. 1988:48; Forbush and May 1939:45; Imhof 1976:91; Kale 1978:52; James and Neal 1986:98; Lowery 1974:160; Oberholser 1974(I):132; Ohlendorf et al. 1979; Palmer 1962:534; Potter et al. 1980:76; Rappole et al. 1983:162; Robinson 1990:42; Root 1988:25; Sprunt and Chamberlain 1970:101; Sprunt 1954:47.

Wood Stork

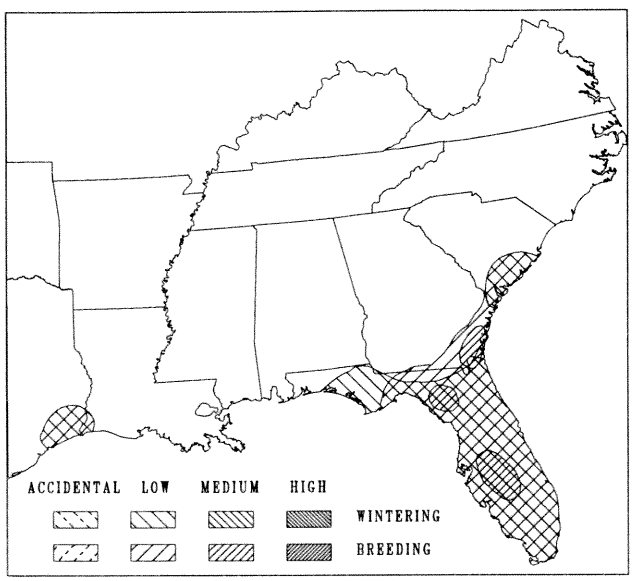
Mycteria americana **WOST**

PROTECTION STATUS

Federally listed as Endangered. State listed as Endangered in Florida, North Carolina, and South Carolina, Threatened in Texas, and Special Concern in Alabama (unofficially). Blue Listed by Tate (1981). Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program.

ABUNDANCE STATUS

Breeding— U to FC within the range, locally C at a few rookeries; nest north to Okefenokee Swamp in Georgia, and on very rare occasions possibly in coastal South Carolina. Non-breeding— during the warmer months, FC over much of Florida, and northward along the coast to central South Carolina; small numbers occur on the coast north to southern North Carolina, and inland over the southern halves of South Carolina and Georgia. In the colder months (when most breeding occurs), most individuals are in Florida; R on the coasts of Georgia and South Carolina. Stork numbers have declined drastically in recent decades, largely because of fluctuating water levels in the Florida wetlands.



PRIMARY HABITATS

Nest site— in swamps, tall trees along lake shores or thickets of trees or large shrubs; mainly near fresh water, but also in coastal areas. Foraging— favor fresh water in Florida, but frequent all salinity types, and mainly in salt water north of Florida; habitats include swamps, lake shores, pools, streams, estuaries, and mudflats.

KEY HABITAT REQUIREMENTS

Nest site— trees (or rarely shrubs) near a large body of water. Foraging— areas of shallow water, preferably where 6 to 10 inches (1-2 dm) deep.

SAMPLE BREEDING DENSITIES

Recorded on 44 of 888 BBS routes in the region, 1966-1985; maximum route mean 19 birds, overall mean 0.13±1.01 birds/route, total of route means 113 birds.

SAMPLE WINTER DENSITIES

1(1) Everglades.

REPRODUCTION

The breeding season extends from mid-December to late April, with the peak from late January to mid-March. The stick platform nests are usually placed high in trees in a swamp. Three eggs are normal, with 2 or 4 rather uncommon.

FOOD HABITS

Storks feed in shallow water, moving the bill around in the water until it touches a prey item, when the bill then quickly grabs the animal in a reflex action. Prey items are mainly fish, but also frogs, tadpoles, crustaceans, and others.

GUILD

Tree nesting, aquatic stalking or gleaning carnivore.

REFERENCES

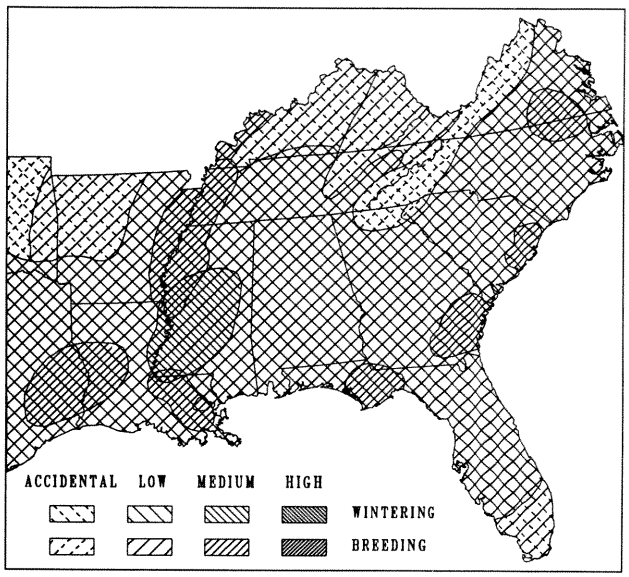
Burleigh 1958:118; Ehrlich et al. 1988:42; Forbush and May 1939:41; Imhof 1976:84; Kale 1978:3; James and Neal 1986:98; Lowery 1974:154; Mengel 1965:171; Monroe et al. 1988:7; Oberholser 1974(I):124; Ohlendorf et al. 1979; Palmer 1962:509; Potter et al. 1980:73; Rappole et al. 1983:161; Robinson 1990:42; Root 1988:25; Sprunt and Chamberlain 1970:97; Sprunt 1954:41; Stewart and Robbins 1958:63.

Wood Duck

Aix sponsa WODU

ABUNDANCE STATUS

Breeding— FC to C over most of the Coastal Plain and Piedmont; FC in the lower elevations of the Virginia mountains, but U in the North Carolina mountains. Wintering— C over much of the Coastal Plain, U in the Piedmont, and VR in the mountains.



PRIMARY HABITATS

Nest site— in a cavity, such as a nest box or a tree cavity, in a swamp, wooded stream, or at a lake or pond. Foraging— strictly in fresh water, and usually near wooded areas; open swamps, wooded lakes, streams, or in marshes.

KEY HABITAT REQUIREMENTS

Nest site— a cavity near a body of fresh water. Foraging— body of fresh water, usually close to wooded cover.

SAMPLE BREEDING DENSITIES

1.6(2) sapling/poletimber oak-gum- cypress, 13(3) sawtimber oak-gum-cypress. Recorded on 265 of 888 BBS routes in the region, 1966-1985; maximum route mean 14 birds, overall mean 0.31± 0.96 birds/route, total of route means 280 birds.

SAMPLE WINTER DENSITIES

0.5(1) shrub-seedling elm-ash-cottonwood, 4(1) sapling/poletimber bay swamp-pocosin, 4(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

Breeding season extends from late February to late July, with peak in late March to late April. Nest in cavities, such as abandoned Pileated Woodpecker holes, other large tree cavities, or in nest boxes; always near or over water. Clutch size 9-14, averaging 11-12.

FOOD HABITS

Forage in shallow fresh water, usually near deciduous woods or other vegetation. Glean food from water surface, from vegetation, etc. Summer diet includes aquatic insects, other invertebrates, as well as fish, tadpoles, and plants. Winter diet is primarily plant matter, often acorns.

GUILD

Cavity nesting, aquatic diving or gleaning omnivore.

REFERENCES

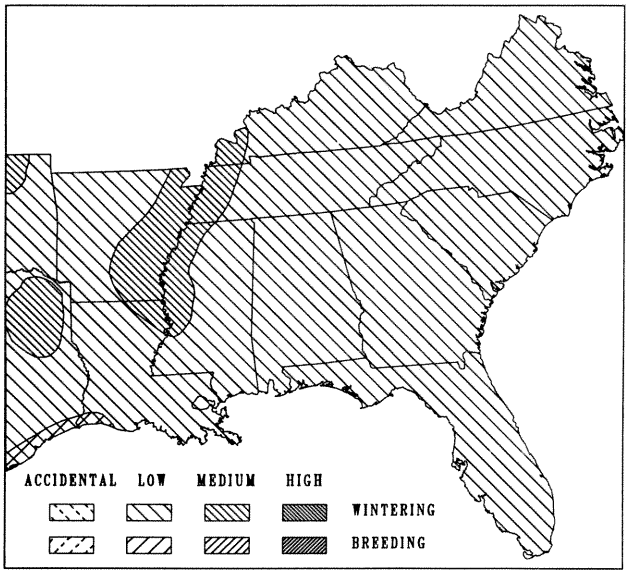
Bellrose 1976:170; Burleigh 1958:145; DeGraaf and Rudis 1986:162; DeGraaf et al. 1980:150; Ehrlich et al. 1988:74; Forbush and May 1939:70; Imhof 1976:111; James and Neal 1986:105; Johnsgard 1978:160; Lowery 1974:190; Mengel 1965:186; Monroe et al. 1988:9; Oberholser 1974(I):171; Palmer 1976(III):252; Potter et al. 1980:90; Rappole et al. 1983:165; Robbins et al. 1986:18; Robinson 1990:48; Root 1988:29; Scott et al. 1977:8; Sprunt 1954:73; Sprunt and Chamberlain 1970:124; Stewart and Robbins 1958:85; Verner and Boss 1980:108.

Mallard

Anas platyrhynchos **MALL**

ABUNDANCE STATUS

Breeding—Some wild Mallards nested in the lowlands of western Kentucky in historic times. Presently, the number of domestic birds, escapes, and hybrids makes the discussion of nesting of truly wild birds in the South moot. Winter—Occur throughout the South, are more common in the Coastal Plain than farther inland, and most numerous in the southern Mississippi River valley. The birds winter as far north as ice free water permits.



PRIMARY HABITATS

All seasons—Marshes, lakes, reservoirs, and flooded bottomlands; almost exclusively in fresh water.

KEY HABITAT REQUIREMENTS

All seasons—Shallow water ca. 12-16 in deep (3-4 dm) for foraging, and vegetation cover such as cattails or reeds for nesting. R. B. Hamilton (pers. comm.) suggests that the females, particularly, may depend for winter survival on flooded bottomland timber.

REPRODUCTION

Scattered breeding records exist for the entire region, primarily by feral individuals and hybrids with domestic stock. Nests are always placed upon the ground in herbaceous vegetation, where the females incubate clutches of 8-12 eggs. The season extends from March-July.

FOOD HABITS

Mallards have a varied diet of waste grain, seeds and stems of herbs, as well as grasses, acorns, cypress seeds, and other mast. A small proportion of the food consists of small invertebrate animals and a few fish.

GUILD

Ground nesting, aquatic or terrestrial gleaning or probing omnivore.

REFERENCES

Barbour et al. 1973:11; Burleigh 1958:131; DeGraaf et al. 1980:134; DeGraaf and Rudis 1986:165; Ehrlich et al. 1988:60; Forbush and May 1939:58; Imhof 1976:101; James and Neal 1986:109; Johnsgard 1978:216; Leopold et al. 1981:76; Lowery 1974:181; Mengel 1965:177; Monroe et al. 1988:9; Oberholser 1974 (I):153; Palmer 1976(II):275; Potter et al. 1980:83; Rappole et al. 1983:163, 419; Robbins et al. 1986:16; Robinson 1990:50; Root 1988:31, 275; Sprunt 1954:59; Sprunt and Chamberlain 1970:112; Sutton 1967:60; Verner and Boss 1980:102.

Hooded Merganser

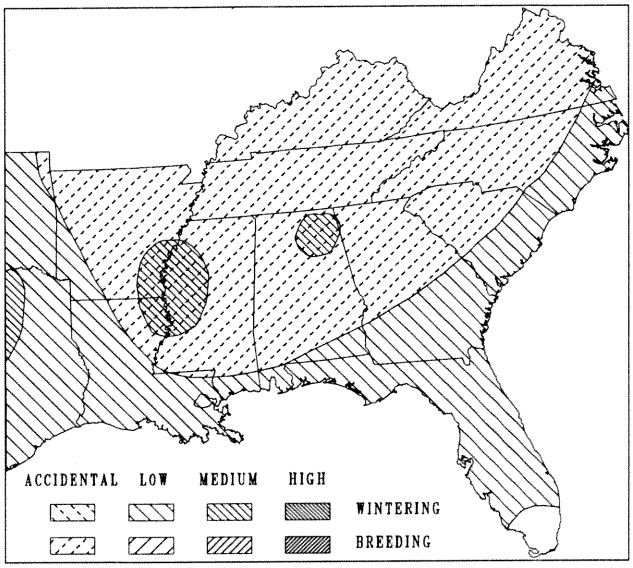
Lophodytes cucullatus HOME

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission. Monitored by Arkansas Natural Heritage Commission, Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R to casual, as well as sporadic; only in northeastern North Carolina and southeastern Virginia. Wintering— generally FC over most of the Coastal Plain, U to locally FC in the Piedmont, and R to U in the mountains. Most Hooded Mergansers breed north of the region. Fall arrival— late October to mid-November; spring departure— late March to mid-April.



PRIMARY HABITATS

Nest site— in a cavity (usually in a tree or bird box), in a swamp or bottomland forest. Foraging— usually in freshwater swamps, lakes, or ponds; infrequent in brackish water, but rare in salt water. Often in open bodies of water in winter, but close to wooded cover during the breeding season.

KEY HABITAT REQUIREMENTS

Nest site— a cavity near water in wooded country. Foraging— body of water, usually fresh water.

SAMPLE WINTER DENSITIES

1(1) grass/forb longleaf pine-slash pine.

REPRODUCTION

Breeding occurs from mid-February to late April, with peak in early to mid-March. Nests are placed in cavities such as nest boxes or abandoned Pileated Woodpecker holes. Clutch size 6-18, usually 8-12.

FOOD HABITS

Dive beneath the water surface of a lake, pond, or swamp for small fish, crayfish, other crustaceans, aquatic insects, etc.

GUILD

Cavity nesting, aquatic diving carnivore.

REFERENCES

Bellrose 1976:437; Burleigh 1958:163; DeGraaf and Rudis 1986:175; DeGraaf et al. 1980:166; Ehrlich et al. 1988:94; Forbush and May 1939:89; Imhof 1976:124; James and Neal 1986:127; Johnsgard 1978:346; Lowery 1974:207; Mengel 1965:197; Monroe et al. 1988:13; Oberholser 1974(I):195; Palmer 1976(III):448; Potter et al. 1980:99; Rappole et al. 1983:166; Robinson 1990:61; Root 1988:45; Scott et al. 1977:12; Sprunt 1954:86; Sprunt and Chamberlain 1970:145; Stewart and Robbins 1958:102; Verner and Boss 1980:117.

Black Vulture

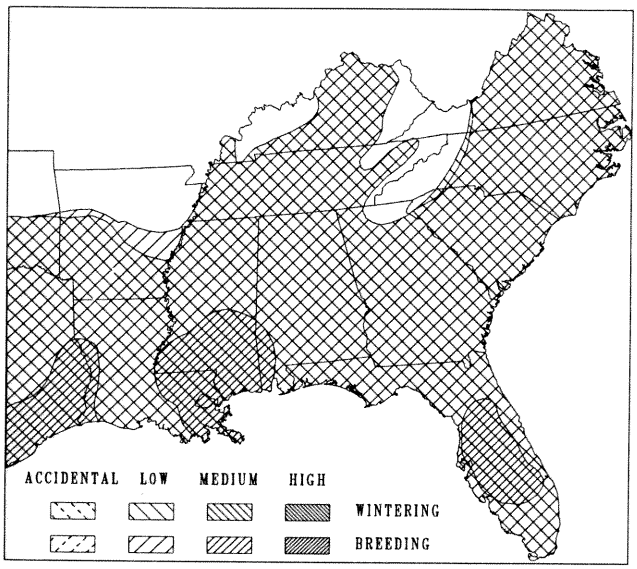
Coragyps atratus **BLVU**

PROTECTION STATUS

State listed as Threatened in North Carolina, Rare in West Virginia, and "in need of management" in Tennessee. Blue Listed by Tate (1981).

ABUNDANCE STATUS

All seasons— C throughout Florida, the Coastal Plain of Georgia and South Carolina, and most of Virginia; FC in the Coastal Plain of North Carolina; U to locally FC in the Piedmont of the Carolinas and Georgia; VR to absent in the mountains of North Carolina and extreme western Virginia, and in the Florida Keys. Essentially non-migratory.



PRIMARY HABITATS

Nest site— mainly in remote woodlands, with the nest on the ground in a thicket, in a hollow log, in a shed, or in many other spots. Partial to limestone cliffs in karst areas. Foraging— soar over a wide variety of habitats, from woods to open country; frequently feed in cities and towns in the southern part of the region.

KEY HABITAT REQUIREMENTS

Nest site— a sheltered spot in many situations, but usually in a forest. Foraging— no essential habitat requirements, though generally not in rugged mountainous areas.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in four habitats. Recorded on 315 of 888 BBS routes in the region, 1966-1985; maximum route mean 34 birds, overall mean 0.90±2.72 birds/route, total of route means 798 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp- pocosin, 4(2) grass forb loblolly pine-shortleaf pine.

REPRODUCTION

Breeding occurs from January to July, with peak egg-laying activity from early March to mid-April. Build no nests, but lay the two egg clutch on cliffs, in caves, hollow trees, logs, sheds, or under thickets.

FOOD HABITS

Often feed in large flocks on carrion detected visually while soaring. Prey is primarily carrion, and occasionally young animals, garbage, etc. They are reputed to have a weak sense of smell.

GUILD

Cavity, ground, or ledge nesting, terrestrial soaring scavenger.

REFERENCES

Bent 1937:28; Burleigh 1958:170; Eagar and Hatcher 1982(A):71; Ehrlich et al. 1988:216; Forbush and May 1939:95; Imhof 1976:129; James and Neal 1986:131; Lowery 1974:216; Mengel 1965:201; Monroe et al. 1988:14; Oberholser 1974(I):203; Potter et al. 1980:103; Rappole et al. 1983:167; Robinson 1990:64; Root 1988:48; Scott et al. 1977:15; Sprunt and Chamberlain 1970:150; Sprunt 1954:92; Stewart and Robbins 1958:106.

Turkey Vulture

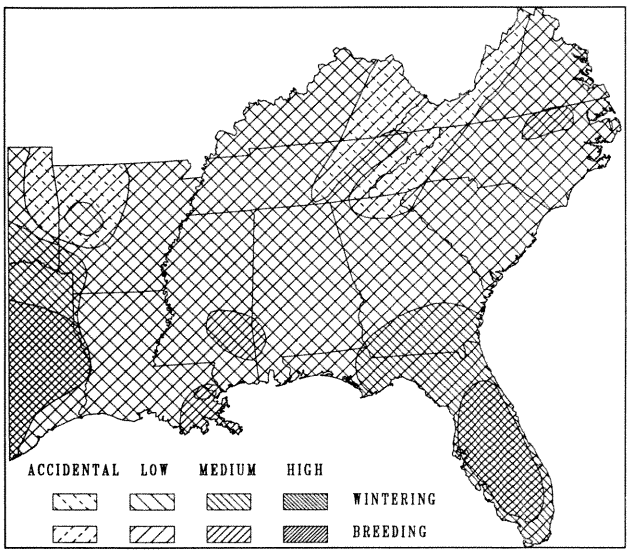
Cathartes aura **TUVU**

PROTECTION STATUS

State listed as "in need of management" in Tennessee.

ABUNDANCE STATUS

All seasons— C throughout the Coastal Plain; FC to locally C inland, less numerous at higher elevations. Moderate to heavy spring and fall migration through the region, mainly of birds that breed to the north of the region and winter primarily in the southern portion of the region.



PRIMARY HABITATS

Nest site— usually in a woodland, or in a remote area; commonly on the ground in a wooded thicket, in an old barn or shed, or on ledges of cliffs. Foraging— occur over many habitats as they soar, searching for carrion; often over mountains or woodlands, and somewhat less so around extensive fields. These birds are not associated with any single habitat.

KEY HABITAT REQUIREMENTS

Nest site— a sheltered spot on the ground or on a ledge, in many situations. Foraging— no essential habitat requirements.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 12 habitats; 0.5(1) sawtimber loblolly pine-shortleaf pine. Recorded on 506 of 888 BBS routes in the region, 1966-1985; maximum route mean 61 birds, overall mean 3.08±6.50 birds/route, total of route means 2733 birds.

SAMPLE WINTER DENSITIES

0.5(3) shrub-seedling elm-ash-cottonwood, 6(1) Everglades.

REPRODUCTION

Breeding season extends from March to June, with peak in early April to early May. Do not build nests, but lay the clutch of two eggs on cliffs, in caves, in hollow logs, in old sheds, or beneath the vegetation of thickets.

FOOD HABITS

Usually alone or in pairs, soar and glide on set wings searching for their primarily carrion prey. Possibly locate carrion by smell; rarely kill live prey.

GUILD

Cavity, ground, or ledge nesting, terrestrial soaring scavenger.

REFERENCES

Bent 1937:12; Burleigh 1958:168; DeGraaf and Rudis 1986:178; DeGraaf et al. 1980:172; Eagar and Hatcher 1982(A):67; Ehrlich et al. 1988:216; Forbush and May 1939:94; Imhof 1976:128; James and Neal 1986:132; Lowery 1974:213; Mengel 1965:200; Monroe et al. 1988:14; Oberholser 1974(I):201; Potter et al. 1980:102; Rappole et al. 1983:167; Robbins et al. 1986:18; Robinson 1990:65; Root 1988:49; Scott et al. 1977:14; Sprunt 1954:90; Sprunt and Chamberlain 1970:149; Stewart and Robbins 1958:104; Verner and Boss 1980:119.

Osprey

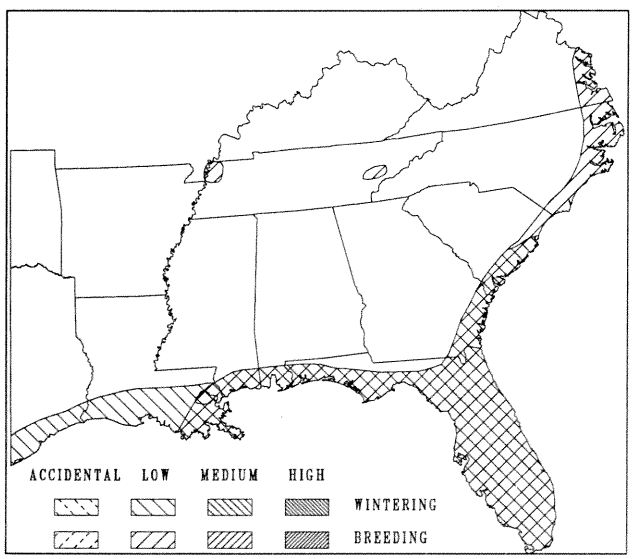
Pandion haliaetus **OSPR**

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission, in Missouri, Tennessee, and Alabama (unofficially); Threatened in South Carolina; Protected in Texas; Special Concern in Monroe County, Florida; and Rare in West Virginia. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program, Oklahoma Natural Heritage Inventory. Forest Service sensitive on Chattahoochee-Oconee, Cherokee , Daniel Boone, Francis Marion-Sumter, Kisatchie National Forests, National Forests in Florida, and Savannah River Forest Station.

ABUNDANCE STATUS

Breeding C over much of Florida; FC to locally C elsewhere in tidal areas, local further inland. Somewhat less numerous than 30 to 40 years ago. Wintering— U along the coast and in parts of northwestern Florida; increasing southward, becoming C in southern Florida. Spring arrival— late February to mid-March; fall departure— late October to mid-November.



PRIMARY HABITATS

Nest site— usually in an exposed structure (dead tree, marker, buoy, and others) near or in a large body of water; prefer coastal to inland shores. Foraging— always at large bodies of water: bays, lakes, and even the ocean; prefer salt water shores, and favor a few trees for perching.

KEY HABITAT REQUIREMENTS

Nest site— a conspicuous structure, commonly a dead tree, near a large body of water. Foraging— large bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in one habitat.

SAMPLE WINTER DENSITIES

0.5(1) grass/forb longleaf pine-slash pine, 0.5(1) sapling/poletimber live oak maritime.

REPRODUCTION

The nesting season extends from November to early July, with a Florida peak from mid-March to mid-April, and a Virginia peak from late April to mid-May. The nests are commonly built in the tops of trees, especially dead ones. Other sites include buoys, platforms, and markers; rarely on the ground. The clutch size is almost always 3, rarely 2 or 4.

FOOD HABITS

Ospreys feed almost entirely on fish, diving onto them from a considerable height.

GUILD

Tree or ledge nesting, aquatic pouncing carnivore.

REFERENCES

Bent 1937:352; Burleigh 1958:193; DeGraaf and Rudis 1986:179; DeGraaf et al. 1980:194; Eagar and Hatcher 1982(A):23; Ehrlich et al. 1988:242; Forbush and May 1939:121; Imhof 1976:146; Kale 1978:30; James and Neal 1986:134; Lowery 1974:239; Mengel 1965:218; Monroe et al. 1988:14; Oberholser 1974(I): 249; Ogden 1977; Potter et al. 1980:114; Rappole et al. 1983:170; Robbins et al. 1986:21; Robinson 1990:65; Root 1988:50; Sprunt 1954:120; Sprunt and Chamberlain 1970:177; Stewart and Robbins 1958:118; Verner and Boss 1980:131.

American Swallow-tailed Kite

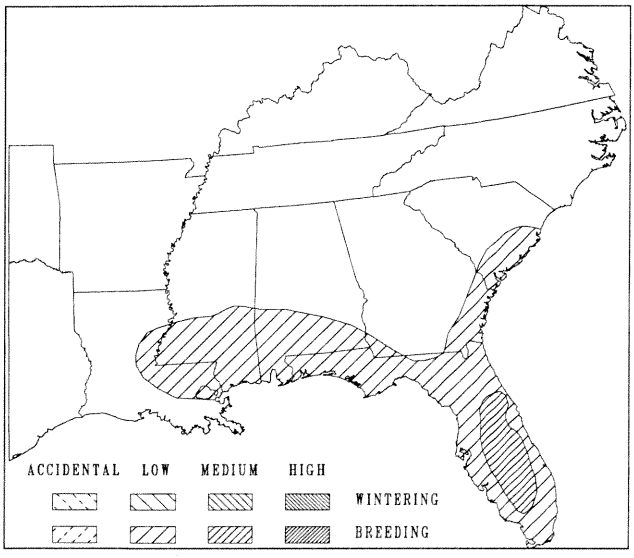
Elanoides forficatus **ASTK**

PROTECTION STATUS

Federally listed as Category C2. State listed as Endangered in South Carolina, Threatened in Texas, and Special Concern in Alabama (unofficially). Monitored by Arkansas Natural Heritage Commission, Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program. Forest Service sensitive, Francis Marion National Forest

ABUNDANCE STATUS

Breeding— C in southern Florida; FC to locally C over most of the remainder of Florida; mostly U and local in the Georgia and South Carolina portion of the range; 1 or 2 pairs possibly nest in coastal North Carolina. Winter south of the United States. Spring arrival— late February to mid-March; fall departure— mid-August to late September.



PRIMARY HABITATS

Prefer a mixture of swamp forests and marshes; feed over marshes and ponds, as well as in open swamps, usually avoid dry or upland habitats.

KEY HABITAT REQUIREMENTS

Mature trees (either in forests or in the open) adjacent to marshes or ponds; usually a swamp is essential.

SAMPLE BREEDING DENSITIES

Recorded on 27 of 888 BBS routes in the region, 1966-1985; maximum route mean 7 birds, overall mean 0.04±0.37 birds/route, total of route means 35 birds.

REPRODUCTION

Breeding season extends from mid-March to mid-May, with peak in April. Nests are usually built at great heights in living trees, often in pines; in forests near water. Clutch size 2, or less commonly 3.

FOOD HABITS

Forage in the air by gracefully swooping and gliding. Snatch prey from foliage and branches of trees, and from other substrates; often eat on the wing. Diet is primarily small reptiles, amphibians, large insects, and some nestling birds.

GUILD

Tree nesting, aerial or soaring insectivore, or pouncing carnivore on various substrates.

REFERENCES

Bent 1937:44; Burleigh 1958:172; Ehrlich et al. 1988:22; Forbush and May 1939:97; Imhof 1976:131; James and Neal 1986:135; Lowery 1974:219; Mengel 1965:204; Monroe et al. 1988:15; Oberholser 1974(I):208; Potter et al. 1980:105; Rappole et al. 1983:167; Robinson 1990:66; Sprunt 1954:94; Sprunt and Chamberlain 1970:153; Stewart and Robbins 1958:107.

Black-shouldered Kite (White-tailed Kite)

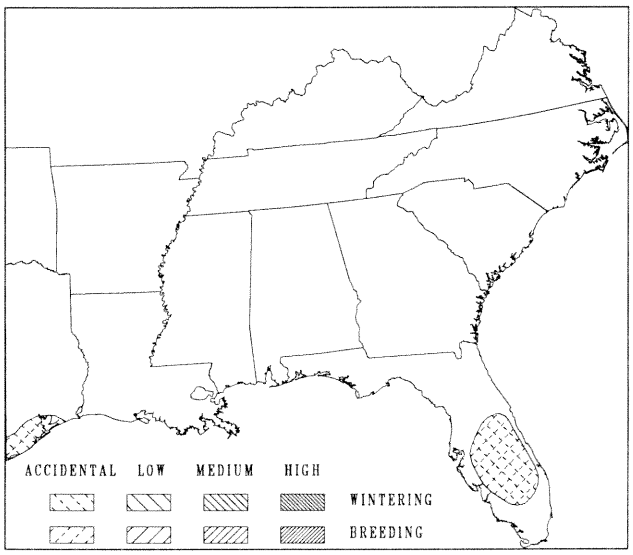
Elanus caeruleus **BSKI**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

All seasons— VR, status is poorly known; seldom more than 1 or 2 are sighted in a given year. Non-migratory. Presumably somewhat more numerous in the 19th Century, but these have always been rare birds in Florida. Most occur in Mexico and Central America.



PRIMARY HABITATS

All seasons— open, savanna-like habitats with scattered trees; prairies, marshes, and other fields.

KEY HABITAT REQUIREMENTS

Scattered trees or saplings in extensive open country.

REPRODUCTION

Breeding season extends from February to May, with peak in April. Nests are built in trees 10-30 feet (3-9 m) high. Clutch size 4-5, sometimes 3.

FOOD HABITS

Forage in slow flight, often hovering, at low heights over open areas. Drop onto the ground chiefly for small mammals; small birds, lizards, amphibians, and large insects, etc., are also taken.

GUILD

Tree nesting, pouncing carnivore on many substrates.

REFERENCES

Bent 1937:54; Ehrlich et al. 1988:222; Forbush and May 1939:96; Imhof 1976:130; Kale 1978:54; James and Neal 1986:135; Lowery 1974:219; Oberholser 1974(I):206; Potter et al. 1980:104; Robbins et al. 1986:18; Root 1988:51; Sprunt 1954:93; Sprunt and Chamberlain 1970:152; Verner and Boss 1980:121.

Snail Kite (Everglade Kite)

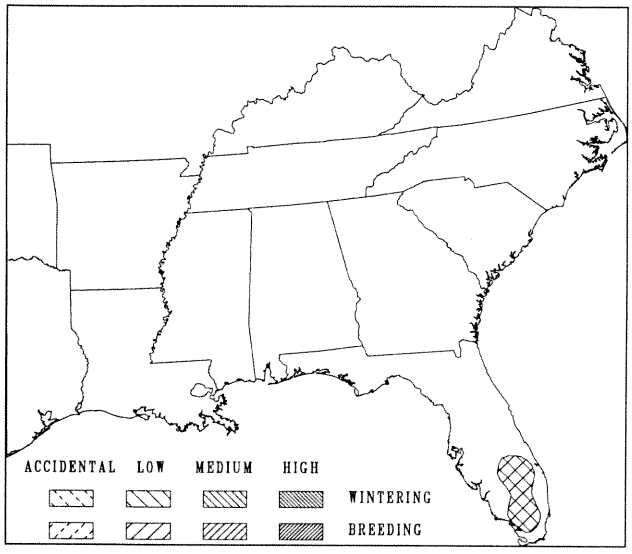
Rostrhamus sociabilis **SNKI**

PROTECTION STATUS

Federally listed as Endangered. State listed as Endangered in Florida. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program.

ABUNDANCE STATUS

All seasons— R and restricted, only in southern Florida, where perhaps 100 pairs are present. Most "Snail Kites" occur from Mexico and the West Indies south to South America. Non-migratory, but gregarious and somewhat nomadic.



PRIMARY HABITATS

All seasons— extensive freshwater marshes, usually where scattered shrubs or small trees are present, in addition to areas of shallow open water.

KEY HABITAT REQUIREMENTS

Freshwater marshes where Apple Snails (*Pomacea paludosa*) are present.

REPRODUCTION

Breeding season extends from mid-February to mid-July with peak in mid-March to late April. Nests are placed in marsh grassed, shrubs, or small trees. The birds readily accept artificial platforms into which the nests have been transferred. Clutch size 2-4, usually 3.

FOOD HABITS

Feed almost entirely on large freshwater snails, (*Pomacea paludosa*), which are located while the birds fly slowly low over the marshes, and are captured by pouncing. Captured prey are taken to a tree or feeding post for eating.

GUILD

Bush or ground nesting, aquatic or herb pouncing carnivore.

REFERENCES

Bent 1937:70; Ehrlich et al. 1988:224; Forbush and May 1939:98; Kale 1978:4; Oberholser 1974(I):211; Sprunt 1954:98; Stieglitz and Thompson 1967; Sykes 1979.

Mississippi Kite

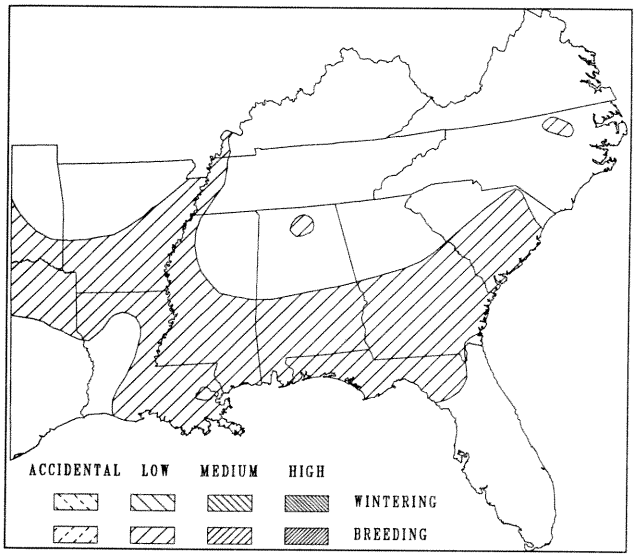
Ictinia mississippiensis **MIKI**

PROTECTION STATUS

State listed as Endangered in Tennessee, as Special Concern by Kentucky Academy of Sciences and Nature Preserves Commission, and as Significantly Rare in North Carolina. Monitored by South Carolina Heritage Trust Program.

ABUNDANCE STATUS

Breeding— FC to locally C along large rivers in the range; U over most of the range; probably breed sparingly at several sites in North Carolina. Winter to the south of the United States. Spring arrival— mid-April to late April; fall departure— late August to late September.



PRIMARY HABITATS

Primarily in extensive riverbottom hardwoods, where the nests are built, but feed over adjacent fields or marshes. Much foraging is done in the vicinity of cultivated fields, as well as over bottomland woods.

SAMPLE BREEDING DENSITIES

Recorded on 94 of 888 BBS routes in the region, 1966-1985; maximum route mean 23 birds, overall mean 0.19±1.38 birds/route, total of route means 171 birds.

REPRODUCTION

Breeding season extends from May to July, with peak in early June. Nests built high in canopies of trees, sometimes over 100 feet (30 m), in forests. Clutch size 1-2, sometimes 3.

FOOD HABITS

While on the wing over open areas or forests, Mississippi Kites capture and eat their primarily large insect prey. Occasionally take reptiles and amphibians.

GUILD

Tree nesting, aerial insectivore at various heights.

REFERENCES

Bent 1937:63; Burleigh 1958:173; Eagar and Hatcher 1982(A):21; Ehrlich et al. 1988:220; Forbush and May 1939:98; Imhof 1976:132; James and Neal 1986:135; Lowery 1974:220; Mengel 1965:204; Monroe et al. 1988:15; Oberholser 1974(I):209; Potter et al. 1980:105; Rappole et al. 1983:168; Robbins et al. 1986:18; Robinson 1990:67; Sprunt and Chamberlain 1970:155; Sprunt 1954:97.

Bald Eagle

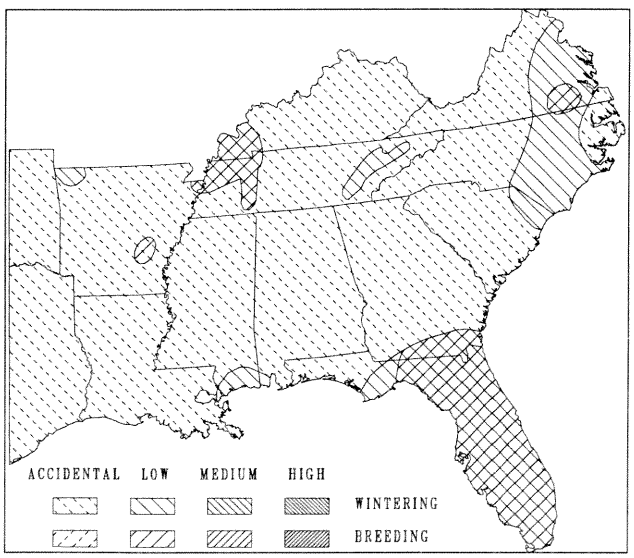
Haliaeetus leucocephalus BAEA

PROTECTION STATUS

H. l. leucocephalus is federally listed as Endangered. State listed as Endangered in Alabama, Arkansas, Delaware, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; as Threatened in Florida, and as Rare in West Virginia (*sic*).

ABUNDANCE STATUS

All seasons— have greatly declined throughout the Southeast since the 1930's and 1940's. mainly because of poor reproductive success resulting directly from the use of DDT, a chemical that causes egg-shell thinning in the birds. At present, FC over much of the Florida peninsula; U in the Chesapeake Bay area of Virginia, and in parts of northern Florida and coastal South Carolina; R and local elsewhere, mainly along the coast north of Florida. Have not nested in the past several years in Georgia and North Carolina, though breeding in these states could resume at any time. There is some migration of individuals throughout the Southeast, and small numbers winter on a few of the large inland lakes along the Mississippi River in Tennessee and Kentucky and in Northwestern Arkansas.



PRIMARY HABITATS

Nest site— usually in a large living tree near a body of water, either in the open or in a grove, but seldom in deep woods; usually in a conspicuous location. Foraging— almost always near estuaries, lakes, large ponds, open marshes, and shorelines; feed in both salt water and fresh water.

KEY HABITAT REQUIREMENTS

Nest site— tall, usually living trees near water. Foraging— large bodies of water, with trees nearby for perching.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in one habitat. Recorded on 13 of 888 BBS routes in the region, 1966-1985; maximum route mean 1 bird, overall mean 0.007±0.078 birds/route, total of route means 7 birds. BBS information was not used in preparation of the map of breeding distribution.

REPRODUCTION

The nesting season extends from early November to May, with a peak in Florida from early December to late January, and in Virginia from late February to mid-March. The large nests, reused in succeeding years, are built in crotches of large living trees (usually); pines are common nest sites. Two is the normal clutch size; rarely 1 or 3.

FOOD HABITS

Bald Eagles soar over a body of water and swoop to the surface for fish. They also scavenge for dead fish along shores, and they occasionally consume birds and small mammals.

GUILD

Tree nesting, aquatic soaring or pouncing carnivore or scavenger.

REFERENCES

Bent 1937:321-348; Burleigh 1958:189; DeGraaf and Rudis 1986:180; DeGraaf et al. 1980:190; Eagar and Hatcher 1982(A):9; Ehrlich et al. 1988:220; Forbush and May 1939:117; Imhof 1976:143; James and Neal 1986:136; Kale 1978:27; Lowery 1974:236; Mengel 1965:215; Monroe et al. 1988:15; Oberholser 1974(I):244; Potter et al. 1980:112; Robinson 1990:68; Root 1988:52; Spencer 1976; Sprunt and Chamberlain 1970:172; Sprunt 1954:116; Steenhoff and Brown 1978; Stewart and Robbins 1958:115; Verner and Boss 1980:129.

Northern Harrier (Marsh Hawk)

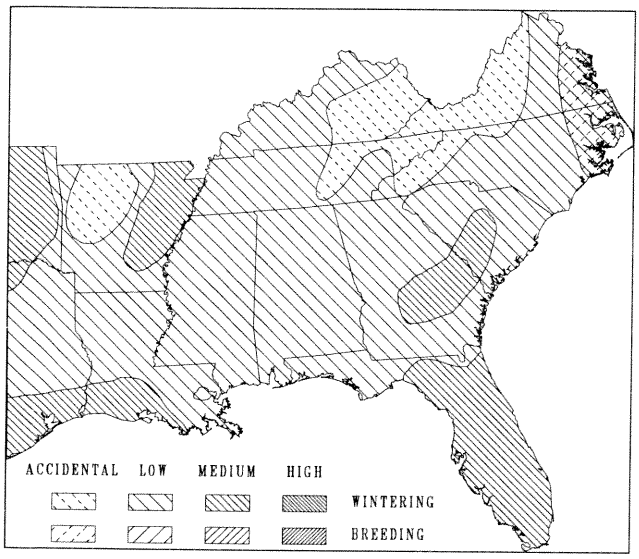
Circus cyaneus **NOHA**

PROTECTION STATUS

State listed as Endangered in Missouri, Threatened in Tennessee, Significantly Rare in North Carolina, and Rare in West Virginia. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R to U along the Virginia coast; VR to R along the northern coast of North Carolina; a few breeding records for northern Florida, but very irregular. Wintering— C in most coastal localities; U to FC in inland Florida, but mostly U elsewhere inland; R in the mountains. Fall arrival— late August to late September; spring departure— early April to early May.



PRIMARY HABITATS

Breeding— only in marshes, generally where fresh or brackish and rather extensive. Wintering— favor extensive marshes, but also forage at weedy fields and other open country habitats. Absolutely avoid wooded habitats.

KEY HABITAT REQUIREMENTS

Breeding— extensive marsh. Wintering— large areas of open country, preferably marshes but also weedy fields.

SAMPLE WINTER DENSITIES

0.5(2) shrub-seedling elm-ash-cottonwood, 2.5(2) saw-timber longleaf pine-slash pine.

REPRODUCTION

The nesting season extends from early May to late May, perhaps into April and June; the peak appears to be in early May and mid-May. The nests are built on the ground in a marsh, amid tall reeds. The clutch size is frequently 4 to 6, ranging up to 9.

FOOD HABITS

The birds fly slowly over a marsh or field, generally within 10 feet (3 m) of the ground, and drop onto small mammals. At times, birds, herps, and insects are also taken.

GUILD

Ground nesting, herb or terrestrial pouncing carnivore.

REFERENCES

Bent 1937:78; Burleigh 1958:191; DeGraaf and Rudis 1986:181; DeGraaf et al. 1980:192; Eagar and Hatcher 1982(A):43; Ehrlich et al. 1988:226; Forbush and May 1939:119; Imhof 1976:145; James and Neal 1986:139; Lowery 1974:238; Mengel 1965:217; Monroe et al. 1988:15; Oberholser 1974(I):246; Potter et al. 1980:114; Robbins et al. 1986:21; Rappole et al. 1983:170; Robinson 1990:69; Root 1988:53; Sprunt 1954:118; Sprunt and Chamberlain 1970:175; Stewart and Robbins 1958:116; Verner and Boss 1980:130; Watson 1977.

Sharp-shinned Hawk

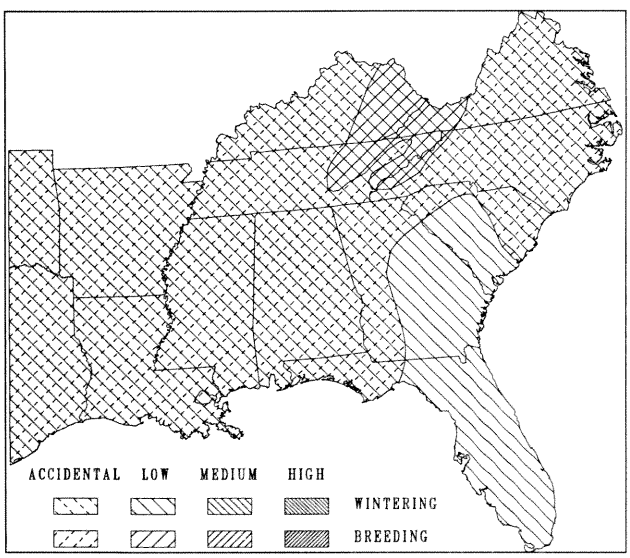
Accipiter striatus **SSHA**

PROTECTION STATUS

State listed as Endangered in Missouri, Threatened in Tennessee, Rare in West Virginia, Significantly Rare in North Carolina, and Special Concern by Kentucky Academy of Sciences and Nature Preserves Commission, and in Alabama (unofficially). Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission. Forest Service sensitive, Jefferson National Forest.

ABUNDANCE STATUS

Breeding— mostly U in the Southern Appalachians and Cumberland Plateau; R elsewhere. Wintering— FC in coastal areas; mostly U to FC elsewhere. Heavy fall migration along the coast and in the mountains, less so elsewhere. Fall arrival— mid-August to late September; spring departure— mid-April to early May.



PRIMARY HABITATS

Nest site— in a wide variety of forests, but generally where extensive. Most numerous in mixed forest, but not partial to hardwoods or conifers. Foraging— a mixture of woods and open country is preferred, especially a complex of woodlots and openings; occur in most types of wood, but in winter mainly in pines.

KEY HABITAT REQUIREMENTS

Nest site— forests of many types; few strict requirements. Foraging— mixture of woods and open country.

SAMPLE BREEDING DENSITIES

0.5(1) sawtimber loblolly pine- shortleaf pine. Recorded on 47 of 888 BBS routes in the region, 1966-1985; maximum route mean 1 bird, overall mean 0.008± 0.04 birds/route, total of route means 8 birds.

SAMPLE WINTER DENSITIES

0.5(2) shrub-seedling elm-ash-cottonwood, 3.5(4) sawtimber longleaf pine-slash pine.

REPRODUCTION

Breeding season extends from early May to late June with peak in late May. Nests are hidden in the canopies of large forest trees, often pines. Clutch size 3-8, usually 4-5.

FOOD HABITS

Sharpies are bird hawks, chasing and catching small birds on the wing in woodlands. Seldom forage in open areas. Small mammals, lizards, and insects are also taken.

GUILD

Tree nesting, aerial or hawking carnivore.

REFERENCES

Bent 1937:95; Burleigh 1958:175; DeGraaf and Rudis 1986:182; DeGraaf et al. 1980:176; Eagar and Hatcher 1982(A):27; Ehrlich et al. 1988:226; Forbush and May 1939:101; Imhof 1976:134; James and Neal 1986:141; Lowery 1974:223; Mengel 1965:206; Monroe et al. 1988:15; Oberholser 1974(1):214; Potter et al. 1980:106; Rappole et al. 1983:168; Robbins et al. 1986:18; Robinson 1990:69; Root 1988:54, 277; Sprunt 1954:102; Sprunt and Chamberlain 1970:156; Stewart and Robbins 1958:108; Verner and Boss 1980:123.

Cooper's Hawk

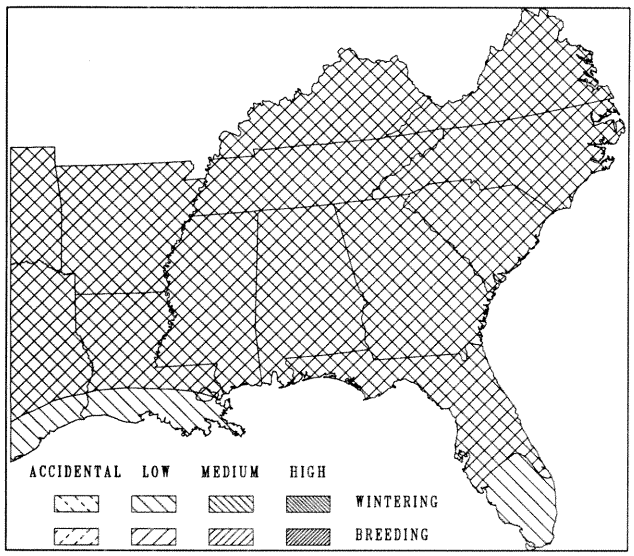
Accipiter cooperii **COHA**

PROTECTION STATUS

State listed as Endangered in Missouri, Threatened in North Carolina, South Carolina, and Tennessee; and Special Concern by Kentucky Academy of Sciences and Nature Preserves Commission, and in Alabama (unofficially). Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Florida Natural Areas Inventory, Louisiana Natural Heritage Program, Virginia Natural Heritage Program. Listed as Forest Service sensitive on National Forests in Texas, Jefferson, George Washington, and Kisatchie National Forests.

ABUNDANCE STATUS

Breeding— U in the northern parts of the South; generally R elsewhere, south to central Florida. Wintering— mostly U throughout the region; not numerous anywhere. Moderate migration of individuals into the Southeast in the fall; generally more numerous everywhere in winter than in summer.



PRIMARY HABITATS

Nest site— in forests of a wide variety, either in an extensive stand or near an opening. Foraging— usually where forests or woodlots are interspersed with fields and other openings; mainly in mixed woods or pinewoods in winter.

KEY HABITAT REQUIREMENTS

Nest site— in a wide variety of forested habitats. Foraging— woodlands with scattered fields or other openings.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 4 habitats, 1(3) sawtimber mixed pine-hardwood.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp-pocosin, 0.5(1) sapling/poletimber live oak maritime, 0.5(2) grass/forb or shrub-seedling elm-ash-cottonwood, 1(2) sawtimber mixed pine-hardwood.

REPRODUCTION

Breeding season extends from early April to late May, with peak occurring during early to mid-May. Nests are placed in crotches of limbs well up in forest trees. Clutch size 3-6, usually 4-5.

FOOD HABITS

Chase and catch medium-sized (e.g. Robin-sized) birds on the wing or from other substrates, usually in forests, occasionally in open areas. Lizards and amphibians are also taken.

GUILD

Tree nesting, aerial or hawking carnivore.

REFERENCES

Bent 1937:112; Burleigh 1958:177; DeGraaf and Rudis 1986:183; DeGraaf et al. 1980:178; Eagar and Hatcher 1982(A):25; Ehrlich et al. 1988:228; Forbush and May 1939:104; Imhof 1976:135; James and Neal 1986:141; Kale 1978:85; Lowery 1974:224; Mengel 1965:207; Monroe et al. 1988:16; Oberholser 1974(I):216; Potter et al. 1980:108; Rappole et al. 1983:168; Robbins et al. 1986:18; Robinson 1990:70; Root 1988:54, 278; Sprunt 1954:104; Sprunt and Chamberlain 1970:158; Stewart and Robbins 1958:109; Verner and Boss 1980:124.

Northern Goshawk

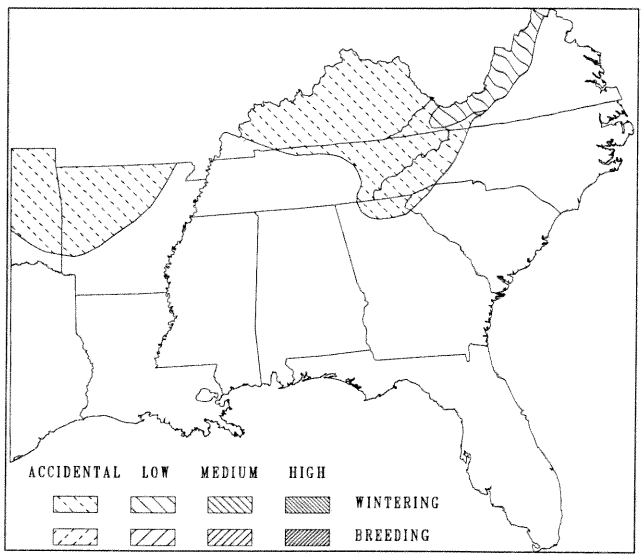
Accipiter gentilis NOGO

PROTECTION STATUS

State listed as Rare in West Virginia.

ABUNDANCE STATUS

Winter— These birds apparently come into the South only when their northern food supplies fail. They are Very Rare in Kentucky, Virginia, and in the mountains of North Carolina and Tennessee, and in northern Arkansas. Their occurrence is irregular farther south. Formerly they bred in Kentucky, they have bred in Maryland, and the breeding range may be expanding to the south.



PRIMARY HABITATS

Winter— Extensive forested areas, woods edges, primarily in upland forest types where they may utilize coniferous and mixed habitats more than deciduous forests. Breeding— May prefer to nest in a headwaters area.

KEY HABITAT REQUIREMENTS

Winter— Extensive forested areas.

SAMPLE WINTER DENSITIES

Unknown. Breeding densities as low as 1 pr/1500-4000 ha (3800-10000 acres; Brown and Amadon 1968) and as high as 0.82 pr/260 ha (640 ac; DeGraaf et al. 1980) have been reported.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

These birds are secretive and fierce predators on medium-sized and larger birds, such as grouse, jays, and woodpeckers. Grouse, quail, and poultry are often taken, reflecting the birds' preference for gallinaceous prey. A number of Arkansas records are associated with poultry farms in the northern part of that state. They also eat such mammals as squirrels, weasels, chipmunks, rabbits, groundsquirrels, and mice. Goshawks' primary foraging method is a surprise attack from an elevated, concealed perch. Once after prey, they will pursue doggedly, even on the ground by running under shrubs, etc. (or into buildings!; Bent 1937:133). Mengel (1965) reports that these birds may have followed the wintering hordes of Passenger Pigeons (*Ectopistes migratorius*) before the decimation of the latter in the last century. They require about 120-150 gm (4-5 oz) of meat/day, about the weight of a plucked pigeon [Brown and Amadon 1968(II):455].

GUILD

Aerial, pouncing or hawking carnivore at variable heights

REFERENCES

Barbour et al. 1973:19; Bent 1937:125, 139; Brown and Amadon 1968(II):452; DeGraaf et al. 1980:174; DeGraaf and Rudis 1986:184; Ehrlich et al. 1988:228; Forbush and May 1939:100; Imhof 1976:133; James and Neal 1986:142; Lowery 1974:221; Mengel 1965:205; Monroe et al. 1988:16; Oberholser 1974 (I):213; Potter et al. 1980:106; Robinson 1990:71; Root 1988:54, 278; Sprunt 1954:101; Stewart and Robbins 1958:108; Sutton 1967:99; Verner and Boss 1980:122.

Red-shouldered Hawk

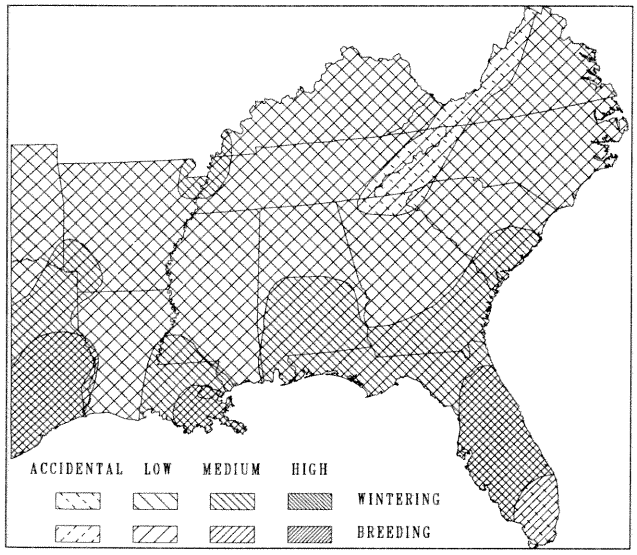
Buteo lineatus **RSHA**

PROTECTION STATUS

State listed as Endangered in Missouri, "in need of management" in Tennessee, and Special Concern in Alabama (unofficially). Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission.

ABUNDANCE STATUS

All seasons— C in the southern half of Florida; FC to C elsewhere in Florida; FC over the remainder of the Coastal Plain; mainly U in the Piedmont; R in the mountains, with most occurring in Virginia. Light migration into the Southeast in the fall; thus, probably slightly more numerous in winter than in summer at most localities.



PRIMARY HABITATS

Nest site— generally in swamps or bottomland forests; at times in other moist forests; never nest in upland forests. Foraging— seldom far from wetlands; feed at marshes, wooded lakes or ponds, or in swamps.

KEY HABITAT REQUIREMENTS

Nest site— wet or moist hardwood forests. Foraging— wetlands, both in forests and open areas.

SAMPLE BREEDING DENSITIES

0.5(3) sapling/poletimber oak-gum- cypress, 3.5(2) sawtimber elm-ash-cottonwood. Recorded on 333 of 888 BBS routes in the region, 1966-1985; maximum route mean 23 birds, overall mean 0.62±1.91 birds/route, total of route means 550 birds.

SAMPLE WINTER DENSITIES

0.5(4) shrub-seedling elm-ash-cottonwood, 5(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The season extends from late January to early June, with the peak from early March to early April. Nests are built in crotches in large trees growing in swamps or bottomlands; generally not reused in succeeding years. Two or 3 eggs are normal, rarely 4.

FOOD HABITS

The birds observe prey from soaring flight or from a perch, and swoop onto small mammals, herps, large insects, and occasionally birds; generally feed in wetlands.

GUILD

Tree nesting, soaring or pouncing carnivore on variable substrates.

REFERENCES

Bent 1937:180-211; Burleigh 1958:182-185; DeGraaf and Rudis 1986:185; DeGraaf et al. 1980:182; Eagar and Hatcher 1982(A):63; Ehrlich et al. 1988:230; Forbush and May 1939:108; Imhof 1976:137; James and Neal 1986:142; Lowery 1974:227; Mengel 1965:211; Monroe et al. 1988:16; Oberholser 1974(I):221; Potter et al. 1980:110; Robbins et al. 1986:21; Robinson 1990:71; Root 1988:56; Sprunt 1954:107-109; Sprunt and Chamberlain 1970:162, 167; Stewart and Robbins 1958:112; Verner and Boss 1980:126.

Broad-winged Hawk

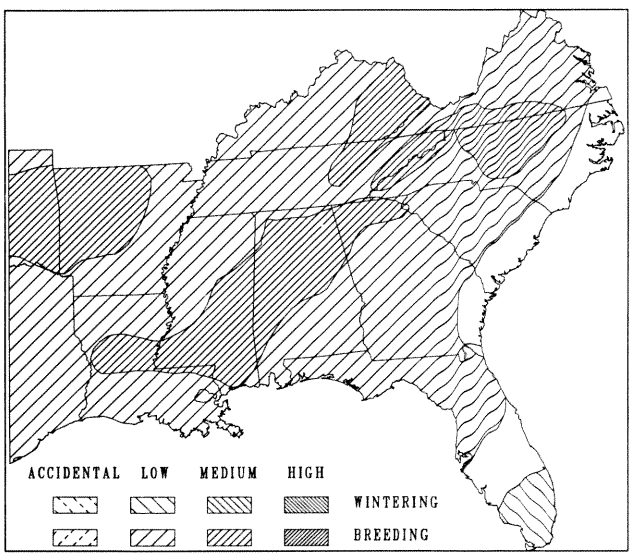
Buteo platypterus **BWHA**

PROTECTION STATUS

Monitored by Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— U to FC in the mountains; U in the Piedmont; R over most of the Coastal Plain portion of the range. Wintering— U in southern Florida. Scattered winter records over most of the region, but many (or perhaps the majority) of those north of Florida are suspect. Most of the birds winter south of the United States. Heavy fall migration in the mountain section, mainly in late September. Spring arrival— mid-March to mid-April; fall departure— late September to late October.



PRIMARY HABITATS

Breeding— mainly in deciduous forests; prefer upland often hilly, woods, as opposed to bottomlands; forage mainly in woodlands, and not normally over extensive open country. Wintering— mainly in woodlands, preferring broadleaf evergreen woods.

KEY HABITAT REQUIREMENTS

Breeding— deciduous or mixed forests, usually in uplands. Wintering— woodlands.

SAMPLE BREEDING DENSITIES

1(6) sawtimber oak-hickory, 3(1) sapling/poletimber oak-gum-cypress. Recorded on 212 of 888 BBS routes in the region, 1966-1985; maximum route mean 3 birds, overall mean 0.09±0.24 birds/route, total of route means 83 birds.

REPRODUCTION

The breeding season extends from mid-April to mid-June, with a peak from early to mid-May. The nests are built in crotches of trees, in the canopy, either in conifers or hardwoods; and usually used for just one season. Two eggs are the most common clutch size, but 3 eggs are frequent.

FOOD HABITS

Broad-wings generally spot prey from a perch, but also in soaring flight. Small mammals, herps, and large insects are the normal foods, taken from inside a forest.

GUILD

Tree nesting, pouncing carnivore on variable substrates.

REFERENCES

Bent 1937:236; Burleigh 1958:185; DeGraaf and Rudis 1986:186; DeGraaf et al. 1980:184; Ehrlich et al. 1988:230; Forbush and May 1939:110; Imhof 1976:138; James and Neal 1986:143; Lowery 1974:228; Mengel 1965;212; Monroe et al. 1988:16; Oberholser 1974(I):232; Potter et al. 1980:110; Rappole et al. 1983:169; Robbins et al. 1986:21; Robinson 1990:72; Root 1988:54, 278; Sprunt and Chamberlain 1970:168; Sprunt 1954:109; Stewart and Robbins 1958:113.

Short-tailed Hawk

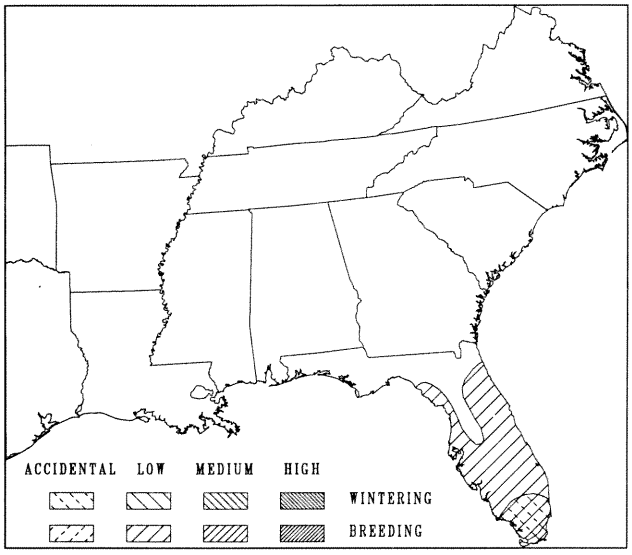
Buteo brachyurus **STHA**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

Breeding— R, and breeding habits rather poorly known; primarily in the southern two-thirds of Florida; most numerous in the center of the state. Wintering— U in the Everglades National Park, but R elsewhere, mainly in the southern quarter of the state. Most occur south of the United States.



PRIMARY HABITAT

Nest site— in swamps or bottomland woods, especially in cypress swamps, less so in mangrove forests; occasionally in pines or in upland woods. Foraging— mainly in wetlands, such as open swamps, wooded streams, marshes, and bottomlands.

KEY HABITAT REQUIREMENTS

Nest site— moist or wet forests. Foraging— mainly wet places, such as swamps, marshes, or ponds.

REPRODUCTION

The nesting season extends from late January to early May, with a peak from mid-March to late April. The nests are placed in crotches of trees, especially cypresses. The usual clutch size is 2, with a range of 1 to 3.

FOOD HABITS

Usually spot prey while soaring, often at great heights. They swoop down onto birds, the major prey item, as well as onto rodents, herps, and large insects.

GUILD

Tree nesting, soaring or pouncing carnivore on various substrates.

REFERENCES

Bent 1937:254; Ehrlich et al. 1988:240; Forbush and May 1939:113; Imhof 1976:141; Kale 1978:55; Oberholser 1974(I):233; Root 1988:54; Sprunt 1954:111.

Swainson's Hawk

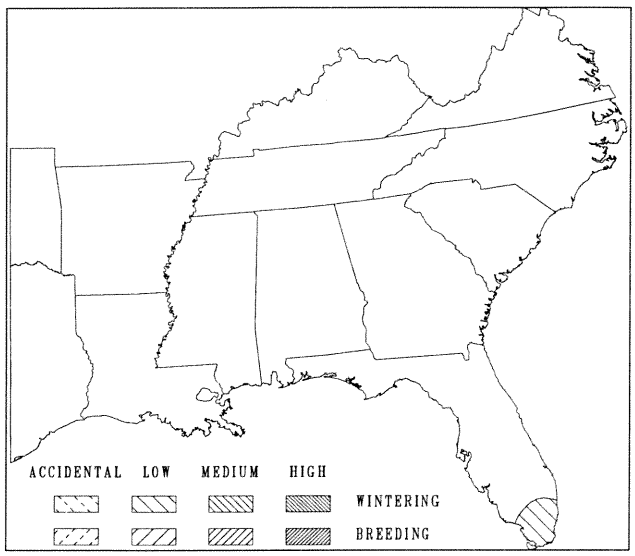
Buteo swainsoni **SWHA**

PROTECTION STATUS

Federally listed as category 3C. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Oklahoma Natural Heritage Inventory.

ABUNDANCE STATUS

Wintering— R to U in extreme southern Florida, in extensive fields. Breed to the west of the region (western North America); most winter in South America.



PRIMARY HABITATS

Generally in the vicinity of freshly plowed fields; less numerous in other types of fields; always in extensive open country.

KEY HABITAT REQUIREMENTS

Extensive, usually plowed, fields.

SAMPLE WINTER DENSITIES

1(1) sawtimber longleaf pine-slash pine.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Observe prey from a perch in open country and drop to the ground to feed. Large insects are most common prey, but rodents, herps, and other animals are also taken.

GUILD

Terrestrial pouncing insectivore or carnivore.

REFERENCES

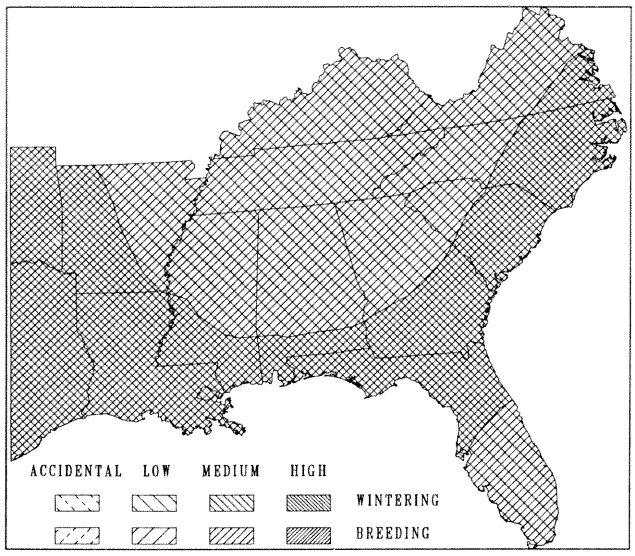
Bent 1937:222; Ehrlich et al. 1988:234; Forbush and May 1939:112; Imhof 1976:139; James and Neal 1986:144; Lowery 1974:230; Monroe et al. 1988:16; Oberholser 1974(I):234; Potter et al. 1980:111; Rappole et al. 1983:169; Robinson 1990:73; Root 1988:54, 278; Sprunt and Chamberlain 1970:169; Sprunt 1954:110; Verner and Boss 1980:127.

Red-tailed Hawk

Buteo jamaicensis **RTHA**

ABUNDANCE STATUS

Breeding— generally FC throughout the Southeast. Wintering— more numerous in most localities at this season than in summer; C over most of the region, though generally U in southern Florida at all seasons.



PRIMARY HABITATS

Nest site— in mature, usually deciduous or mixed forests; primarily in uplands. Foraging— prefer a mixture of forests and extensive open fields; generally in deciduous or mixed forests. In winter favor more open habitats than during the nesting season.

KEY HABITAT REQUIREMENTS

Nest site— mature forests, mainly in upland hardwoods. Foraging— mixture of forests and open country.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 7 habitats, 1(1) sawtimber cove hardwoods.

SAMPLE WINTER DENSITIES

0.5(6) shrub-seedling elm-ash-cottonwood, 3(1) grass/forb oak-hickory.

REPRODUCTION

The nesting season extends from mid-February to mid-June, with a peak from mid-March to mid-April. The nests are placed in crotches of trees, usually large ones, in woodland. They are used year after year, if not taken over by another species (such as Great Horned Owl). Two is the usual clutch size; 3 eggs are rare.

FOOD HABITS

Feed on rodents and other small to medium-sized mammals, with some herps and birds taken. The birds sight prey from soaring flight or from a perch and swoop down on the animals.

GUILD

Tree nesting, terrestrial or herb soaring or pouncing carnivore.

REFERENCES

Bent 1937:147-179; Burleigh 1958:179-182; DeGraaf and Rudis 1986:187; DeGraaf et al. 1980:180; Ehrlich et al. 1988:232; Forbush and May 1939:105; Imhof 1976:136; James and Neal 1986:144; Lowery 1974:225; Mengel 1965:208; Monroe et al. 1988:16; Oberholser 1974(I):217; Potter et al. 1980:109; Rappole et al. 1983:168; Robbins et al. 1986:18; Robinson 1990:73; Root 1988:55; Sprunt 1954:105; Sprunt and Chamberlain 1970:159; Stewart and Robbins 1958:110; Verner and Boss 1980:125

Ferruginous Hawk

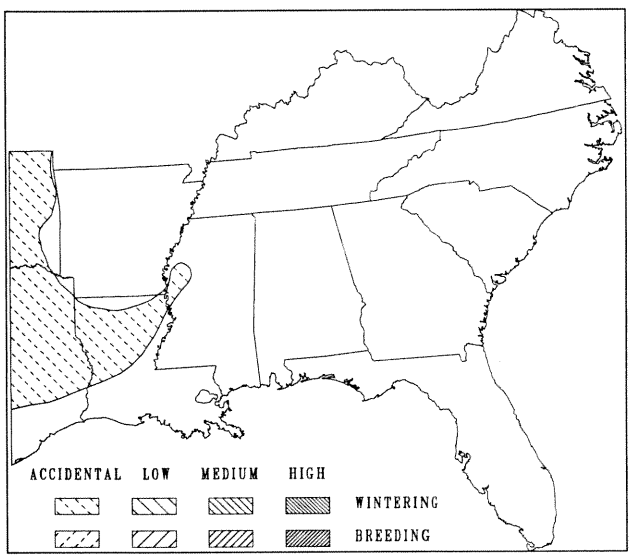
Buteo regalis **FEHA**

PROTECTION STATUS

Federally listed as Category 2. State listed as Special Concern in Oklahoma. Listed as Special Concern by Tate and Tate (1982).

ABUNDANCE STATUS

Winter—Very Rare in Louisiana, Arkansas, and Texas. These birds are Occasional visitors from the Great Plains that penetrate the region usually only W of the Mississippi River. In some years they are Uncommon, but in most winters absent from the region east of 96° W. Occasionally (formerly regularly) nest in the Texas panhandle as far south as 33° N.



PRIMARY HABITATS

Winter—Extensive open areas in upland situations, agricultural lands, and especially prairies.

KEY HABITAT REQUIREMENTS

Winter—Extensive treeless areas with a few perches and abundant rodent populations.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Ferruginous Hawks eat mice, groundsquirrels, and other small mammals as large as jackrabbits. Prairie dogs were their specialty in the past. Occasionally snakes, grasshoppers, crickets, lizards, and birds are taken. They frequently dine on roadkills in the winter, when many experience the same fate. Foraging methods include quartering back and forth low over the fields, or soaring and hovering at greater heights.

GUILD

Terrestrial or herb soaring or pouncing carnivore or scavenger

REFERENCES

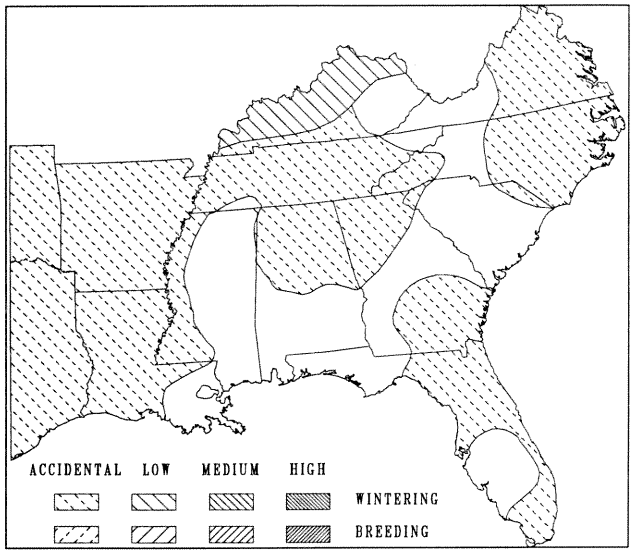
Bent 1937:284; Brown and Amadon 1968(II):626; Ehrlich et al. 1988:236; James and Neal 1986:147; Lowery 1974:232; Monroe et al. 1988:63; Oberholser 1974 (I):227; Rappole et al. 1983:169; Root 1988:57; Sutton 1967:113.

Rough-legged Hawk

Buteo lagopus **RLHA**

ABUNDANCE STATUS

Wintering— U in extreme northern Virginia, and near the coast of that state; VR to R, and somewhat erratic, southward to central North Carolina; many scattered records elsewhere in the region. Breed to the north of the region. Fall arrival— late October to mid-December; spring departure— mid-February to late March.



PRIMARY HABITATS

Extensive open country; avoid woodlands. Occur in large expanses of marshes or grassy fields; less commonly around plowed fields and coastal dunes.

KEY HABITAT REQUIREMENTS

Extensive areas of fields or marshes; favor a few widely scattered trees or fence posts for perching.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Rough-legs fly slowly and low over fields or marshes, and drop onto rodents they find. Some prey are observed from perches. Large insects and medium-sized mammals are sometimes eaten.

GUILD

Terrestrial or herb pouncing carnivore.

REFERENCES

Bent 1937:269; Burleigh 1958:187; DeGraaf and Rudis 1986:188; DeGraaf et al. 1980:186; Ehrlich et al. 1988:234; Forbush and May 1939:113; Imhof 1976:141; James and Neal 1986:148; Lowery 1974:232; Mengel 1965:214; Monroe et al. 1988:17; Oberholser 1974(I):226; Potter et al. 1980:111; Robinson 1990:73; Root 1988:58; Sprunt and Chamberlain 1970:170; Sprunt 1954:113; Stewart and Robbins 1958:114.

Golden Eagle

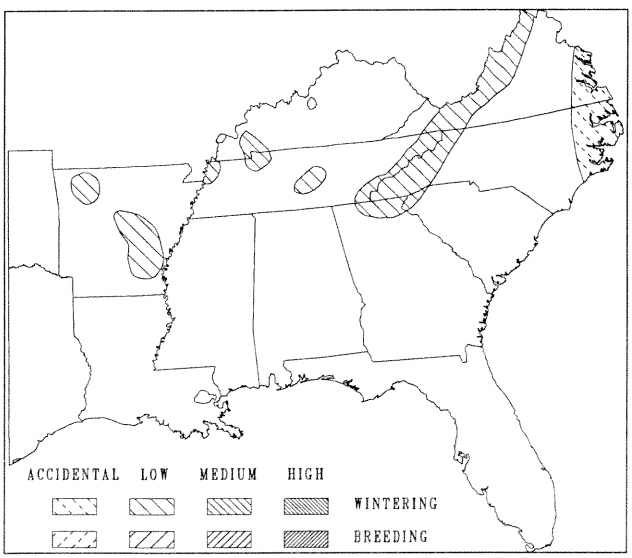
Aquila chrysaetos **GOEA**

PROTECTION STATUS

State listed as Endangered in South Carolina, Tennessee; Threatened in Alabama (unofficially); Significantly Rare in North Carolina, and Rare in West Virginia. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program, Oklahoma Natural Heritage Inventory, Virginia Natural Heritage Program. Forest Service sensitive on Chattahoochee, George Washington National Forests, National Forests in North Carolina.

ABUNDANCE STATUS

Breeding— R to casual in the Southern Appalachians as summer visitors, but do not currently breed; apparently nested on rare occasions many decades ago in the mountains of Virginia and North Carolina, though positive records are not known. Wintering— more numerous at this season than in summer; R at high elevations in North Carolina; VR and local elsewhere, though generally absent from the Florida peninsula. The majority of the population in North America breeds in the western half of the continent.



PRIMARY HABITATS

Nest site— only on ledges of steep and remote mountain cliffs. Foraging— prefer extensive open country, such as large pastures, fields, or marshes. Most frequently seen in the region in high elevation fields, pastures, and grassy balds; may be seen soaring over forests, but most foraging is in open areas.

KEY HABITAT REQUIREMENTS

Nest site— a ledge on a cliff. Foraging— extensive open country, mainly at high elevations (over 4000 feet, 1200 m).

REPRODUCTION

Rumors indicate that Golden Eagles once nested in the region, but this has never been proved. Based on data from other areas. the nests are built on ledges of cliffs in remote places. Two is the usual clutch size, rarely 1 or 3.

FOOD HABITS

These eagles soar high over fields or woods, stooping onto prey they observe. Small to medium-sized mammals are the major food items; some carrion and birds are taken.

GUILD

Ledge nesting, terrestrial soaring carnivore.

REFERENCES

Bent 1937:293; Burleigh 1958:187; DeGraaf and Rudis 1986:189; DeGraaf et al. 1980:188; Eagar and Hatcher 1982(A):17; Ehrlich et al. 1988:218; Forbush and May 1939:115; Imhof 1976:142; James and Neal 1986:148; Lowery 1974:234; Mengel 1965:214; Monroe et al. 1988:17; Oberholser 1974(I):242; Potter et al. 1980:111; Robinson 1990:74; Root 1988:60; Sprunt 1954:115; Sprunt and Chamberlain 1970:171; Stewart and Robbins 1958:115; Verner and Boss 1980:128.

Crested Caracara

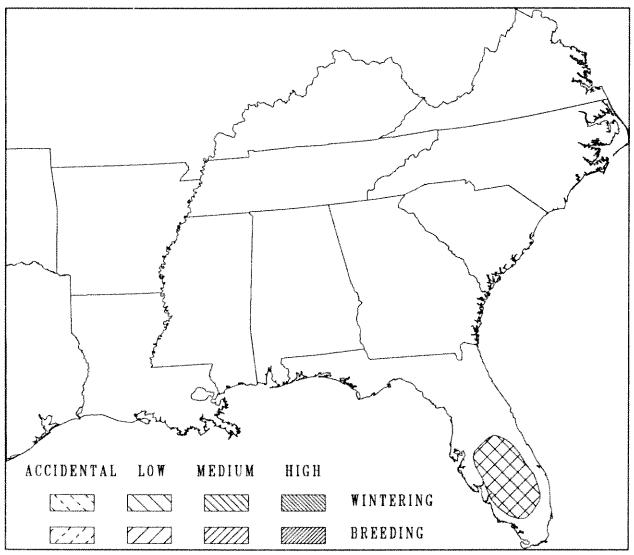
Polyborus plancus **CRCA**

PROTECTION STATUS

Federally listed as Threatened. State listed as Threatened in Florida. Blue Listed by Tate (1981). Monitored by Louisiana Natural Heritage Program.

ABUNDANCE STATUS

All seasons— restricted to a fairly small area in peninsular Florida (though widespread in Mexico and Central America); U in the central section of the range, mainly in the Kissimmee Prairie; R near the coasts. Non-migratory. A steady decline has occurred in the Florida population, and only several hundred individuals are believed to exist.



PRIMARY HABITATS

Prairie and savanna areas, usually in fairly dry areas with scattered trees and saplings, especially cabbage palmettos. The open areas may be native prairie, pastures, or cultivated fields.

KEY HABITAT REQUIREMENTS

Extensive open country with scattered trees; a typical savanna landscape.

REPRODUCTION

The breeding season extends from September to April, with a peak from late January to late February. The nests are usually built in the crowns of small cabbage palmettos, often not high above ground, and always in open country. Two eggs are common, 3 frequent, and 4 rare.

FOOD HABITS

Caracaras frequently forage on carrion, as well as on a great variety of live animals. They often find food by soaring, or by stalking on foot in short grass habitats.

GUILD

Bush nesting, terrestrial pouncing or stalking carnivore or scavenger.

REFERENCES

Bent 1938:127; Ehrlich et al. 1988:244; Forbush and May 1939:123; Kale 1978:34; Lowery 1974:242; Oberholser 1974(I):251; Potter et al. 1980:116; Root 1988:61; Sprunt and Chamberlain 1970:178; Sprunt 1954:121.

American Kestrel

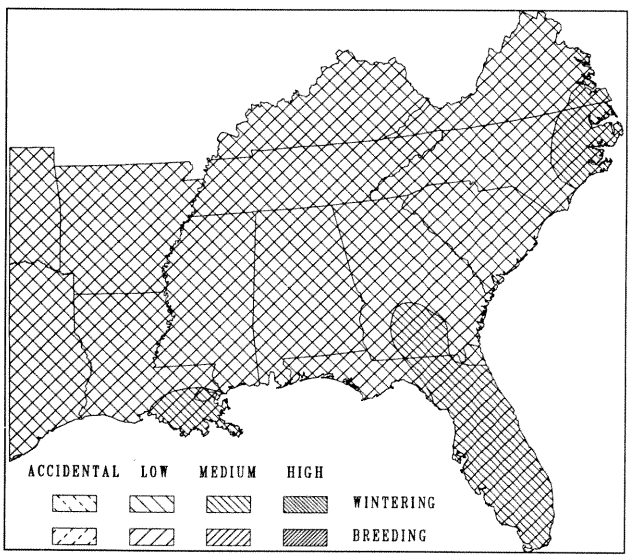
Falco sparverius **AMKE**

PROTECTION STATUS

F. s. paulus federally listed category C2, state listed as Threatened in Florida. Blue Listed by Tate (1981). Forest Service sensitive, Chatahoochee-Oconee National Forests and National Forests in Florida.

ABUNDANCE STATUS

Breeding— U over most of Virginia, and the mountains of North Carolina; R over most of Georgia, and the Piedmont of the Carolinas; U to FC in Florida, most numerous in the central portion; very few nest in the Coastal Plain of the Carolinas, and Absent from extreme southern Florida. Wintering— C throughout the Coastal Plain, even VC in parts of Florida and Louisiana; FC to C farther inland, least numerous at higher elevations.



PRIMARY HABITATS

Nest site— in extensive open country, where scattered trees occur, such as in open pine savannas, trees in a pasture or grassy field, or telephone poles in open areas. Foraging— in open areas; plowed fields, grassy fields, savannas, roadsides, and woodland margins; usually perch on telephone wires or poles or in exposed trees.

KEY HABITAT REQUIREMENTS

Nest site— a cavity (such as in a dead tree) in extensive open country. Foraging— open country with scattered high perches.

SAMPLE BREEDING DENSITIES

0.6(2) shrub-seedling southern scrub oak, 1.7(3) sawtimber oak-hickory. Recorded on 195 of 888 BBS routes in the region, 1966-1985; maximum route mean 7 birds, overall mean 0.19±0.61 birds/route, total of route means 170 birds. BBS information was not used in preparation of the map of breeding distribution.

SAMPLE WINTER DENSITIES

0.5(9) shrub/seedling elm-ash-cottonwood, 6.2(4) sawtimber longleaf pine-slash pine.

REPRODUCTION

The nesting season extends from late March to early June, with a peak from mid-April to mid-May. The usual nest sites are cavities in dead trees, dug by woodpeckers; also used are holes in telephone poles and crevices in buildings. The clutch generally contains 4 or 5 eggs, with a range of 3 to 7.

FOOD HABITS

Kestrels sit on exposed perches, commonly telephone wires, and drop to the ground when food is spotted; they also hover over fields. Small mammals and birds predominate in winter diet.

GUILD

Cavity nesting, terrestrial pouncing insectivore-carnivore.

REFERENCES

Bent 1938:106-126; Burleigh 1958:199, 200; DeGraaf and Rudis 1986:190; DeGraaf et al. 1980:198; Ehrlich et al. 1988:244; Forbush and May 1939:131; Imhof 1976:150; James and Neal 1986:149; Kale 1978:32; Lowery 1974:245; Mengel 1965:222; Monroe et al. 1988:17; Oberholser 1974(I):260; Potter et al. 1980:117; Rappole et al. 1983:171; Robbins et al. 1986:21; Robinson 1990:75; Root 1988:62; Scott et al. 1977:18; Sprunt 1954:126; Sprunt and Chamberlain 1970:182; Stewart and Robbins 1958:122; Verner and Boss 1980:135.

Merlin

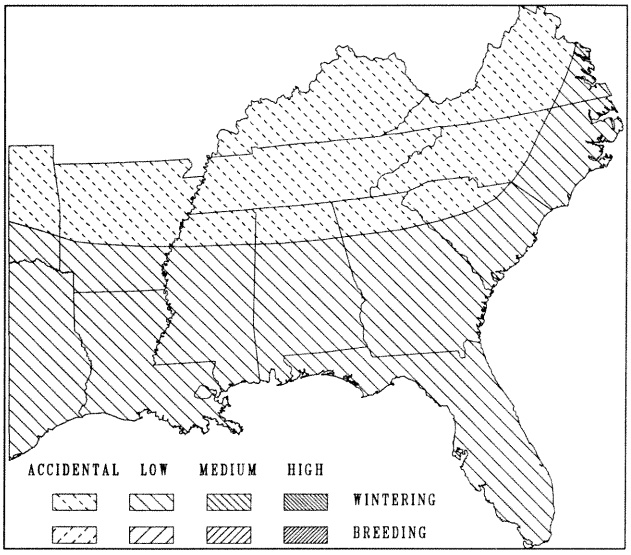
Falco columbarius **MERL**

PROTECTION STATUS

State listed as Rare in West Virginia, and Special Concern in Alabama (unofficially). Blue Listed by Tate (1981). Monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

Wintering— generally U along the entire coast; R in the interior of Florida; VR to R, and erratic, elsewhere inland. Often FC along the Atlantic coast in fall. Breed to the north of the region. Fall arrival— early September to mid-October; spring departure— mid-March to early May.



PRIMARY HABITATS

Only in open country; most numerous at coastal wetlands, such as mudflats, ponds, marshes and thickets. Often in large fields or pastures. Perches, such as fence posts, bare trees, or telephone poles, must be present for observing prey.

KEY HABITAT REQUIREMENTS

Extensive open country, usually near coastal wetlands.

SAMPLE WINTER DENSITIES

0.5(4) shrub-seedling elm-ash-cottonwood, 1(1) sawtimber live oak maritime.

REPRODUCTION

Do not breed in the region.

GUILD

Aerial or pouncing carnivore.

REFERENCES

Bent 1938:70-95; Burleigh 1958:197, 198; DeGraaf and Rudis 1986:191; Ehrlich et al. 1988:246; Forbush and May 1939:129; Imhof 1976:149; James and Neal 1986:151; Kale 1978:111; Lowery 1974:245; Mengel 1965:221; Monroe et al. 1988:17; Oberholser 1974(I):258; Potter et al. 1980:117; Rappole et al. 1983:171; Robinson 1990:75; Root 1988:63, 279; Scott et al. 1977:17; Sprunt 1954:125; Sprunt and Chamberlain 1970:181; Stewart and Robbins 1958:121; Verner and Boss 1980:134.

Peregrine Falcon

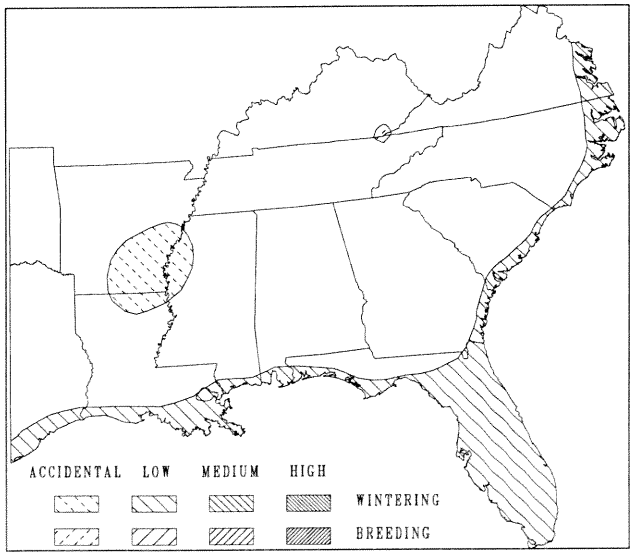
Falco peregrinus **PEFA**

PROTECTION STATUS

F. p. anatum and *F. p. tundrius* are federally listed as Endangered and Threatened, respectively, and state listed as Endangered in Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia; Threatened in Alabama (unofficially); and Rare in West Virginia [*sic*].

ABUNDANCE STATUS

Breeding— Nest primarily north of the region. Formerly nested at high elevations on rare occasions in the mountains from Virginia and Kentucky to northwestern Georgia. Hacked birds and their descendants now breed sporadically throughout their former mountain range. Wintering— U along the coast of Florida, but mainly in the southern half of the state; generally R elsewhere along the coast, and in the interior of Florida; VR and erratic elsewhere. Moderate fall migration along the Atlantic coast. Fall arrival— mid-September to mid-October; spring departure— early April to early May.



PRIMARY HABITATS

Nest only on remote cliffs, where ledges are present. Foraging— along the coast, they prefer open areas, such as mudflats, dunes, ponds, and marshes; inland, mainly where a mixture of forests and extensive fields, marshes, or water are present. Perches, such as telephone poles, bare trees, or stumps, are generally necessary.

KEY HABITAT REQUIREMENTS

Nest site— a ledge on a cliff. Foraging— extensive open country, preferably near wetlands; at times in or near forests.

REPRODUCTION

The breeding season is poorly known in the Southeast, as few nests have been found. It is apparently from March to May. Nests are built on ledges on remote cliffs. The clutch size is mainly 3 or 4, rarely 5.

FOOD HABITS

Observe prey items from a perch or during soaring flight. They swoop down on medium-sized birds from above, striking them in midair. Birds such as doves, pigeons, quail, and shorebirds are often taken.

GUILD

Ledge nesting, aerial or pouncing carnivore.

REFERENCES

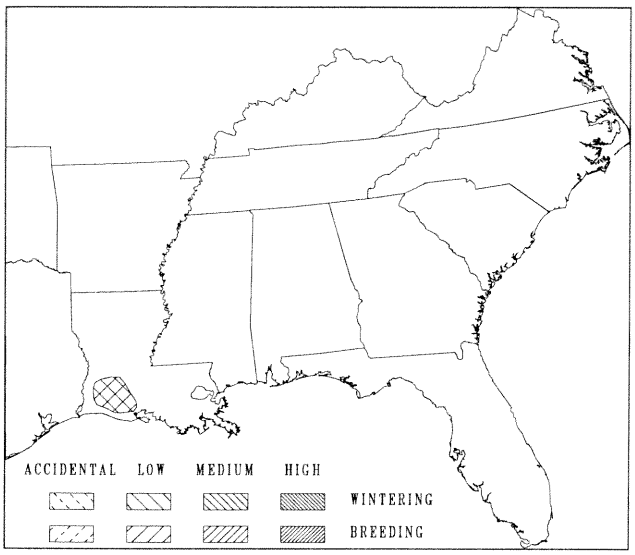
Bent 1938:42-69; Burleigh 1958:195; DeGraaf and Rudis 1986:192; DeGraaf et al. 1980:196; Eagar and Hatcher 1982(A):5; Ehrlich et al. 1988:248; Forbush and May 1939:126; Hickey 1969; Imhof 1976:148; James and Neal 1986:151; Kale 1978:7; Lowery 1974:243; Mengel 1965:219; Monroe et al. 1988:17; Oberholser 1974(I):254; Potter et al. 1980:116; Rappole et al. 1983:170; Ratcliffe 1980; Robinson 1990:76; Root 1988:63, 279; Scott et al. 1977:16; Sprunt 1954:123; Sprunt and Chamberlain 1970:179; Stewart and Robbins 1958:119; Verner and Boss 1980:133.

Black Francolin

Francolinus francolinus BLFR*

ABUNDANCE STATUS

Permanent resident— Known only from one area in Cameron Parish, Louisiana, where birds introduced into a tract for hunting have become established, and are now Fairly Common in that limited area.



PRIMARY HABITATS

All seasons— Grasslands, cultivated fields, and early successional stages of a number of primarily upland forest types.

KEY HABITAT REQUIREMENTS

All seasons— Grassland habitats with adequate nesting cover and sufficient elevated perches for males to display.

REPRODUCTION

Females build grass-lined nests in shallow depressions in grassy fields, where they lay 4-18, usually 6-10, eggs. The season extends from March-October.

FOOD HABITS

These francolins eat a diversity of foods including all parts of a variety of plants, waste grain, other seeds; and some small animals, especially ground-dwelling insects.

GUILD

Ground nesting, terrestrial gleaning omnivore.

REFERENCES

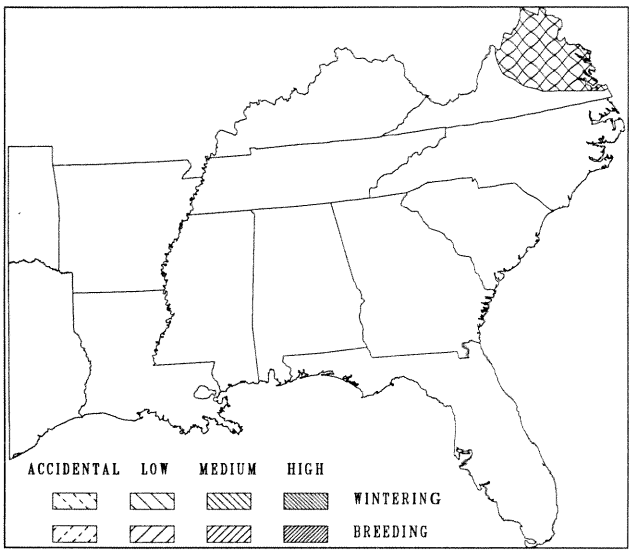
Long 1981:135; Lowery 1974:251.

Ring-necked Pheasant

Phasianus colchicus RNPH*

ABUNDANCE STATUS

Introduced from Europe. All seasons— locally C on Hatteras Island, North Carolina; elsewhere, occur only in Virginia, where R to U in most areas; not thriving in that state, and introductions elsewhere have been unsuccessful. Non-migratory.



PRIMARY HABITATS

Occur in fields, meadows, croplands, and dry borders of marshes; generally where the vegetation is 1 to 3 feet (.3-1 m) high.

KEY HABITAT REQUIREMENTS

Moderate to tall herbaceous cover.

REPRODUCTION

The breeding season extends from mid-April to mid-July, with the peak probably from mid-April to early May. The nests are built on the ground, well hidden in fields or other grasslands, Clutch size ranges from 6 to 15, with 10 to 20 common.

FOOD HABITS

Pheasants forage on the ground, gleaning seeds, fruits, and nuts, as well as numerous insects. A large amount of seeds consumed are various crop and grain varieties.

GUILD

Ground nesting, herb or terrestrial gleaning omnivore.

REFERENCES

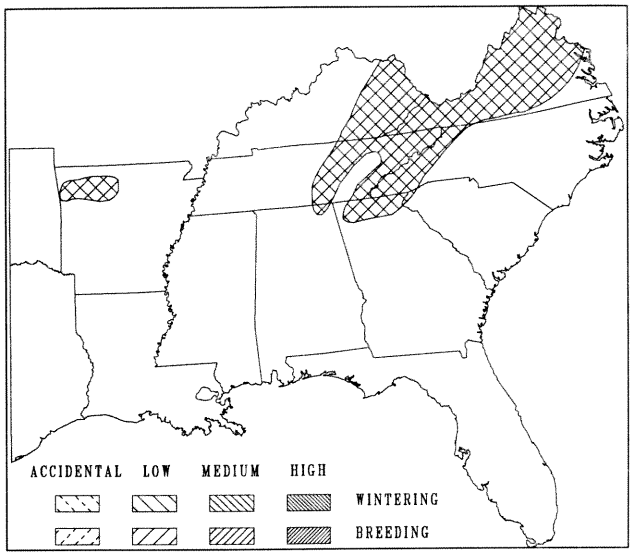
Bent 1932:310; DeGraaf and Rudis 1986:194; DeGraaf et al. 1980:206; Ehrlich et al. 1988:268; Forbush and May 1939:151; Oberholser 1974(I):279; Potter et al. 1980:121; Robinson 1990:78; Root 1988:65; Stewart and Robbins 1958:125.

Ruffed Grouse

Bonasa umbellus **RUGR***

ABUNDANCE STATUS

All season— FC over most of the range in the mountains; U and local away from the mountains in Virginia. Mainly over 1500 feet (500 m), ranging to the highest elevations. Despite their numbers, they are secretive and quiet, and often difficult to find. Non-migratory.



PRIMARY HABITATS

Forests of a wide variety; in summer mainly in deciduous or mixed forests, where the understory is moderate to rather light, and often where very hilly. In winter, they move to areas with some evergreen cover, and are found mainly in mixed forests. They often forage along wooded roadsides or openings in woods.

KEY HABITAT REQUIREMENTS

Hardwood or mixed forests, usually in uplands, with a moderate understory; some evergreen cover is preferred in winter.

SAMPLE BREEDING DENSITIES

0.5(5) sawtimber cove hardwoods, 8(3) sapling/poletimber oak-hickory.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber oak-hickory, 3.7(3) shrub-seedling oak-hickory.

REPRODUCTION

The breeding season extends from mid-April to early June, with the peak from late April to mid-May. The nests are built on the ground in thick cover in a woodland usually next to a tree, shrub, or fallen log. The clutch size is generally 9 to 12, ranging from 8 to 14.

FOOD HABITS

These birds forage by walking on the ground, gleaning and scratching for seeds, or in shrubs or small trees, taking buds, fruits, and leaves; some insects are also eaten.

GUILD

Ground nesting, terrestrial or bush gleaning folivore, frugivore, or granivore.

REFERENCES

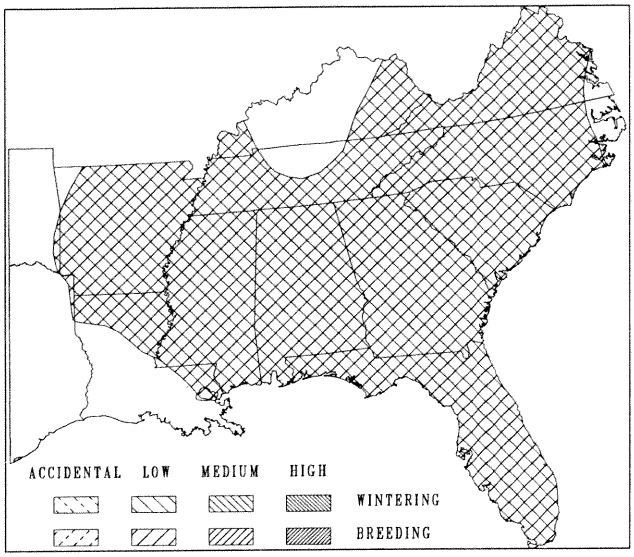
Bent 1932:141-177; Bump et al. 1947; Burleigh 1958:202; DeGraaf and Rudis 1986:196; DeGraaf et at. 1980:202; Ehrlich et al. 1988:250; Forbush and May 1939:135; Imhof 1976:152; James and Neal 1986:153; Johnsgard 1973:253; Mengel 1965:223; Monroe et al. 1988:17; Potter et al. 1980:119; Robbins et al. 1986:21; Robinson 1990:78; Root 1988:66; Sprunt and Chamberlain 1970:185; Stewart and Robbins 1958:124.

Wild Turkey

Meleagris gallopavo WITU*

ABUNDANCE STATUS

All seasons— R over much of the Coastal Plain, but FC to C in certain bottomlands; U to FC inland; U at higher elevations. Not at all widespread, and completely absent from many localities; most numerous in wildlife refuges, state or national parks or forests, or on game management lands. Very secretive for such large birds; non-migratory.



PRIMARY HABITATS

Most common in extensive bottomland forests, where understory is moderate; also in extensive upland hardwood or mixed forests, less so in pine forests; not numerous in open woods, wood margins, and woodland openings, though they do forage in these areas.

KEY HABITAT REQUIREMENTS

Mature forests with a moderate understory, preferably in bottomlands.

SAMPLE BREEDING DENSITIES

0.8(2) sawtimber loblolly pine- shortleaf pine, 2(1) sawtimber live oak maritime.

SAMPLE WINTER DENSITIES

0.8(2) sawtimber oak-hickory.

REPRODUCTION

The nesting season extends from late March to late May, with a peak from late April to mid-May. The nests are built on the ground in woodlands, well hidden under shrubs or other vegetation. The usual clutch size is 8 to 15, occasionally 20, eggs.

FOOD HABITS

Turkeys forage on the ground, gleaning a wide variety of food items. Seeds, nuts, fruits, and other plant foods are most numerous, bur substantial numbers of insects are also consumed.

GUILD

Ground nesting, terrestrial gleaning omnivore.

REFERENCES

Bent 1932:323-344; Burleigh 1958:205; DeGraaf and Rudis 1986:197; DeGraaf et al. 1980:208; Ehrlich et al. 1988:268; Forbush and May 1939:152; Hewitt 1967; Imhof 1976:154; James and Neal 1986:154; Lowery 1974:253; Mengel 1965:227; Monroe et al. 1988:18; Oberholser 1974(I):282; Potter et al. 1980:122; Robinson 1990:79; Root 1988:68; Sprunt 1954:131-133; Sprunt and Chamberlain 1970:188; Stewart and Robbins 1958:126; Verner and Boss 1980:141.

Northern Bobwhite (Bobwhite)

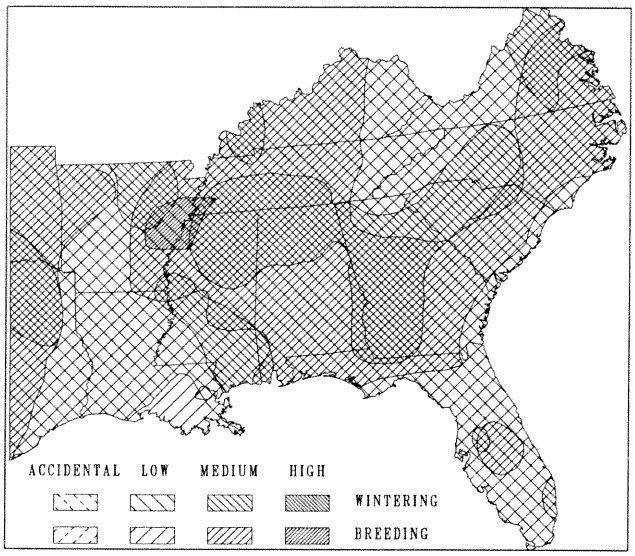
Colinus virginianus **NOBO***

PROTECTION STATUS

Blue Listed by Tate (1981)

ABUNDANCE STATUS

All seasons— C to often VC throughout, though not numerous in the higher mountains. Non-migratory. Occur in coveys of 10 to 30 birds in non-breeding seasons.



PRIMARY HABITATS

Brushy areas; favored habitat is abandoned fields; also numerous in hedgerows, thickets, woodland margins, and open woods (usually pines).

KEY HABITAT REQUIREMENTS

Thickets where tall herbs, shrubs, and saplings are present.

SAMPLE BREEDING DENSITIES

1(4) sapling/poletimber oak-hickory, 12(5) shrub-seedling southern scrub oak. Recorded on 571 of 888 BBS routes in the region, 1966-1985; maximum route mean 277 birds, overall mean 21.34±27 birds/route, total of route means 18,955 birds.

REPRODUCTION

The nesting season extends from mid-April to mid-September, with a peak from mid-May to mid-June. The nests are built on the ground, in dense grass or other thick cover, in hedgerows or thickets. The clutch size ranges from 12 to 20, with 14 to 16 being common.

FOOD HABITS

These birds feed on the ground in thick cover, taking seeds, nuts, fruits, and other items, including some insects. Insects are commonly eaten in summer, as well as seeds.

GUILD

Ground nesting, herb or terrestrial gleaning omnivore-granivore.

REFERENCES

Bent 1932:9-36; Burleigh 1958:204; DeGraaf and Rudis 1986:199; DeGraaf et al. 1980:204; Ehrlich et al. 1988:260; Forbush and May 1939:147; Imhof 1976:153; James and Neal 1986:157; Johnsgard 1973:408; Lowery 1974:249; Mengel 1965:226; Monroe et al. 1988:18; Oberholser 1974(I):270; Potter et al. 1980:120; Reid and Goodrum 1979; Robbins et al. 1986:21; Robinson 1990:80; Root 1988:69; Rosahn 1980; Rosene 1969; Sprunt 1954:128-131; Sprunt and Chamberlain 1970:186; Stewart and Robbins 1958:125.

Yellow Rail

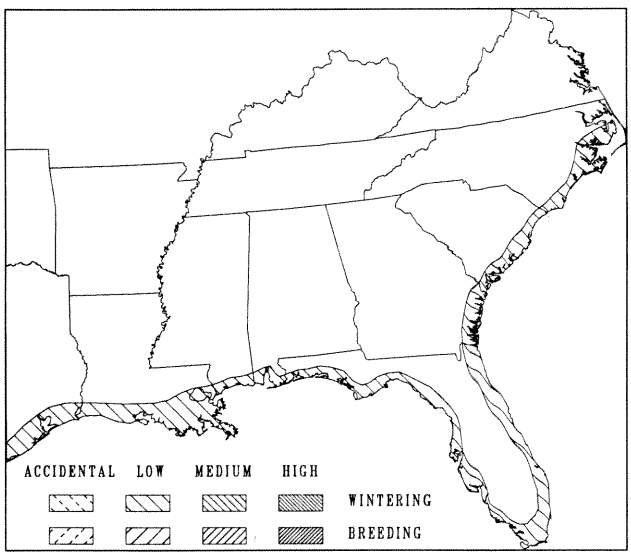
Coturnicops noveboracensis **YERA**

PROTECTION STATUS

State listed as Poorly Known in Alabama. Monitored by North Carolina Natural Heritage Program.

ABUNDANCE STATUS

Wintering— perhaps the most secretive birds in North America, and quiet (as well) during the winter months; exact status poorly known. Seemingly R most everywhere along the coast, north to North Carolina; locally numerous, possibly C, in a few areas; might winter regularly in coastal Virginia. Breed to the north of the region. Fall arrival— late September to mid-October; spring departure— late March to early May.



PRIMARY HABITATS

The drier portions of marshes, mainly fresh or brackish ones; wet grassy areas, such as low meadows; infrequent in dry fields or grain fields.

KEY HABITAT REQUIREMENTS

Thick herbaceous cover in semi-moist places; at times in dry areas.

REPRODUCTION

Do not nest in the region.

FOOD HABITS

These very secretive birds glean small invertebrates from mud, shallow water, or the vegetation of a marsh; some plant seeds are also taken.

GUILD

Herb gleaning omnivore.

REFERENCES

Bent 1926:316; Burleigh 1958:221; Ehrlich et al. 1988:100; Forbush and May 1939:164; Imhof 1976:160; James and Neal 1986:159; Lowery 1974:267; Mengel 1965:232; Monroe et al. 1988:18; Oberholser 1974(I):299; Potter et al. 1980:129; Robinson 1990:80; Sprunt 1954:147; Sprunt and Chamberlain 1970:197; Stewart and Robbins 1958:130.

Black Rail

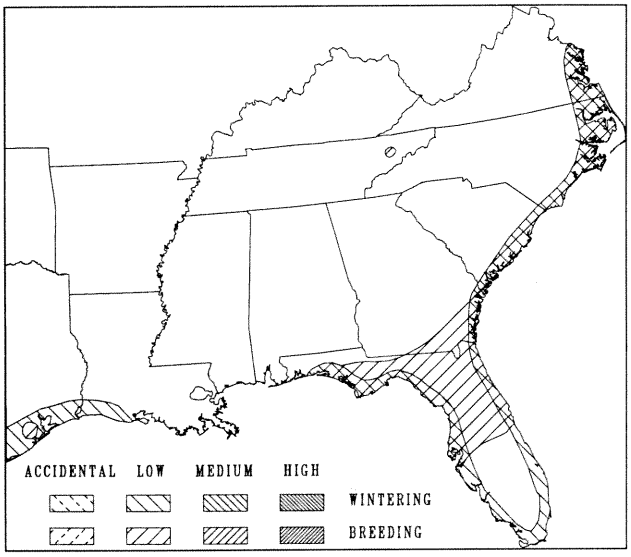
Laterallus jamaicensis **BLRA**

PROTECTION STATUS

State listed as Poorly Known in Alabama (unofficially), Significantly Rare in North Carolina. Monitored by Florida Natural Areas Inventory, Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program, Tennessee Natural Heritage Program, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— secretive at all seasons, and call mainly at night in warm weather; thus, the status is poorly known. R over much of the breeding range, though locally C in some coastal areas; R and irregular inland. Wintering— probably some withdrawal southward, but this is only speculation; apparently only near the coast in winter, ranging north at least to North Carolina, and perhaps Virginia.



PRIMARY HABITATS

All seasons— favor brackish marshes, or the dry portions of salt marshes in a wide range of vegetation; in some areas with matted grass only 6 inches (15 cm) high, in others in tall sedges over 3 feet (1 m) high. Less frequent in fresh marshes, moist meadows, and other damp spots. Rare in wet salt marshes.

KEY HABITAT REQUIREMENTS

Dense herbaceous cover of marshes or wet meadows.

REPRODUCTION

The nesting season extends from mid-May to mid-August. The peak is poorly known, but it is likely from late May to early July. Nests are built in marshes or wet meadows, on the ground, with grasses arched over the top. Clutch size is generally 6 to 10, rarely to 13.

FOOD HABITS

These very secretive rails glean small invertebrates and some seeds from mud, shallow water, and vegetation in marshes.

GUILD

Ground nesting, herb gleaning omnivore.

REFERENCES

Bent 1926:326-336; Burleigh 1958:222; DeGraaf et al. 1980:218; Eagar and Hatcher 1982(A):31; Ehrlich et al. 1988:102; Forbush and May 1939:165; Imhof 1976:161; Kale 1978:114; James and Neal 1986:159; Lowery 1974:268; Oberholser 1974(I):300; Potter et al. 1980:130; Rappole et al. 1983:172; Robinson 1990:81; Root 1988:73; Sprunt and Chamberlain 1970:198; Sprunt 1954:148; Stewart and Robbins 1958:130; Wilbur 1974.

Clapper Rail

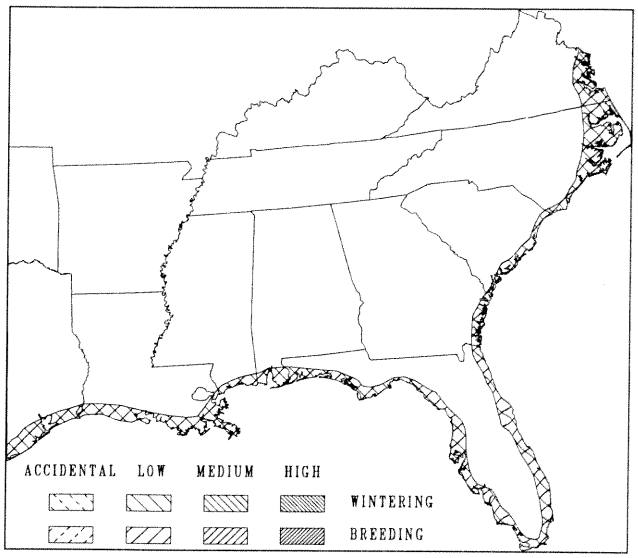
Rallus longirostris **CLRA**

PROTECTION STATUS

R. l. insularum federally listed as category C2, and with *R. l. scottii* monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

All seasons— C to VC essentially everywhere along the coast, south to central Florida; mostly U in southern Florida. Light migration of individuals into the Southeast, as there are several inland tower kills, but seasonal changes of abundance in the region are not detectable.



PRIMARY HABITATS

All seasons— essentially in salt marshes, favoring *Spartina alterniflora*, and infrequent in brackish marshes.

KEY HABITAT REQUIREMENTS

Salt marshes.

REPRODUCTION

The nesting season extends from mid-March to mid-October, with a peak from early May to mid-June. The nests are built in salt marshes, mainly in clumps of grass on high ground. Clutch size is generally 9 to 12, ranging from 6 to 14.

FOOD HABITS

Glean or probe for prey items from mud or shallow water in marshes. Small crabs, mollusks, insects, and other invertebrates are taken; rarely plant material.

GUILD

Ground nesting, herb or aquatic gleaning or probing carnivore.

REFERENCES

Bent 1926:267-292; Burleigh 1958:216, 217; DeGraaf et al. 1980:212; Ehrlich et al. 1988:98; Forbush and May 1939:160; Imhof 1976:158; Kale 1978:112, 113; Lowery 1974:265; Oberholser 1974(I):294; Potter et al. 1980:127; Robinson 1990:81; Root 1988:73; Sprunt and Chamberlain 1970:194; Sprunt 1954:143-145; Stewart and Robbins 1958:127; Wilbur and Tomlinson 1976

King Rail

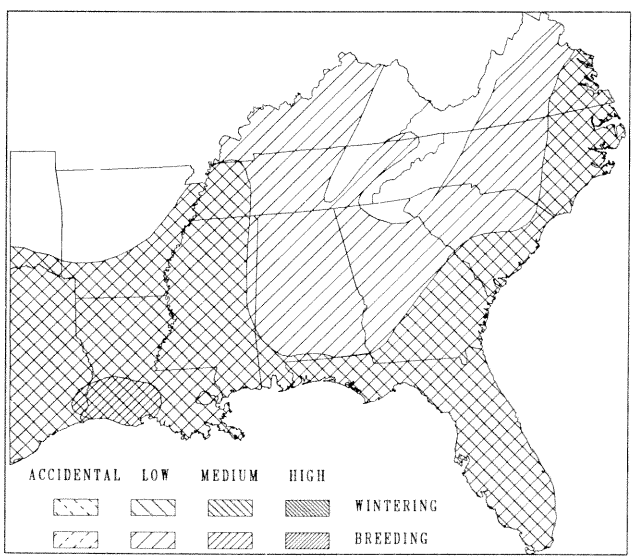
Rallus elegans KIRA

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Tennessee Natural Heritage Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC to C in suitable habitat in most of Florida, southern Louisiana, and northward near the coast; R in most inland areas north of Florida. Wintering— mostly U in coastal Virginia; FC along the southern Atlantic and Gulf coasts; FC to C in most of Florida; R elsewhere. Essentially absent at all seasons in the mountains. Inland status at all seasons is poorly known.



PRIMARY HABITATS

All seasons— extensive freshwater or brackish marshes; occasionally in rice fields or wet meadows.

KEY HABITAT REQUIREMENTS

Favor freshwater marshes; also use brackish areas.

SAMPLE BREEDING DENSITIES

1(1) Everglades. Recorded on 21 of 888 BBS routes in the region, 1966-1985; maximum route mean 34 birds, overall mean 0.08±1.27 birds/route, total of route means 67 birds.

SAMPLE WINTER DENSITIES

4(1) Everglades.

REPRODUCTION

The breeding season extends from April to early July, but the peak is poorly known. The nests are built in marshes, generally several inches above the water. Usual clutch size is 8 to 11, ranging from 6 to 15.

FOOD HABITS

These birds glean or probe for food in mud or shallow water in marshes. The summer prey items are mainly invertebrates, but plant material is also consumed in winter.

GUILD

Ground nesting, herb or aquatic gleaning or probing carnivore-omnivore.

REFERENCES

Bent 1926:260; Burleigh 1958:215; DeGraaf and Rudis 1986:200; DeGraaf et al. 1980:210; Eagar and Hatcher 1982(A):33; Ehrlich et al. 1988:96; Forbush and May 1939:159; Imhof 1976:157; James and Neal 1986:159; Lowery 1974:264; Meanley 1969a; Mengel 1965:230; Monroe et al. 1988:18; Oberholser 1974(I):293; Potter et al. 1980:126; Rappole et al. 1983:172; Robinson 1990:81; Root 1988:74; Sprunt and Chamberlain 1970:193; Sprunt 1954:141; Stewart and Robbins 1958:126.

Virginia Rail

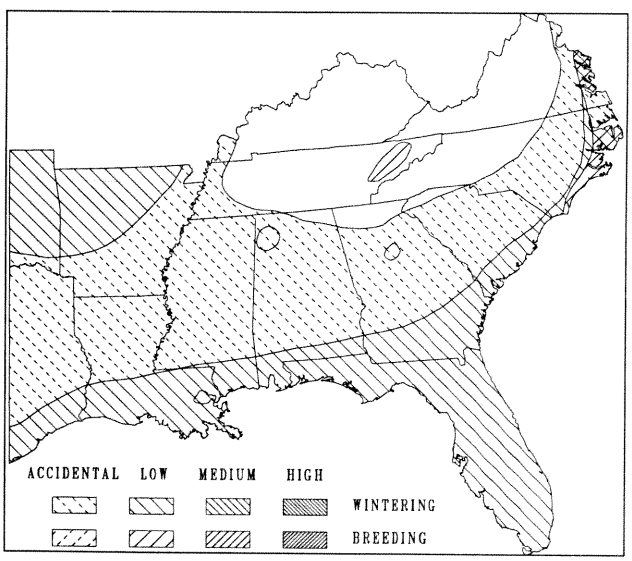
Rallus limicola **VIRA**

PROTECTION STATUS

Monitored by Tennessee Natural Heritage Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— U to locally FC on the coast and tidewater sections of Virginia and North Carolina, but mainly in Virginia. Status inland poorly known; apparently VR to R in much of Virginia; have occurred in summer in both Carolinas, Georgia, and Tennessee, nesting on occasions, but believed to be only of casual occurrence. Wintering— FC to locally C along the coasts of Virginia and North Carolina; FC southward along the coast to central Florida, and the northern Gulf coast; U in south Florida. Inland, apparently R to locally U, though regular in suitable marshes. Fall arrival— early September to early October; spring departure— late April to mid-May.



PRIMARY HABITATS

All seasons— generally in fresh or brackish marshes; infrequent in salt marshes (and mainly in winter).

KEY HABITAT REQUIREMENTS

Marshes, preferably extensive ones, but marshes of very small size (0.1 ha) are also inhabited.

SAMPLE BREEDING DENSITIES

15(1) sapling/poletimber elm-ash-cottonwood (small plot).

REPRODUCTION

The breeding season extends from mid-May to mid-July, with a peak from mid-May to early June. Nests are built in marshes, usually only a few inches above the water. Clutch size is generally 8 or 9, ranging from 7 to 12.

FOOD HABITS

These rails feed on a great variety of small animals, such as insects, small fish, worms, and others; rarely plant material. Forage is by gleaning or probing in shallow water or mud in marshes.

GUILD

Ground nesting, herb or aquatic gleaning or probing insectivore or carnivore.

REFERENCES

Bent 1926:292; Burleigh 1958:218; DeGraaf and Rudis 1986:201; DeGraaf et al. 1980:214; Eagar and Hatcher 1982(A):35; Ehrlich et al. 1988:98; Forbush and May 1939:162; Imhof 1976:158; James and Neal 1986:160; Lowery 1974:265; Mengel 1965:231; Monroe et al. 1988:18; Oberholser 1974(I):295; Potter et al. 1980:128; Rappole et al. 1983:172; Robinson 1990:82; Root 1988:75; Sprunt 1954:145; Sprunt and Chamberlain 1970:196; Stewart and Robbins 1958:128; Verner and Boss 1980:142.

Sora

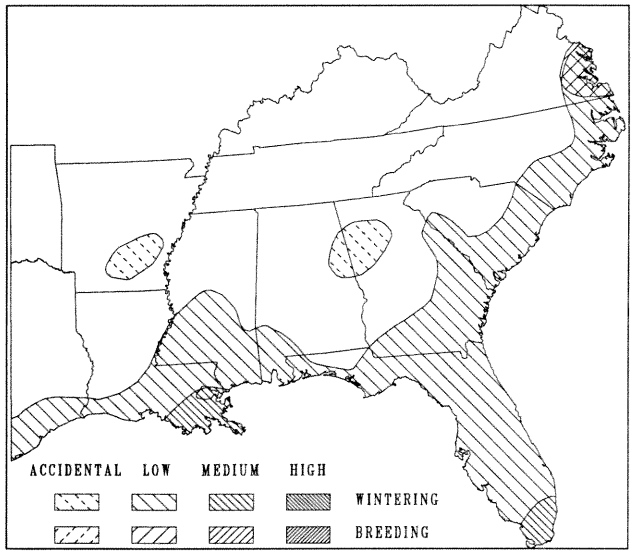
Porzana carolina **SORA**

PROTECTION STATUS

Monitored by Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R in tidewater Virginia; exact status poorly known. Wintering— C along the northern half of the Atlantic coast of Florida; FC elsewhere in Florida, and northward on the coast to southern North Carolina; decreasing to R in coastal Virginia; R inland (north of Florida). Fall arrival— mid-August to mid-September; spring departure— early to mid-May.



PRIMARY HABITATS

All seasons— generally in freshwater marshes; infrequent in brackish ones, and very rare in salt marshes. Also occur in winter in wet grassy areas, such as low meadows.

KEY HABITAT REQUIREMENTS

Marshes, usually in fresh ones; small marshes (0.1 ha) may be inhabited, as well as extensive marshes.

SAMPLE WINTER DENSITIES

1(1) Everglades.

REPRODUCTION

Nesting data for the Southeast are essentially non-existent; the only evidence of breeding being an adult with young in June, and a nest with eggs in late April, both in Virginia. The nests are built in marshes several inches above the water. Clutch size varies from 6 to 15, with 10 or 11 being normal.

FOOD HABITS

Soras glean food from mud or shallow water in marshes, with a variety of seeds and small invertebrates being taken.

GUILD

Ground nesting, herb or aquatic gleaning omnivore.

REFERENCES

Bent 1926:303; Burleigh 1958:220; DeGraaf and Rudis 1986:202; DeGraaf et al. 1980:216; Ehrlich et al. 1988:100; Forbush and May 1939:163; Imhof 1976:159; James and Neal 1986:161; Lowery 1974:266; Mengel 1965:231; Monroe et al. 1988:18; Oberholser 1974(I):297; Potter et al. 1980:128; Rappole et al. 1983:172; Robinson 1990:83; Root 1988:76; Sprunt and Chamberlain 1970:196; Sprunt 1954:146; Stewart and Robbins 1958:129.

Purple Gallinule

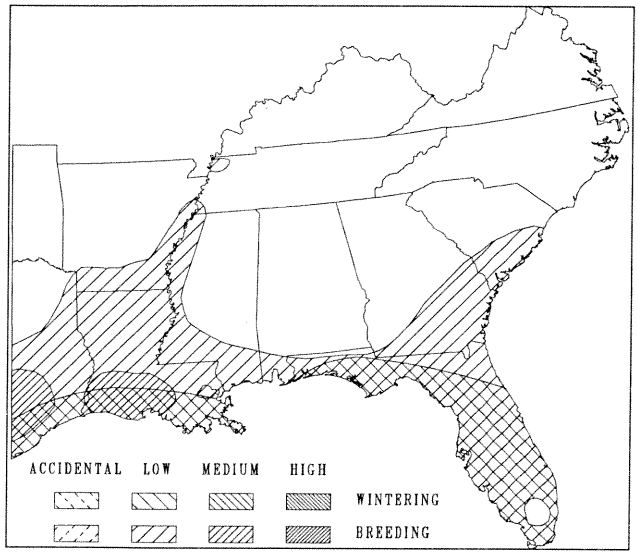
Porphyrula martinica **PUGA**

PROTECTION STATUS

State listed as Significantly Rare in North Carolina. Monitored by Arkansas Natural Heritage Commission, Oklahoma Natural Heritage Inventory, Tennessee Natural Heritage Program.

ABUNDANCE STATUS

Breeding— only U to FC over the range, in general, but C at many localities; U in most of South Carolina and North Carolina. Wintering— only in peninsular Florida, where U in most areas. Spring arrival— early April to late April; fall departure— late August to early Octoberr.



PRIMARY HABITATS

All seasons— margins of lakes or ponds with floating and emergent vegetation; marshes with open water; open swamps with marsh vegetation. Use freshwater habitats only.

KEY HABITAT REQUIREMENTS

Freshwater wetlands with emergent and floating vegetation along the margins.

SAMPLE BREEDING DENSITIES

1(1) Everglades. Recorded on 14 of 888 BBS routes in the region, 1966-1985; maximum route mean 6 birds, overall mean 0.03±0.33 birds/route, total of route means 24 birds.

SAMPLE WINTER DENSITIES

4(1) Everglades.

REPRODUCTION

The breeding season extends from mid-April to late June, with the peak from early May to late May. The nests are shallow cups, supported by vegetation, just above the water in marshes; usually close to open water. Typical clutch size is 6 to 8, ranging from 5 to 10.

FOOD HABITS

Glean small insects and seeds in summer, and mainly seeds and other plant matter in winter. Foraging is done on lily pads, in mud, in marsh vegetation, or shallow water.

GUILD

Ground nesting, aquatic or herb gleaning omnivore-granivore.

REFERENCES

Bent 1926:339; Burleigh 1958:223; Eagar and Hatcher 1982(A):57; Ehrlich et al. 1988:102; Forbush and May 1939:165; Imhof 1976:161; James and Neal 1986:161; Lowery 1974:269; Monroe et al. 1988:19; Oberholser 1974(I):302; Potter et al. 1980:131; Rappole et al. 1983:173; Robinson 1990:84; Root 1988:77; Sprunt 1954:150; Sprunt and Chamberlain 1970:203; Stewart and Robbins 1958:131.

Common Moorhen (Common Gallinule)

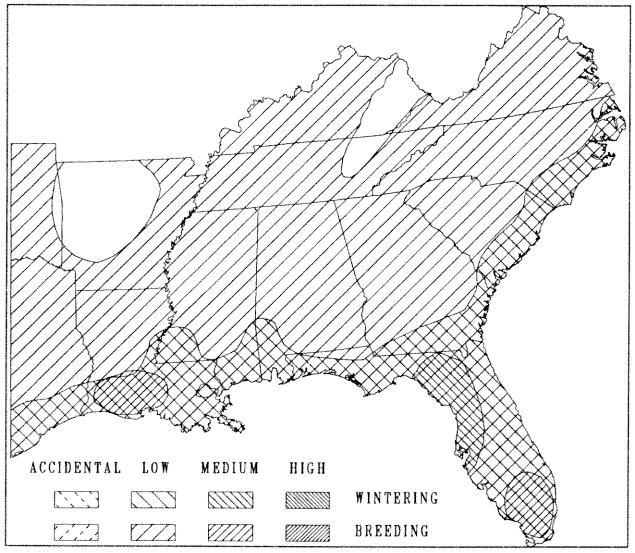
Gallinula chloropus COMO

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission. Monitored by Arkansas Natural Heritage Commission, Tennessee Natural Heritage Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— generally C over most of Florida, and in the Outer Coastal Plain of Georgia and South Carolina; mostly U to locally FC elsewhere in the range. Wintering— C over most of Florida; FC along the coast north to South Carolina; generally U elsewhere, and R to U in Virginia.



PRIMARY HABITATS

All seasons— freshwater ponds, lakes, marshes, and open swamps, where marsh vegetation occurs along the edges of the water; prefer somewhat more open water than Purple Gallinules do. Avoid brackish or salty habitats.

KEY HABITAT REQUIREMENTS

Open fresh water with marshy vegetation along the shores.

SAMPLE BREEDING DENSITIES

12(1) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 50 of 888 BBS routes in the region, 1966-1985; maximum route mean 64 birds, overall mean 0.27±2.66 birds/route, total of route means 240 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp-pocosin, 2(1) Everglades.

REPRODUCTION

The season extends from mid-May to mid-July, with the peak from late May to mid-June. The nests are built in marsh vegetation just above the water, usually not far from open water. Clutch size ranges from 6 to 17, with 10 to 12 usual.

FOOD HABITS

These birds glean food from shallow water or marsh vegetation, taking mainly parts of aquatic plants, such as seeds, roots, and berries. Invertebrates are infrequently taken.

GUILD

Ground nesting, aquatic or herb gleaning granivore or folivore.

REFERENCES

Bent 1926:346; Burleigh 1958:225; DeGraaf and Rudis 1986:203; DeGraaf et al. 1980:220; Eagar and Hatcher 1982(A):51; Ehrlich et al. 1988:104; Forbush and May 1939:166; Imhof 1976:162; James and Neal 1986:163; Lowery 1974:270; Mengel 1965:233; Monroe et al. 1988:19; Oberholser 1974(I):303; Potter et al. 1980:132; Rappole et al. 1983:173; Robinson 1990:84; Root 1988:77; Sprunt and Chamberlain 1970:204; Sprunt 1954:152; Stewart and Robbins 1958:132.

American Coot

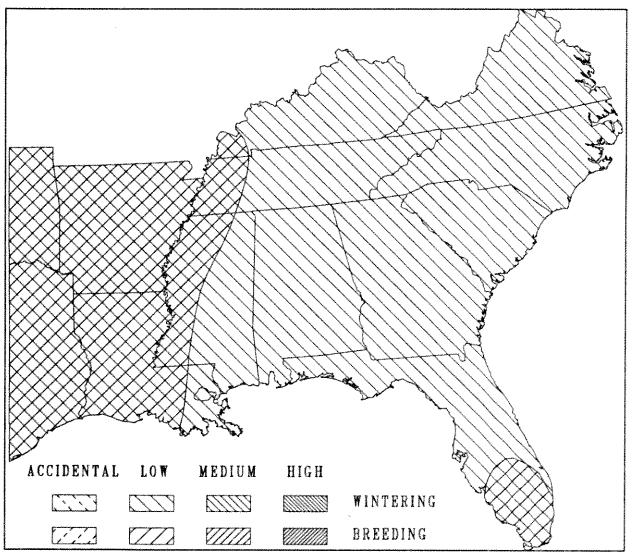
Fulica americana AMCO

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission. Monitored by Arkansas Natural Heritage Commission, Tennessee Natural Heritage Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— mostly U in Florida; VR to R, and sporadic nester elsewhere, mainly near the coast; non-breeding birds are often C over much of the breeding range in summer. Wintering— C to A along the coast and in most of Florida; FC to C inland elsewhere, but generally U in the mountains. Fall arrival— early October to late October; spring departure— mid-April to early May.



PRIMARY HABITATS

Breeding— on lakes or ponds where some marsh vegetation is present; generally avoid wooded areas, such as open swamps. Wintering— mainly on lakes and ponds, but also on bays and other brackish water. Rare on salt water; tend to occur in more open water in winter than in summer.

KEY HABITAT REQUIREMENTS

Breeding— body of fresh water with marsh vegetation. Wintering— open, shallow fresh water; infrequently in brackish water.

SAMPLE WINTER DENSITIES

0.5 (1) Everglades, 5(1) sawtimber live oak maritime.

REPRODUCTION

The nesting season extends from late April to late July, with the peak likely from mid-May to mid-June. Nests are floating platforms or reeds, anchored to marsh vegetation, near or at the edge of a lake or pond. Clutch sizes are usually 8 to 12, ranging from 6 to 20.

FOOD HABITS

Coots forage in water, tipping from the surface and obtaining roots and leaves of plants, in addition to aquatic invertebrates, fish, and other items. They occasionally dive underwater, and often walk on shores gleaning food items.

GUILD

Ground nesting, aquatic gleaning or diving omnivore.

REFERENCES

Bent 1926:358; Burleigh 1958:226; DeGraaf and Rudis 1986:204; DeGraaf et al. 1980:222; Eagar and Hatcher 1982(A):95; Ehrlich et al. 1988:104; Forbush and May 1939:168; Imhof 1976:163; James and Neal 1986:164; Lowery 1974:271; Mengel 1965:233; Monroe et al. 1988:19; Oberholser 1974(I):304; Potter et al. 1980:133; Rappole et al. 1983:173; Robinson 1990:85; Root 1988:78; Sprunt 1954:153; Sprunt and Chamberlain 1970:206; Stewart and Robbins 1958:132; Verner and Boss 1980:143.

Limpkin

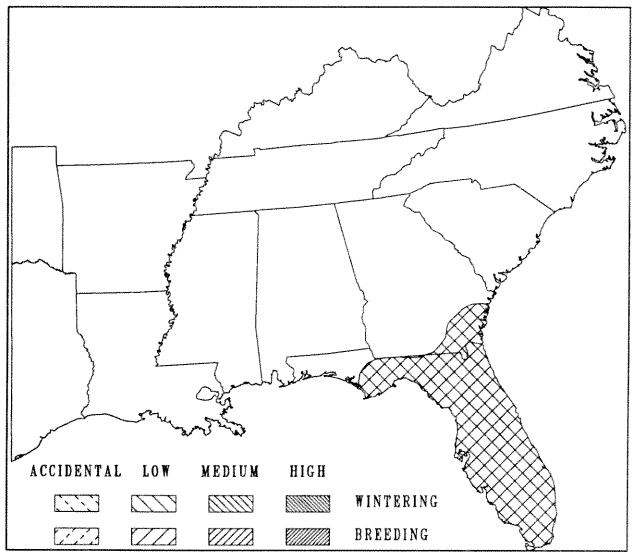
Aramus guarauna **LIMP**

PROTECTION STATUS

State listed as Special Concern in Florida. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program. Forest Service sensitive, National Forests in Florida.

ABUNDANCE STATUS

All seasons— generally U to FC over most of Florida; locally C in a few places; R and poorly known in Georgia. Non-migratory.



PRIMARY HABITATS

Open swamps, marshes, swamp borders, lake margins, and woods or thickets along rivers are the principal habitats; occur only in freshwater situations. Active at night as well as during daylight. Forage in shallow fresh water.

KEY HABITAT REQUIREMENTS

Vegetation near open fresh water, preferably in fairly dense woody areas.

SAMPLE BREEDING DENSITIES

0.5(1) Everglades.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber oak-gum-cypress, 3(1) Everglades.

REPRODUCTION

The nesting season extends from December to September, with the peak from mid-March to mid-April. The platform nests are usually built in marshes, but may also be placed in shrubs or small trees up to 15 feet (5 m) from the ground. Clutch size ranges from 4 to 8, and is usually 5 or 6.

FOOD HABITS

Limpkins wade in shallow water or walk on muddy shores, consuming mainly large aquatic snails. Other mollusks, crustaceans, insects, and herps are also taken.

GUILD

Ground or bush nesting, aquatic gleaning carnivore.

REFERENCES

Bent 1926:254; Burleigh 1958:213; Ehrlich et al. 1988:96; Forbush and May 1939:157; Kale 1978:86; Lowery 1974:262; Oberholser 1974(I):291; Potter et al. 1980:125; Robinson 1990:86; Root 1988:73; Sprunt and Chamberlain 1970:192; Sprunt 1954:138.

Sandhill Crane

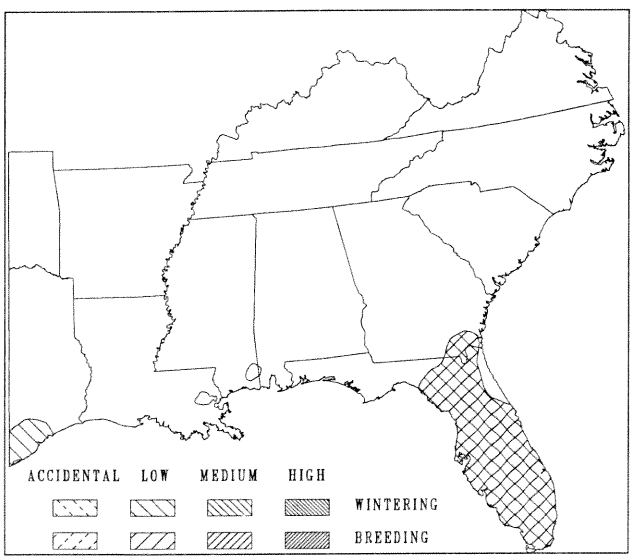
Grus canadensis **SACR**

PROTECTION STATUS

State listed as Endangered in Alabama (unofficially); "in need of management" in Tennessee. *G. c. pratensis* listed as Threatened in Florida, and *G. c. pulla* listed as Endangered in Mississippi. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program, Oklahoma Natural Heritage Inventory. *G. c. pulla* Forest Service sensitive , National Forests in Mississippi. *G.c. pratensis* Forest Service sensitive, National Forests in Florida.

ABUNDANCE STATUS

Breeding— U over most of the range, but locally FC. Wintering— FC to locally C in a few areas, though U over much of Florida. The breeding population is non-migratory, but a moderate migration of individuals from the Great Lakes and Canada into the region occurs in November.



PRIMARY HABITAT

Breeding— prairies with marshy areas and small ponds; open pine savannas with small pools or ponds. Wintering— in similar habitats as for breeding, though not as restricted to shallow ponds; prairies, marshes, cattle pastures, and margins of bodies of fresh water; often in somewhat dry areas in winter.

KEY HABITAT REQUIREMENTS

Breeding— extensive prairies or marshes with shallow open water. Wintering— extensive areas of short grass, either wet or somewhat dry.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in one habitat.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp-pocosin, 1(2) grass/forb longleaf pine-slash pine.

REPRODUCTION

The season extends from late January to August, with the peak from late February to late March. The nests are built on mounds of grasses and dead plants in marshes or shallow ponds. Two eggs form the usual clutch; 1 or 3 are rare.

FOOD HABITS

Cranes glean items from shallow water, mud, or short grass; the major foods are roots, tubers, seeds, and other plant matter. Insects, herps, and other animals are also consumed.

GUILD

Ground nesting, terrestrial or aquatic gleaning omnivore.

REFERENCES

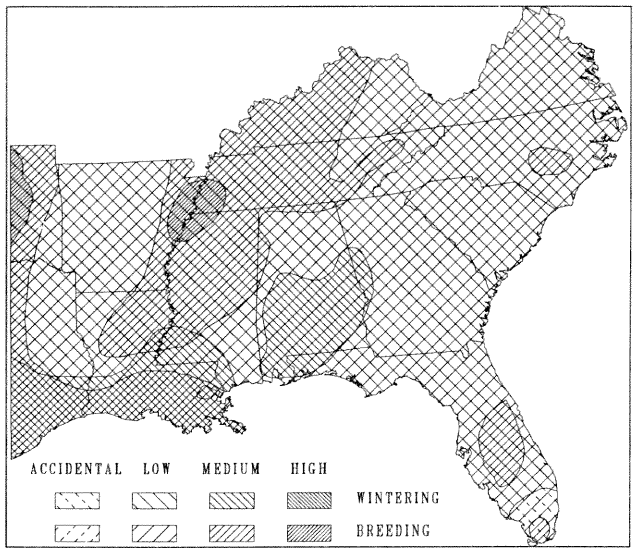
Bent 1926:231-253; Buller 1979; Burleigh 1958:212; Eagar and Hatcher 1982(A):7; Ehrlich et al. 1988:48; Forbush and May 1939:156; Imhof 1976:156; James and Neal 1986:166; Lowery 1974:261; Mengel 1965:229; Monroe et al. 1988:19; Oberholser 1974(I):288; Potter et al. 1980:124; Rappole et al. 1983:171; Robinson 1990:86; Root 1988:78, 279; Sprunt and Chamberlain 1970:191; Sprunt 1954:135; Kale 1978:36.

Killdeer

Charadrius vociferus **KILL**

ABUNDANCE STATUS

Breeding— FC over most of Virginia, and the Piedmont of the Carolinas and Georgia; generally U elsewhere, becoming R near the coast. Wintering— FC to C over most of the Southeast, but less numerous in the mountains.



PRIMARY HABITATS

Breeding— prefer large fields with a few areas of bare ground; also nest on gravel rooftops in towns; common habitats are plowed fields, pastures, and farms, preferably near ponds or lakes. Wintering— considerably more widespread; mudflats, plowed fields, pastures, large lawns, airports, and other areas with bare ground or short grass.

KEY HABITAT REQUIREMENTS

Breeding— extensive open country with some patches of bare ground or gravel. Wintering— open areas in short grass or bare ground, in wet or dry situations.

SAMPLE BREEDING DENSITIES

1(4) grass/forb elm-ash- cottonwood. Recorded on 515 of 888 BBS routes in the region, 1966-1985; maximum route mean 35 birds, overall mean 2.58±4.24 birds/route, total of route means 2293 birds.

SAMPLE WINTER DENSITIES

2.5(13) grass/forb elm-ash- cottonwood, 66(4) sawtimber longleaf pine-slash pine.

REPRODUCTION

The nesting season extends from mid-March to mid-June, with the peak from late March to mid-May. Nests are usually on the ground, in a bare area or near gravel, but not exposed. The birds frequently nest on flat-topped gravel roofs. Four eggs are the normal clutch, with 3 or 5 fairly common.

FOOD HABITS

Killdeers glean small insects and other invertebrates from such substrates as mudflats, bare ground, and short grass.

GUILD

Ground nesting, terrestrial gleaning insectivore.

REFERENCES

Bent 1927:202; Burleigh 1958:235; DeGraaf and Rudis 1986:205; DeGraaf et al. 1980:226; Ehrlich et al. 1988:114; Forbush and May 1939:173; Imhof 1976:168; James and Neal 1986:168; Lowery 1974:279; Mengel 1965:236; Monroe et al. 1988:20; Oberholser 1974(I):316; Potter et al. 1980:140; Rappole et al. 1983:175; Robbins et al. 1986:23; Robinson 1990:90; Root 1988:83; Sprunt 1954:161; Sprunt and Chamberlain 1970:215; Stewart and Robbins 1958:136; Verner and Boss 1980:144.

Upland Sandpiper

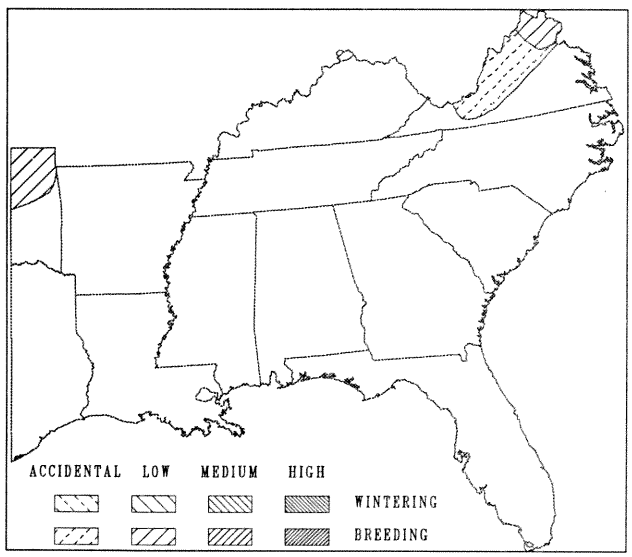
Bartramia longicauda **UPSA**

PROTECTION STATUS

State Listed as Endangered by Kentucky Academy of Sciences and Nature Preserves Commission, Rare in West Virginia. Blue Listed by Tate (1981). Monitored by Oklahoma Natural Heritage Inventory, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R, only in Virginia; occur in the extreme northern Piedmont, and in valleys in the northern half of the mountains. Formerly more numerous as breeders in the mountains of that state. The bulk of the population breeds to the north of the region, and all individuals winter south of the United States. Spring arrival— late March to mid-April; fall departure— late August to mid-September.



PRIMARY HABITATS

Fields or meadows where the grass is 1 to 3 feet (.3-1 m) high; must have an extensive area, perhaps 10 to 15 acres (4 to 6 ha).

KEY HABITAT REQUIREMENTS

Extensive grasslands, with moderate to tall vegetation.

SAMPLE BREEDING DENSITIES

Recorded on 19 of 888 BBS routes in the region, 1966-1985; maximum route mean 15 birds, overall mean 0.04±0.57 birds/route, total of route means 35 birds.

REPRODUCTION

The breeding season is poorly known, but it is apparently from early May to mid-June. Nests are placed on the ground in dense grasses in a field. Four is the usual clutch size, with 3 or 5 frequent.

FOOD HABITS

These shorebirds forage in tall grasses for insects, which are gleaned from the ground or vegetation.

GUILD

Ground nesting, herb gleaning insectivore.

REFERENCES

Bent 1927:55; Burleigh 1958:246; DeGraaf and Rudis 1986:207; DeGraaf et al. 1980:232; Ehrlich et al. 1988:154; Forbush and May 1939:185; Imhof 1976:177; James and Neal 1986:172; Lowery 1974:291; Mengel 1965:242; Monroe et al. 1988:22; Oberholser 1974(I):334; Potter et al. 1980:145; Rappole et al. 1983:177; Robbins et al. 1986:23; Robinson 1990:96; Sprunt and Chamberlain 1970:227; Sprunt 1954:172; Stewart and Robbins 1958:141.

Common Snipe

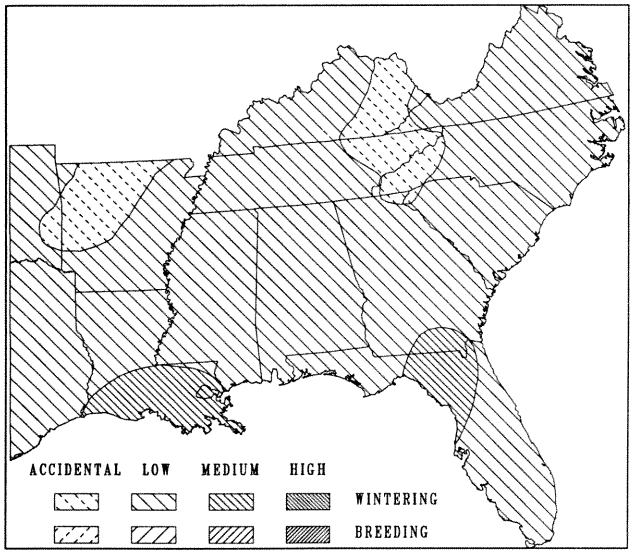
Gallinago gallinago COSN

PROTECTION STATUS

Monitored by West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Wintering— C over most of the Coastal Plain; FC inland ; U in the lower mountains, but R above 3000 feet (900 m). Breed to the north of the region. Fall arrival— early September to early October; spring departure— late April to mid-May.



PRIMARY HABITATS

Favor damp grassy places, such as boggy spots in pastures, short-grass marshes, margins of marshes and ponds, and on mudflats. Prefer freshwater situations.

KEY HABITAT REQUIREMENTS

Damp ground in open country, generally where short grass is present.

SAMPLE WINTER DENSITIES

0.5(1) grass/forb elm-ash-cottonwood, 7.5(2) grass/forb longleaf pine-slash pine.

REPRODUCTION

Do not breed in the Southeast.

FOOD HABITS

Snipes probe their long bills into mud or wet ground for various worms, insects, insect larvae, and other invertebrates.

GUILD

Terrestrial or aquatic probing insectivore.

REFERENCES

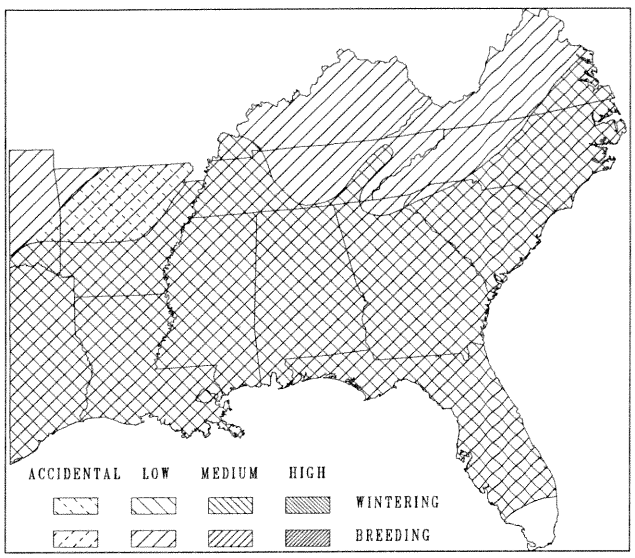
Bent 1929:78-98; Burleigh 1958:242; DeGraaf and Rudis 1986:208; DeGraaf et al. 1980:230; Ehrlich et al. 1988:138; Forbush and May 1939:181; Imhof 1976:175; James and Neal 1986:180; Lowery 1974:305; Mengel 1965:241; Monroe et al. 1988:26; Oberholser 1974(I):327; Potter et al. 1980:153; Rappole et al. 1983:176; Robbins et al. 1986:23; Robinson 1990:107; Root 1988:103; Sprunt 1954:169; Sprunt and Chamberlain 1970:222; Stewart and Robbins 1958:140; Verner and Boss 1980:145.

American Woodcock

Scolopax minor AMWO

ABUNDANCE STATUS

Breeding— U to FC over most of the northern part of the region; U over the remainder of the range. Wintering— FC to perhaps locally C throughout the southern part of the region and northern Florida; mostly U elsewhere, and R in the southern Appalachians; accidental in the Ozarks and Ouachitas.



PRIMARY HABITATS

All seasons— woodland thickets and bottomland forests, preferably where somewhat moist, with moderate shrub and understory layers, and plenty of dead leaves on the ground. Forage in moist woods or in open places, commonly in plowed fields, marshes, roadsides, and other short grass habitats; in the South, woodcock feed only at night, thus seldom seen in daylight except when flushed from a forest floor.

KEY HABITAT REQUIREMENTS

Deciduous or mixed woods with an abundance or dead leaves on the ground; generally in moist soil.

SAMPLE BREEDING DENSITIES

0.6(2) sawtimber oak-gum-cypress, 15(8) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 31 of 888 BBS routes in the region, 1966-1985; maximum route mean 1 bird, overall mean 0.007±0.04 birds/route, total of route means 7 birds. BBS information was not used in preparation of the map of breeding distribution.

SAMPLE WINTER DENSITIES

1(3) sawtimber elm-ash-cottonwood.

REPRODUCTION

The breeding season extends from late February to mid-May, with the peak from mid-March to mid-April. Nests are built on the ground in woodlands with plenty of dead leaves, often under shrubs or saplings. Clutch sizes range from 3 to 5, with 4 most common.

FOOD HABITS

These birds feed at twilight or at night, probing in damp ground fields or woods for earthworms and larvae.

GUILD

Ground nesting, nocturnal or crepuscular terrestrial probing insectivore.

REFERENCES

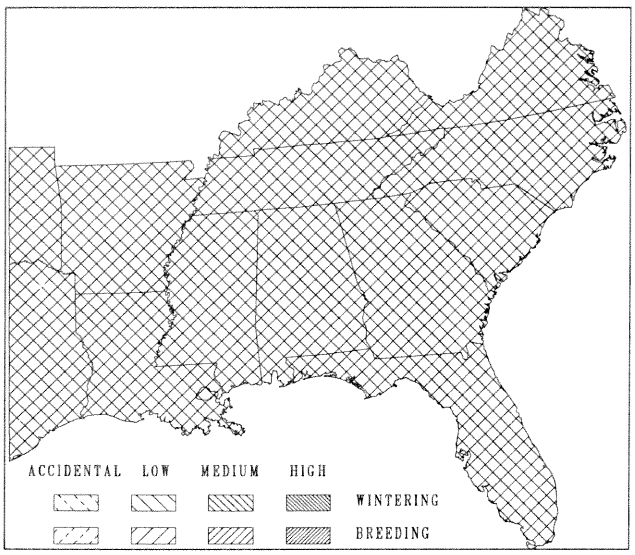
Bent 1929:61; Burleigh 1958:240; DeGraaf and Rudis 1986:209; DeGraaf et al. 1980:228; Dwyer et al. 1979; Ehrlich et al. 1988:140; Forbush and May 1939:178; Imhof 1976:173; James and Neal 1986:182; Lowery 1974:303; Mengel 1965:239; Monroe et al. 1988:26; Oberholser 1974(I):325; Potter et al. 1980:152; Robinson 1990:107; Root 1988:104; Sheldon 1967; Sprunt 1954:167; Sprunt and Chamberlain 1970:220; Stewart and Robbins 1958:139.

Rock Dove

Columba livia **RODO***

ABUNDANCE STATUS

All seasons— C to A in cities and town throughout the Southeast; infrequently away from urban areas, except at farms; not common in most of the mountains. Non-migratory. Introduced from Europe.



PRIMARY HABITATS

All seasons— cities with ledges on buildings for nesting, and parks or other open places for foraging; often feed on concrete and other man-made substances. Also occur in farmyards, such as in feedlots.

KEY HABITAT REQUIREMENTS

A ledge on a building or inside a barn; bare ground or short grass for foraging.

SAMPLE BREEDING DENSITIES

Recorded on 401 of 888 BBS routes in the region, 1966-1985; maximum route mean 179 birds, overall mean 2.50±9.01 birds/route, total of route means 2222 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber oak-hickory, 85(2) sawtimber live oak maritime.

REPRODUCTION

The nesting season extends from February to August, with a likely peak in April and May. Nests are built on ledges on man-made structures; commonly on city buildings, but also in barns or sheds, under bridges, and in many other places. Two is the normal clutch size, sometimes only 1.

FOOD HABITS

These tame birds forage almost entirely on the ground, gleaning seeds and grain; some insects and berries are eaten from time to time.

GUILD

Ledge nesting, terrestrial gleaning granivore.

REFERENCES

DeGraaf and Rudis 1986:215; DeGraaf et al. 1980:236; Ehrlich et al. 1988:274; Forbush and May 1939:251; Imhof 1976:221; James and Neal 1986:196; Lowery 1974:358; Mengel 1965:265; Monroe et al. 1988:31; Oberholser 1974(I):413; Potter et al. 1980:188; Robbins et al. 1986:25; Robinson 1990:119; Root 1988:119; Sprunt and Chamberlain 1970:287.

White-crowned Pigeon

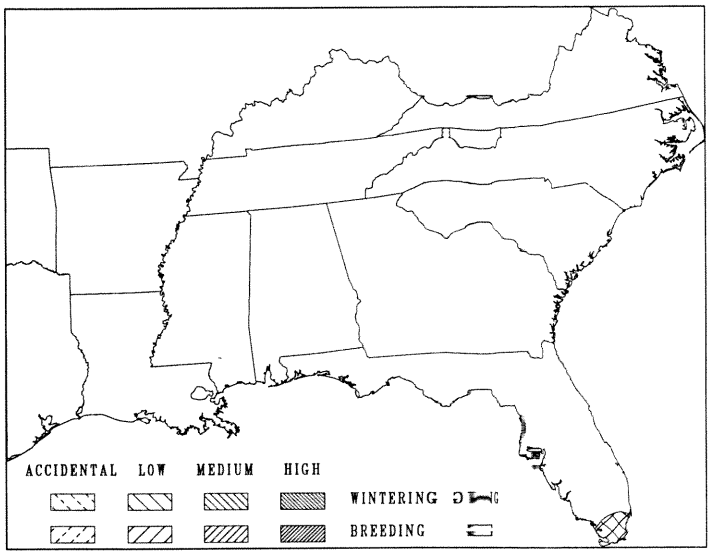
Columba leucocephala WCPI

PROTECTION STATUS

Federally listed as category C2. State listed as Threatened in Florida.

ABUNDANCE STATUS

Breeding— C in the restricted range in southern Florida, mainly on the Keys, but also on the adjacent mainland. Wintering— U to FC, but the bulk of the breeding population leaves Florida in the winter. Primarily a species of the West Indies. Spring arrival— late March to late April; fall departure— poorly known, perhaps mainly in October.



PRIMARY HABITATS

All seasons— generally in broadleaf evergreens; prefer mangrove thickets, but also use tropical hammocks and other thickets.

KEY HABITAT REQUIREMENTS

Moderate to dense stands of broadleaf evergreens, generally where berries are present.

REPRODUCTION

The nesting season is poorly known in Florida, though it probably extends from May to July. Nests are built in trees or shrubs, in rather dense woods or thickets. Two is the usual clutch size, though single egg clutches are not rare.

FOOD HABITS

These pigeons feed almost wholly in trees, picking berries and other fruits from twigs. Also take some insects and seeds.

GUILD

Bush or tree nesting, tree foliage gleaning frugivore.

REFERENCES

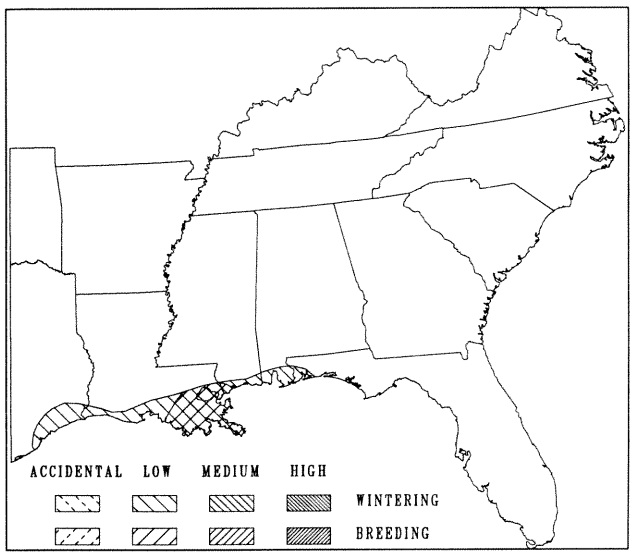
Bent 1932:369; Ehrlich et al. 1988:272; Forbush and May 1939:250; Kale 1978:43; Rappole et al. 1983:189; Root 1988:119; Sprunt 1954:230.

White-winged Dove

Zenaida asiatica **WWDO**

ABUNDANCE STATUS

Winter—Along the western Gulf Coast they are Uncommon but regular in Texas and Louisiana, and increasingly Rare farther east and farther inland. While primary breeding range is south of the region, White-winged Doves breed regularly on Galveston Island, Texas, and occasionally in coastal Louisiana.



PRIMARY HABITATS

White-winged Doves inhabit the dry brushlands of southern and western Texas, Mexico, and the Southwest, where they nest in shade trees in towns, citrus groves, and thickets in brushland. Winter—In the region they are confined to shrubby thickets in coastal prairies and grasslands.

KEY HABITAT REQUIREMENTS

Winter—Dense herb or shrub cover for foraging and resting.

SAMPLE WINTER DENSITIES

1/40 ha on 1 census, sawtimber Longleaf Pine-Slash Pine.

REPRODUCTION

These birds build their frail platform nests of sticks and small twigs in shrubs, trees or other vegetation. They lay 1-3, usually 2, eggs; laying dates extend from mid-April to mid-August.

FOOD HABITS

Primary foods are seeds of a variety of shrubs, grasses, cacti, grains, and weed species. Some fruits and insects are also taken.

GUILD

Terrestrial gleaning granivore or omnivore.

REFERENCES

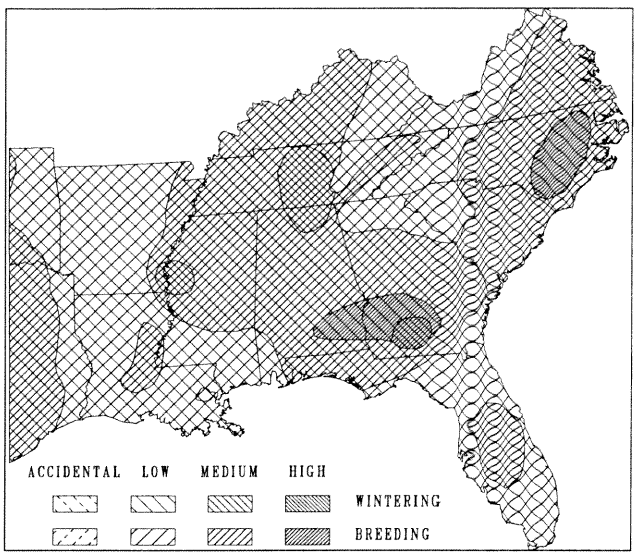
Bent 1932:425, 428; Burleigh 1958:303; Ehrlich et al. 1988:280; Imhof 1976:222; Lowery 1974:359; Oberholser 1974 (I):422; Potter et al. 1980:188; Rappole et al. 1983:190, 450; Robbins et al. 1986:28; Root 1988:120; Sprunt 1954:235; Sprunt and Chamberlain 1970:609.

Mourning Dove

Zenaida macroura **MODO**

ABUNDANCE STATUS

All seasons— VC nearly everywhere in the Southeast; tend to be C in the lower mountains in summer, but somewhat less numerous in winter; scarce above 4500 feet (1350 m). There is considerable movement of birds into the region in the winter, when Mourning Doves are A at many places.



PRIMARY HABITATS

Nest site— prefer open woods, wood margins, trees or shrubs along a hedgerow, or woods in residential areas; seldom nest in deep woods; nests are not far from open fields. Foraging— in cultivated fields, plowed fields, farmyards, roadsides, lawns, and other areas of short grass or bare ground.

KEY HABITAT REQUIREMENTS

Nest site— trees, saplings, or shrubs in the vicinity of fields or other open country. Foraging— open areas of bare ground or short grass, generally in agricultural country.

SAMPLE BREEDING DENSITIES

0.7(13) grass/forb or shrub-seedling elm-ash-cottonwood, 11(3) sawtimber oak-gum-cypress. Recorded on 595 of 888 BBS routes in the region, 1966-1985; maximum route mean 246 birds, overall mean 25.97±32.11 birds/route, total of route means 23,064 birds.

SAMPLE WINTER DENSITIES

1(1) shrub-seedling southern scrub oak, 1(2) grass/forb longleaf pine-slash pine, 1(1) sapling/poletimber oak-gum-cypress, 1(1) sapling/poletimber live oak maritime, 1(1) sawtimber elm-ash-cottonwood, 70(9) sapling/poletimber pine savanna.

REPRODUCTION

The breeding season extends from early March to late August, with the peak from mid-March to mid-April. Nests are frail platforms of sticks, placed at a fairly low (often 10 to 15 feet, 3-5 m) height in trees or shrubs, mainly along a wooded edge. Clutch sizes range from 1 to 4, though 2 is the usual number.

FOOD HABITS

These doves forage mainly in short grass or on bare ground. Seeds and other grains form nearly the entire diet.

GUILD

Bush or tree nesting, terrestrial gleaning granivore.

REFERENCES

Bent 1932:402-416; Burleigh 1958:303, 305; DeGraaf and Rudis 1986:216; DeGraaf et al. 1980:238; Ehrlich et al. 1988:278; Forbush and May 1939:252; Imhof 1976:223; James and Neal 1986:196; Lowery 1974:359; Mengel 1965:265; Monroe et al. 1988:32; Oberholser 1974(I):413; Potter et al. 1980:189; Rappole et al. 1983:190; Robbins et al. 1986:28; Robinson 1990:120; Root 1988:121; Sprunt 1954:232; Sprunt and Chamberlain 1970:288; Stewart and Robbins 1958:172; Verner and Boss 1980:152.

Common Ground Dove (Ground Dove)

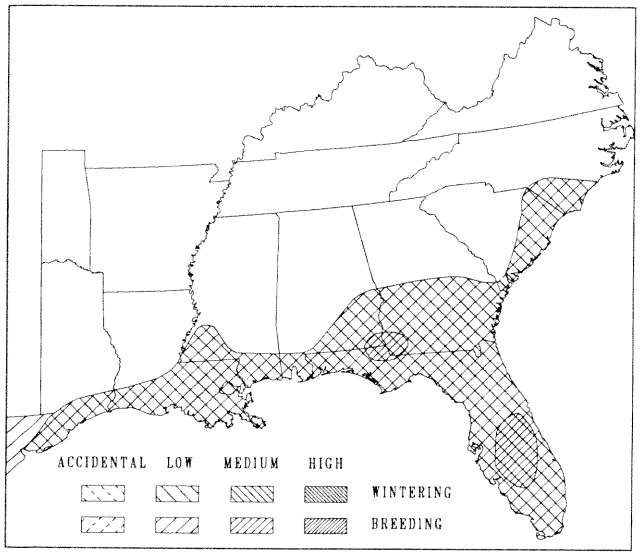
Columbina passerina CGDO

PROTECTION STATUS

State listed as Special Concern in Alabama (unofficially), Significantly Rare in North Carolina. Monitored by Louisiana Natural Heritage Program.

ABUNDANCE STATUS

All seasons— C over most of Florida and extreme southern Georgia; FC north on the coast to central South Carolina; U to locally FC elsewhere, occurring north to Beaufort Inlet, North Carolina. Essentially non-migratory, though vagrants have occurred at many places in the region.



PRIMARY HABITATS

Nest site— generally in a shrub or small tree along a woodland edge, in a thicket or hedgerow, or in residential areas. Foraging— favor sandy soil, such as in dunes, lawns, roadsides, farmyards, and others. Generally infrequent in open fields or extensive open country; usually stay close to woods or thickets.

KEY HABITAT REQUIREMENTS

Nest site— small trees or shrubs not far from open areas. Foraging— short grass or bare ground, mainly in sandy soil.

SAMPLE BREEDING DENSITIES

1(2) sapling/poletimber mixed pine-hardwood, 6(2) shrub-seedling southern scrub oak. Recorded on 134 of 888 BBS routes in the region, 1966-1985; maximum route mean 51 birds, overall mean 0.58±2.57 birds/route, total of route means 516 birds.

SAMPLE WINTER DENSITIES

1(2) sapling/poletimber pine savanna, 6(4) sawtimber longleaf pine-slash pine, 7(1) shrub-seedling live oak maritime.

REPRODUCTION

The nesting season extends from late February to mid-October, with a peak from mid-April to mid-June. The frail platform nests are built in shrubs, low trees, or on the ground. The clutch size is usually 2, with 3 not unusual.

FOOD HABITS

These birds forage on the ground, especially in sandy soil. They glean seeds primarily, with some berries and insects also consumed.

GUILD

Bush or ground nesting, terrestrial gleaning granivore.

REFERENCES

Bent 1932:435-443; Burleigh 1958:310, 311; Ehrlich et al. 1988:76; Forbush and May 1939:255; Imhof 1976:225; James and Neal 1986:199; Lowery 1974:361; Oberholser 1974(I):424; Potter et al. 1980:190; Robbins et al. 1986:28; Robinson 1990:121; Root 1988:123; Sprunt 1954:236; Sprunt and Chamberlain 1970:290; Stewart and Robbins 1958:175.

Black-billed Cuckoo

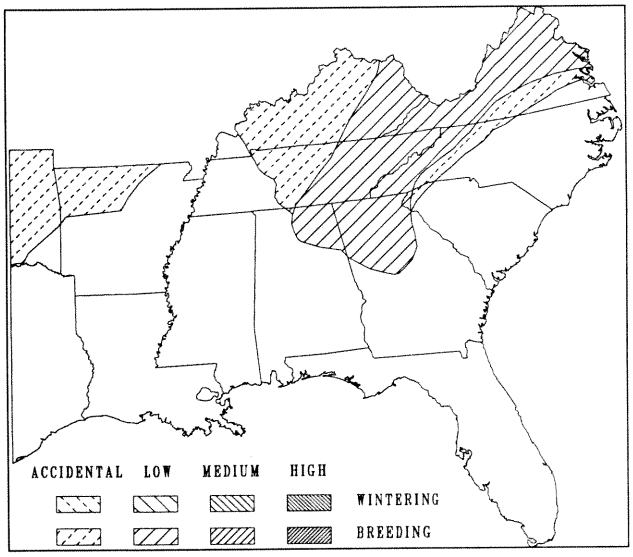
Coccyzus erythropthalmus BBCU

PROTECTION STATUS

State listed as Significantly Rare in North Carolina. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program.

ABUNDANCE STATUS

Breeding— U in the mountains of Virginia and extreme northern North Carolina; R in the remainder of the Southern Appalachians, eastern Kentucky, and northern Virginia; VR and sporadic farther south. Accidental in the Ozarks and Ouachitas. Winter south of the United States. Spring arrival— late April to mid-May; fall departure— late September to mid-October.



PRIMARY HABITATS

Mature and usually extensive deciduous forests, often where tangles are present; at times in rather open woods, such as along streams; also in mixed forests on occasions; range up to 5000 feet (1500 m).

KEY HABITAT REQUIREMENTS

Deciduous forests, particularly in dark, tangled places; mainly in montane country.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in two habitats. Recorded on 49 of 888 BBS routes in the region, 1966-1985; maximum route mean 3 birds, overall mean 0.03±0.18 birds/route, total of route means 24 birds. BBS information was not used in preparation of the map of breeding distribution.

REPRODUCTION

The nesting season extends from mid-May to mid-July, with a likely peak during the first half of June. The nests are built in shrubs or trees, often within 10 feet (3 m) of the ground, usually in dense tangles. The most common clutch size is 2 or 3, ranging from 2 to 5.

FOOD HABITS

These birds feed primarily on caterpillars, especially hairy ones. Foraging is generally in the canopy of trees where tangles are present.

GUILD

Tree or bush nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1940:70; Burleigh 1958:317; DeGraaf and Rudis 1986:217; DeGraaf et al. 1980:242; Ehrlich et al. 1988:286; Forbush and May 1939:259; Imhof 1976:229; James and Neal 1986:201; Lowery 1974:370; Mengel 1965:272; Monroe et al. 1988:32; Oberholser 1974(I):435; Potter et al. 1980:196; Rappole et al. 1983:191; Robbins et al. 1986:28; Robinson 1990:123; Sprunt and Chamberlain 1970:296; Sprunt 1954:244; Stewart and Robbins 1958:177.

Yellow-billed Cuckoo

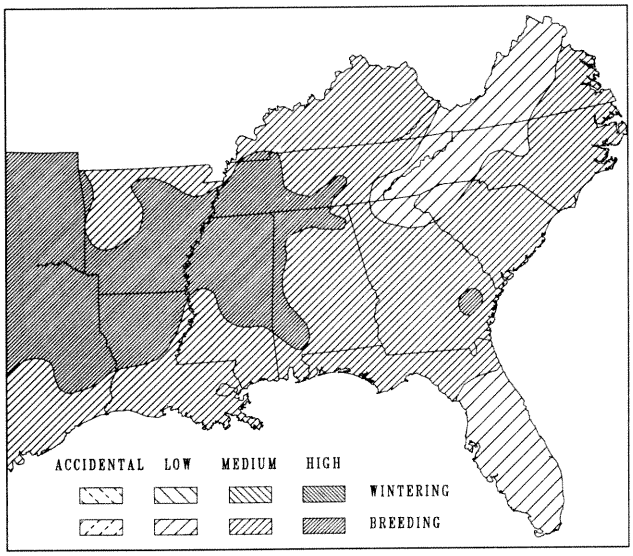
Coccyzus americanus **YBCU**

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

Breeding— C throughout the Coastal Plain; FC to C in the Piedmont; FC in mountain valleys, but seldom above 3500 feet (1050 m). Winter south of the United States. Spring arrival— early April to early May; fall departure— early October to late October.



PRIMARY HABITATS

Mainly in deciduous forests, especially where moist; bottomland woods, woodland thickets, and other hardwood forests; usually where tangles occur in the canopy. Generally avoid coniferous woods.

KEY HABITAT REQUIREMENTS

Broadleaf woods or forests, especially in rather thick vegetation.

SAMPLE BREEDING DENSITIES

0.4(3) shrub-seedling mixed pine- hardwood, 7.8(23) sawtimber oak-hickory, 8.5(6) sawtimber oak-gum-cypress. Recorded on 568 of 888 BBS routes in the region, 1966-1985; maximum route mean 46 birds, overall mean 5.87±6.90 birds/route, total of route means 5216 birds.

REPRODUCTION

The breeding season extends from mid-April to mid-September, with the peak during the first half of May in Florida, but from early June to early July farther north. The frail nests are built in dense tangles (often in vines) in small to medium-sized trees, but usually within 20 feet (6 m) of the ground. The usual clutch size is 3 or 4, ranging from 1 to 5.

FOOD HABITS

These cuckoos forage on caterpillars, especially hairy ones, in the vegetation in the canopy of trees.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1940:54-69; Burleigh 1958:315; DeGraaf and Rudis 1986:218; DeGraaf et al. 1980:240; Ehrlich et al. 1988:286; Forbush and May 1939:257; Imhof 1976:228; James and Neal 1986:201; Lowery 1974:368; Mengel 1965:271; Monroe et al. 1988:32; Oberholser 1974(I):434; Potter et al. 1980:194; Rappole et al. 1983:190; Robbins et al. 1986:28; Robinson 1990:124; Root 1988:123; Sprunt and Chamberlain 1970:295; Sprunt 1954:243; Stewart and Robbins 1958:176.

Mangrove Cuckoo

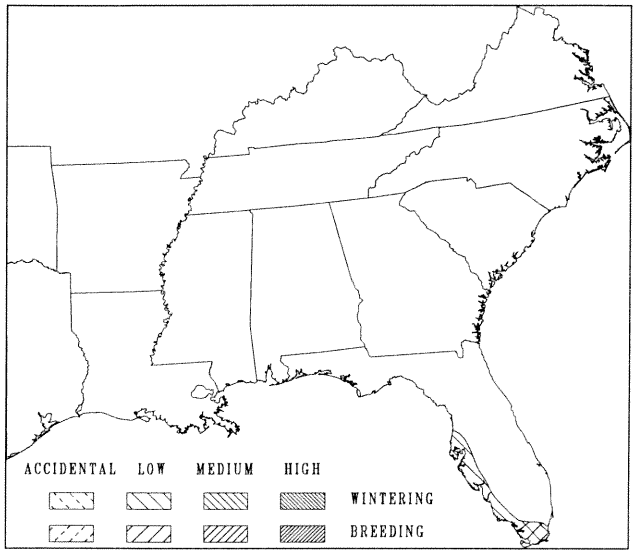
Coccyzus minor **MACU**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

Breeding— U, in the Florida Keys, and the mainland from the southern tip north to the central Gulf coast. Wintering— presumably somewhat less numerous than in summer, apparently R in many areas. Details of seasonal movements are poorly known. Apparently absent in winter north of Everglades National Park. Primarily a West Indian species.



PRIMARY HABITATS

All seasons— mainly in mangrove thickets; also occur in tropical hammocks and other thickets.

KEY HABITAT REQUIREMENTS

Dense broadleaf evergreen woods, generally in mangroves.

REPRODUCTION

The nesting season extends from mid-May to mid-July, but the peak is unknown. The nests are usually built in mangroves, being well hidden in the dense vegetation of a mangrove forest. Two or 3 eggs is the usual clutch size.

FOOD HABITS

These birds are easily overlooked in the dense foliage of mangroves, where most foraging takes place. They take caterpillars most commonly, but other insects are eaten also.

GUILD

Bush or tree nesting, tree foliage gleaning insectivore.

REFERENCES

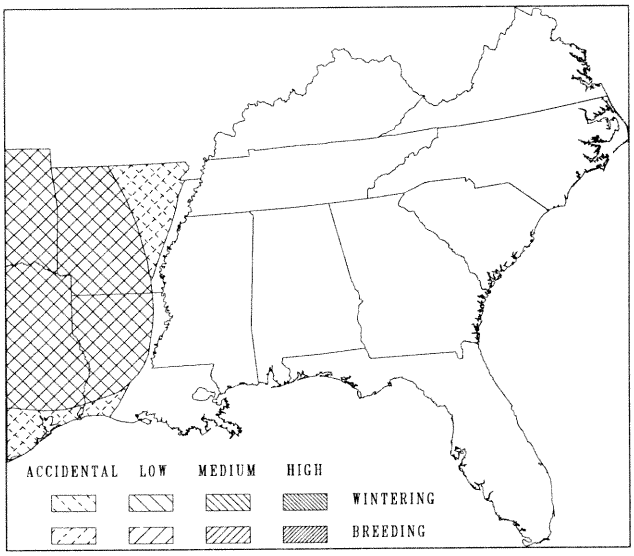
Bent 1940:51; Ehrlich et al. 1988:288; Forbush and May 1939:257; Kale 1978:57; Oberholser 1974(I):434; Rappole et al. 1983:190; Root 1988:123; Sprunt 1954:242.

Greater Roadrunner

Geococcyx californianus GRRO

ABUNDANCE STATUS

Permanent residents—Common in interior Texas; Uncommon in east Texas, the Texas coast, and eastern Oklahoma; Rare to Locally Common in Arkansas and northwestern Louisiana. Populations of these sedentary birds are susceptible to extensive mortality during cold winters (Evans and Probasco 1982). The birds are extending their range eastward.



PRIMARY HABITATS

All seasons—Open stands with bare ground, particularly shrub-seedling areas but also a variety of upland habitats.

KEY HABITAT REQUIREMENTS

All seasons—"Bare ground with more or less scattered trees and bushes where it can walk about freely; it is not much interested in botany." (Oberholser 1974 (I):437)

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sawtimber Oak-hickory on 2 censuses.

SAMPLE WINTER DENSITIES

Not recorded on a census in region; outside region, 0.5/40 ha in Live oak-mesquite brushland.

REPRODUCTION

The breeding season extends from early March to early October. Egg dates include April and May. Roadrunners build a large nest of sticks in a shrub or small tree, or even a hollow stump, most often between 3-15 ft (1-5 m) up. Clutch size 2-13, usually 3-6.

FOOD HABITS

These 'Snake-killers' eat snakes, grasshoppers, lizards, and other small animals which they chase and capture. They also eat birds, eggs, insects, and some fruits and seeds. "The Road-runner is as nearly omnivorous as any of our birds, eating anything in its habitat that is readily available and swallowable" (W. L. McAtee, in Bent 1940:50).

GUILD

Bush or tree nesting, terrestrial or herb gleaning or stalking carnivore or insectivore.

REFERENCES

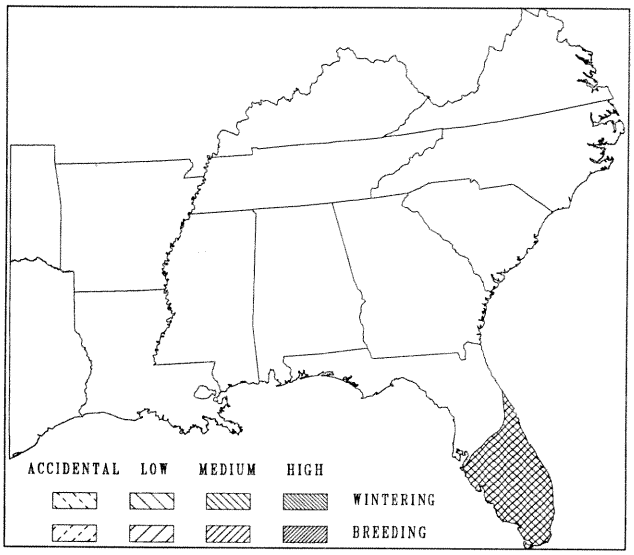
Bent 1940:36; Ehrlich et al. 1988:284; James and Neal 1986:202; Lowery 1974:370; Oberholser 1974 (I):436; Root 1988:124; Sutton 1967:244; Verner and Boss 1980:153.

Smooth-billed Ani

Crotophaga ani **SBAN**

ABUNDANCE STATUS

All seasons— FC in most of southern Florida; locally C in a few areas, mainly near Lake Okeechobee; scarce in the Keys. Essentially non-migratory. Invaded Florida from the West Indies, mainly since 1930.



PRIMARY HABITATS

All seasons— generally around farms and fields with scattered groves, thickets, and hedgerows; often occur around cattle, and occur in residential areas. The nests are built in trees or shrubs along a hedgerow or in a thicket.

KEY HABITAT REQUIREMENTS

Scattered trees or shrubs in open country, especially in agricultural areas.

SAMPLE WINTER DENSITIES

16(3) sawtimber longleaf pine-slash pine.

REPRODUCTION

The season apparently extends from March to September, but the peak is poorly known. Nests are very bulky structures placed in shrubs or trees; several females may lay eggs in the same nest. Generally 3 or 4 eggs are laid by a female, but communal nests with 20 or more eggs have been reported.

FOOD HABITS

They forage primarily on insects, as well as ticks, with some seeds and fruits taken. Most foraging is on the ground in short grass, especially in pastures, though they do feed in trees.

GUILD

Bush or tree nesting, terrestrial gleaning insectivore.

REFERENCES

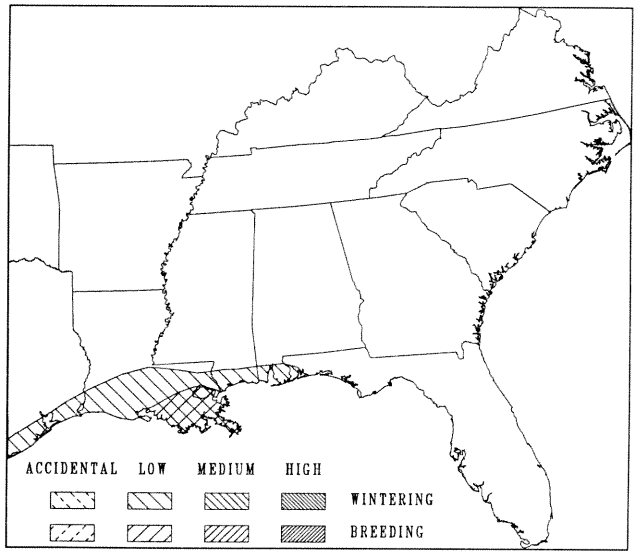
Bent 1940:19; Ehrlich et al. 1988:282; Lowery 1974:371; Oberholser 1974(I):439; Root 1988:124; Sprunt 1954:245.

Groove-billed Ani

Crotophaga sulcirostris **GBAN**

ABUNDANCE STATUS

Breeding—Primary range is in south Texas, outside the region; occasionally they breed in the Mississippi River delta region of Louisiana. Winter— They are locally Uncommon to Fairly Common along the western Gulf Coast in Texas and Louisiana, and Very Rare east as far as the Alabama coast.



PRIMARY HABITATS

All seasons— Agricultural areas, pastures, coastal prairies, citrus orchards, and early successional areas are winter habitats for these birds. In Louisiana the birds frequent citrus orchards, old fields, and pastures. In south Texas the birds breed in dry thornscrub thickets (*Pithecellobium flexicaule* and mesquite (*Prosopis glandulosa*).

KEY HABITAT REQUIREMENTS

All seasons—Grass or shrubby areas for foraging and shrub cover for nesting and roosting, usually not far from water.

REPRODUCTION

These birds place their bulky nests in shrubs or small trees, usually 6-12 ft (2-4 m) up, but sometimes as high as 25 ft (8 m). The season extends from mid-May to mid-July. Clutch size 3-6, or as many as 14 when more than one female is involved.

FOOD HABITS

Large insects form an important part of the diet; the birds often follow cattle while foraging. They also consume other small animals and some fruit.

GUILD

Bush or tree nesting, terrestrial, herb, or bush gleaning insectivore

REFERENCES

Bent 1940:19, 35; Ehrlich et al. 1988:284; Imhof 1976:230; James and Neal 1986:203; Lowery 1974:372; Monroe et al. 1988:32; Oberholser 1974 (I):440; Robinson 1990:124; Root 1988:124; Sprunt 1954:246; Sutton 1967:246.

Common Barn-Owl

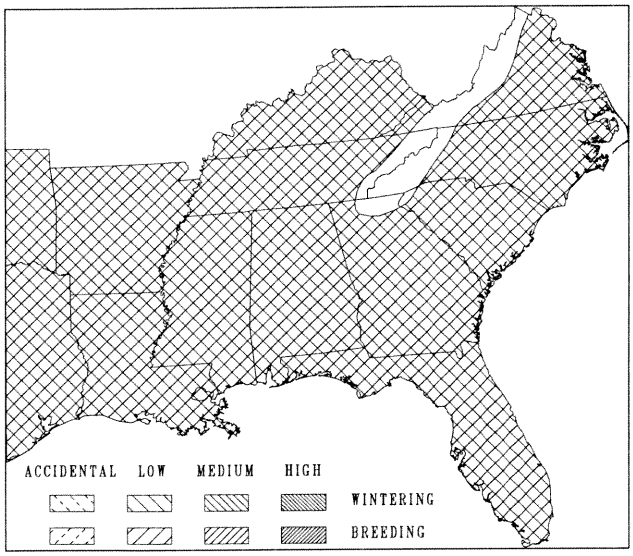
Tyto alba COBO

PROTECTION STATUS

State listed as Endangered in Missouri, "in need of management" in Tennessee, Special Concern by Kentucky Academy of Sciences and Nature Preserves Commission and Oklahoma, and Rare in West Virginia. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, South Carolina Heritage Trust Program.

ABUNDANCE STATUS

All seasons— generally U over the entire area, but somewhat more numerous near the coast. Absent in the higher elevations (presumably) migrating into the Southeast in fall; tend to be more numerous coastally and in southern Florida in winter than in summer, at some places being FC.



PRIMARY HABITATS

All seasons— strictly in open country; favor extensive marshes and weedy fields for foraging. May nest in old barns, hunting blinds, in belfries, tree cavities, or in many other places; frequently nest in towns and residential areas. In winter, the birds roost in dense trees or shrubs, often in stands of young pines or cedars.

KEY HABITAT REQUIREMENTS

Forage in extensive fields or marshes; nest in sheltered cavities or old buildings, and roost in dense cover of evergreen trees or saplings.

SAMPLE BREEDING DENSITIES

1(2) sapling- poletimber live oak maritime.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber pine savanna.

REPRODUCTION

Breed in all months of the year, even north of Florida. The peak is generally from March to May. Nest in sheltered cavities or other dark areas; often in old barns, hunting blinds, tree cavities, and belfries. The usual clutch size is 5 to 7, ranging up to 11.

FOOD HABITS

These owls feed at night by flying low over marshes or fields, dropping onto rodents and other small mammals they hear.

GUILD

Ledge or cavity nesting, nocturnal herb pouncing carnivore.

REFERENCES

Bent 1938:140; Burleigh 1958:319; DeGraaf and Rudis 1986:219; DeGraaf et al. 1980:244; Eagar and Hatcher 1982(A):39; Ehrlich et al. 1988:288; Forbush and May 1939:260; Imhof 1976:231; James and Neal 1986:205; Lowery 1974:376; Mengel 1965:274; Monroe et al. 1988:32; Oberholser 1974(I):442; Potter et al. 1980:197; Robinson 1990:124; Root 1988:125, 282; Scott et al. 1977:19; Sprunt 1954:248; Sprunt and Chamberlain 1970:299; Stewart 1980; Stewart and Robbins 1958:178; Verner and Boss 1980:154.

Eastern Screech-Owl

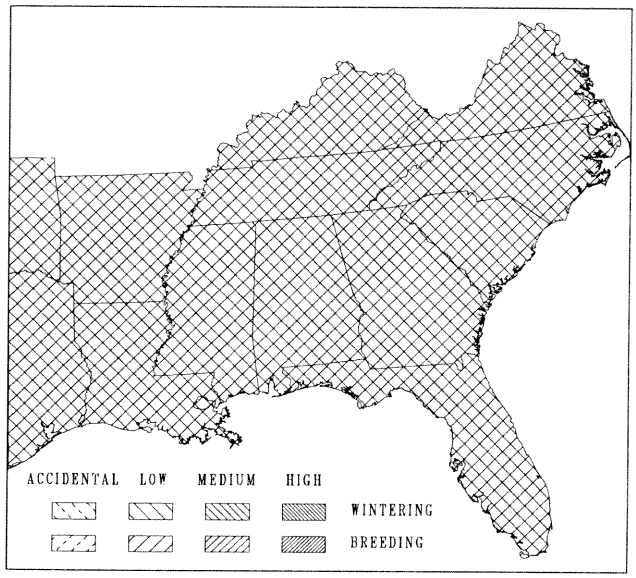
Otus asio **EASO**

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

All seasons— essentially C throughout; in the Mountains rarely up to 4500 feet (1350 m). Believed to be non-migratory.



PRIMARY HABITATS

Nest site— in a wide variety of woods and forests; prefer open to medium growth woods, both in residential areas and in rural country; pine woods or mixed woods are favored over bottomlands and swaps. Foraging— in open to medium growth woods, and also in open areas, such as fields, clearings, and wood margins.

KEY HABITAT REQUIREMENTS

Nest site— a cavity, generally in a tree, in a woodland; few strict requirements. Foraging— no essential requirements, but woodlands of some type must be present.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 4 habitats, 2.8(5) sawtimber cove hardwoods.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber oak-gum-cypress, 2.5(11) sawtimber mixed pine-hardwood.

REPRODUCTION

The nesting season extends from mid-March to late May, with a peak from early April to mid-April. Nest in cavities, not dug by the birds; mainly in old woodpecker holes, but also in natural tree cavities and bird houses. The average clutch size is 4 or 5, ranging from 3 to 8.

FOOD HABITS

Screech Owls sit on perches, usually in woods, and drop to the ground when food is seen or (at night) heard. Insects, rodents, herps, birds, and other invertebrates are taken.

GUILD

Cavity nesting, nocturnal terrestrial pouncing carnivore.

REFERENCES

Bent 1938:243-385; Burleigh 1958:321-324; DeGraaf and Rudis 1986:220; DeGraaf et al. 1980:246; Ehrlich et al. 1988:298; Forbush and May 1939:261; Imhof 1976:232; James and Neal 1986:206; Lowery 1974:378; Mengel 1965:275; Monroe et al. 1988:32; Oberholser 1974(I):444; Potter et al. 1980:198; Robbins et al. 1986:30; Robinson 1990:125; Root 1988:125; Scott et al. 1977:20; Sprunt 1954:249; Sprunt and Chamberlain 1970:301; Stewart and Robbins 1958:179; Van Camp and Henny 1975; Verner and Boss 1980:155.

Great Horned Owl

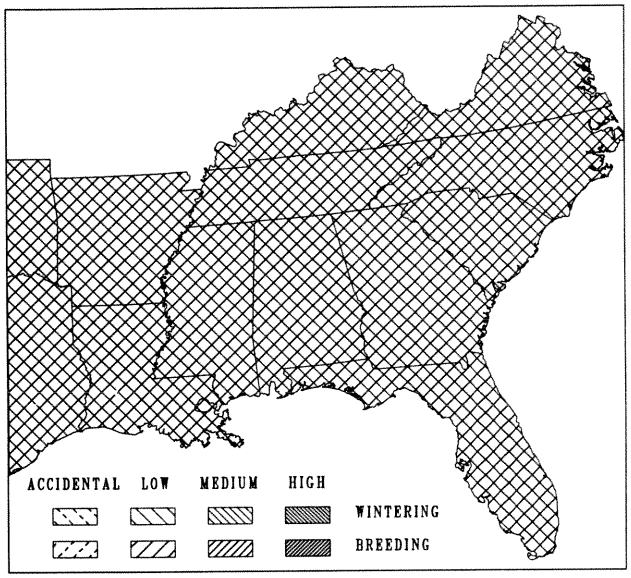
Bubo virginianus **GHOW**

PROTECTION STATUS

State listed as Rare in West Virginia.

ABUNDANCE STATUS

All seasons— FC essentially throughout the region, but scarce over 3500 feet (1050 m). Non-migratory.



PRIMARY HABITATS

Nest site— generally in pinewoods or mixed woods in upland areas; favor medium growth woods, but near the coast may nest in rather open groves. Not normally associated with wet or moist forests, and infrequent in deciduous forests. Foraging— both inside forests or in adjacent open country; especially in weedy fields and marshes.

KEY HABITAT REQUIREMENTS

Nest site— fairly mature woods or forests, preferably in pines. Foraging— no essential requirements, but a combination of woods and field/marsh is usually present.

SAMPLE BREEDING DENSITIES

0.3(18) sawtimber mixed pine-hardwood, 0.6(4) sawtimber oak-hickory, 1(1) sapling/poletimber longleaf pine-scrub oak.

SAMPLE WINTER DENSITIES

Recorded as 1 individual/40 ha on 13 plots in 5 habitats.

REPRODUCTION

The breeding season extends from mid-December to late April, with the peak from mid-January to early March. At most localities, Great Horned Owls are the first birds to begin nesting in late winter. Do not build nests; instead, they utilize abandoned hawk or crow nests in treetops, especially in pines. Rarely nest on ledges or other sites. Two eggs are common, with 3 frequent.

FOOD HABITATS

These owls may hunt in flight, or from a perch. They pounce on rabbits, squirrels, other mammals, birds, and herps, on open ground or the woodland floor, always at night.

GUILD

Tree nesting, nocturnal terrestrial pouncing carnivore.

REFERENCES

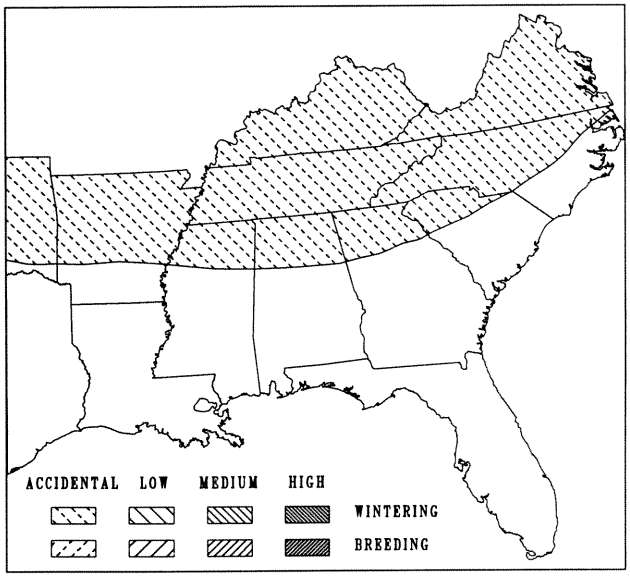
Bent 1938:295-357; Burleigh 1958:325; DeGraaf and Rudis 1986:221; DeGraaf et al. 1980:248; Ehrlich et al. 1988:292; Forbush and May 1939:265; Imhof 1976:233; James and Neal 1986:207; Lowery 1974:379; Mengel 1965:277; Monroe et al. 1988:32; Oberholser 1974(I): 447; Potter et al. 1980:200; Robbins et al. 1986:30; Robinson 1990:125; Root 1988:126; Sprunt 1954:250; Sprunt and Chamberlain 1970:303; Stewart and Robbins 1958:179; Verner and Boss 1980;157.

Snowy Owl

Nyctea scandiaca **SNOW**

ABUNDANCE STATUS

Winter— Don't expect these birds in the South very often. They are Very Rare in the northern part of the region: Kentucky, Tennessee, Arkansas, and Virginia; and Extremely Rare in Alabama, Louisiana, Texas, the Carolinas, and Georgia. They may only reach the South when the lemming food source in their Arctic and Sub-arctic range is scarce. Dates of occurrence extend from November to March.



PRIMARY HABITATS

Winter— Pastures, cultivated fields, very early successional areas in a variety of types; also beach and dune areas along the ocean shore.

KEY HABITAT REQUIREMENTS

Winter— Extensive open areas.

SAMPLE WINTER DENSITIES

None known. Evans (1980) reports densities of 2 birds/km^2 in agricultural land in Ontario, and as high as 15/km^2 near grain elevators near Duluth, Minnesota. Averages in the South and Southeast will be microscopic compared to these.

REPRODUCTION

Do not breed in the region.

REPRODUCTION

In the North, Snowy Owls are carnivorous on ground dwelling mammals and birds. When they visit the South they take a wider variety of foods, including songbirds and carrion.

GUILD

Diurnal or nocturnal terrestrial pouncing carnivore

REFERENCES

Barbour et al. 1973:41; Bent 1938:358; Burleigh 1958:327; DeGraaf and Rudis 1986:222; Ehrlich et al. 1988:296; Forbush and May 1939:267; Imhof 1976:234; James and Neal 1986:208; Lowery 1974:380; Mengel 1965:278; Monroe et al. 1988:33; Oberholser 1974 (I):449; Potter et al. 1980:200; Robinson 1990:126; Root 1988:126, 283; Sprunt 1954:499; Sprunt and Chamberlain 1970:304, 610; Stewart and Robbins 1958:180; Sutton 1967:259.

Burrowing Owl

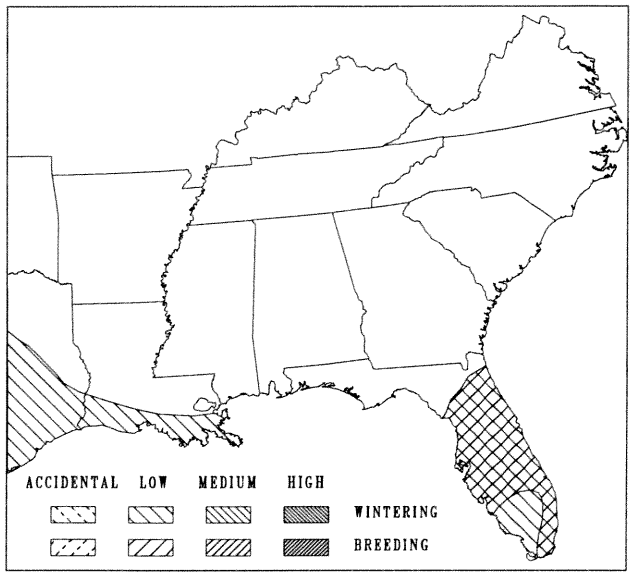
Athene cunicularia **BUOW**

PROTECTION STATUS

State listed as Special Concern in Florida. Monitored by Oklahoma Natural Heritage Inventory. Blue Listed by Tate (1981). *A. c. floridana* listed as Forest Service sensitive on National Forests in Florida.

ABUNDANCE STATUS

All seasons— quite local, but often FC where found; R over most of the range. Non-migratory.



PRIMARY HABITATS

Extensive open country; such as prairies, savannas, grassy fields, airports, and large lawns. Favor sandy areas.

KEY HABITAT REQUIREMENTS

Short grass habitats in sandy soil.

SAMPLE BREEDING DENSITIES

Recorded on 35 of 888 BBS routes in the region, 1966-1985; maximum route mean 117 birds, overall mean 0.19±3.94 birds/route, total of route means 166 birds.

REPRODUCTION

The breeding season extends from November to mid-May, with the peak from early April to mid-April. Nest in underground burrows in sandy soil, either dug by the birds or taken over from other animals. Nests are often in colonies, always in an open area of short grass. The usual clutch size is 5 or 6, ranging from 4 to 8.

FOOD HABITS

Most foraging is at night, though they are sometimes active by day. The owls run along the ground for prey items or make short chases in the air, feeding on beetles, other insects, rodents, herps, and other animals.

GUILD

Burrow nesting, nocturnal terrestrial stalking insectivore or carnivore.

REFERENCES

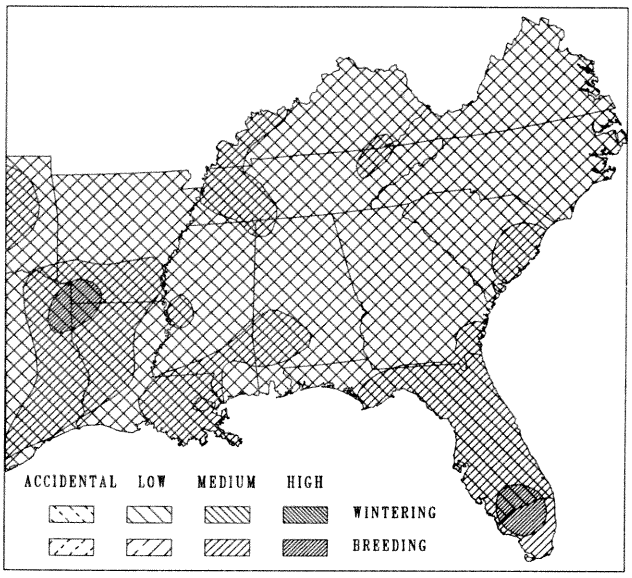
Bent 1938:384-400; Ehrlich et al. 1988:306; Forbush and May 1939:271; Imhof 1976:234; Kale 1978:97; James and Neal 1986:208; Lowery 1974:381; Oberholser 1974(I):454; Potter et al. 1980:201; Rappole et al. 1983:191; Robbins et al. 1986:30; Root 1988:127, 283; Sprunt 1954:251-252; Sprunt and Chamberlain 1970:305; Verner and Boss 1980:159.

Barred Owl

Strix varia **BAOW**

ABUNDANCE STATUS

All seasons— FC to C in the Coastal Plain; FC over much of the Piedmont; mainly U in the mountains, but regularly occur to the tops of the highest mountains (6600+ feet, 1980 m). Non-migratory.



PRIMARY HABITATS

Nest site— generally in swamps or bottomlands hardwoods in the Piedmont and Coastal Plain; in the mountains occur along wooded streams, in spruce-fir forest, or in hemlocks. Foraging— in both moist forests and in open country, such as weedy fields and marshes.

KEY HABITAT REQUIREMENTS

Nest site— wet or moist forests, usually in swamps; cavities must be present for nesting. Foraging— in moist woods, usually with fields or marshes in the vicinity.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 3 habitats, 1.4(5) sapling/poletimber oak-gum-cypress, 1.7(28) sawtimber mixed pine-hardwood. Recorded on 249 of 888 BBS routes in the region, 1966-1985; maximum route mean 5 birds, overall mean 0.19± 0.53 birds/route, total of route means 170 birds.

SAMPLE WINTER DENSITIES

1(1) in four habitats, 2(1) sapling/poletimber oak-gum-cypress, 2.4(17) sawtimber mixed pine-hardwood.

REPRODUCTION

The nesting season extends from mid-January to mid-May, with the peak from late February to late March. Nest usually in large trees that are hollow at the top, in swamps or moist woods; rarely in old crow or hawk nests. Two eggs form the usual clutch, with 3 also frequent.

FOOD HABITS

These owls forage at night from flight or from a perch. They drop onto rodents (usually), but also consume birds, herps, insects, crustaceans, and many animals.

GUILD

Cavity nesting, nocturnal pouncing carnivore on variable substrates.

REFERENCES

Bent 1938:182-201; Burleigh 1958:327; DeGraaf and Rudis 1986:224; DeGraaf et al. 1980:250; Ehrlich et al. 1988:292; Forbush and May 1939:272; Imhof 1976:235; James and Neal 1986:208; Lowery 1974:381; Mengel 1965:279; Monroe et al. 1988:33; Oberholser 1974(I):455; Potter et al. 1980:201; Robbins et al. 1986:30; Robinson 1990:126; Root 1988:127; Scott et al. 1977:27; Sprunt 1954:254; Sprunt and Chamberlain 1970:306; Stewart and Robbins 1958:180.

Long-eared Owl

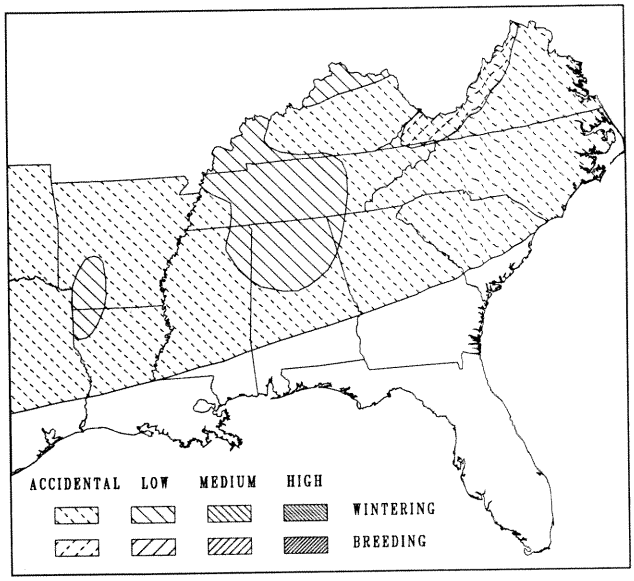
Asio otus **LEOW**

PROTECTION STATUS

State listed as Rare in West Virginia, Poorly Known in Alabama (unofficially). Monitored by Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R, and poorly known, in the mountains of Virginia and the extreme northern Piedmont of that state. Wintering— very secretive at this season, as they are silent and roost in dense trees; apparently R but regular over the region south to central South Carolina and central Georgia. Fall arrival— mid-October to late November; spring departure— late February to early April.



PRIMARY HABITATS

Breeding— in dense and fairly dark coniferous forests, probably most numerous in white pines or hemlocks. Wintering— in dense dark places; most often in dense stands of pine saplings; but also in pine forests, thick cedars in old fields, and thickets. Forage at all seasons in forests and in fields.

KEY HABITAT REQUIREMENTS

Breeding— cool, coniferous forests; abandoned nests of crows or hawks are generally requisite for nesting. Wintering— dense conifers, usually not far from open fields.

REPRODUCTION

The nesting season extends from mid-March to late May, but the peak is not known, as few nests have been found in Virginia. Nest in abandoned crow or hawk nests, generally in crotches in evergreen trees in a cool, shady forest. Four or 5 is the normal clutch size, with a range of 3 to 8.

FOOD HABITS

Like most owls, these birds forage at night either in flight or from a perch, in woods or in the open. They drop to the ground for rodents or other small mammals; birds are taken rarely.

GUILD

Tree nesting, nocturnal terrestrial pouncing carnivore.

REFERENCES

Armstrong 1958; Bent 1938:153; Burleigh 1958:329; DeGraaf and Rudis 1986:226; DeGraaf et al. 1980:252; Ehrlich et al. 1988:290; Forbush and May 1939:274; Imhof 1976:236; James and Neal 1986:210; Lowery 1974:382; Mengel 1965:280; Monroe et al. 1988:33; Oberholser 1974(I):458; Potter et al. 1980:203; Robinson 1990:127; Root 1988:128; Sprunt 1954:255; Sprunt and Chamberlain 1970:311; Stewart and Robbins 1958:181; Verner and Boss 1980:162;.

Short-eared Owl

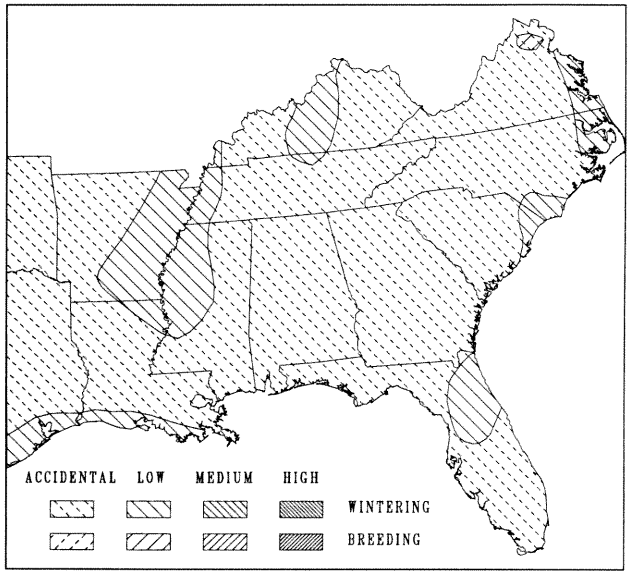
Asio flammeus **SEOW**

PROTECTION STATUS

Blue Listed by Tate (1981). Monitored by Louisiana Natural Heritage Program, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R in Loudoun County, Virginia; formerly scarce breeders along the Virginia coast. Breed mainly north of the region. Wintering— U to locally FC along the coast of the region, and in tidewater areas; VR to R, and erratic, inland; regular only in Loudoun County away from the coast. Fall arrival— late October to mid-November; spring departure— mid-March to mid-April.



PRIMARY HABITATS

Breeding— in large wet meadows or marshes, preferably fresh or brackish ones. Wintering— mainly in marshes (fresh, brackish, or salt), but also in weedy fields, wet meadows, dunes, and shrub thickets. Roost in grassy cover or in shrubs. Unlike other owls, which are almost strictly nocturnal, these birds frequently forage in the very late afternoon in partial light.

KEY HABITAT REQUIREMENTS

Breeding— extensive areas of tall grasses or sedges in damp places. Wintering— marshes or other grasslands.

SAMPLE WINTER DENSITIES

4(1) grass/forb loblolly pine- shortleaf pine.

REPRODUCTION

The nesting season extends from mid-April to mid-May, but the peak is not known, though presumably in late April or early May. The nests are built on the ground in marshes, well hidden in tall grasses. The clutch is usually 5 to 7 eggs.

FOOD HABITS

These owls forage by slowly flying a few feet over a marsh or weedy field, then dropping onto prey when movement is seen or heard. Rodents are the primary food, but other small mammals, insects, and birds are sometimes taken.

GUILD

Ground nesting, nocturnal herb pouncing carnivore.

REFERENCES

Bent 1938:169; Burleigh 1958:329; DeGraaf and Rudis 1986:227; DeGraaf et al. 1980:254; Ehrlich et al. 1988:290; Forbush and May 1939:275; Imhof 1976:237; James and Neal 1986:210; Lowery 1974:383; Mengel 1965:281; Monroe et al. 1988:33; Oberholser 1974(I):459; Potter et al. 1980:203; Rappole et al. 1983:191; Robinson 1990:127; Root 1988:129; Sprunt 1954:256; Sprunt and Chamberlain 1970:312; Stewart and Robbins 1958:181; Verner and Boss 1980:163;.

Northern Saw-whet Owl

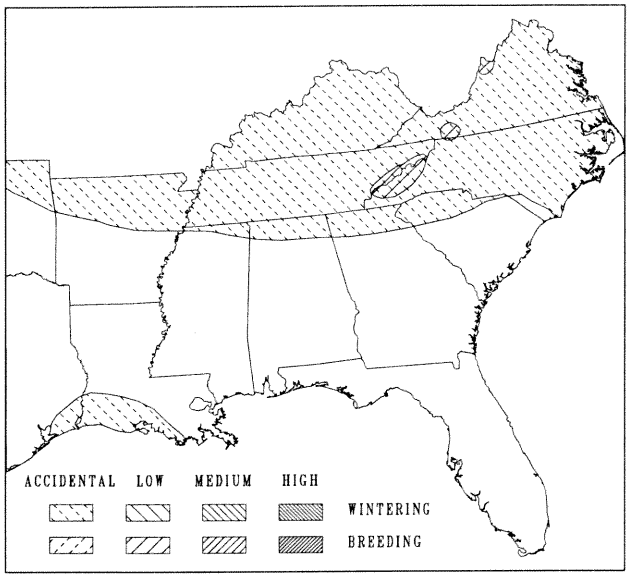
Aegolius acadicus **NSWO**

PROTECTION STATUS

State listed as Threatened in North Carolina, Rare in West Virginia, Poorly Known in Alabama (unofficially). Monitored by Tennessee Natural Heritage Program, Virginia Natural Heritage Program. Forest Service sensitive, Jefferson National Forest.

ABUNDANCE STATUS

Breeding— at high elevations in the Blue Ridge, generally over 5000 feet (1500 m); R in Virginia; U in North Carolina, but FC in a few areas. Wintering— status poorly known, as they are silent at this season; apparently R over most of the region. Fall arrival— mid-October to mid-November; spring departure— mid-March to early April.



PRIMARY HABITATS

Breeding— in spruce-fir forests, or where mixed with hardwoods; nest in cavities in dead trees. Wintering— in conifers, such as pinewoods, dense young pines, and cedars; often in conifers in open country. Forage in woods primarily in summer, but in woods or fields in winter.

KEY HABITAT REQUIREMENTS

Breeding— cavity in dead tree in a spruce-fir forest. Wintering— dense conifers, usually saplings, in either woods or open country.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sawtimber spruce-fir.

REPRODUCTION

The nesting season is poorly known, and no active nest has been discovered in the region; it is probably late April to early June. Nest in abandoned woodpecker cavities in dead trees in spruce-fir forest. Clutch sizes are usually 5 or 6, ranging from 4 to 7.

FOOD HABITS

These tiny owls search for food from a perch, usually inside a forest. They drop onto rodents and other small mammals, and forage only at night.

GUILD

Cavity nesting, nocturnal terrestrial pouncing carnivore.

REFERENCES

Bent 1938:228-242; Burleigh 1958:331; DeGraaf and Rudis 1986:229; DeGraaf et al. 1980:256; Eagar and Hatcher 1982(A):85; Ehrlich et al. 1988:304; Forbush and May 1939:278; Imhof 1976:238; James and Neal 1986:211; Lowery 1974:383; Mengel 1965:282; Monroe et al. 1988:33; Oberholser 1974(I):461; Potter et al. 1980:203; Robinson 1990:128; Root 1988:126, 283; Scott et al. 1977:30; Sprunt and Chamberlain 1970:313; Stewart and Robbins 1958:182; Verner and Boss 1980:164.

Common Nighthawk

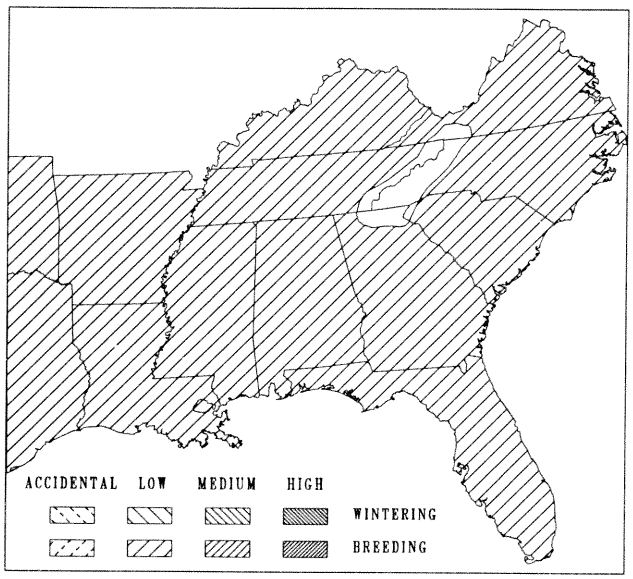
Chordeiles minor CONI

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

C over much of Florida, especially in the southern part; U to FC, but local, elsewhere. More numerous in cities than in rural country. Arrive from early April to early May, and depart from late September to mid-October. Large flocks of migrants are frequently seen from late August to mid-September, mainly in the mountains. Winter south of the United States.



PRIMARY HABITATS

Over most of Florida, and northward along the coast, prefer area with sand and bare ground, such as dunes, open scrubby woods, and margins of thickets. Inland they nest mainly in cities and large towns, where they breed on flat-topped gravel roofs.

KEY HABITAT REQUIREMENTS

Areas of bare ground, both on graveled rooftops in cities and in sandy soil in rural country.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 5 habitats, 3.5(4) sapling/poletimber longleaf pine-scrub oak. Recorded on 354 of 888 BBS routes in the region, 1966-1985; maximum route mean 208 birds, overall mean 2.50±9.34 birds/route, total of route means 2222 birds.

REPRODUCTION

Breed from mid-April (in Florida) to mid-July, peaking from mid-May to mid-June. Eggs, almost always 2, are laid directly onto gravel or sand, as no nest is built.

FOOD HABITS

Nighthawks catch a variety of insects in extended flight, generally well off the ground. They feed mostly in very late afternoon and at night; are frequently seen before dark.

GUILD

Ground or ledge nesting, nocturnal aerial insectivore.

REFERENCES

Bent 1940:205-243; Burleigh 1958:335, 337; DeGraaf and Rudis 1986:230; DeGraaf et al. 1980:260; Ehrlich et al. 1988:312; Forbush and May 1939:282; Imhof 1976:241; James and Neal 1986:212; Kale 1978:58; Lowery 1974:389; Mengel 1965:285; Monroe et al. 1988:34; Oberholser 1974(I):470; Potter et al. 1980:206; Rappole et al. 1983:192; Robbins et al. 1986:30; Robinson 1990:128; Root 1988:129; Sprunt 1954:260; Sprunt and Chamberlain 1970:319; Stewart and Robbins 1958:185; Verner and Boss 1980:166.

Chuck-will's-widow

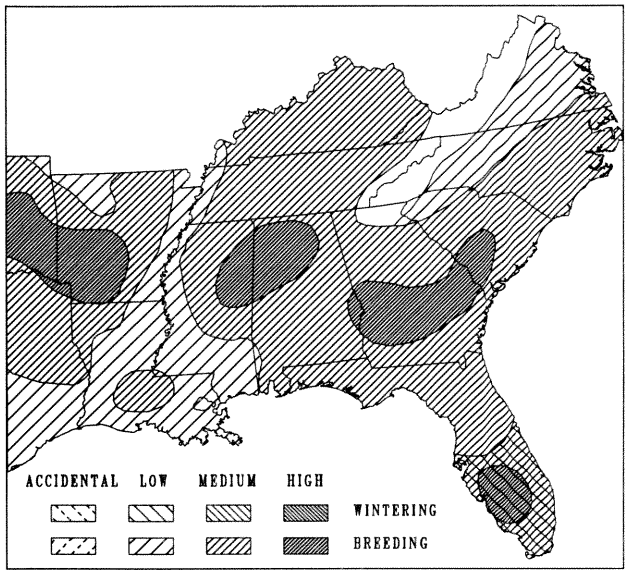
Caprimulgus carolinensis CWWI

PROTECTION STATUS

Monitored by West Virginia Natural Heritage Program.

ABUNDANCE STATUS

C over most of its breeding range, especially in the Coastal Plain; R to U in Florida in winter. Arrive early April to late April; depart— August to September (departure dates poorly known).



PRIMARY HABITATS

Breed in woods and forests, primarily dry or mesic ones; pines or hardwoods, but favor mixed woods; feed mainly over adjacent fields and clearings. Winter in dense woods, hammocks, etc.; mainly in broadleaf evergreen woods.

KEY HABITAT REQUIREMENTS

Breeding— woodlands of many types, with a light to moderate understory, generally near open country. Wintering— woodlands of broadleaf evergreens, generally with a moderate understory.

SAMPLE BREEDING DENSITIES

0.3(2) sapling/poletimber live oak maritime, 0.6(7) sawtimber mixed pine-hardwood, 6(3) sawtimber longleaf pine-slash pine, 7(1) sapling/poletimber longleaf pine-scrub oak. Recorded on 365 of 888 BBS routes in the region, 1966-1985; maximum route mean 12 birds, overall mean 1.05± 90 birds/route, total of route means 932 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber oak-gum-cypress, 0.5(1) sapling/poletimber live oak maritime.

REPRODUCTION

From mid-March in Florida, until late June; peak is from early May to late May. The birds lay their eggs (almost always 2) in a woodland on the ground in dead leaves.

FOOD HABITS

Feed at night, chasing insects in sustained flight over fields, clearings, and woods. Large insects, such as moths and beetles, are preferred; rarely small birds are taken.

GUILD

Ground nesting, nocturnal aerial insectivore.

REFERENCES

Bent 1940:147; Burleigh 1958:332; Ehrlich et al. 1988:308; Forbush and May 1939:279; Imhof 1976:239; James and Neal 1986:212; Lowery 1974:386; Mengel 1965:282; Monroe et al. 1988:34; Oberholser 1974(I):462; Potter et al. 1980:205; Rappole et al. 1983:192; Robbins et al. 1986:30; Robinson 1990:129; Root 1988:130; Sprunt 1954:257; Sprunt and Chamberlain 1970:315; Stewart and Robbins 1958:183.

Whip-poor-will

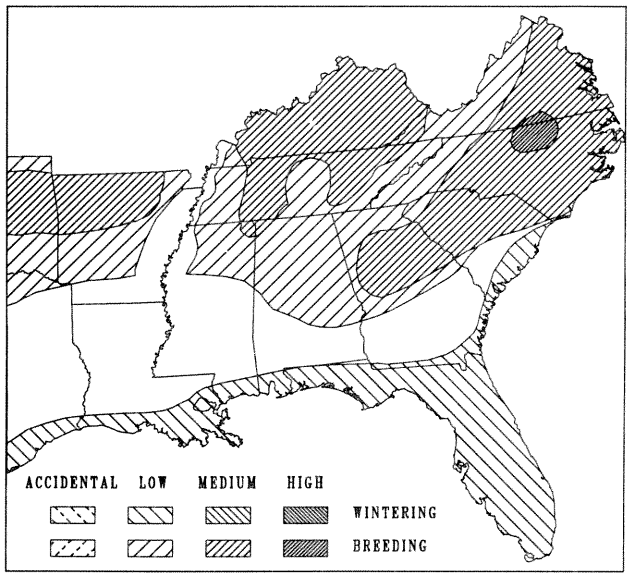
Caprimulgus vociferus **WPWI**

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

Breeding— C, somewhat less so in the mountains (absent at higher elevations). Winter— U to FC in central and southern Florida, apparently U elsewhere. Arrive— mid-March to early April, and depart in September and October (departure dates poorly known).



PRIMARY HABITATS

Breeding— woodlands, usually not far from fields and other open country. Inhabit mostly medium-growth and upland woods, primarily where deciduous or mixed. Feed over adjacent fields. Wintering— primarily in mixed woods, often in broadleaf evergreen woods.

KEY HABITAT REQUIREMENTS

Breeding— medium growth woods of many types, usually in uplands and not far from open country. Wintering— broadleaf evergreen woods, not far from open country.

SAMPLE BREEDING DENSITIES

1.9(6) sapling/poletimber oak-hickory, 3.7(3) shrub-seedling mixed pine-hardwood. Recorded on 146 of 888 BBS routes in the region, 1966-1985; maximum route mean 7 birds, overall mean 0.20±0.68 birds/route, total of route means 183 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber sand pine-southern scrub oak, 2(1) Everglades.

REPRODUCTION

Breed from mid-April to early July, with a peak from early May to early June. Lay their clutches of 2 in a woodland on the ground on dead leaves.

FOOD HABITS

Feed at night, catching insects in sustained flight over fields, woods, or small openings. A wide variety of flying insects are taken.

GUILD

Ground nesting, nocturnal aerial insectivore.

REFERENCES

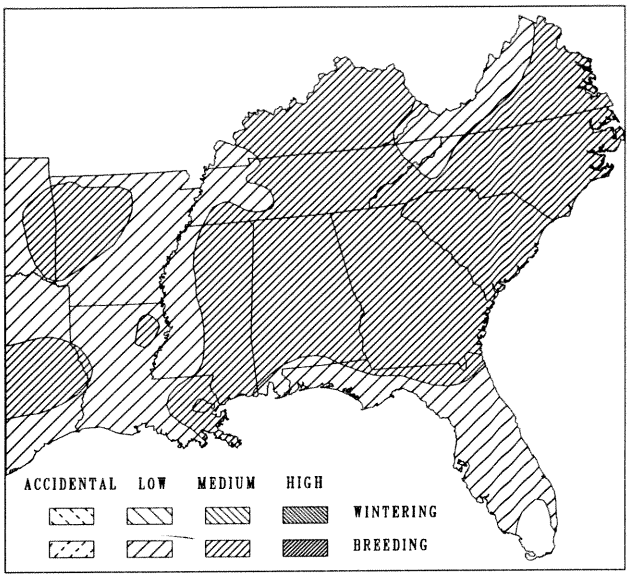
Bent 1940:163-186; Burleigh 1958:333; DeGraaf and Rudis 1986:231; DeGraaf et al. 1980:258; Ehrlich et al. 1988:308; Forbush and May 1939:280; Imhof 1976:240; James and Neal 1986:213; Lowery 1974:388; Mengel 1965:284; Monroe et al. 1988:34; Oberholser 1974(I):464; Potter et al. 1980:206; Rappole et al. 1983:192; Robbins et al. 1986:30; Robinson 1990:130; Root 1988:130; Sprunt 1954:259; Sprunt and Chamberlain 1970:317; Stewart and Robbins 1958:184.

Chimney Swift

Chaetura pelagica CHSW

ABUNDANCE STATUS

Breeding— C to A nearly throughout; less numerous in the mountains, though C in much of this region. Winter south of the United States. Arrive from mid-March to mid-April, and depart from early October to late October.



PRIMARY HABITATS

Mainly around towns, cities, and other open areas near human settlements. Feed over various habitats, even forests, but most common over open country and residential areas.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 16 habitats, 1.3(4) sawtimber oak-gum-cypress, 2.6(2) sapling/poletimber oak-gum- cypress, 14(2) grass/forb mixed pine-hardwood. Recorded on 537 of 888 BBS routes in the region, 1966-1985; maximum route mean 93 birds, overall mean 8.09±11.53 birds/route, total of route means 7182 birds.

REPRODUCTION

The stick nest is glued by saliva to the inside of a hollow or open structure; usually in the inside of a tall chimney, rarely in a hollow tree. Clutch size usually 4 or 5, rarely 3 or 6. Breed from early May to mid-July, peaking from late May to mid-June.

FOOD HABITS

The swifts are the most aerial of all landbirds, catching small insects in sustained flight.

GUILD

Cavity nesting, aerial insectivore.

REFERENCES

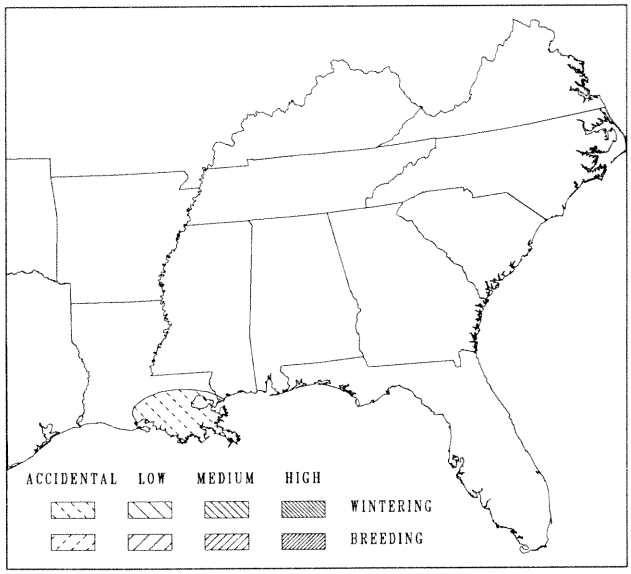
Bent 1940:271; Burleigh 1958:339; DeGraaf and Rudis 1986:232; DeGraaf et al. 1980:262; Ehrlich et al. 1988:316; Forbush and May 1939:284; Imhof 1976:243; James and Neal 1986:215; Lowery 1974:394; Mengel 1965:287; Monroe et al. 1988:34; Oberholser 1974(I):475; Potter et al. 1980:208; Rappole et al. 1983:193; Robbins et al. 1986:30; Robinson 1990:131; Scott et al. 1977:31; Sprunt 1954:263; Sprunt and Chamberlain 1970:321; Stewart and Robbins 1958:186.

Buff-bellied Hummingbird

Amazilia yucatanensis **BUFH**

ABUNDANCE STATUS

Winter— Occasional stragglers sometimes are found in the Mississippi River Delta region of Louisiana, December-February.



PRIMARY HABITATS

Winter— Suburban areas, evergreen thickets.

KEY HABITAT REQUIREMENTS

Winter— The birds may depend for survival upon ornamental flowers and hummingbird feeders.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Like other hummingbirds, these birds hover while feeding. Their diet consists of nectar and insects. They are notable for defending feeding territories against other hummingbirds; because they are large hummingbirds, they usually succeed in such defense.

GUILD

Herb or bush gleaning or probing nectarivore or insectivore

REFERENCES

Bent 1940:444; Ehrlich et al. 1988:320; Lowery 1974:405; Oberholser 1974 (I):494; Rappole et al. 1983:196.

Ruby-throated Hummingbird

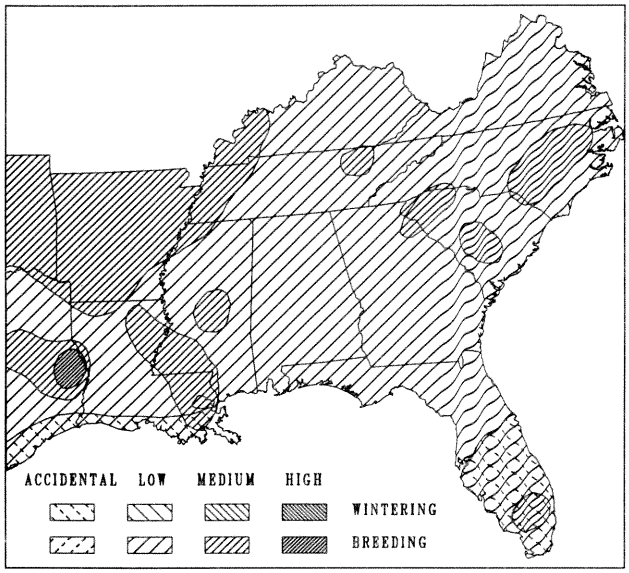
Archilochus colubris RTHU

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

Breeding— FC over most of the Southeast, seldom C anywhere. Wintering— mostly U along eastern Gulf Coast and in Florida, tending to increase in numbers in extreme southern Florida. Spring arrival is mainly early April to late April; departure is from mid-September to mid-October.



PRIMARY HABITATS

Breeding and wintering— quite varied, but always near tubular flowers. They are more numerous in somewhat moist areas, such as bottomland woods, wet thickets, and tangles. Also inhabit upland woods, overgrown fields, and residential areas. Generally avoid coniferous woods.

KEY HABITAT REQUIREMENTS

Breeding— woody vegetation (woods or thickets) near tubular flowers, usually in moist habitats. Wintering woods or thickets near tubular flowers or hummingbird feeders.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in seven habitats, 4.2(14) sawtimber oak-hickory, 5.4(5) sawtimber oak-gum-cypress. Recorded on 374 of 888 BBS routes in the South, 1966-1985; maximum route mean 11 birds, overall mean 0.37±0.76 birds/route, total of route means 330 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber oak-gum- cypress, 0.5(1) sapling/poletimber live oak maritime, 4.2(4) sawtimber longleaf pine-slash pine.

REPRODUCTION

Nesting ranges from early April (in Florida) to mid-July, with the peak from mid-May to early June. Nests are very small cups saddled on the tops of branches, in woodlands or thickets. Typically the nest is 10-20 feet (3-6 m) above the ground, usually near or over a stream. the clutch size is always 2.

FOOD HABITS

Generally small insects and nectar obtained from tubular flowers, while hovering. Most foraging is within 10 feet (3 m) of the ground. Frequently take colored sugar-water from hummingbird feeders.

GUILD

Tree or bush nesting, nectarivore or insectivore.

REFERENCES

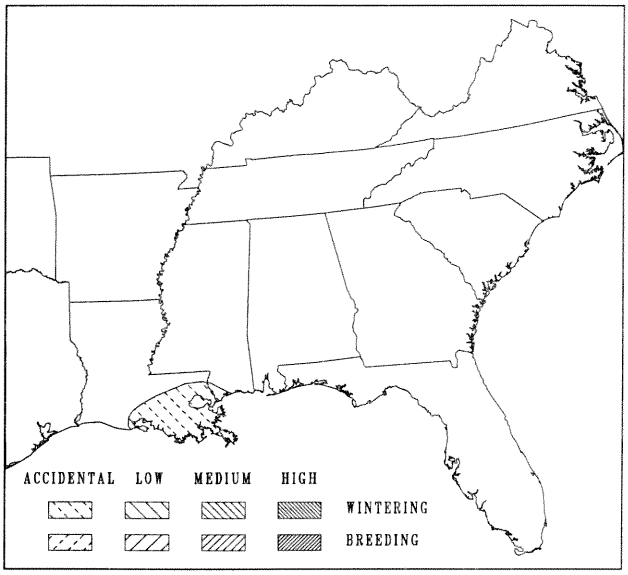
Bent 1940:332; Burleigh 1958:341; DeGraaf and Rudis 1986:233; DeGraaf et al. 1980:264; Ehrlich et al. 1988:328; Forbush and May 1939:286; Imhof 1976:244; James and Neal 1986:216; Lowery 1974:400; Mengel 1965:288; Monroe et al. 1988:34; Oberholser 1974(I):482; Potter et al. 1980:209; Rappole et al. 1983:194; Robbins et al. 1986:32; Robinson 1990:132; Root 1988:130; Sprunt 1954:265; Sprunt and Chamberlain 1970:323; Stewart and Robbins 1958:187.

Black-chinned Hummingbird

Archilochus alexandri **BCHU**

ABUNDANCE STATUS

Winter— Very rare and irregular in Mississippi River Delta region of Louisiana. Our knowledge of winter distribution of these and other hummers is undergoing a period of clarification thanks to several workers, such as N. Newfield in the New Orleans area, R. Sargent in the Birmingham area, and others.



PRIMARY HABITATS

Winter— Evergreen thickets, suburban areas with ornamental flowers and hummingbird feeders.

KEY HABITAT REQUIREMENTS

Winter— These birds, like other wintering hummingbirds of the Gulf Coast, probably depend for survival on a combination of favorable weather and ornamental flowers and hummingbird feeders provided for them.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Black-chinned Hummingbirds forage primarily by hovering and probing for nectar and gleaning insects from blooms of a variety of plants. They also have been observed hawking for insects away from flowers.

GUILD

Gleaning or probing at various heights, nectarivore or insectivore.

REFERENCES

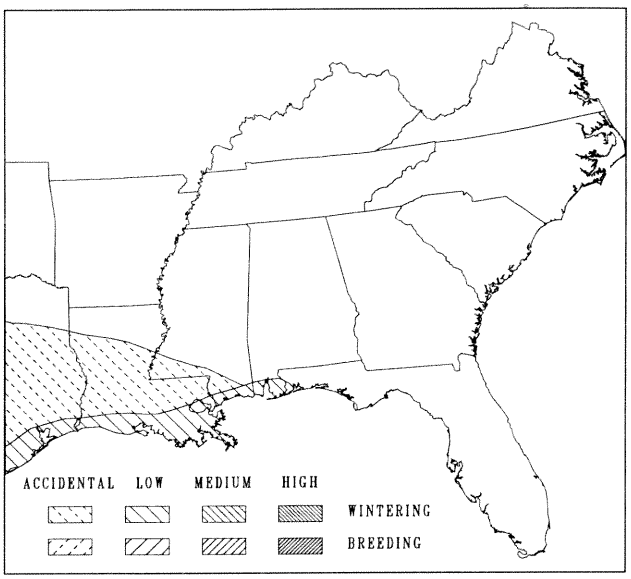
Bent 1940:352; Ehrlich et al. 1988:328; Lowery 1974:402; Oberholser 1974 (I):483; Rappole et al. 1983:194; Root 1988:131; Sutton 1967:286; Verner and Boss 1980:170.

Rufous Hummingbird

Selasphorus rufus **RUHU**

ABUNDANCE STATUS

Winter— These most northern of hummingbirds are occasional visitors to the Gulf Coast in October April, where they are regular and Locally Common on the Texas coast, Uncommon but regular in south Louisiana, and Rare and irregular east into Alabama and the extreme western end of the Florida panhandle.



PRIMARY HABITATS

Winter— Gardens, suburban areas, and particularly around hummingbird feeders.

KEY HABITAT REQUIREMENTS

Winter— Cultivated tubular flowers, especially red ones such as *Salvia* sp. and hibiscus for feeding. The birds often disappear after prolonged cold spells, possibly because they do not survive.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Rufous Hummingbirds forage while hovering. They probe tubular flowers for nectar, glean small insects from the plants, and eat sugar-water from feeders. These birds are vigorously territorial in defense of food sources.

GUILD

Herb or bush gleaning or probing hovering nectarivore or insectivore

REFERENCES

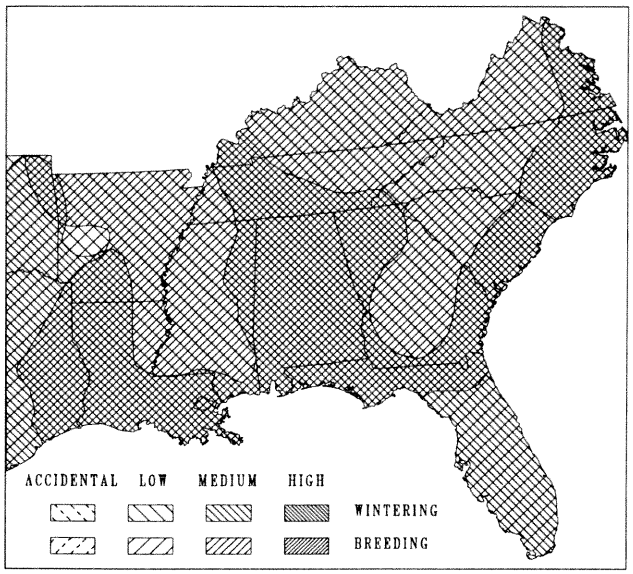
Bent 1940:396; Conway and Drennan 1979; Ehrlich et al. 1988:334; Imhof 1976:245; James and Neal 1986:217; Lowery 1974:404; Monroe et al. 1988:35; Oberholser 1974 (I):489; Potter et al. 1980:210; Rappole et al. 1983:195, 457; Robinson 1990:133; Root 1988:131; Sprunt 1954:266; Sprunt and Chamberlain 1970:324; Stewart and Robbins 1958:189; Sutton 1967:288; Verner and Boss 1980:173.

Belted Kingfisher

Ceryle alcyon **BEKI**

ABUNDANCE STATUS

Breeding and wintering— C near the coast; mostly FC elsewhere, but U over much of the higher elevations. Not C as breeders in southern Florida. There is some movement of birds into the Southeast, from farther north, in the fall.



PRIMARY HABITATS

Breeding and wintering— always near water, such as lakes, ponds, streams, and tidewater. Breed in holes in vertical banks along streams or lakes. Perch on trees, stubs, telephone wires, etc.

KEY HABITAT REQUIREMENTS

Breeding— vertical, sandy banks adjacent to or near a body of water. Wintering— a body of water with scattered perches.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 6 habitats, 0.6(2) sawtimber elm-ash-cottonwood. Recorded on 369 of 888 BBS routes in the region, 1966-1985; maximum route mean 5 birds, overall mean 0.26±0.47 birds/route, total of route means 228 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber oak-gum-cypress, 0.5(1) sapling/poletimber live oak maritime, 0.5(1) shrub-seedling oak-hickory, 2.3(3) sawtimber live oak maritime, 5(1) sawtimber elm-ash-cottonwood.

REPRODUCTION

Nesting occurs from early April to mid-June, for the most part, with a peak from early May to late May. The nests are long tunnels or burrows, dug by the birds, in vertical banks of sand or dirt near water. Commonly 6 or 7 eggs are laid, though 5 or 8 eggs are not an unusual clutch.

FOOD HABITS

Kingfishers hover or fly slowly over water and plunge into the water when food is sighted. Small fish are the primary food, but some insects, crayfish, shellfish, and other prey items are also taken.

GUILD

Burrow nesting, aquatic pouncing carnivore.

REFERENCES

Bent 1940:111-129; Burleigh 1958:344; DeGraaf and Rudis 1986:234; DeGraaf et al. 1980:266; Ehrlich et al. 1988:336; Forbush and May 1939:290; Imhof 1976:247; James and Neal 1986:218; Lowery 1974:406; Mengel 1965:289; Monroe et al. 1988:35; Oberholser 1974(I):501; Potter et al. 1980:211; Rappole et al. 1983:197; Robbins et al. 1986:32; Robinson 1990:133; Root 1988:132; Sprunt 1954:268; Sprunt and Chamberlain 1970:326; Stewart and Robbins 1958:189; Verner and Boss 1980:175.

Red-headed Woodpecker

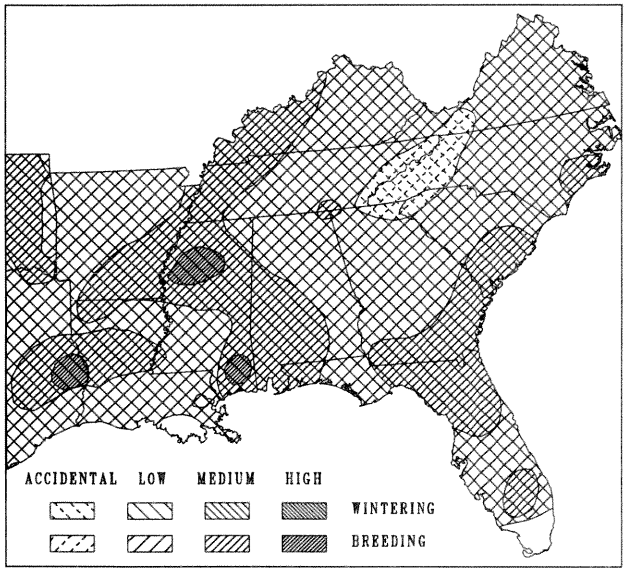
Melanerpes erythrocephalus RHWO

PROTECTION STATUS

State listed as "in need of management" in Tennessee. Blue Listed by Tate (1981). Monitored by West Virginia Natural Heritage Program.

ABUNDANCE STATUS

FC, though local, in much of the Coastal Plain; mostly U and local in the Piedmont; generally R below 2500 feet (750 m) in the Mountains and absent above that elevation except in migration. Noticeable fall migration in September. Slightly more numerous in winter than in summer, particularly in swamps and bottomland woods.



PRIMARY HABITATS

Breeding— prefer open woods and groves, such as parks, campuses, open pinewoods, rural groves, and open swamps. Wintering— same habitats as for breeding, except considerably more numerous in winter in beaver pond woods, open woods, open swamps, and other wet places where there is an abundance of dead trees.

KEY HABITAT REQUIREMENTS

Breeding— open, mature woods and groves, with dead trees, stubs, or poles for nesting. Wintering— open woods, especially in bottomlands.

SAMPLE BREEDING DENSITIES

1(1) shrub-seedling southern scrub oak, 3.8(4) sapling/poletimber mixed pine-hardwood, 4(2) grass/forb mixed pine- hardwood. Recorded on 369 of 888 BBS routes in the region, 1966-1985; maximum route mean 13 birds, overall mean 0.71±1.48 birds/route, total of route means 630 birds.

SAMPLE WINTER DENSITIES

0.5(2) shrub-seedling elm-ash-cottonwood, 5(1) sawtimber live oak maritime.

REPRODUCTION

Nesting season ranges from mid-April to mid-July, with the peak from mid-May to mid-June. Nest cavities are dug by the birds in dead trees or limbs (usually); occasionally in telephone poles or fence posts. They usually nest in fairly open situations. Five eggs are most commonly laid, though 4, 6, or 7 are frequent.

FOOD HABITS

These birds have a varied diet. They usually dig for insects and grubs in the bark of trunks and twigs; but also take nuts and berries from twigs, flycatch for flying insects, and probe for insects on the ground.

GUILD

Cavity-nesting tree trunk probing insectivore-omnivore.

REFERENCES

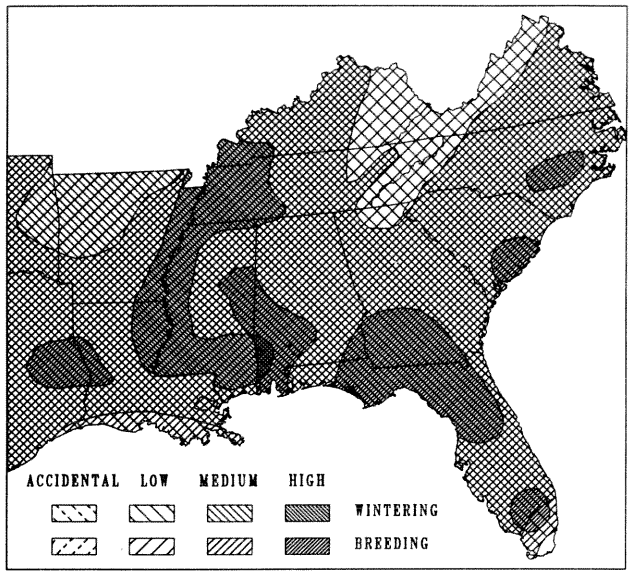
Bent 1939:195; Burleigh 1958:355; DeGraaf and Rudis 1986:235; DeGraaf et al. 1980:274; Eagar and Hatcher 1982(A):75; Ehrlich et al. 1988:342; Forbush and May 1939:298; Imhof 1976:251; James and Neal 1986:219; Lowery 1974:412; Mengel 1965:297; Monroe et al. 1988:35; Oberholser 1974(I):514; Robbins et al. 1986:34; Potter et al. 1980:216; Robinson 1990:133; Root 1988:134; Scott et al. 1977:39; Sprunt 1954:276; Sprunt and Chamberlain 1970:333; Stewart and Robbins 1958:193.

Red-bellied Woodpecker

Melanerpes carolinus **RBWO**

ABUNDANCE STATUS

C throughout the Coastal Plain and Piedmont; U in the mountains up to approximately 2500 feet (750 m), and generally absent above 3000 feet (900 m). Non-migratory.



PRIMARY HABITATS

All seasons— widespread in woodlands and forests; most common in bottomland hardwoods, but also common in upland deciduous woods, pine forests, and residential woodlands.

KEY HABITAT REQUIREMENTS

Breeding and wintering— mature woodlands or forests of many types with some dead trees or stubs for nesting.

SAMPLE BREEDING DENSITIES

1(2) sapling/poletimber longleaf pine-slash pine, 1(1) shrub-seedling loblolly pine-shortleaf pine, 1(1) sapling/poletimber oak-hickory, 8.1(33) sawtimber oak-hickory, 9.4(5) sawtimber oak-gum-cypress, 10(8) sawtimber longleaf pine-slash pine, 12(4) sapling/poletimber oak-gum-cypress. Recorded on 527 of 888 BBS routes in the region, 1966-1985; maximum route mean 51 birds, overall mean 5.79±7.29 birds/route, total of route means 5145 birds.

SAMPLE WINTER DENSITIES

0.5(5) shrub-seedling elm-ash-cottonwood, 10(3) sawtimber elm-ash-cottonwood, 15(1) sapling/poletimber longleaf pine-scrub oak, 16(2) sapling/poletimber live oak maritime, 26(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The breeding season extends from mid-April to early July, with the peak from late April to mid-May. Nest in cavities dug by the birds dead trees or branches in woodland. Occasionally they nest in abandoned holes dug by other species. Eggs are generally 4 or 5 to a clutch, rarely as few as 3 or as many as 8.

FOOD HABITS

The birds pick and probe for food on trunks and branches of trees, preferably hardwoods. Insects and insect larvae are the chief foods, but fruits, nuts, and berries are also consumed. They occasionally feed on the ground.

GUILD

Cavity nesting, tree trunk probing insectivore-omnivore.

REFERENCES

Bent 1939:237; Burleigh 1958:351, 353; DeGraaf and Rudis 1986:236; DeGraaf et al. 1980:272; Ehrlich et al. 1988:340; Forbush and May 1939:297; Imhof 1976:250; James and Neal 1986:220; Kroll et al. 1980; Lowery 1974:411; Mengel 1965:295; Monroe et al. 1988:35; Oberholser 1974(I):510; Potter et al. 1980:216; Robbins et al. 1986:34; Robinson 1990:134; Root 1988:137; Scott et al. 1977:36; Sprunt 1954:274; Sprunt and Chamberlain 1970:332; Stewart and Robbins 1958:192.

Yellow-bellied Sapsucker

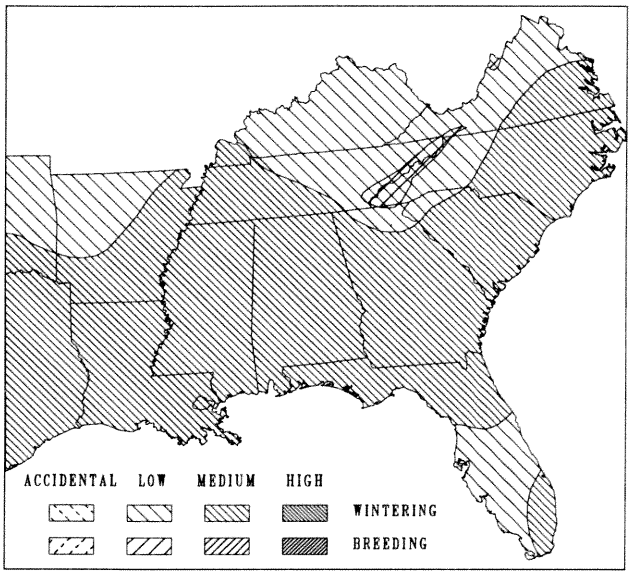
Sphyrapicus varius **YBSA**

PROTECTION STATUS

State listed as "in need of management" in Tennessee, Significantly Rare in North Carolina. Monitored by Virginia Natural Heritage Program, West Virginia Natural Heritage Program. Forest Service sensitive on Jefferson National Forest.

ABUNDANCE STATUS

Breeding— mostly U and local, mainly over 4000 feet (1200 m) in the Southern Appalachians. Wintering— FC to C over the entire Southeast. Fall migration mainly from late September to mid-October; spring migration generally from late March to late April.



PRIMARY HABITATS

Breeding— high elevation deciduous forests that are open with dead trees, such as near burns, diseased areas, woodland borders, and blowdowns. Wintering— in various habitats; mainly in open deciduous woods, groves, residential areas, and parks; not common in deep, dense woods.

KEY HABITAT REQUIREMENTS

Breeding— dead trees in or near high elevation deciduous forest. Wintering— woodlands of many types, mainly in hardwoods.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in grass/forb mixed pine-hardwood.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber sand pine-southern scrub oak, 9.5(2) sapling/poletimber live oak maritime, 16(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The breeding season extends from mid-April to mid-June, with the peak probably from mid-May to late May (few nests with eggs have been found in the Southeast). Nest cavities are dug by the birds in dead trees or stubs, and are generally in open situations. Eggs are usually 5 or 6, with 4 or 7 being frequent.

FOOD HABITS

Sapsuckers feed on insects and grubs in the bark of trees, drill holes in bark to feed on cambium and sap, and also pick berries and nuts in winter. They rarely feed on the ground.

GUILD

Cavity nesting, tree trunk probing omnivore.

REFERENCES

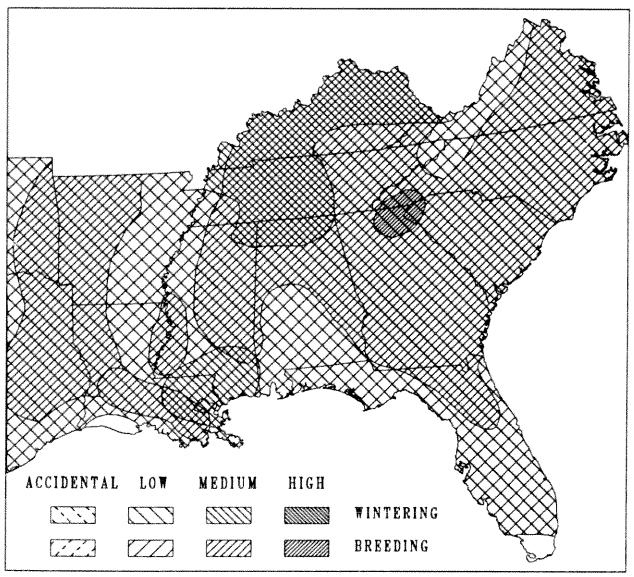
Bent 1939:126-153; Burleigh 1958:356, 358; DeGraaf and Rudis 1986:237; DeGraaf et al. 1980:276; Eagar and Hatcher 1982(A):81; Ehrlich et al. 1988:348; Forbush and May 1939:299; Imhof 1976:252; James and Neal 1986:220; Lawrence 1967; Lowery 1974:413; Mengel 1965:299; Monroe et al. 1988:35; Oberholser 1974(I):518; Potter et al. 1980:217; Rappole et al. 1983:198; Robbins et al. 1986:34; Robinson 1990:134; Root 1988:138; Scott et al. 1977:42; Sprunt 1954:277; Sprunt and Chamberlain 1970:335; Stewart and Robbins 1958:194; Verner and Boss 1980:180.

Downy Woodpecker

Picoides pubescens **DOWO**

ABUNDANCE STATUS

C over most of the region, but only FC in the mountains; generally only FC in Florida, becoming U in the southern half of that state. Essentially non-migratory.



PRIMARY HABITATS

All seasons— a wide variety of woodlands; inhabit middle- aged and mature woods, from uplands to lowlands; prefer hardwoods to conifers. Common in woodlots, groves, parks, and residential areas as well as in forests.

KEY HABITAT REQUIREMENTS

All seasons— middle-aged to mature trees in many situations; dead trees or stubs necessary for nesting.

SAMPLE BREEDING DENSITIES

0.3(2) sawtimber loblolly pine-shortleaf pine, 0.3(4) shrub-seedling mixed pine-hardwood, 5.7(10) sawtimber cove hardwoods, 6.1(33) sawtimber oak-hickory, 8.7(3) sawtimber elm-ash-cottonwood. Recorded on 493 of 888 BBS routes in the region, 1966-1985; maximum route mean 25 birds, overall mean 1.78± 2.48 birds/route, total of route means 1578 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber longleaf pine-slash pine, 1(3) sawtimber longleaf pine-slash, 1(3) sawtimber live oak maritime, 1(1) shrub-seedling Virginia pine-pitch pine, 0.6(8) shrub-seedling elm-ash-cottonwood, 4.1(20) sawtimber oak-hickory, 8(1) sapling/poletimber oak- hickory.

REPRODUCTION

The breeding season extends from early April to late May, with a peak from mid-April to early May. Nest cavities are dug by the birds in dead trees or stubs; frequently excavated in stubs of living trees. Like most woodpecker cavities, nest holes are at medium height from the ground (30-50 feet or 9-15 m). Eggs are usually 4 or 5, rarely 3 or 6.

FOOD HABITS

They probe in bark of trunks and twigs for insects and larvae in both hardwoods and conifers. Nuts and berries are infrequently taken. Downies feed on smaller twigs and in smaller trees than other woodpeckers

GUILD

Cavity nesting, arboreal or bush probing insectivore.

REFERENCES

Bent 1939:45-71; Burleigh 1958:360-363; DeGraaf and Rudis 1986:238; DeGraaf et al. 1980:280; Ehrlich et al. 1988:350; Forbush and May 1939:302; Imhof 1976:253; James and Neal 1986:221; Kroll et al. 1980; Lawrence 1967; Lowery 1974:414; Mengel 1965:302; Monroe et al. 1988:35; Oberholser 1974(I):522; Potter et al. 1980:219; Robbins et al. 1986:34; Robinson 1990:135; Root 1988:141; Scott et al. 1977:45; Sprunt 1954:280; Sprunt and Chamberlain 1970:337, 338; Stewart and Robbins 1958:196; Verner and Boss 1980:183.

Hairy Woodpecker

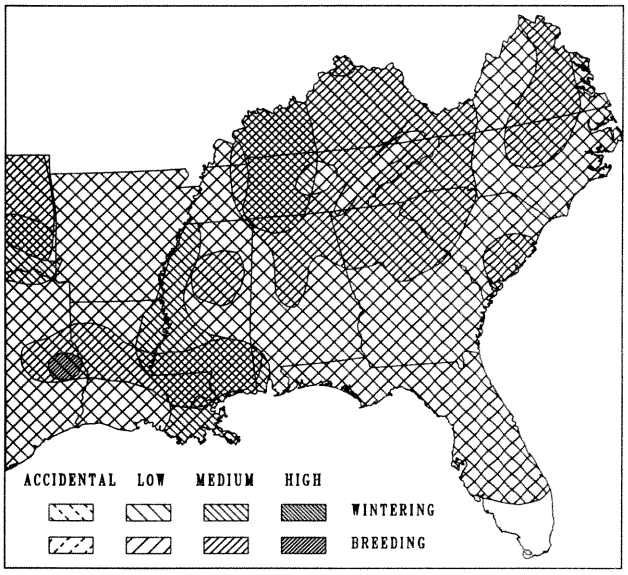
Picoides villosus **HAWO**

PROTECTION STATUS

Blue Listed by Tate (1981). Monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

FC in the mountains and most of the Piedmont; generally U over most of the Coastal Plain; especially scarce in southern Florida. Essentially non-migratory.



PRIMARY HABITATS

All seasons— mature forests of many types; mainly in deciduous or mixed woods, but do occur in spruce-fir, hemlocks, and pines; not partial to either uplands or lowlands, but generally scarce in woods near human habitation.

KEY HABITAT REQUIREMENTS

All seasons— mature, and usually extensive, forest; dead trees or stubs required for nesting.

SAMPLE BREEDING DENSITIES

0.7(3) sapling/poletimber oak-gum- cypress, 5.3(8) sawtimber cove hardwoods, 5.5(20) sawtimber oak-hickory, 10(2) sawtimber white pine-hemlock. Recorded on 315 of 888 BBS routes in the region, 1966-1985; maximum route mean 4 birds, overall mean 0.20±0.41 birds/route, total of route means 181 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber longleaf pine-slash pine, 1(1) sapling poletimber oak-hickory, 1(1) sawtimber live oak maritime, 1(1) sapling/poletimber Virginia pine-pitch pine, 5(1) sapling/poletimber longleaf pine-scrub oak, 5(3) sawtimber elm-ash-cottonwood.

REPRODUCTION

The season extends from early April to mid-May, with the peak in late April and early May. Nest cavities are dug by the birds in dead trees or stubs, and are usually well hidden in the forest interior. Commonly 4 eggs are laid, but 5 are regular, as well.

FOOD HABITS

Very similar to most other woodpeckers; generally probe for insects and larvae on bark of trunks and limbs, favoring deciduous trees. A few berries and nuts are consumed in cold water.

GUILD

Cavity nesting, tree trunk probing insectivore.

REFERENCES

Bent 1939:13-44; Burleigh 1958:358-360; DeGraaf and Rudis 1986:239; DeGraaf et al. 1980:278; Ehrlich et al. 1988:352; Forbush and May 1939:300; Imhof 1976:253; James and Neal 1986:221; Kale 1978:99; Kroll et al. 1980; Lawrence 1967; Lowery 1974:413; Mengel 1965:299; Monroe et al. 1988:35; Oberholser 1974(I):521; Potter et al. 1980:218; Robinson 1990:135; Root 1988:142; Scott et al. 1977:44; Sprunt 1954:279; Sprunt and Chamberlain 1970:336; Stewart and Robbins 1958:196; Verner and Boss 1980:182.

Red-cockaded Woodpecker

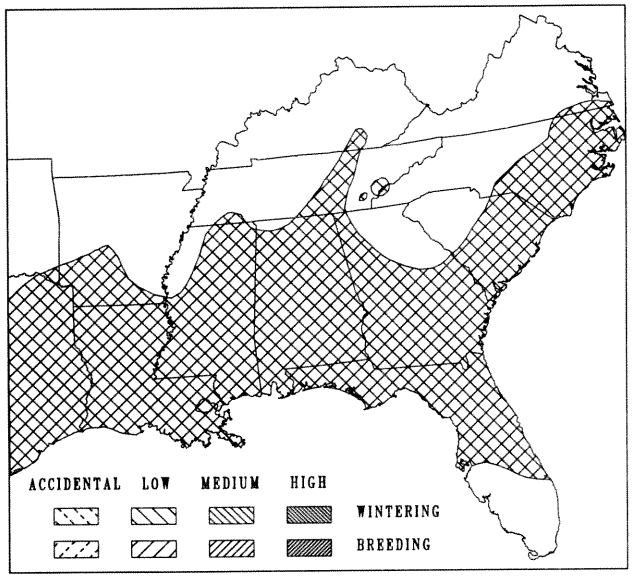
Picoides borealis **RCWO**

PROTECTION STATUS

Federally listed as Endangered. State listed as Endangered in Alabama, Arkansas, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia; and as Threatened in Florida.

ABUNDANCE STATUS

In the Coastal Plain; U to locally FC from southeastern North Carolina to northern Florida, west to Texas; R further inland. Local, non-migratory and very much dependent upon public lands.



PRIMARY HABITATS

Strictly in open pinewoods; prefer longleaf pine, but also use loblolly, shortleaf, and slash pines. Habitat is generally of fairly mature trees with little or no midstory (resembling a park-like stand).

KEY HABITAT REQUIREMENTS

Mature and open pinewoods; and some trees must have proper heartwood conditions for nest cavities. The birds prefer conditions of minimal understory.

SAMPLE BREEDING DENSITIES

0.6(2) sapling/poletimber longleaf pine-slash pine, 1.5(2) sawtimber longleaf pine-slash pine.

SAMPLE WINTER DENSITIES

2(1) sapling/poletimber longleaf pine-slash pine.

REPRODUCTION

The nesting season is from early April to late May, with the peak from late April to mid-May. The nest cavity is unique: it is always in the trunk of a live pine. The birds dig their own cavity, and they then peck small holes around the exterior of the nest hole to cause sap to run. Eggs are usually 3 or 4, rarely 5.

FOOD HABITS

The birds pick and probe for insects and larvae in the bark of pines (very seldom on hardwoods). They feed fairly high up on the trunks of the trees, as well as on large branches. Nuts and berries are rarely taken.

GUILD

Cavity nesting, tree trunk probing insectivore.

REFERENCES

Bent 1939:72; Burleigh 1958: 363; Eagar and Hatcher 1982(A):11; Ehrlich et al. 1988:356; Forbush and May 1939:304; Hooper et al. 1980; Imhof 1976:254; Jackson et al. 1979; James and Neal 1986:222; Kale 1978:11; Lennartz and McClure 1979; Lowery 1974:415; Mengel 1965:306; Monroe et al. 1988:35; Oberholser 1974(I):526; Patterson and Robertson 1981; Potter et al. 1980:220; Robinson 1990:136; Root 1988:143; Scott et al. 1977:49; Sprunt 1954:280; Sprunt and Chamberlain 1970:339; Stewart and Robbins 1958:197; Thompson 1971.

Ivory-billed Woodpecker

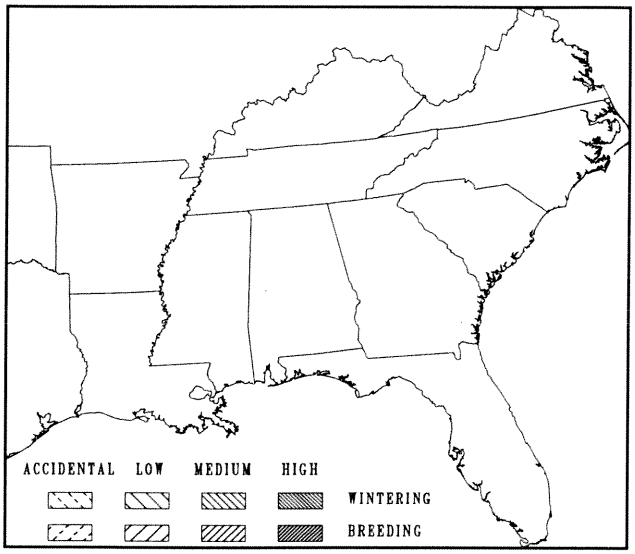
Campephilus principalis IBWO

PROTECTION STATUS:

Federally listed as Endangered, state listed in virtually all states within former range.

ABUNDANCE STATUS:

Permanent Resident— commonly believed to be extirpated entirely from former range in continental United States. A tiny population currently is known in the mountains in eastern Cuba.



PRIMARY HABITATS:

Associated with extensive tracts (1500 acres, 300 ha/pair) of primarily old-growth forests. Bottomland forests are most commonly associated with these birds, although Jackson (in litt.) believes pine forests also formed habitat for them.

KEY HABITAT REQUIREMENTS:

Extensive areas of old-growth forests, where dead and dying trees are frequent. Tanner (1942) presents suggestions for land management in which timber harvest and Ivory billed Woodpecker occurrence are simultaneously possible.

SAMPLE DENSITIES:

Not recorded on a BBS or BBC in the region. Tanner (1942) estimated 1 pr/15 km^2 of suitable habitat.

REPRODUCTION:

Breeding season was apparently from January-April and variable at any particular site. Nests were built in a dead tree or dead part of a living tree in great variety of species, usually above 13 m height. Mean recorded clutch size 2.6-2.9 (range 1-5, n=18).

FOOD HABITS:

Larvae of wood-boring insects, particularly of Cerambycids, Buprestids, and Elaterids that feed in cambium of large recently-dead limbs of live trees and boles of recently-dead trees. Tanner (1942) noted that preferred prey of Ivory-billed Woodpeckers were much less abundant than those Pileated Woodpeckers. Fruits and mast were also taken.

GUILD:

Cavity nesting, arboreal probing insectivore.

REFERENCES:

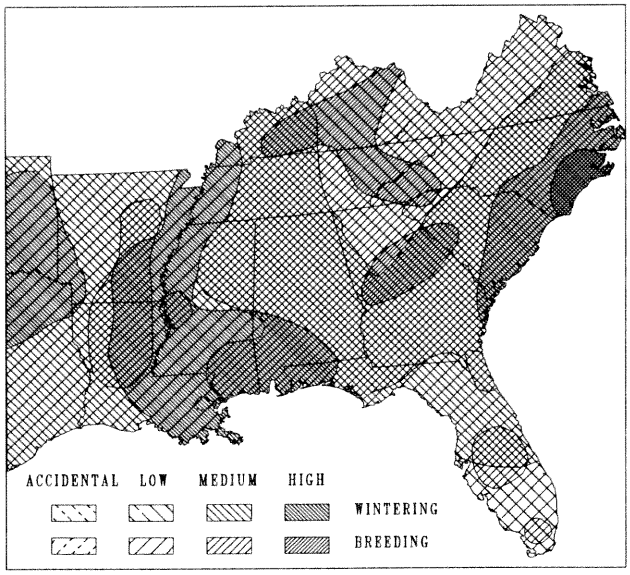
Tanner 1942:1-110.

Northern Flicker (Yellow-shafted Flicker)

Colaptes auratus YSFL*

ABUNDANCE STATUS

C over most of the South; FC at lower and middle elevations in the mountains, but scarce over 4000 feet (1200 m). There is some movement of flickers into the Southeast in fall. They tend to be conspicuously more C on the coast in winter than in summer. Migration is generally in October and November, and again in March and April.



PRIMARY HABITATS

All seasons— prefer open woods and groves (generally hardwoods) in a variety of situations; wooded residential areas, woodland margins, groves in rural country, and many forest types. They are seldom common in deep, extensive forests.

KEY HABITAT REQUIREMENTS

Breeding— open woods, groves, or scattered trees, with dead trees or poles for a nesting cavity. Wintering— open woods and scattered trees.

SAMPLE BREEDING DENSITIES

0.5(5) sawtimber longleaf pine-slash pine, 0.6(4) sawtimber cove hardwoods, 3.1(28) sawtimber mixed pine-hardwood, 4(5) sapling/poletimber mixed pine-hardwood, 6(4) sawtimber oak-gum-cypress. Recorded on 465 of 888 BBS routes in the region, 1966-1985; maximum route mean 13 birds, overall mean 1.39±2.05 birds/route, total of route means 1239 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp- pocosin, 0.5(14) grass/forb elm-ash-cottonwood, 0.5(1) shrub-seedling Virginia pine-pitch pine, 6.7(3) sawtimber elm-ash-cottonwood, 10(3) sawtimber longleaf pine-slash pine, 25(3) sawtimber live oak maritime.

REPRODUCTION

Nesting season ranges from late March to mid-July, with a peak from late April to mid-May. Nests are cavities, dug by the birds, generally in dead trees, but sometimes in telephone poles or posts; the holes are usually high above the ground. Clutch size is commonly 6 to 8, ranging from 4 to 10.

FOOD HABITS

Flickers feed commonly on ants, as well as other insects; berries and seeds are frequently taken in fall and winter. They probe for insects on tree trunks and limbs, but spend considerably time on the ground feeding on ants.

GUILD

Cavity nesting, tree trunk or terrestrial probing insectivore-omnivore.

REFERENCES

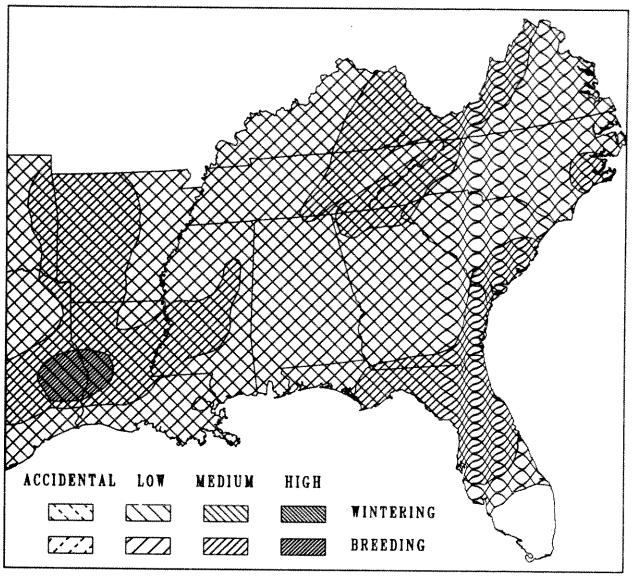
Bent 1939:259-308; Burleigh 1958:346-348; DeGraaf and Rudis 1986:242; DeGraaf et al. 1980:268; Ehrlich et al. 1988:338; Forbush and May 1939:291; Imhof 1976:248; James and Neal 1986:224; Lawrence 1967; Lowery 1974:409; Mengel 1965:290; Monroe et al. 1988:36; Oberholser 1974(I):506, 508; Potter et al. 1980:213; Robbins et al. 1986:32; Robinson 1990:137; Root 1988:145; Scott et al. 1977:34; Sprunt 1954:271; Sprunt and Chamberlain 1970:328, 329; Stewart and Robbins 1958:190; Verner and Boss 1980:176.

Pileated Woodpecker

Dryocopus pileatus PIWO

ABUNDANCE STATUS

FC in most of the Coastal Plain and mountains; generally U to locally FC in the Piedmont. They are absent from the higher mountains. Non-migratory.



PRIMARY HABITATS

All seasons— mature and extensive forests, primarily in deciduous forests. Occur in both deep woods and swamps as well as in rather open and upland forests; seem most numerous in riverbottom hardwoods.

KEY HABITAT REQUIREMENTS

Breeding and wintering— mature and extensive forests with dead trees for nesting.

SAMPLE BREEDING DENSITIES

0.5(1) sawtimber loblolly pine-shortleaf pine, 4(1) sawtimber live oak maritime, 7.2(10) sawtimber cove hardwoods, 0.6(2) sapling/poletimber Virginia pine-pitch pine, 4(1) sapling/poletimber oak-hickory, 5.5(2) sapling/poletimber live oak maritime. Recorded on 426 of 888 BBS routes in the region, 1966-1985; maximum route mean 19 birds, overall mean 1.09±1.95 birds/route, total of route means 968 birds.

REPRODUCTION

The nesting season extends from mid-March to late May, with the peak from mid-April to late April. Nests are large cavities, dug by the birds in dead trees, usually over 30 feet (9 m) from the ground; mainly in forests where well hidden. Clutch size is commonly 4, with 3 or 5 also frequent.

FOOD HABITS

They feed on the trunks of large trees, for the most part, but are frequently seen also on fallen logs. They probe in the wood for ants, insects, and insect larvae; some fruits and berries are taken in fall and winter.

GUILD

Cavity nesting, tree trunk probing insectivore.

REFERENCES

Bent 1939:164-194; Burleigh 1958:348; DeGraaf and Rudis 1986:243; DeGraaf et al. 1980:270; Ehrlich et al. 1988:360; Forbush and May 1939:294; Imhof 1976:249; James and Neal 1986:225; Kroll et al. 1980; Lowery 1974:410; Mengel 1965:293; Monroe et al. 1988:36; Oberholser 1974(I):509; Potter et al. 1980:214; Robbins et al. 1986:34; Robinson 1990:137; Root 1988:147; Scott et al. 1977:35; Sprunt 1954:273; Sprunt and Chamberlain 1970:331; Stewart and Robbins 1958:191; Verner and Boss 1980:177.

Olive-sided Flycatcher

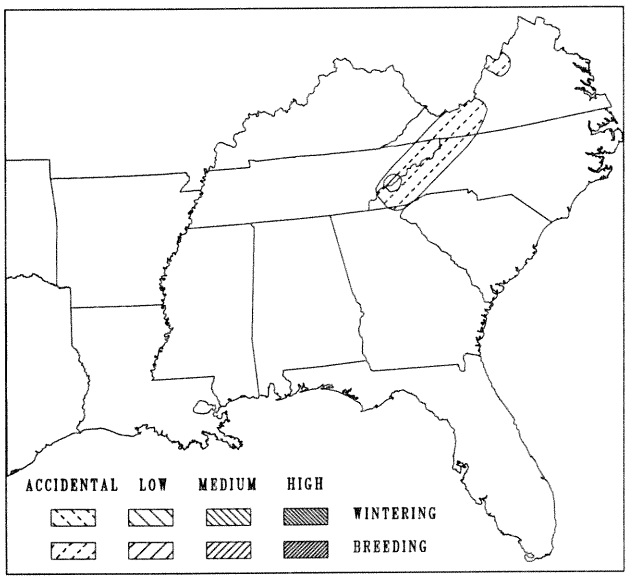
Contopus borealis OSFL

PROTECTION STATUS

State listed as Threatened in North Carolina. Monitored by Tennessee Natural Heritage Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program. Forest Service sensitive on George Washington National Forest.

ABUNDANCE STATUS

Breeding— R to VR everywhere; mainly confined to the Great Smoky Mountains National Park; mostly above 5000 feet (1500 m). Apparently more numerous 50 or more years ago. Winter south of the United States. Arrival— early May to mid-May; departure— late August to late September.



PRIMARY HABITATS

Favor openings and edges of coniferous forests, mainly in spruce-fir; generally in areas where dead trees are present (from disease or fire) above 5000 feet (1500 m).

KEY HABITAT REQUIREMENTS

High elevation coniferous forest with openings and dead trees.

REPRODUCTION

The breeding season is poorly known in the South, but is probably from late May to early July. The peak is presumably in early and mid-June. Nests are built on horizontal limbs of conifers, generally fairly high up in the trees. Clutch size is almost always 3; 4 eggs are rare.

FOOD HABITS

These flycatchers eat flying insects strictly, especially bees and wasps. The birds sally after the insects from conspicuous perches near tree tops, particularly dead branches in conifers.

GUILD

Tree nesting, arboreal hawking insectivore.

REFERENCES

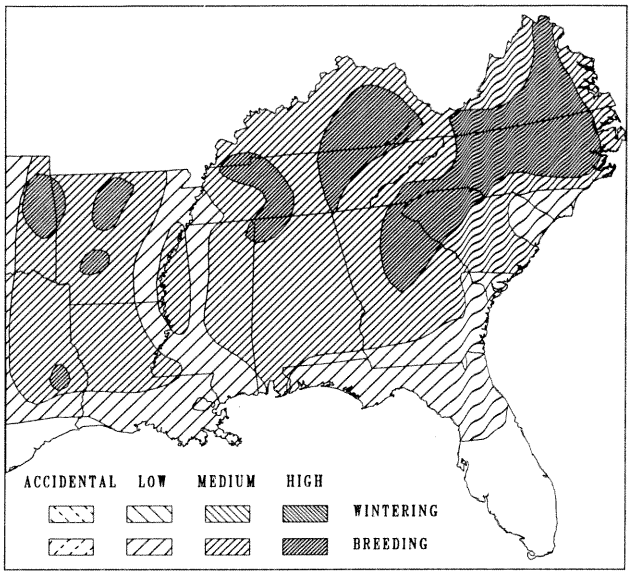
Bent 1942:288; Burleigh 1958:385; DeGraaf and Rudis 1986:244; DeGraaf et al. 1980:304; Eagar and Hatcher 1982(A):97; Ehrlich et al. 1988:376; Forbush and May 1939:320; Imhof 1976:271; James and Neal 1986:227; Lowery 1974:436; Mengel 1965:317; Monroe et al. 1988:36; Oberholser 1974(II):563; Potter et al. 1980:234; Rappole et al. 1983:205; Robbins et al. 1986:39; Robinson 1990:138; Sprunt 1954:299; Sprunt and Chamberlain 1970:358; Stewart and Robbins 1958:208; Verner and Boss 1980:196.

Eastern Wood-Pewee

Contopus virens **EAWP**

ABUNDANCE STATUS

Breeding— C over nearly all the Southeast, up to 3000 feet (900 m); FC up to 4500 feet (1350 m); seldom above 4500 feet. Winter south of the United States. Arrive from mid-April to early May; depart from early October to late October.



PRIMARY HABITATS

A variety of open to medium-growth forests and woodlots; favor neither pines nor hardwoods; preferred habitat is a rather open, mature woodland in a rather dry situation. Inhabit open pines, parks, wooded residential areas, as well as remote forests.

KEY HABITAT REQUIREMENTS

Open to medium-growth woods, with few other specific requirements.

SAMPLE BREEDING DENSITIES

1.4(3) sawtimber cove hardwoods, 9.3(28) sawtimber oak-hickory, 9.5(11) sapling/poletimber oak-hickory, 11(3) sawtimber loblolly pine-shortleaf pine. Recorded on 434 of 888 BBS routes in the region, 1966-1985; maximum route mean 27 birds, overall mean 2.79±4.37 birds/route, total of route means 2475 birds.

REPRODUCTION

The season extends from mid-May to mid-July, with the peak from early June to mid-June. Nests are built well out from the trunks of hardwoods or conifers, on horizontal limbs, and generally 15-50 feet (4-15 m) from the ground. Clutch size is usually 3, though 2 or 4 are frequent.

FOOD HABITS

Pewees sally after flying insects from a twig of a tree. Most foraging occurs at the canopy level; occasionally hover at leaves and twigs to take insects.

GUILD

Tree nesting, arboreal hawking insectivore.

REFERENCES

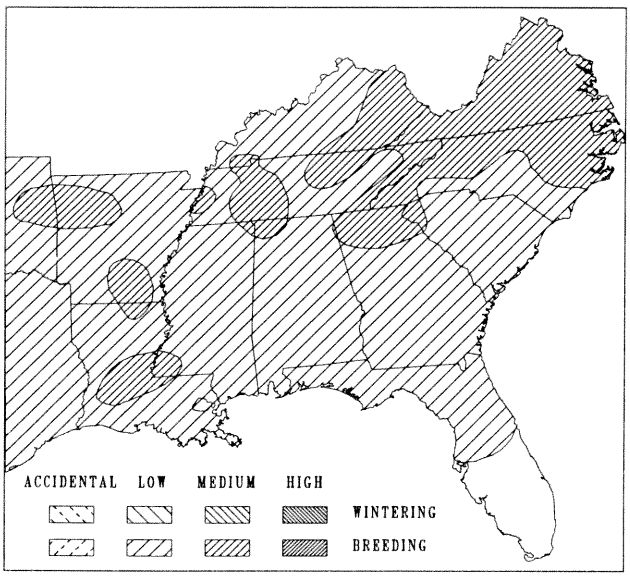
Bent 1942:266; Burleigh 1958:384; DeGraaf and Rudis 1986:245; DeGraaf et al. 1980:302; Ehrlich et al. 1988:376; Forbush and May 1939:319; Imhof 1976:270; James and Neal 1986:227; Lowery 1974:435; Mengel 1965:316; Monroe et al. 1988:36; Oberholser 1974(II):561; Potter et al. 1980:233; Rappole et al. 1983:205; Robbins et al. 1986:39; Robinson 1990:139; Root 1988:148; Sprunt 1954:297; Sprunt and Chamberlain 1970:357; Stewart and Robbins 1958:206.

Acadian Flycatcher

Empidonax virescens **ACFL**

ABUNDANCE STATUS

Breeding— C nearly throughout; occur in the mountains up to 4000 feet (1200 m). Winter south of the United States. Spring arrival— early April to early May; fall departure— early September to early October.



PRIMARY HABITATS

Mainly in deciduous forests near streams; favored habitats are bottomland hardwoods and rich deciduous forests along small streams.

KEY HABITAT REQUIREMENTS

Moist deciduous forests with a moderate understory, generally near a stream.

SAMPLE BREEDING DENSITIES

1(1) shrub-seedling loblolly pine- shortleaf pine, 3(1) sawtimber live oak maritime, 28(5) sawtimber oak-gum- cypress, 43(10) sawtimber cove hardwood. Recorded on 340 of 888 BBS routes in the region, 1966-1985; maximum route mean 26 birds, overall mean 1.11±2.62 birds/route, total of route means 988 birds.

REPRODUCTION

The season extends from late April to late July, with the peak from late May to mid-June. Nests are built on horizontal or down-hanging branches of deciduous trees in forests, usually over a stream. Typical nest is 10-15 feet (3-4 m) above the ground. Clutch size is generally 3, with 2 or 4 being somewhat rare.

FOOD HABITS

Acadians generally sit near a stream on a branch 10-40 feet (3-12 m) from the ground, beneath the hardwood canopy, and sally after flying insects.

GUILD

Tree nesting, arboreal hawking insectivore.

REFERENCES

Bent 1942:183; Burleigh 1958:379; DeGraaf and Rudis 1986:247; DeGraaf et al. 1980:294; Ehrlich et al. 1988:386; Forbush and May 1939:316; Imhof 1976:267; James and Neal 1986:228; Lowery 1974:432; Mengel 1965:313; Monroe et al. 1988:36; Oberholser 1974(II):552; Potter et al. 1980:230; Rappole et al. 1983:202; Robbins et al. 1986:39; Robinson 1990:140; Sprunt 1954:295; Sprunt and Chamberlain 1970:355; Stewart and Robbins 1958:203.

Alder Flycatcher

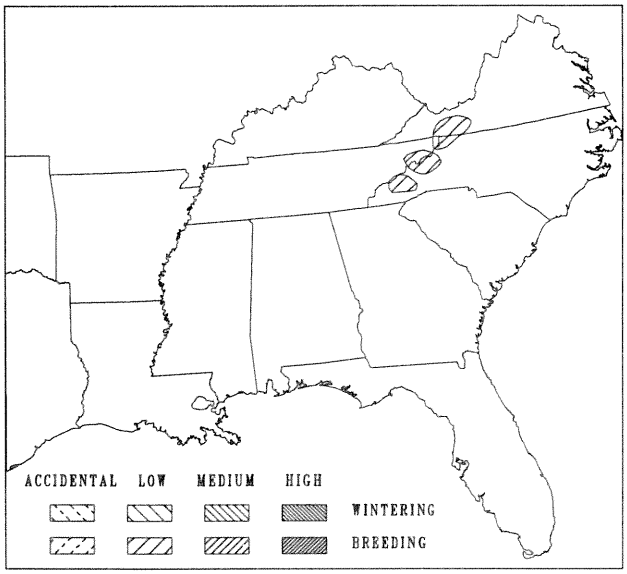
Empidonax alnorum **ALFL**

PROTECTION STATUS

State listed as Significantly Rare in North Carolina, Poorly Known in Alabama. Monitored by Tennessee Natural Heritage Program, Virginia Natural Heritage Program. Forest Service listed as sensitive on George Washington and Jefferson National Forests.

ABUNDANCE STATUS

Breeding— R and quite local, at elevations above 3500 feet (1050 m), known to occur in summer at Mt. Rogers in Virginia; and in North Carolina in Watauga County, at Roan Mt., and in southern Haywood County. These recent colonizers have begun breeding in the region within the past 15 years. Winter south of the United States. Arrive late, probably from mid-May to late May; departure is probably from mid-August to mid-September.



PRIMARY HABITATS

Two distinct habitats— high elevation bogs, with scattered shrubs and saplings, and high elevation shrub-sapling thickets in uplands. Occur in alders (*Alnus crispa*) on Roan Mt., as well as in spruce-fir saplings and blackberry thickets.

KEY HABITAT REQUIREMENTS

High elevation (above 1050 m) shrub or sapling thickets.

REPRODUCTION

Essentially nothing is known of the breeding season in the Southeast, and no nest with eggs has been found in the region. The season probably extends from early June to early July. Nests are built in shrubs or saplings, within 10 feet (3 m) of the ground. The usual clutch size is 3 or 4.

FOOD HABITS

Essentially the same as the Willow Flycatcher. They sally out after flying insects in thickets and bogs.

GUILD

Bush nesting, bush hawking insectivore.

REFERENCES

Bent 1942:204; Burleigh 1958:381; DeGraaf and Rudis 1986:248; Ehrlich et al. 1988:388; Forbush and May 1939:317; Imhof 1976:269; James and Neal 1986:230; Lowery 1974:434; Mengel 1965:314; Monroe et al. 1988:37; Oberholser 1974(II):553; Potter et al. 1980:231; Rappole et al. 1983:202; Robbins et al. 1986:39; Robinson 1990:140; Sprunt 1954:297; Sprunt and Chamberlain 1970:356; Stewart and Robbins 1958:204.

Yellow-bellied Flycatcher

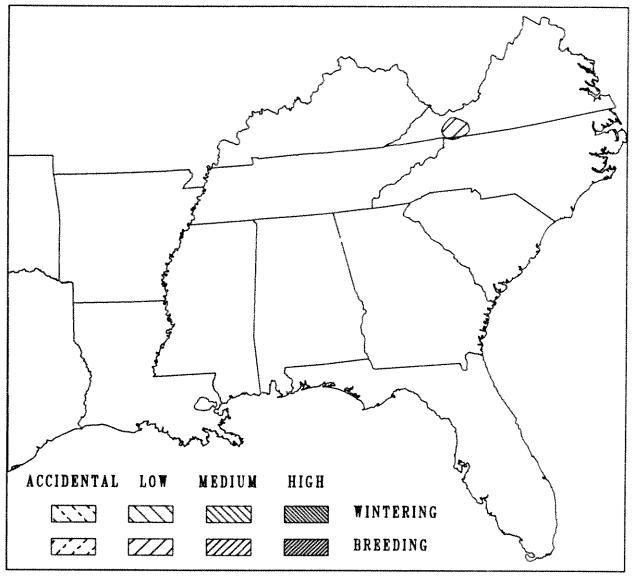
Empidonax flaviventris **YBFL**

PROTECTION STATUS:

Forest Service sensitive on the Jefferson National Forest.

ABUNDANCE STATUS:

Breeding-- VR only in high mountains of southwest Virginia, such as Mount Rogers. Winter south of the United States.



PRIMARY HABITATS:

Mainly in high elevation spruce-fir forests; favored habitats are moist openings in these forests with a rich groundcover of mosses.

KEY HABITAT REQUIREMENTS:

Moist moss covered openings in high elevation spruce-fir forests, may utilize root wads (vikhrots) of fallen spruces for nesting.

SAMPLE BREEDING DENSITIES:

Not recorded on a BBS or BBC in the region.

REPRODUCTION:

The season extends from late May to late July. Nests in the primary breeding range to the north of the region are usually built in mats of mosses, on or only a meter or so above the ground, and frequently in the root masses (vikhrots) of upended spruce or fir trees. Clutch size is generally 3 or 4, with 5 being somewhat rare.

FOOD HABITS:

Yellow-bellied Flycatchers are active foragers in low vegetation, where they take many spiders, as well as large numbers of Hymenoptera, particularly ants, and other insects.

GUILD:

Ground or bush nesting, bush or herbaceous gleaning or hawking insectivore.

REFERENCES:

Bent 1942:174; DeGraaf and Rudis 1986:246; DeGraaf et al. 1980:292; Ehrlich et al. 1988:390; Forbush and May 1939; Imhof 1976:267; James and Neal 1986:228; Monroe et al. 1988; Potter et al. 1980:229; Rappole et al. 1983:202; Robbins et al. 1986; Robinson 1990:139; Sprunt and Chamberlain 1970:354; Stewart and Robbins 1958:202.

Willow Flycatcher

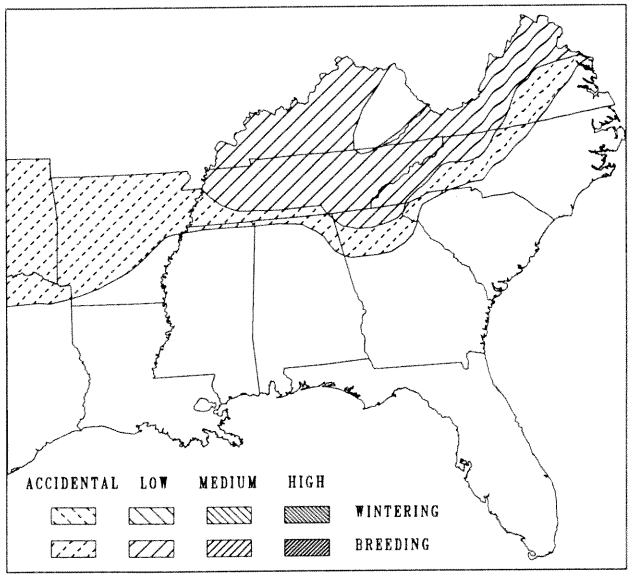
Empidonax traillii WIFL

PROTECTION STATUS

State listed as Poorly Known in Alabama. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— U to locally FC in mountain valleys along streams; quite R above 2000 feet (850 m); R to VR, and local in the Piedmont, mostly in Virginia. Winter south of the United States. Arrive very late, generally from mid-May to late May; depart from mid-August to mid-September.



PRIMARY HABITATS

Generally in shrub thickets along streams or ponds in open country; favor alders and willows; seldom far from water. Also inhabit bogs, but to a lesser extent than streamside shrubbery.

KEY HABITAT REQUIREMENTS

Shrub or sapling thickets in open country, generally near water.

SAMPLE BREEDING DENSITIES

0.7(3) shrub-seedling elm-ash-cottonwood, 39(18) sapling/poletimber elm-ash-cottonwood (small plot).

REPRODUCTION

The nesting season is apparently from early June to late June, with a probable peak in early and mid-June (few nests with eggs have been found in the region). Nests are built in shrubs or small trees, usually 2-8 feet (.6-3 m) from the ground, in thickets. The clutch size is 3 or 4, rarely 2.

FOOD HABITS

Sally after flying insects from shrubs and saplings in thickets, foraging entirely within 20 feet (6 m) of the ground.

GUILD

Bush nesting, bush hawking insectivore.

REFERENCES

Bent 1942:197; Burleigh 1958:381; DeGraaf and Rudis 1986:249; DeGraaf et al. 1980:296; Ehrlich et al. 1988:388; Forbush and May 1939:317; Imhof 1976:267; James and Neal 1986:230; Lowery 1974:433; Mengel 1965:314; Monroe et al. 1988:37; Oberholser 1974(II):553; Potter et al. 1980:230; Rappole et al. 1983:202; Robbins et al. 1986:39; Robinson 1990:141; Sprunt 1954:297; Sprunt and Chamberlain 1970:356; Stewart and Robbins 1958:204; Verner and Boss 1980:191.

Least Flycatcher

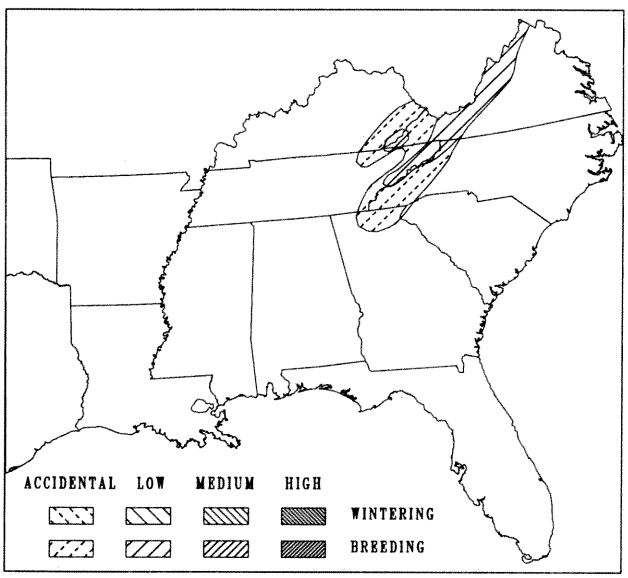
Empidonax minimus **LEFL**

PROTECTION STATUS

State listed as Threatened by Kentucky Academy of Sciences and Kentucky Nature Preserves Commission. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program.

ABUNDANCE STATUS

Breeding— very local, being U in many areas of the mountains, FC in some others, but C in only a few areas. Occur mainly between 2500-4500 feet (750-1350 m). Wintering— R to U in extreme southern Florida; bulk of the breeding population winters south of the Unites States. Spring arrival— mid-April to early May; fall departure— mid-September to early October.



PRIMARY HABITATS

Breeding— favor groves, open woods, streamside trees, woods in residential areas, and golf courses; mostly in rural, open country where scattered hardwoods are present. Avoid deep woods, and infrequent in conifers. Wintering— generally at the edge of hammocks and other woods, or in thickets.

KEY HABITAT REQUIREMENTS

Breeding— open woods or groves in the mountains, but few strict requirements. Wintering— shrubs, saplings, or other brushy places.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in grass/forb oak-hickory, 15(2) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 13 of 888 BBS routes in the region, 1966-1985; maximum route mean 10 birds, overall mean 0.02±0.33 birds/route, total of route means 16 birds.

SAMPLE WINTER DENSITIES

1(3) sawtimber longleaf pine-slash pine.

REPRODUCTION

The nesting season extends from mid-May to mid-June, with the peak from late May to early June. Nests are built on horizontal limbs, well out from the trunks of hardwood trees (rarely conifer), generally 15-25 feet (4-8 m) off the ground. The clutch size is most commonly 4, but 3, 5, and 6 also occur.

FOOD HABITS

Essentially only flying insects, caught in flight from a perch. The perch is usually a branch of a tree in a fairly open situation, and foraging (in the summer) is mainly 15-50 feet (4-15 m) from the ground.

GUILD

Tree nesting, arboreal hawking insectivore.

REFERENCES

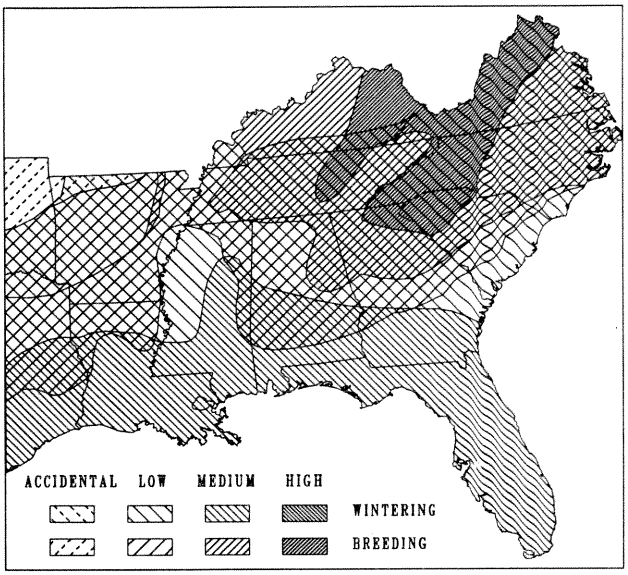
Bent 1942:213; Burleigh 1958:382; DeGraaf and Rudis 1986:250; DeGraaf et al. 1980:300; Ehrlich et al. 1988:384; Forbush and May 1939:318; Imhof 1976:270; James and Neal 1986:233; Lowery 1974:434; Mengel 1965:315; Monroe et al. 1988:37; Oberholser 1974(II):555; Potter et al. 1980:232; Rappole et al. 1983:203; Robbins et al. 1986:39; Robinson 1990:142; Sprunt and Chamberlain 1970:356; Stewart and Robbins 1958:205.

Eastern Phoebe

Sayornis phoebe **EAPH**

ABUNDANCE STATUS

Breeding— FC to C in the mountains; mostly FC east of the mountains. Wintering— generally FC over the Coastal Plain and most of the Piedmont; rather U in the mountains. Migration mainly in March, and October - November.



PRIMARY HABITATS

Breeding— usually, but not necessarily, near water; the preferred habitats are near small bridges over creeks, in farmyards, near cliffs and waterfalls. Wintering— widespread in open or partly open stream margins, farmyards, hedgerows, stubble fields, wood margins, and even residential areas.

KEY HABITAT REQUIREMENTS

Breeding— ledges, such as on buildings, under bridges, or on cliffs; no other essential requirements. Wintering— no essential requirements, but usually in open habitats.

SAMPLE BREEDING DENSITIES

0.6(2) sawtimber elm-ash-cottonwood, 8.3(7) sawtimber oak-hickory, 9(2) shrub-seedling mixed pine-hardwood. Recorded on 331 of 888 BBS routes in the region, 1966-1985; maximum route mean 13 birds, overall mean 1.03±2.05 birds/route, total of route means 912 birds.

SAMPLE WINTER DENSITIES

1(1) Everglades, 1(1) shrub-seedling southern scrub oak, 1(1) sapling/poletimber longleaf pine-slash pine, 1(2) sawtimber elm-ash-cottonwood, 1(1) shrub-seedling Virginia pine-pitch pine, 1(2) sapling/poletimber Virginia pine-pitch pine, 1(5) grass/forb mixed pine-hardwood, 1(3) grass/forb oak-hickory, 7(1) sapling/poletimber oak-gum-cypress, 14(2) sapling/poletimber live oak maritime.

REPRODUCTION

The nesting season ranges from late March to mid-July, with the peak from mid-April to late May. Nests are built in crannies or on ledges in sheltered places; most commonly underneath bridges over streams, but also on rafters of barns and farm houses, on cliff ledges, and other spots. Five is the most common clutch size, with a range from 3 to 8.

FOOD HABITS

Sally for flying insects from a perch, such as a bare twig or telephone wire, usually during the warmer months; do much feeding from the ground, dropping onto prey from a perch, especially in winter.

GUILD

Ledge nesting, hawking or pouncing insectivore at variable heights.

REFERENCES

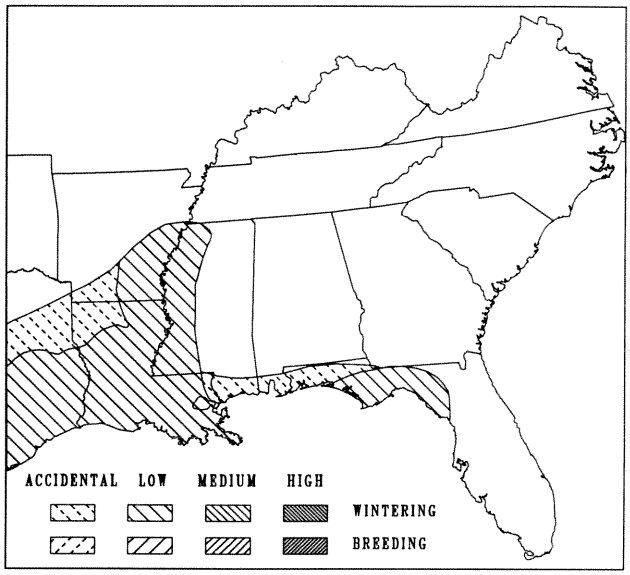
Bent 1942:140; Burleigh 1958:376; DeGraaf and Rudis 1986:251; DeGraaf et al. 1980:290; Ehrlich et al. 1988:378; Forbush and May 1939:313; Imhof 1976:264; James and Neal 1986:233; Lowery 1974:430; Mengel 1965:311; Monroe et al. 1988:37; Oberholser 1974(II):547; Potter et al. 1980:228; Rappole et al. 1983:201; Robbins et al. 1986:36; Robinson 1990:143; Root 1988:149; Sprunt 1954:294; Sprunt and Chamberlain 1970:353; Stewart and Robbins 1958:201.

Vermilion Flycatcher

Pyrocephalus rubinus VEFL

ABUNDANCE STATUS

Winter—Uncommon but regular in small numbers along the western Gulf Coast in Louisiana, Texas, and southwestern Arkansas, mid-September to March; Rare farther east into southwestern Tennessee, Mississippi, coastal Alabama, and the Florida panhandle.



PRIMARY HABITATS

Winter—Riparian woodland of cottonwood and willow, or scattered shrubs and trees near water, in a variety of forest types; the water is often a watering hole or farm pond made by people.

KEY HABITAT REQUIREMENTS

Winter—"the periphery of a small pond that has at least a few willows on its edge." (Lowery 1974:437)

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Vermilion Flycatchers glean and hawk for insects in the outer foliage of shrubs and small trees.

GUILD

Herb, bush or arboreal gleaning, hawking or pouncing insectivore

REFERENCES

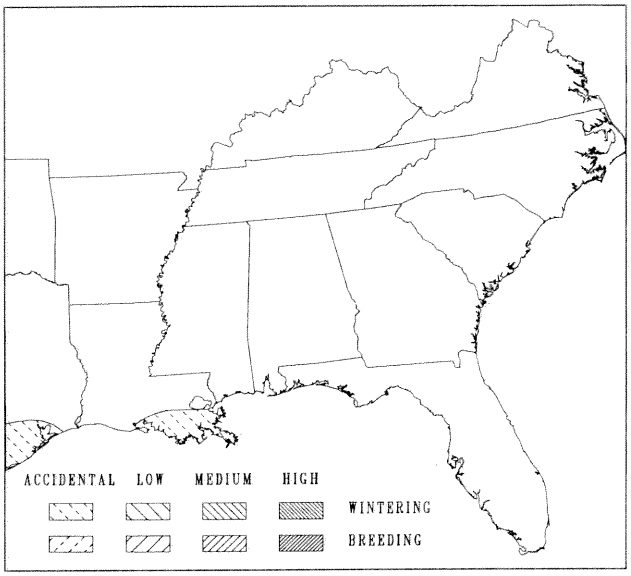
Barbour et al. 1973:51; Bent 1942:302; Burleigh 1958:387; Ehrlich et al. 1988:382; Imhof 1976:272; James and Neal 1986:235; Lowery 1974:437; Mengel 1965:318; Monroe et al. 1988:38; Oberholser 1974 (II):565; Potter et al. 1980:235; Rappole et al. 1983:205; Robinson 1990:144; Root 1988:151; Sprunt 1954:299; Sprunt and Chamberlain 1970:614; Sutton 1967:350.

Ash-throated Flycatcher

Myiarchus cinerascens ATFL

ABUNDANCE STATUS

Winter—Very Rare, early October early April, in the Mississippi River Delta region of Louisiana and along the Texas Gulf Coast. They may also winter in the Florida Keys.



PRIMARY HABITATS

These birds are found in coastal Live Oak (*Quercus virginiana*) thickets, mottes, and chenieres during the winter, and in arid lands during the breeding season. They may also use mangroves.

KEY HABITAT REQUIREMENTS

Winter— Not presently known.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Ash-throated Flycatchers are primarily insectivorous but also consume fruit. Most of the foraging is hawking from a perch after such aerial prey as bees, wasps, and ants; they glean foliage for caterpillars and other food as well. During the winter the birds are usually observed below 2 m, and frequently glean rather than hawk for insect prey.

GUILD

Bush or arboreal hawking or gleaning insectivore or omnivore

REFERENCES

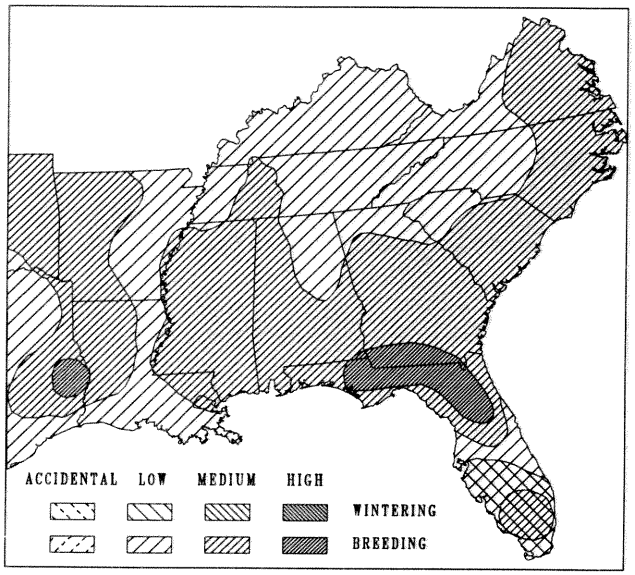
Bent 1942:128; Ehrlich et al. 1988:372; Imhof 1976:262; Lowery 1974:430; Murphy 1982; Oberholser 1974 (II):545; Potter et al. 1980:228; Rappole et al. 1983:201, 459; Robbins et al. 1986:36; Robinson 1990:144; Root 1988:150; Scott et al. 1977:57; Sprunt 1954:293; Stewart and Robbins 1958:201; Sutton 1967:337; Verner and Boss 1980:188.

Great Crested Flycatcher

Myiarchus crinitus **GCFL**

ABUNDANCE STATUS

Breeding— C in the Coastal Plain; FC to C in the Piedmont; U to FC in the lower mountains, but generally absent above 4500 feet (1350 m). Wintering— U to FC in southern Florida, mainly at the southern tip and Keys; majority of the breeding population winters south of Florida. Spring arrival— late March to late April; fall departure— mid-September to mid-October.



PRIMARY HABITATS

All seasons— medium-growth to somewhat open woods and forest; occur in hardwoods, mixed woods, or pines (no clear preference); also found in groves and wooded residential areas, but generally scarce in dense forests.

KEY HABITAT REQUIREMENTS

Breeding— woodlands or forests, generally somewhat open, with a suitable cavity for a nest. Wintering— a wide variety of woodlands and forests.

SAMPLE BREEDING DENSITIES

2(3) sawtimber loblolly pine-shortleaf pine, 2.3(10) sapling/poletimber oak-hickory, 12(2) sawtimber live oak maritime, 15(5) sapling/poletimber mixed pine-hardwood, 25(4) sawtimber oak-gum-cypress. Recorded on 535 of 888 BBS routes in the region, 1966-1985; maximum route mean 43 birds, overall mean 3.71±5.58 birds/route, total of route means 3295 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber live oak maritime,7(1) sapling/poletimber oak-gum-cypress, 7.3(6) sapling/poletimber longleaf pine-scrub oak.

REPRODUCTION

The season extends from late March (in Florida) to early July, with the peak from early May to early June. These flycatchers nest in vacant cavities. Generally these cavities are old woodpecker holes in dead trees or stubs, but they also nest in bird boxes, natural cavities, and even mailboxes. Nests are lined with twigs and often include a shed snakeskin. The clutch size is usually 5 or 6, with 4, 7, or 8 eggs rare.

FOOD HABITS

Varied; sally after flying insects from a branch, generally in the canopy; hover at vegetation to take caterpillars and other insects; occasionally take fruits and berries. Do not hunt from exposed perches.

GUILD

Cavity nesting, arboreal hawking insectivore.

REFERENCES

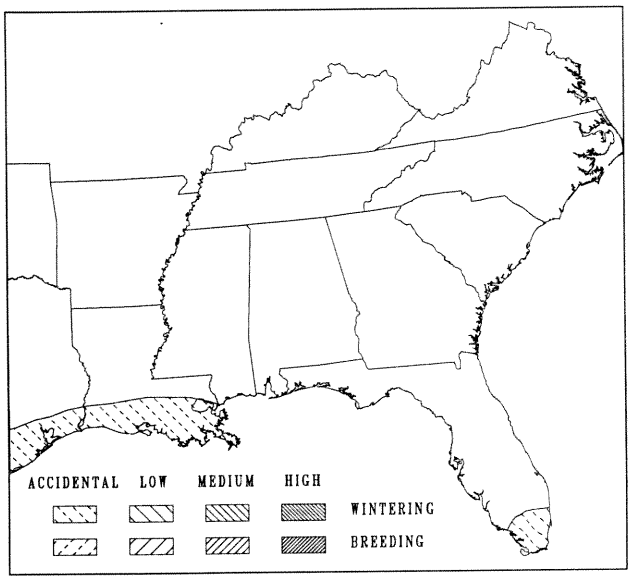
Bent 1942:106-122; Burleigh 1958:373-376; DeGraaf and Rudis 1986:252; DeGraaf et al. 1980:288; Ehrlich et al. 1988:370; Forbush and May 1939:311; Imhof 1976:262; James and Neal 1986:235; Lowery 1974:428; Mengel 1965:310; Monroe et al. 1988:38; Oberholser 1974(II):542; Potter et al. 1980:227; Rappole et al. 1983:200; Robbins et al. 1986:36; Robinson 1990:144; Root 1988:151; Scott et al. 1977:55; Sprunt 1954:291-294; Sprunt and Chamberlain 1970:351, 352; Stewart and Robbins 1958:199.

Brown-crested Flycatcher

Myiarchus tyrannulus **BCFL**

ABUNDANCE STATUS

Winter—Occasional and Very Rare, late November-late January, along the Texas coast, in southeastern Louisiana in the Mississippi River delta, and extreme south Florida.



PRIMARY HABITATS

Winter—Riparian woodland of a variety of types, and coastal live oak (*Quercus virginiana*) thickets, mottes, and chenieres.

KEY HABITAT REQUIREMENTS

Winter—Not presently known.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Insects and possibly some fruit. These birds are the subtropical counterparts of Great Crested Flycatchers (*M. crinitus*).

GUILD

Hawking insectivore at variable heights

REFERENCES

Bent 1942:123, 127; Ehrlich et al. 1988:372; Lowery 1974:430; Murphy 1982; Oberholser 1974 (II):544; Rappole et al. 1983:201, 459; Scott et al. 1977:56.

Western Kingbird

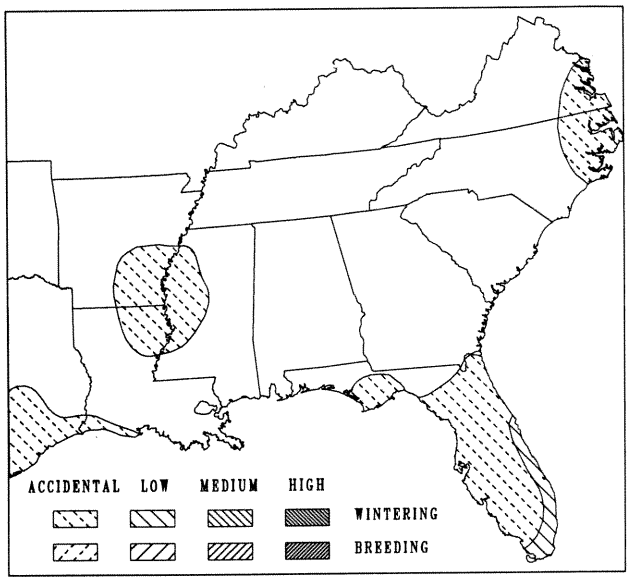
Tyrannus verticalis **WEKI**

PROTECTION STATUS

Monitored by Arkansas Natural Heritage Commission.

ABUNDANCE STATUS

Small numbers winter in the southern half of Florida, mainly along the east coast and in the Keys. Breed mainly in the western United States; occur in fall (late September to November) along the Atlantic coast. Fall arrival in southern Florida is mid-October; depart in early April.



PRIMARY HABITATS

Open country. Usually on telephone wires, fences, or other exposed perches in the vicinity of fields, pastures, and other open spots.

KEY HABITAT REQUIREMENTS

Extensive open country with plenty of exposed perches.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Most foraging is done by sallying after flying insects, but they frequently drop to the ground to feed on insects.

GUILD

Hawking or pouncing insectivore at variable heights.

REFERENCES

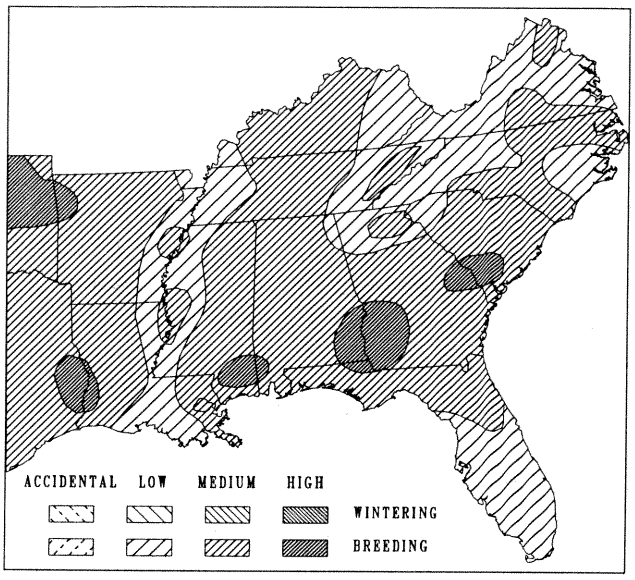
Bent 1942:57; Burleigh 1958:371; Ehrlich et al. 1988:364; Forbush and May 1939:310; Imhof 1976:260; James and Neal 1986:236; Lowery 1974:424; Monroe et al. 1988:38; Oberholser 1974(II):536; Potter et al. 1980:225; Rappole et al. 1983:199; Robbins et al. 1986:36; Robinson 1990:145; Root 1988:152, 284; Sprunt 1954:289; Sprunt and Chamberlain 1970:349; Stewart and Robbins 1958:199; Verner and Boss 1980:187.

Eastern Kingbird

Tyrannus tyrannus **EAKI**

ABUNDANCE STATUS

Breeding— C over most of the Coastal Plain and Piedmont; U in mountain valleys, and generally absent above 3000 feet (900 m). Winter south of the United States. Spring arrival— late March to Mid-April, rarely to late April; fall departure— mid-August to late September. A heavy fall migration occurs along the coast.



PRIMARY HABITATS

Birds of open country. Prefer areas with scattered trees, fences, telephone wires, and fields. Groves and roadsides are typical habitats.

KEY HABITAT REQUIREMENTS

Open country with scattered trees, telephone wires, or other perches.

SAMPLE BREEDING DENSITIES

1(2) sapling/poletimber longleaf pine-slash pine, 1(2) sawtimber longleaf pine-slash pine, 8(2) grass/forb mixed pine-hardwood, 15(2) sapling poletimber (edge) elm-ash-cottonwood (small plot), 10(3) grass/forb bay swamp-pocosin. Recorded on 523 of 888 BBS routes in the region, 1966-1985; maximum route mean 36 birds, overall mean 3.32±4.65 birds/route, total of route means 2945 birds.

REPRODUCTION

The nesting season is from early May to mid-July, with the peak from late May to mid-June. The nests are typical cup nests built in trees growing in the open, usually 15-25 feet (4-8 m) high. They frequently are well out from the trunks on horizontal limbs. The normal clutch is 3, sometimes 4 or 5, eggs.

FOOD HABITS

Kingbirds dart after flying insects from a conspicuous perch in a tree, on a fence, or on a telephone wire. In addition to flying insects, a few caterpillars and berries are gleaned from leaves and twigs.

GUILD

Tree nesting, hawking insectivore at variable heights.

REFERENCES

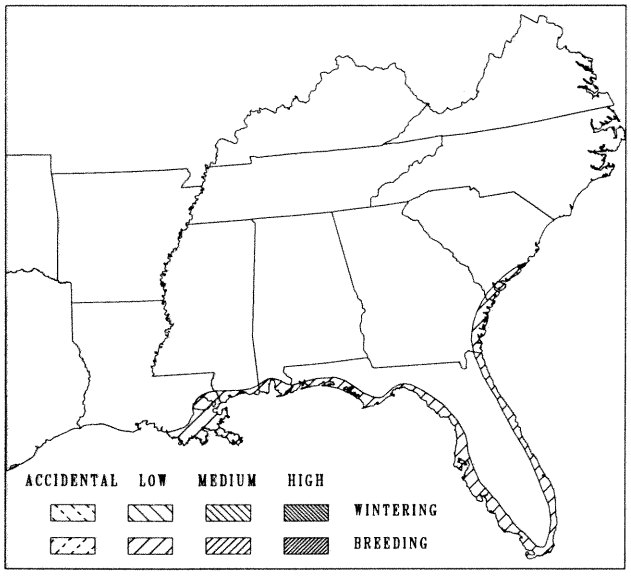
Bent 1942:11; Burleigh 1958:367; DeGraaf and Rudis 1986:253; DeGraaf et al. 1980:286; Ehrlich et al. 1988:360; Forbush and May 1939:308; Imhof 1976:257; James and Neal 1986:236; Lowery 1974:421; Mengel 1965:309; Monroe et al. 1988:38; Oberholser 1974(II):533; Potter et al. 1980:224; Rappole et al. 1983:198; Robbins et al. 1986:36; Robinson 1990:146; Root 1988:152; Sprunt 1954:286; Sprunt and Chamberlain 1970:347; Stewart and Robbins 1958:198.

Gray Kingbird

Tyrannus dominicensis **GRAK**

ABUNDANCE STATUS

Breeding— C in the southern half of Florida, particularly in the Key. Decreasing in abundance northward; thus, R and local in northwestern Florida and the coasts of Georgia and South Carolina. Winter south of the United States. Spring arrival— late March to mid-April; fall departure— late August to late September.



PRIMARY HABITATS

Open or semi-open areas near the coast; prefer the edges of mangroves and other thickets where plenty of perches exist; also occur in scattered trees in residential areas, wood margins, golf courses, and rural country.

KEY HABITAT REQUIREMENTS

Scattered trees, shrubs, or thickets not far from salt water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sapling/poletimber live oak maritime.

REPRODUCTION

The breeding season extends from early April to late July, with the peak in mid-May and late May. The cup nests are usually 3-20 feet (1-6 m) from the ground, and are placed in thickets, especially in mangroves. The clutch size is generally 3, with 4 infrequent and 5 rare.

FOOD HABITS

Sally after insects from a perch, or glean insects from vegetation while hovering. Flying insects are the most common food items. Berries and fruit are also taken.

GUILD

Bush or tree nesting, hawking insectivore at variable heights.

REFERENCES

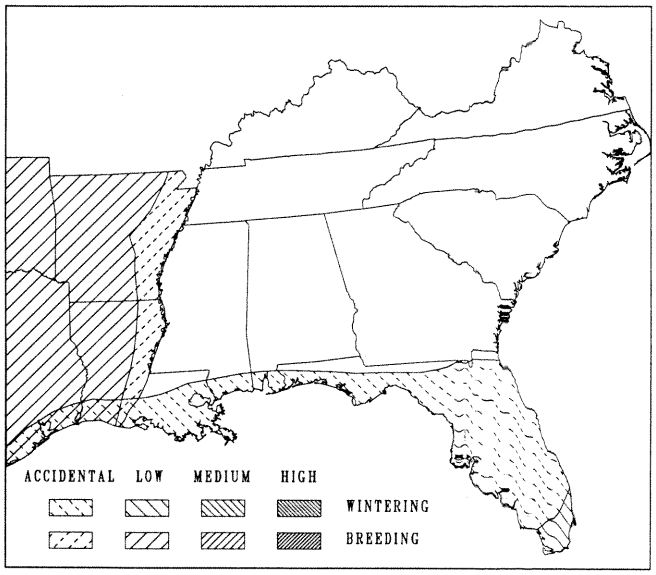
Bent 1942:29; Burleigh 1958:369; Ehrlich et al. 1988:362; Forbush and May 1939:310; Imhof 1976:258; Lowery 1974:422; Potter et al. 1980:224; Rappole et al. 1983:198; Sprunt 1954:287; Sprunt and Chamberlain 1970:348.

Scissor-tailed Flycatcher

Tyrannus forficatus STFL

ABUNDANCE STATUS

Breeding—Common throughout Texas and Oklahoma, the birds are also conspicuous if not as numerous in western Louisiana and Arkansas. Extralimital breeding records exist for Mississippi (Jackson et al. 1975), South Carolina (Mancke 1982), and Tennessee (Robinson 1990); breeding season records exist for Alabama. Winter—Rare along the Gulf Coast and in southern Florida.



PRIMARY HABITATS

Breeding—Open areas, coastal prairies, agricultural lands, pastures, roadsides, areas with scattered trees. Winter habitats are similar.

KEY HABITAT REQUIREMENTS

Breeding—Grass-forb stage habitats in a variety of types associated with some elevated perches, such as scattered trees, fences, powerlines, and scattered trees for nesting. Winter requirements are similar.

SAMPLE BREEDING DENSITIES

Recorded densities range from Visitor to 0.5 pairs/40 ha in open canopy riparian woodland, sawtimber elm-ash-cottonwood (3 censuses), 0.6/40 ha in virgin tallgrass prairie (1 census), Visitor to 5 pairs/40 ha in pasture with scattered oak and shortleaf pine sawtimber trees (2 censuses); all in eastern Oklahoma, where this is the state bird.

REPRODUCTION

The birds build their flimsy open cup nests in open country at a height of 5-80 ft (2-25 m), often below 15 ft (5 m), in a shrub, tree, or building or other structure. Clutches are 3-6, usually 4-5, laid in early April to late July. Scissor-tails are vigorous in defense of their nests against potential predators such as hawks, crows, and others.

FOOD HABITS

Scissor-tails are almost exclusively insectivorous and take large prey such as grasshoppers, crickets, beetles, and others. Much foraging is done by sallying from a perch after airborne quarry, but the birds pounce on or glean terrestrial prey as well.

GUILD

Bush or tree nesting, hawking insectivore at variable heights.

REFERENCES

Barbour et al. 1973:48; Bent 1942:82; Burleigh 1958:372; Ehrlich et al. 1988:368; Forbush and May 1939:311; Hamel et al. 1982:312; Imhof 1976:261; Jackson et al. 1975; James and Neal 1986:238; Lowery 1974:425; Mancke 1982; Mengel 1965:518; Monroe et al. 1988:38; Oberholser 1974 (II):540; Potter et al. 1980:226; Rappole et al. 1983:200; Robbins et al. 1986:36; Robinson 1990:146; Root 1988:152; Sprunt 1954:290; Sprunt and Chamberlain 1970:350, 613; Stewart and Robbins 1958:199; Sutton 1967:333.

Horned Lark

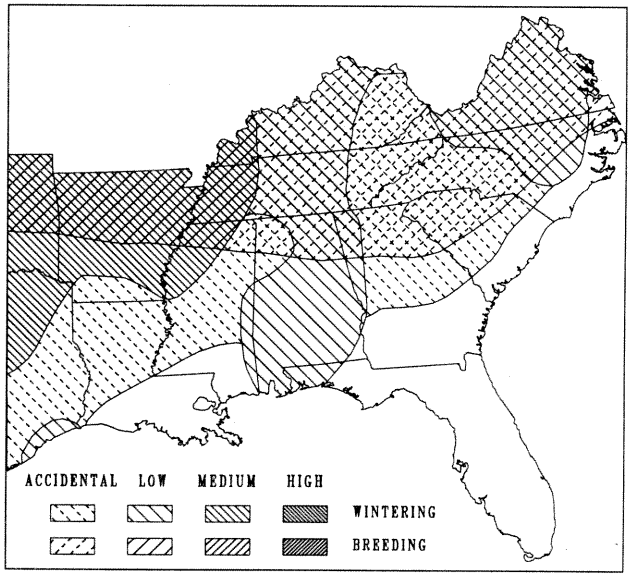
Eremophila alpestris **HOLA**

PROTECTION STATUS

Monitored by Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC to C over most of the Virginia Piedmont and Coastal Plain; generally U and local in the Piedmont of North Carolina, South Carolina, and Georgia; R to U in most of the mountains. Wintering— FC to C over most of Virginia; FC in parts of northern North Carolina, but generally U southward. Fall arrival in October and November, and spring departure mainly in March. Erratic in migration, depending on the severity of the winter (more numerous in southern parts in cold winters).



PRIMARY HABITATS

Always in short grass or bare ground habitats. Breeding— mainly at airports, large plowed fields, and grazed pastures; also around extensive lawns. Wintering— most occur in plowed fields, but also in dunes, short grass pastures, lawns and other bare ground habitats.

KEY HABITAT REQUIREMENTS

All seasons— extensive area of bare ground or short grass.

SAMPLE BREEDING DENSITIES

1.8(6) grass/forb elm-ash-cottonwood. Recorded on 159 of 888 BBS routes in the region, 1966-1985; maximum route mean 343 birds, overall mean 2.31±17.55 birds/route, total of route means 2055 birds.

SAMPLE WINTER DENSITIES

3.7(10) grass/forb elm-ash-cottonwood, 96(7) grass/forb oak-hickory.

REPRODUCTION

The season extends from early March to early July, with the peak from early April to mid-May. Nest sites are bare spots on the ground, frequently next to stones, dirt clods, or clumps of grass. Four eggs are most common, but 3 or 5 are not unusual.

FOOD HABITS

Larks feed exclusively on the ground. In summer they glean insects and other invertebrates from grass or the ground, but in winter they take mostly weed seeds.

GUILD

Ground nesting, terrestrial gleaning insectivore-granivore.

REFERENCES

Bent 1942:320-371; Burleigh 1958:389; DeGraaf and Rudis 1986:254; DeGraaf et al. 1980:306; Ehrlich et al. 1988:396; Forbush and May 1939:321; Imhof 1976:272; James and Neal 1986:240; Lowery 1974:438; Mengel 1965:318; Monroe et al. 1988:38; Oberholser 1974(II):568; Potter et al. 1980:235; Robbins et al. 1986:39; Robinson 1990:147; Root 1988:153; Sprunt 1954:301; Sprunt and Chamberlain 1970:359, 360; Stewart and Robbins 1958:208; Verner and Boss 1980:197.

Purple Martin

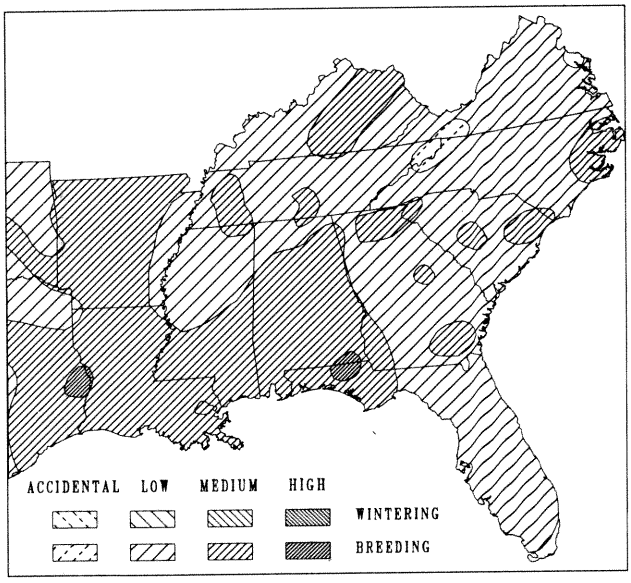
Progne subis **PUMA**

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

Breeding— C over much of the Coastal Plain, but mostly FC in the Piedmont; U to FC in the Southern Appalachians. More numerous in the western than the eastern parts of the region. Not widespread, as they are restricted to areas where proper nest sites are available. Winter south of the United States. Arrive in Florida from late January to mid-February, and by mid-March in Virginia; depart very early, mainly mid-August to early October.



PRIMARY HABITATS

Breed almost entirely at multi-cellular bird houses or gourds; very rarely in other cavities. Feed over adjacent country, primarily over ponds and fields. Often inhabit open residential areas and farmyards, as long as proper nesting cavities are present.

KEY HABITAT REQUIREMENTS

Cavities in open country, preferably multi-celled ones such as martin houses and gourds.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in nine habitats. Recorded on 512 of 888 BBS routes in the region, 1966-1985; maximum route mean 128 birds, overall mean 7.69±13.52 birds/route, total of route means 6828 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber longleaf pine-slash pine.

REPRODUCTION

The season extends from late March to early July, with the peak from mid-April to late May. The nest is built in a cavity, mainly in martin houses and gourds. Martins are highly colonial, and pairs nest in very close proximity to each other. The clutch size is usually 4 or 5, with a range of 3 to 9.

FOOD HABITS

Martins capture insects in sustained flight, frequently foraging several hours before dawn, as well as during daylight.

GUILD

Cavity nesting, aerial insectivore.

REFERENCES

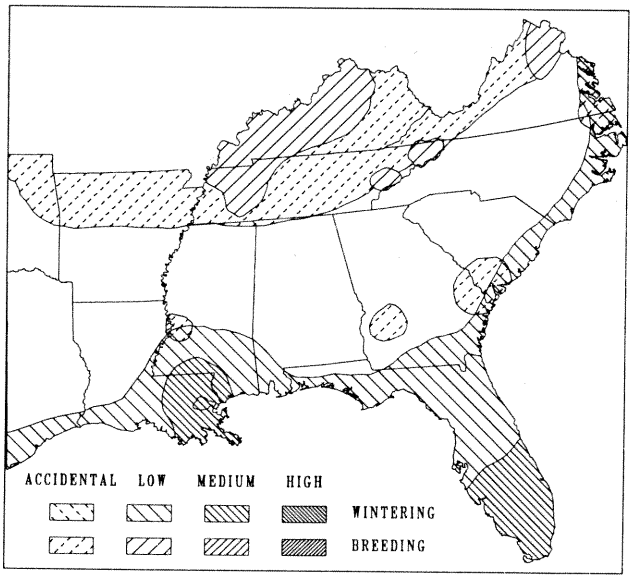
Bent 1942:489; Burleigh 1958:399; DeGraaf and Rudis 1986:255; DeGraaf et al. 1980:318; Ehrlich et al. 1988:398; Forbush and May 1939:334; Imhof 1976:280; James and Neal 1986:242; Lowery 1974:444; Mengel 1965:327; Monroe et al. 1988:39; Oberholser 1974(II):582; Potter et al. 1980:243; Rappole et al. 1983:207; Robbins et al. 1986:43; Robinson 1990:148; Scott et al. 1977:62; Sprunt 1954:311; Sprunt and Chamberlain 1970:366; Stewart and Robbins 1958:216.

Tree Swallow

Tachycineta bicolor **TRES**

ABUNDANCE STATUS

Breeding— locally C on the Virginia coast; mostly R and local elsewhere in Virginia; one North Carolina nesting record (1979); more numerous but local, in western Kentucky and Tennessee. Wintering— C to A along the Florida coast; C in the interior of Florida; generally U as far north as North Carolina and Virginia. Fall arrival in July and August (but heavily in October); spring departure in March and April.



PRIMARY HABITATS

Breeding— mainly where dead trees and stubs occur in or around ponds, lakes, or estuaries. Wintering— very widespread, but generally near water in open country; feed over marshes, ponds, lakes, bays, and in waxmyrtle (*Myrica cerifera)* thickets.

KEY HABITAT REQUIREMENTS

Breeding cavities near open water. Wintering— open country, generally near water. Few essential requirements in winter.

SAMPLE BREEDING DENSITIES

Recorded on 18 of 888 BBS routes in the region, 1966-1985; maximum route mean 3 birds, overall mean 0.01±0.14 birds/route, total of route means 12 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber longleaf pine-slash pine, 17(4) sawtimber longleaf pine-slash pine.

REPRODUCTION

The nesting season extends from late April to early July, with probable peak in mid-May and late May. Nest in cavities, not dug by the birds, usually in old woodpecker holes, but also in bird boxes. They often nest in colonies. Clutches average 5 eggs, but 4 and 6 eggs are frequently laid.

FOOD HABITS

At all seasons they catch flying insects in sustained flight, usually low over ponds, bays, or marshes. They commonly eat berries, especially waxmyrtle berries, in the winter.

GUILD

Cavity nesting, aerial insectivore-omnivore.

REFERENCES

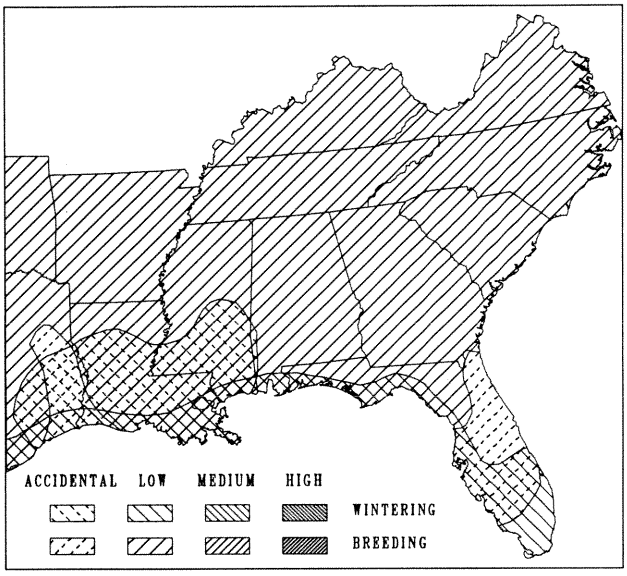
Bent 1942:384; Burleigh 1958:392; DeGraaf and Rudis 1986:256; DeGraaf et al. 1980:308; Ehrlich et al. 1988:396; Forbush and May 1939:324; Imhof 1976:274; James and Neal 1986:242; Lowery 1974:440; Mengel 1965:321; Monroe et al. 1988:39; Oberholser 1974(II): 573; Potter et al. 1980:237; Rappole et al. 1983:206; Robbins et al. 1986:39; Robinson 1990:148; Root 1988:154, 284; Scott et al. 1977:61; Sprunt 1954:302; Sprunt and Chamberlain 1970:361; Stewart and Robbins 1958:209; Verner and Boss 1980:199.

Northern Rough-winged Swallow

Stelgidopteryx serripennis NRWS

ABUNDANCE STATUS

Breeding— FC over most of their range, even in the mountains, but absent at high elevations. Wintering— R to locally U in southeastern Florida. Most of the breeding population winters south of the United States. Spring arrival— mainly early March to mid-March; fall departure— very early, mainly mid-July to late August.



PRIMARY HABITATS

Breeding— usually at vertical banks on the shores of ponds, lakes, rivers, quarries, or road cuts; also nest in drainage pipes in buildings and under bridges. Forage over water or other open country. Wintering— mainly around bodies of water, such as lakes and ponds.

KEY HABITAT REQUIREMENTS

Breeding— vertical banks are preferred; otherwise, a long horizontal drainage pipe or other narrow tunnel. Wintering— no specific requirements, but generally near bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in six habitats, 0.2(9) shrub-seedling elm-ash-cottonwood. Recorded on 409 of 888 BBS routes in the region, 1966-1985; maximum route mean 41 birds, overall mean 1.15±2.63 birds/route, total of route means 1023 birds.

REPRODUCTION

The season extends from late April to mid-June, with the peak from late April to mid-May. Most nests are burrows dug by the birds in vertical banks, but horizontal pipes are also utilized for nesting. These swallows are rather solitary, though several nests may be placed in the same bank. Clutch size is usually 6 or 7, with a range of 4 to 8.

FOOD HABITS

Feed principally on insects caught in sustained flight.

GUILD

Burrow nesting, aerial insectivore.

REFERENCES

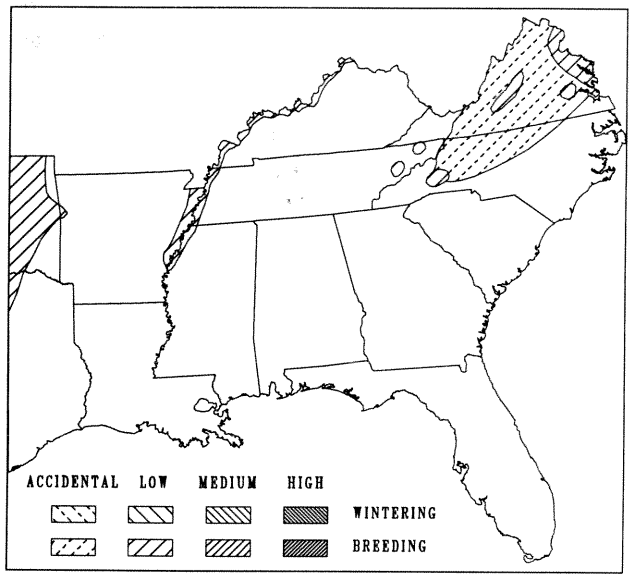
Bent 1942:424; Burleigh 1958:394; DeGraaf and Rudis 1986:257; DeGraaf et al. 1980:312; Ehrlich et al. 1988:400; Forbush and May 1939:327; Imhof 1976:275; James and Neal 1986:243; Lowery 1974:442; Lunk 1962; Mengel 1965:323; Monroe et al. 1988:39; Oberholser 1974(II):576; Potter et al. 1980:239; Rappole et al. 1983:206; Robbins et al. 1986:41; Robinson 1990:149; Root 1988:154; Sprunt 1954:306; Sprunt and Chamberlain 1970:363; Stewart and Robbins 1958:213; Verner and Boss 1980:200.

Bank Swallow

Riparia riparia **BANS**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Sciences and Kentucky Nature Preserves Commission, Significantly Rare in North Carolina. Monitored by Arkansas Natural Heritage Commission, Tennessee Natural Heritage Program, West Virginia Natural Heritage Program.



ABUNDANCE STATUS

Breeding— in several widely scattered colonies in Virginia, and at one Piedmont site in North Carolina, and along the Ohio and Mississippi Rivers south to Rosedale, MS; R and very local. Winter to the south of the United States. Spring arrival from mid-April to mid-May; fall departure is early, from mid-July to mid-September.

PRIMARY HABITATS

Cliffs or bluffs along a river, large stream, or lake; possibly in quarries or road cuts.

KEY HABITAT REQUIREMENTS

A high, steep bank, preferably over 10 feet (3 m) high. Most nests are near water, but this is not an essential requirement.

SAMPLE BREEDING DENSITIES

Recorded on 21 of 888 BBS routes in the region, 1966-1985; maximum route mean 22 birds, overall mean 0.06±0.92 birds/route, total of route means 51 birds. BBS information was not used in preparation of the map of breeding distribution.

REPRODUCTION

The breeding season extends from mid-May to late June, with the peak probably in late May and early June. Nests are long, horizontal burrows, dug by the birds, into high vertical banks. These swallows are highly colonial,often placing dozens of nests in a single bank. Clutch size is usually 4 or 5, with 6 being uncommon.

FOOD HABITS

Feed almost entirely on flying insects caught in sustained flight over water or other open country.

GUILD

Burrow nesting, aerial insectivore.

REFERENCES

Bent 1942:400; Burleigh 1958:393; DeGraaf and Rudis 1986:258; DeGraaf et al. 1980:310; Eagar and Hatcher 1982(A):59; Ehrlich et al. 1988:400; Forbush and May 1939:326; Imhof 1976:275; James and Neal 1986:243; Lowery 1974:441; Mengel 1965:322; Monroe et al. 1988:39; Oberholser 1974(II):574; Potter et al. 1980:238; Rappole et al. 1983:206; Robbins et al. 1986:41; Robinson 1990:150; Sprunt 1954:305; Sprunt and Chamberlain 1970:362; Stewart and Robbins 1958:211.

Cliff Swallow

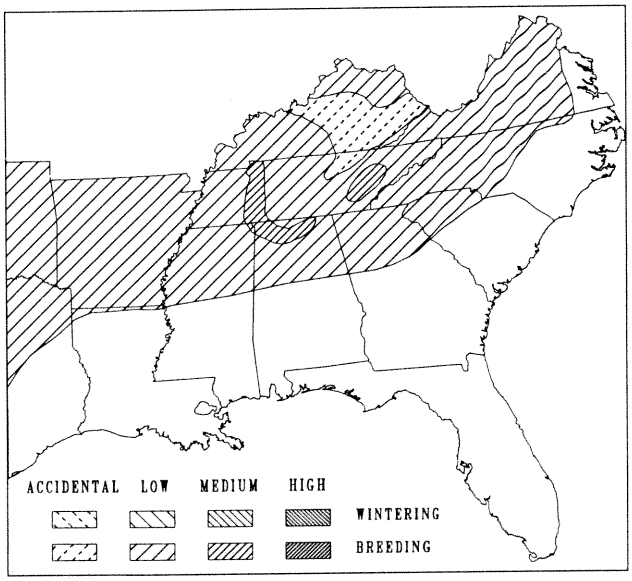
Hirundo pyrrhonota CLSW

PROTECTION STATUS

State listed as Threatened in Mississippi and Rare in West Virginia. Blue Listed by Tate (1981).

ABUNDANCE STATUS

Breeding— generally U and very local, mainly at lakes in the Piedmont, but also sparingly in the Virginia mountains; most common at Kerr Reservoir on the Virginia - North Carolina border. Have declined as breeders in the mountains since 1960, but greatly increased since then in the Piedmont. Some large colonies occur on cement bridges over large reservoirs in the Tennesse River Valley. Arrive mainly from mid-April to early May; depart mainly in August, rarely after mid-September.



PRIMARY HABITATS

Nest primarily under bridges or on dams at large lakes. Thus, breeding sites are very restricted. In the mountains, nest mainly in barns. Foraging occurs over lakes, fields, or other open areas.

KEY HABITAT REQUIREMENTS

Bridges or dams in the Piedmont, and perhaps in the mountains; barns in the mountains.

SAMPLE BREEDING DENSITIES

Recorded on 125 of 888 BBS routes in the region, 1966-1985; maximum route mean 349 birds, overall mean 4.09±24.32 birds/route, total of route means 3631 birds. BBS information was not used in preparation of the map of breeding distribution.

REPRODUCTION

The nesting season extends from mid-May to late June, with a peak in early and mid-June. The unique nests are built of mud and are plastered onto vertical faces or corners beneath bridges, on dams, or barns. The nests are somewhat hemispherical, with a small entrance on the side. These birds are quite colonial, and frequently nest with Barn Swallows. The clutch size is usually 4 or 5.

FOOD HABITS

As with other swallows, Cliff Swallows feed exclusively on insects caught in sustained flight.

GUILD

Nesting on vertical faces, aerial insectivore.

REFERENCES

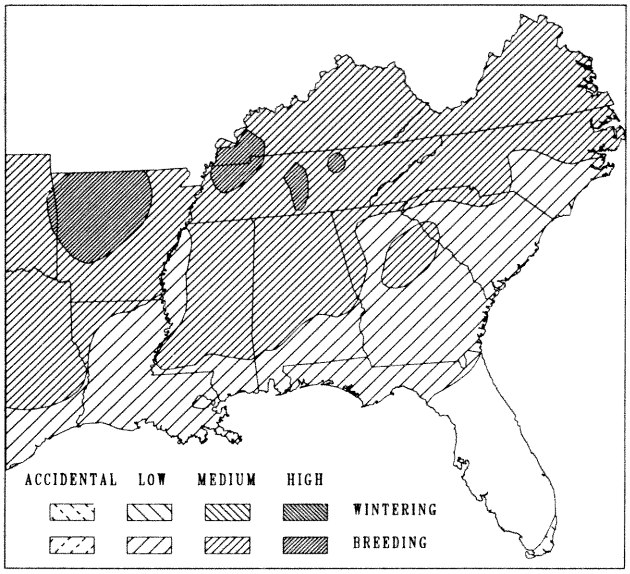
Bent 1942:463-485; Burleigh 1958:398; DeGraaf and Rudis 1986:259; DeGraaf et al. 1980:316; Ehrlich et al. 1988:402; Forbush and May 1939:331; Imhof 1976:278; James and Neal 1986:244; Lowery 1974:444; Mengel 1965:326; Monroe et al. 1988:40; Oberholser 1974(II):578; Potter et al. 1980:242; Rappole et al. 1983:207; Robbins et al. 1986:41; Robinson 1990:151; Sprunt 1954:310; Sprunt and Chamberlain 1970:365; Stewart and Robbins 1958:215; Verner and Boss 1980:202.

Barn Swallow

Hirundo rustica **BARS**

ABUNDANCE STATUS

Breeding— C to A throughout the inland physiograhpic provinces, especially in Kentucky, Tennessee, Arkansas, and the Piedmont further east; mostly R to U elsewhere, decreasing southward. Increasing in numbers and expanding in range. Arrive from mid-March to early April; depart by late September to mid-October, with the heaviest migration in August and early September.



PRIMARY HABITATS

Two major habitats: on dams or under bridges at lakes and ponds, and in barns or sheds in open country. They also nest under bridges over highways, under docks, and on or under many other structures. The vicinity of water is preferred.

KEY HABITAT REQUIREMENTS

Ledges of some type, usually on man-made structures; proximity to water is favored but not essential.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 7 habitats, 10(2) grass/forb mixed pine-hardwood. Recorded on 523 of 888 BBS routes in the region, 1966 1985; maximum route mean 125 birds, overall mean 10.49±16.83 birds/route, total of route means 9319 birds.

REPRODUCTION

The breeding season extends from late April to late July, with the peak from early May to mid-June. Nests are cups placed on ledges, usually in sheltered spots; frequently under bridges, on dams, or inside barns. Colonies are most numerous at bridges over large lakes. Clutch size is usually 4 or 5, with 6 eggs also frequent.

FOOD HABITS

Feed almost solely on flying insects captured in sustained flight over water, fields, or other open habitats.

GUILD

Ledge nesting, aerial insectivore.

REFERENCES

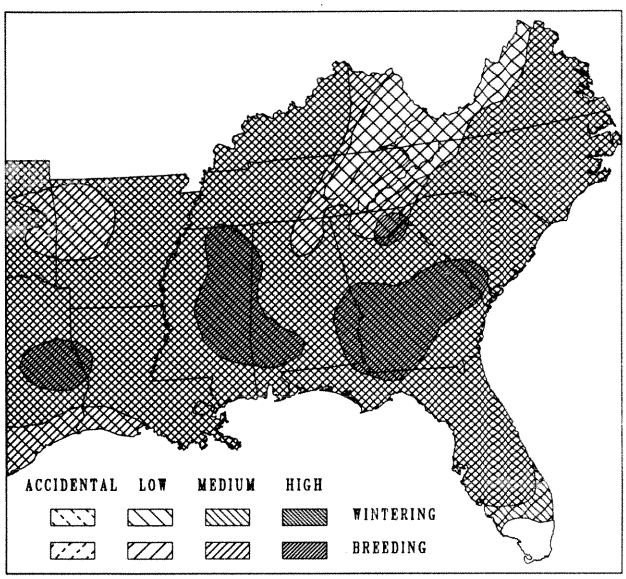
Bent 1942:439-462; Burleigh 1958:396; DeGraaf and Rudis 1986:260; DeGraaf et al. 1980:314; Ehrlich et al. 1988:402; Forbush and May 1939:329; Imhof 1976:276; James and Neal 1986:246; Lowery 1974:443; Mengel 1965:324; Monroe et al. 1988:40; Oberholser 1974(II):577; Potter et al. 1980:240; Rappole et al. 1983:207; Robbins et al. 1986:41; Robinson 1990:151; Root 1988:155; Sprunt 1954:307-310; Sprunt and Chamberlain 1970:364; Stewart and Robbins 1958:214; Verner and Boss 1980:201.

Blue Jay

Cyanocitta cristata **BLJA**

ABUNDANCE STATUS

Breeding and Wintering— C to A throughout the Piedmont and Coastal Plain; FC in the mountains up to 4000 feet (1200 m). Heavy diurnal migration, mainly in the Piedmont, in April-May and September- October.



PRIMARY HABITATS

All seasons— a wide variety of woodlands and forests; most common in open, mature woods, especially in oaks, such as parks, residential areas, and campuses; also common in mixed woods. Not as numerous in deep forests or bottomlands.

KEY HABITAT REQUIREMENTS

Middle-aged to mature trees, preferably oaks, in a wide variety of situations; few strict requirements.

SAMPLE BREEDING DENSITIES

1(1) sawtimber oak-gum-cypress, 6.4(29) sawtimber oak-hickory, 8.2(11) sawtimber cove hardwoods, 8.6(36) sawtimber mixed pine-hardwood, 16(1) sawtimber live oak maritime. Recorded on 536 of 888 BBS routes in the region, 1966-1985; maximum route mean 100 birds, overall mean 11.8±514.77 birds/route, total of route means 10,526 birds.

SAMPLE WINTER DENSITIES

0.5(4) grass/forb elm-ash- cottonwood, 9.4(31) sawtimber mixed pine-hardwood, 52(3) sawtimber live oak maritime. 62(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The breeding season extends from mid-March to early July, with a peak from mid-April to mid-May. The typical cup nest in usually placed on a horizontal limb of a tree from 10-50 feet (3-15 m) above ground. The normal clutch size is 4 or 5; rarely 3 or 6 eggs are laid.

FOOD HABITS

Blue Jays have a varied diet; in summer, they usually glean insects and other invertebrates from vegetation, but in winter they consume mainly nuts and seeds. Acorns are a favored winter food.

GUILD

Tree nesting, arboreal gleaning omnivore.

REFERENCES

Bent 1946:32-56; Burleigh 1958:401-405; DeGraaf and Rudis 1986:262; DeGraaf et al. 1980:322; Ehrlich et al. 1988:408; Forbush and May 1939:337; Imhof 1976:281; James and Neal 1986:247; Lowery 1974:449; Mengel 1965:329; Monroe et al. 1988:40; Oberholser 1974 (II):585; Potter et al. 1980:245; Robbins et al. 1986:43; Robinson 1990:152; Root 1988:157; Sprunt 1954:313-316; Sprunt and Chamberlain 1970:368; Stewart and Robbins 1958:217.

Scrub Jay

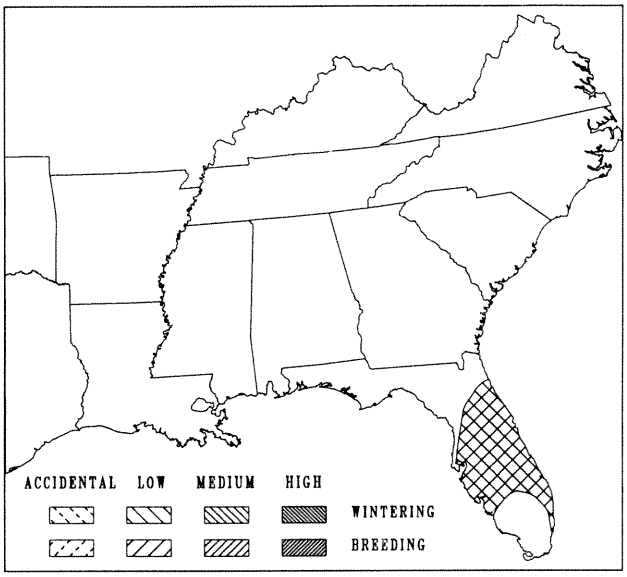
Aphelocoma coerulescens SCJA

PROTECTION STATUS

A. c. coerulescens state listed as Threatened in Florida. Monitored by Oklahoma Natural Heritage Inventory. Blue Listed by Tate (1981). Forest Service sensitive, National Forests in Florida.

ABUNDANCE STATUS

Breeding and Wintering— FC over most of the range, in suitable habitat; locally C in a few places. Non-migratory.



PRIMARY HABITATS

Quite selective; limited to thick scrub vegetation in sandy areas, mainly in various species of scrub oaks; also where sand pine occurs with oaks.

KEY HABITAT REQUIREMENTS

Oaks of sapling or pole-timber size. preferably in poor, sandy soil.

SAMPLE BREEDING DENSITIES

5(1) sapling/poletimber longleaf pine-scrub oak, 7.5(2) shrub-seedling southern scrub oak.

SAMPLE WINTER DENSITIES

20(1) sapling/poletimber longleaf pine-scrub oak, 28(2) shrub-seedling southern scrub oak.

REPRODUCTION

The nesting season extends from mid-March to mid-June, with a peak in mid-April and late April. The usual nest is built in a shrub or small tree and is generally well hidden. Four eggs is the most common clutch size, with 3 or 5 also frequent.

FOOD HABITS

Scrub Jays feed primarily in the vegetation of small oaks or other hardwood saplings. In the warmer months their diet is primarily insects and other small animals gleaned from the vegetation; in winter, nuts, seeds, and fruits are commonly taken.

GUILD

Bush nesting, bush gleaning omnivore.

REFERENCES

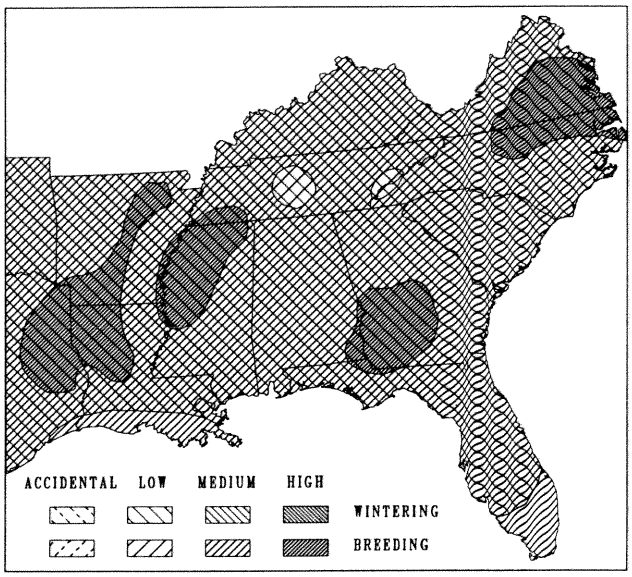
Bent 1946:77-117; Ehrlich et al. 1988:404; Forbush and May 1939:340; Kale 1978:45; Oberholser 1974(II):588; Robbins et al. 1986:46; Root 1988:158; Sprunt 1954:316; Verner and Boss 1980:204.

American Crow

Corvus brachyrhynchos **AMCR**

ABUNDANCE STATUS

All seasons— C essentially everywhere, except rather U in southern Florida; occur on the highest mountains, but not C above 5000 feet (1500 m). Undoubtedly some migration into the Southeast in winter; crows are so common at all seasons that seasonal population changes are difficult to determine.



PRIMARY HABITATS

Breeding— generally in pine or mixed pine - hardwood forests, but feed mostly in cultivated fields, pastures, and other open habitats. Wintering— roost in forests, especially in pines, but continue to forage in a wide variety of open habitats (mainly agricultural ones).

KEY HABITAT REQUIREMENTS

Breeding— woodlands or forest, preferably in pines. Wintering— no essential requirements, other than woods for roosting and open country for foraging.

SAMPLE BREEDING DENSITIES

0.3(8) shrub-seedling elm-ash-cottonwood, 2.2(24) sawtimber oak-hickory, 4.6(10) sapling/poletimber oak-hickory, 8(1) sawtimber longleaf pine-slash pine. Recorded on 536 of 888 BBS routes in the region, 1966-1985; maximum route mean 165 birds, overall mean 20.93±25.25 birds/route, total of route means 18,584 birds.

SAMPLE WINTER DENSITIES

0.5(1) Everglades, 1(1) sapling/poletimber pine savanna, 1(1) sawtimber longleaf pine-scrub oak, 1(1) sapling/poletimber oak-gum-cypress, 12(21) sawtimber mixed pine-hardwood, 66(29) grass/forb elm-ash-cottonwood.

REPRODUCTION

The nesting season extends from late January (in Florida) to early June, with a peak in March and April. The typical nest is built in the crotch of a tree, generally in the canopy of a pine. The nest site is usually in a remote area, and the breeding pair is very quiet and secretive. The clutch size is usually 4 to 6.

FOOD HABITS

Crows take a wide variety of food items, mainly from the ground. In the warmer months they feed mostly on insects and other small animals. In winter they commonly take grain seeds and berries, in addition to small animals.

GUILD

Tree nesting, terrestrial gleaning omnivore.

REFERENCES

Bent 1946:226-274; Burleigh 1958:406; DeGraaf and Rudis 1986:263; DeGraaf et al. 1980:326; Ehrlich et al. 1988:416; Forbush and May 1939:343; Imhof 1976:283; James and Neal 1986:250; Lowery 1974:450; Mengel 1965:332; Monroe et al. 1988:40; Oberholser 1974(II):596; Potter et al. 1980:247; Robbins et al. 1986:46; Robinson 1990:152; Root 1988:162; Sprunt 1954:318; Sprunt and Chamberlain 1970:371, 372; Stewart and Robbins 1958:220; Verner and Boss 1980:208.

Fish Crow

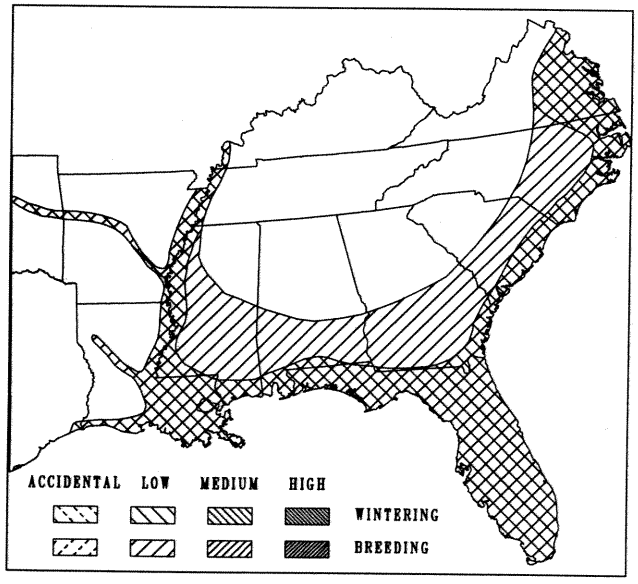
Corvus ossifragus FICR

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Sciences and Kentucky Nature Preserves Commission. Monitored by Tennessee Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C, often A, throughout Florida and tidewater areas of the other states; inland (north of Florida) mostly U to FC, but generally U in the Piedmont and mountain valleys. R in the upper Mississippi Valley. Wintering— essentially the same as for breeding, but usually absent in the Piedmont and Inner Coastal Plain of North and South Carolina and Georgia. Spring arrival— late February to early April; fall departure— early October to mid-November.



PRIMARY HABITATS

Along the coast, occur in a wide variety of habitats; along shores, in marshes, thickets, and even woodlands. Inland, they are more restricted, being found mainly along the shores of lakes and rivers, or in pinewoods. Seldom feed in fields and pastures, though they do occur in towns, residential areas, and other urban areas.

KEY HABITAT REQUIREMENTS

Breeding— woods or thickets, preferably near water; few essential requirements. Wintering— no essential features, though generally near water.

SAMPLE BREEDING DENSITIES

0.4(3) sawtimber oak-hickory, 13(1) sapling/poletimber mixed pine-hardwood.

SAMPLE WINTER DENSITIES

0.4(3) sapling/poletimber pine savanna, 0.4(3) sapling/poletimber Virginia pine-pitch pine, 0.4(3) sawtimber oak hickory, 68(3) sawtimber live oak maritime.

REPRODUCTION

The season extends from late March to mid-June, with a peak from late April to early June. The nests may be high in crotches of trees (usually pines) or in thickets; frequently nest in colonies. The clutch size is seldom other than 4 or 5.

FOOD HABITS

Highly varied; dead fish, garbage, bird eggs, many kinds of small animals, berries, and other items are consumed. Most foraging is done on the ground, especially along shores, but they feed in trees and shrubs as well.

GUILD

Tree or bush nesting, terrestrial gleaning omnivore.

REFERENCES

Bent 1946:275; Burleigh 1958:408; DeGraaf and Rudis 1986:264; DeGraaf et al. 1980:328; Eagar and Hatcher 1982(A):89; Ehrlich et al. 1988:418; Forbush and May 1939:346; Imhof 1976:284; James and Neal 1986:250; Lowery 1974:453; Monroe et al. 1988:40; Oberholser 1974(II):597; Potter et al. 1980:248; Robbins et al. 1986:46; Robinson 1990:153; Root 1988:163; Sprunt 1954:321; Sprunt and Chamberlain 1970:373; Stewart and Robbins 1958:221.

Common Raven

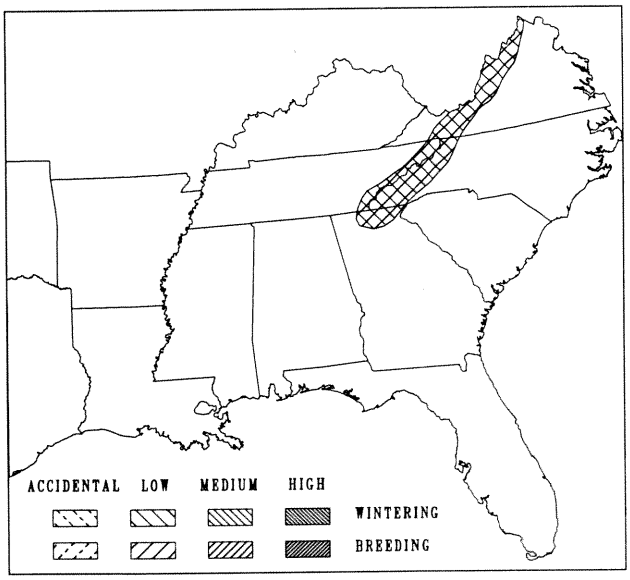
Corvus corax **CORA**

PROTECTION STATUS

State listed as Endangered by Kentucky Academy of Sciences and Kentucky Nature Preserves Commission, and by Tennessee; Significantly Rare in North Carolina, and Rare in West Virginia. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Oklahoma Natural Heritage Inventory. Forest Service sensitive on Chattahoochee, Cherokee, and Daniel Boone National Forests.

ABUNDANCE STATUS

All seasons— U over most of the range, though FC in a few areas; tend to occur in flocks in winter, when several dozen or more individuals may share a roost. Occur mainly above 3500 feet (1050 m), but are present as low as 1500 feet (450 m). Little or no migration of individuals into the Southeast from farther north, but considerable local movements do occur.



PRIMARY HABITATS

Breeding— only in the vicinity of rocky and remote cliffs (where the nest is placed); forage over various habitats, such as open woods, margins, and fields at high elevation. Frequently seen around campgrounds, picnic areas, dumps, and other places where garbage is left. Wintering— widespread in many montane habitats, especially in brushy areas and other open country in remote places.

KEY HABITAT REQUIREMENTS

Breeding— rocky cliffs with ledges (a sheer vertical cliff is unsuitable), especially where far from human habitation. Wintering— no essential requirements.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 4 habitats.

SAMPLE WINTER DENSITIES

0.5(1) shrub-seedling oak-hickory.

REPRODUCTION

The breeding season is early for a passerine, extending from early March to late April; the peak is probably from late March to mid-April. Nests are usually built on ledges on the sides of high cliffs; rarely built in crotches in trees. Five or 6 eggs are most common; 4, 7, or 8 eggs are rare.

FOOD HABITS

Ravens have a highly varied diet, and forage mainly on the ground. Carrion and garbage are commonly consumed, as are small mammals, insects, berries, nuts, and other items.

GUILD

Ledge nesting, terrestrial gleaning omnivore.

REFERENCES

Bent 1946:183-214; Burleigh 1958:405; DeGraaf and Rudis 1986:265; DeGraaf et al. 1980:324; Eagar and Hatcher 1982(A):19; Ehrlich et al. 1988:420; Forbush and May 1939:342; Hooper 1977; Imhof 1976:283; Mengel 1965:331; Monroe et al. 1988:40; Oberholser 1974(II):593; Potter et al. 1980:246; Robbins et al. 1986:46; Robinson 1990:153; Root 1988:164; Sprunt and Chamberlain 1970:370; Stewart and Robbins 1958:218; Verner and Boss 1980:207.

Black-capped Chickadee

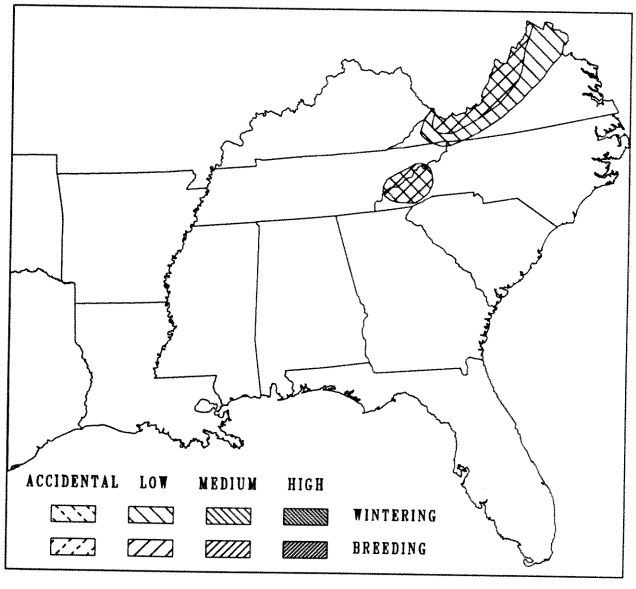
Parus atricapillus **BCCH**

PROTECTION STATUS

State listed as Threatened in North Carolina.

ABUNDANCE STATUS

Breeding— FC in North Carolina part of range, and in northwestern Virginia (near the West Virginia border); mostly U elsewhere in Virginia. Wintering— some movement of birds from north of region into Virginia, so that they are FC over much of that state's mountain region, and U in the northern Piedmont. Little or no migration in winter into North Carolina.



PRIMARY HABITATS

Breeding— in North Carolina, occur in spruce-fir and northern hardwoods, mainly over 4500 feet (1350 m); in Virginia, mainly in hardwoods or mixed forest. Wintering— a wide variety of forests and woodlands, but prefer coniferous or mixed woods. Often in pines in winter.

KEY HABITAT REQUIREMENTS

Breeding— rather mature forests with dead trees or stubs for nesting sites. Wintering— woods of many types, with no strict requirements.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sawtimber cove hardwoods, sawtimber mixed pine-hardwood, 7(1) sawtimber spruce-fir.

SAMPLE WINTER DENSITIES

3(1) sawtimber oak-hickory, 5(1) shrub-seedling oak-hickory.

REPRODUCTION

The breeding season extends from late April to early June, with a probable peak in mid-May and late May. Nest in cavities, generally in dead trees or stubs, but occasionally in bird boxes. The birds may dig their own cavities, or take over vacant ones dug by other species. The clutch size is mostly 6-8; 5, 9, and 10 are rather rare.

FOOD HABITS

In summer, these chickadees glean insects and other small invertebrates from leaves and twigs; whereas, in winter they take insects, larvae, berries, and other fruit.

GUILD

Cavity nesting, arboreal gleaning insectivore-omnivore.

REFERENCES

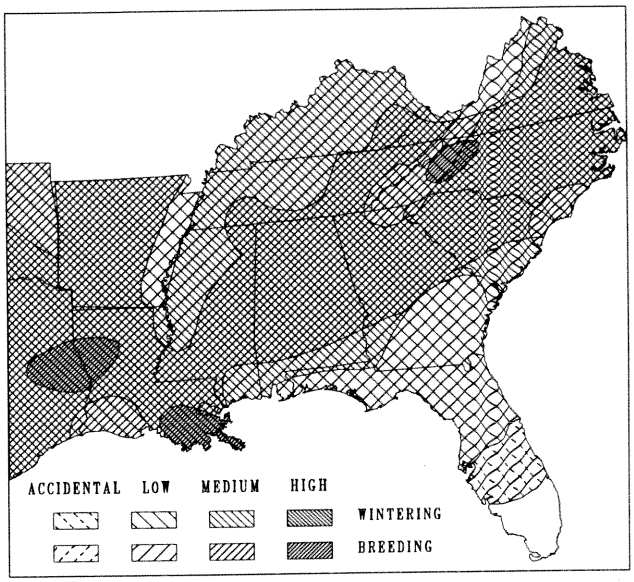
Bent 1946:322-344; DeGraaf and Rudis 1986:266; DeGraaf et al. 1980:330; Ehrlich et al. 1988:424; Forbush and May 1939:347; Monroe et al. 1988:63; Oberholser 1974(II):605; Potter et al. 1980:250; Robbins et al. 1986:54; Robinson 1990:154; Root 1988:165; Scott et al. 1977:63; Stewart and Robbins 1958:222.

Carolina Chickadee

Parus carolinensis **CACH**

ABUNDANCE STATUS

C to VC nearly throughout; occur in mountains up to 5000 feet (1500 m) where Black-capped Chickadees are absent. Non-migratory.



PRIMARY HABITATS

All seasons— woods and forests of many types, but are most common in mixed pine-hardwood forests. Common in pinewoods, but less so in purely hardwood forests. Widespread in wooded residential areas, as well as in remote forested areas.

KEY HABITAT REQUIREMENTS

Breeding— mature woods with a few dead trees or stubs. Wintering— no essential requirements other than woodlands.

SAMPLE BREEDING DENSITIES

1(1) shrub-seedling loblolly pine-shortleaf pine, 1(2) shrub-seedling elm-ash-cottonwood, 13(34) sawtimber oak-hickory, 15(6) sawtimber oak-gum-cypress, 16(10) sawtimber cove hardwoods. Recorded on 515 of 888 BBS routes in the region, 1966-1985; maximum route mean 75 birds, overall mean 5.20±7.67 birds/route, total of route means 4617 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber live oak maritime, 2.7(6) grass forb oak-hickory, 14(19) sawtimber oak-hickory, 15(7) sapling-poletimber Virginia pine-pitch pine, 16(31) sawtimber mixed pine-hardwood, 24(1) sapling/poletimber oak-hickory.

REPRODUCTION

The nesting season extends from early April to mid-June, with the peak from mid-April to early May. Chickadees nest in cavities, usually in dead trees or stubs, at times in bird boxes. They may dig their own cavities or utilize existing ones. Six eggs represent the most frequent clutch size, with 5, 7, or 8 eggs not rare.

FOOD HABITS

Glean insects from the twigs and foliage of trees in summer, and in winter forage mainly on insect larvae or eggs, berries, or seeds.

GUILD

Cavity nesting, arboreal gleaning insectivore-omnivore.

REFERENCES

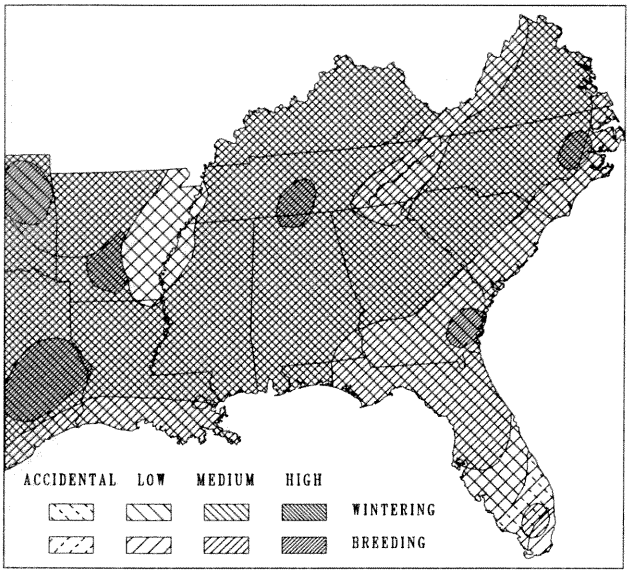
Bent 1946:344-355; Burleigh 1958:409; Ehrlich et al. 1988:426; Forbush and May 1939:349; Imhof 1976:286; James and Neal 1986:252; Lowery 1974:454; Mengel 1965:335; Monroe et al. 1988:41; Oberholser 1974(II):606; Potter et al. 1980:251; Robbins et al. 1986:54; Robinson 1990:154; Root 1988:166; Scott et al. 1977:64; Sprunt 1954:323; Sprunt and Chamberlain 1970:374; Stewart and Robbins 1958:224.

Tufted Titmouse

Parus bicolor ETTI*

ABUNDANCE STATUS

C to VC throughout; occur in the mountains up to 5000 feet (1500 m). Non-migratory.



PRIMARY HABITAT

All seasons— widespread in woodlands and forests; prefer deciduous woods to pines. Both upland woods and bottomlands are suitable; commonly occur in residential areas, parks, and other open woods.

KEY HABITAT REQUIREMENTS

Breeding— woods with a few dead trees or stubs for nesting. Wintering— woodlands of a great variety.

SAMPLE BREEDING DENSITIES

1(1) shrub-seedling loblolly pine-shortleaf pine, 1(1 shrub-seedling mixed pine-hardwood, 11(35) sawtimber mixed pine-hardwood, 13(34) sawtimber oak-hickory, 20(11) sawtimber cove hardwoods, 23(5) sawtimber oak-gum-cypress. Recorded on 514 of 888 BBS routes in the South, 1966-1985; maximum route mean 61 birds, overall mean 6.19±8.25 birds/route, total of route means 5501 birds.

SAMPLE WINTER

0.5(1) sapling/poletimber oak-gum-cypress, 9.8(20) sawtimber oak-hickory, 12(3) sawtimber elm-ash-cottonwood, 16(33) sawtimber mixed pine-hardwood, 20(1) sapling/poletimber oak-hickory.

REPRODUCTION

The season extends from early April to early June, with the peak from late April to mid-May. Titmice nest in cavities in trees or stubs, or in suitable bird boxes. They rarely dig their own cavities. The usual clutch size is 5 or 6; rarely 4, 7, or 8.

FOOD HABITS

During the warmer months, titmice usually glean insects from foliage or twigs of trees, but in winter they take insect eggs, insect larvae, seeds, nuts, and a few other items. Titmice, as well as chickadees, are common at bird feeders in winter, consuming sunflower seeds and suet.

GUILD

Cavity nesting, arboreal gleaning insectivore-omnivore.

REFERENCES

Bent 1946:393-411; Burleigh 1958:411; DeGraaf and Rudis 1986:268; DeGraaf et al. 1980:334; Ehrlich et al. 1988:422; Forbush and May 1939:351; Imhof 1976:286; James and Neal 1986:252; Lowery 1974:455; Mengel 1965:336; Monroe et al. 1988:41; Oberholser 1974(II):608; Potter et al. 1980:252; Robbins et al. 1986:54; Robinson 1990:155; Root 1988:170; Scott et al. 1977:70; Sprunt 1954:324; Sprunt and Chamberlain 1970:376; Stewart and Robbins 1958:225.

Red-breasted Nuthatch

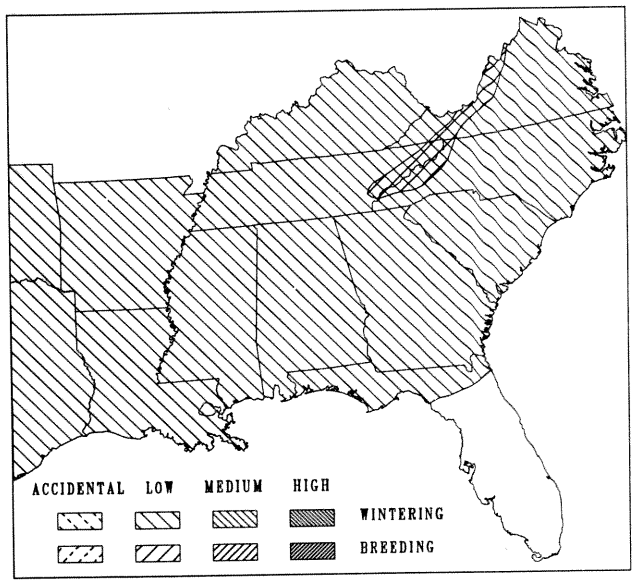
Sitta canadensis **RBNU**

PROTECTION STATUS

Monitored by Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC to C in spruce-fir, but R and local at lower elevations in pines or hemlock; generally above 3500 feet (1050 m), but numerous only above 5000 feet (1500 m). Wintering— very erratic, with a heavy migration into the region generally in alternate winters (in odd-numbered falls); FC to C in some winters, but U in others; usually more in the mountains and Piedmont than in the Coastal Plain. Fall arrival— mid-September to mid-October; spring departure— early April to late April.



PRIMARY HABITATS

Breeding— generally in spruce and/or fir forests; infrequently in hemlocks, and rarely in pines. Favor mature stands. Wintering— prefer coniferous woods, perhaps especially Virginia pines; rarely seen in hardwoods. Occur in mature trees as well as saplings, particularly in rather dense stands; regularly found in residential woodlands.

KEY HABITAT REQUIREMENTS

Breeding— montane coniferous woods with dead trees or stubs. Wintering— coniferous trees, with few other specific requirements.

SAMPLE BREEDING DENSITIES

10(1) sapling/poletimber oak-hickory, 14(2) sawtimber spruce-fir, 17(2) sawtimber white pine-hemlock.

SAMPLE WINTER DENSITIES

0.5(1) shrub-seedling oak-hickory, 1(1) sawtimber elm-ash-cottonwood, 1(1) sapling/poletimber loblolly pine-shortleaf pine, 1(1) sawtimber oak-hickory, 3.5(4) sapling/poletimber Virginia pine-pitch pine, 3.8(13) sawtimber mixed pine-hardwood.

REPRODUCTION

The nesting season extends from mid-May to mid-June, with a probable peak in late May and early June. Nest in cavities, usually dug by the birds, in dead trees or stubs, in a coniferous forest. The clutch size is generally 5 or 6, with 4 or 7 infrequent.

FOOD HABITS

In summer, these birds feed mainly on insects or larvae in the bark of evergreen trees, either on the trunk or on branches. In winter, they take insect larvae or eggs, nuts, and pine seeds.

GUILD

Cavity nesting, arboreal (trunk or foliage) probing or gleaning insectivore-omnivore.

REFERENCES

Bent 1948:22; Burleigh 1958:415; DeGraaf and Rudis 1986:269; DeGraaf et al. 1980:338; Ehrlich et al. 1988:436; Forbush and May 1939:354; Imhof 1976:289; James and Neal 1986:254; Lowery 1974:457; Mengel 1965:341; Monroe et al. 1988:41; Oberholser 1974(II):621; Potter et al. 1980:254; Robbins et al. 1986:59; Robinson 1990:155; Root 1988:175, 285; Scott et al. 1977:74; Sprunt 1954:326; Sprunt and Chamberlain 1970:384; Stewart and Robbins 1958:228; Verner and Boss 1980:216.

White-breasted Nuthatch

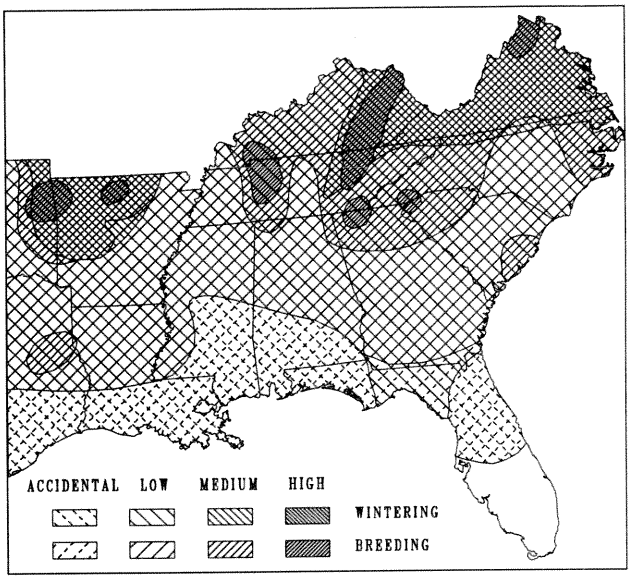
Sitta carolinensis **WBNU**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

U to FC, and fairly widespread, in the mountains (below 5000 feet; 1500 m) and in parts of the upper Piedmont; generally U elsewhere, becoming R near the coast. Formerly regular over much of Florida, but seldom recorded in recent years. Seem to be most numerous in Virginia, decreasing in numbers southward. Light to moderate migration into the area in fall, and thus are slightly more numerous in most localities in winter than in summer.



PRIMARY HABITATS

All seasons— birds of mature trees, preferably hardwoods. Most numerous in rather open upland hardwood forests, but frequently occur in bottomlands, parks, campuses, residential areas, and other places where mature trees are found.

KEY HABITAT REQUIREMENTS

All seasons— mature trees, with stubs, knotholes, or other sites for nesting and roosting cavities; strong preference for hardwoods.

SAMPLE BREEDING DENSITIES

1(1) sawtimber longleaf pine-slash pine, 1(1) sawtimber elm-ash-cottonwood, 5.1(9) sawtimber cove hardwoods, 5.4(3) sawtimber white pine-hemlock, 5.6(5) sawtimber oak-gum-cypress, 6.5(25) sawtimber oak-hickory. Recorded on 222 of 888 BBS routes in the region, 1966-1985; maximum route mean 8 birds, overall mean 0.35±0.96 birds/route, total of route means 314 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber longleaf pine-slash pine, 1(1) grass/forb oak-hickory, 2.8(22) sawtimber mixed pine-hardwood, 3.7(3) sawtimber elm-ash-cottonwood, 4.4(17) sawtimber oak-hickory.

REPRODUCTION

The nesting season extends from mid-March to late May, with the peak from early April to late April. They nest in cavities in living trees, particularly in knotholes. They may dig their own cavities or utilize those of other species. The main clutch size is 6, with a range of 5-8 eggs.

FOOD HABITS

Nuthatches creep up and down tree trunks and limbs, probing in the bark for insects, larvae, and insect eggs. In winter they also take a few seeds and nuts.

GUILD

Cavity nesting, tree trunk probing or gleaning insectivore.

REFERENCES

Bent 1948:1-21; Burleigh 1958:413; DeGraaf and Rudis 1986:270; DeGraaf et al. 1980:336; Ehrlich et al. 1988:434; Forbush and May 1939:352; Imhof 1976:288; James and Neal 1986:255; Kale 1978:101; Lowery 1974:456; Mengel 1965:337; Monroe et al. 1988:41; Oberholser 1974(II):619; Potter et al. 1980:254; Robbins et al. 1986:59; Robinson 1990:156; Root 1988:174; Scott et al. 1977:73; Sprunt 1954:325; Sprunt and Chamberlain 1970:378; Stewart and Robbins 1958:227; Verner and Boss 1980:215.

Brown-headed Nuthatch

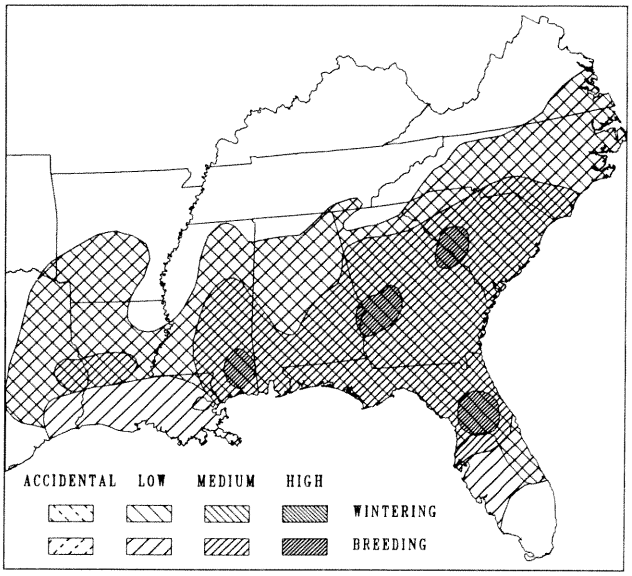
Sitta pusilla **BHNU**

PROTECTION STATUS

Monitored by Tennessee Natural Heritage Program.

ABUNDANCE STATUS

C essentially throughout the range; in the mountains of Georgia and South Carolina they occur up to 1800 feet (550 m), perhaps to 2000 feet (600 m). More widespread in the Coastal Plain because of the greater abundance of pines. Non-migratory.



PRIMARY HABITATS

All seasons— strictly in pines; prefer mature, open pinewoods; not often common in dense stands of pines. Widespread in residential woodlands, parks, and other areas where mature pines are present.

KEY HABITAT REQUIREMENTS

Breeding— a dead tree, stub, or post near or in pines. Wintering— pine trees, particularly mature ones.

SAMPLE BREEDING DENSITIES

1(1) sawtimber oak-hickory, 1(2) sapling/poletimber mixed pine-hardwood, 9.5(2) sapling/poletimber longleaf pine-slash pine, 12(2) sapling/poletimber loblolly pine-shortleaf pine. Recorded on 215 of 888 BBS routes in the region, 1966-1985; maximum route mean 19 birds, overall mean 0.75±1.99 birds/route, total of route means 668 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber oak-hickory, 4(1) sapling/poletimber longleaf pine-slash pine, 5.5(2) sawtimber longleaf pine-scrub oak.

REPRODUCTION

The breeding season extends from early March to mid-June, with the peak from late March to late April. The usual nest is in a cavity, usually dug by the birds, in a stump, post, dead tree, or stub. It is generally within 20 feet (6 m) of the ground, often in an open and conspicuous location. The clutch size is mostly 5 or 6, with a range of 3-9.

GUILD

Cavity nesting, arboreal (trunk or foliage) probing or gleaning insectivore-omnivore.

REFERENCES

Bent 1948:35-43; Burleigh 1958:416-420; Eagar and Hatcher 1982(A):105; Ehrlich et al. 1988:438; Forbush and May 1939:355; Imhof 1976:290; James and Neal 1986:255; Lowery 1974:458; Oberholser 1974(II):623; Potter et al. 1980:257; Robbins et al. 1986:59; Robinson 1990:156; Root 1988:176; Scott et al. 1977:75; Sprunt 1954:327; Sprunt and Chamberlain 1970:384; Stewart and Robbins 1958:229.

Brown Creeper

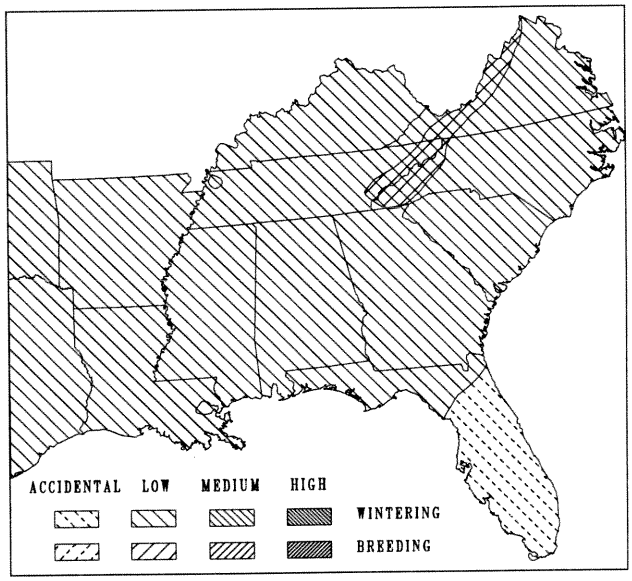
Certhia americana **BRCR**

PROTECTION STATUS

Monitored by Arkansas Natural Heritage Commission, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— U to FC in spruce-fir forests, but generally R and local in hemlocks, pines, or mixed woods. Generally above 3500 feet (1050 m), and mostly over 5000 feet (1500 m). Wintering— FC across the mountains, Piedmont, and Inner Coastal Plain; U in most of the Outer Coastal Plain. Fall arrival in mid-October and late October; spring departure from late March to mid-April.



PRIMARY HABITATS

Breeding— favor mature spruce and/or fir forests, or forests where hardwoods are mixed with spruce of fir; infrequent in hemlock or white pine forests. Wintering— widespread in many woodland types; favor mixed woods or pines, but are found frequently in hardwood forests as well. No clear preference for lowland or uplands woods. Commonly occur with flocks of kinglets, chickadees, and titmice in winter.

KEY HABITAT REQUIREMENTS

Breeding— mature, montane forests, with a preference for spruce or fir. Wintering— no essential requirements, other than middle-aged to mature trees.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sawtimber cove hardwoods, 5.4(5) sawtimber oak-hickory, 5.5(2) sawtimber spruce-fir 8(2) sawtimber white pine-hemlock.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber oak-hickory, 1(2) sawtimber elm-ash-cottonwood, 3.7(6) sapling/poletimber Virginia pine-pitch pine, 3.7(18) sawtimber oak-hickory, 7(1) sapling/poletimber loblolly pine-shortleaf pine.

REPRODUCTION

The nesting season is from mid-May to mid-July, with a probable peak from late May to late June. Typical nest is built behind a loose piece of bark still clinging to the trunk of a tree; usually the nest is on a spruce or fir tree. The clutch size is normally 5 or 6, with a range of 4-8.

FOOD HABITS

Creepers climb up tree trunks, keeping to the shaded side of the trunk; they also creep on large limbs. At all seasons they pick small insects, larvae, and insect eggs from crevices in the bark.

GUILD

Cavity nesting (behind loose bark), tree trunk gleaning insectivore.

REFERENCES

Bent 1948:56-79; Burleigh 1958:420-422; DeGraaf and Rudis 1986:271; DeGraaf et al. 1980:340; Ehrlich et al. 1988:434; Forbush and May 1939:356; Imhof 1976:291; James and Neal 1986:257; Lowery 1974:458; Mengel 1965:342; Monroe et al. 1988:41; Oberholser 1974(II):626; Potter et al. 1980:259; Robbins et al. 1986:59; Robinson 1990:157; Root 1988:177; Scott et al. 1977:77; Sprunt 1954:328; Sprunt and Chamberlain 1970:385; Stewart and Robbins 1958:230; Verner and Boss 1980:218.

Carolina Wren

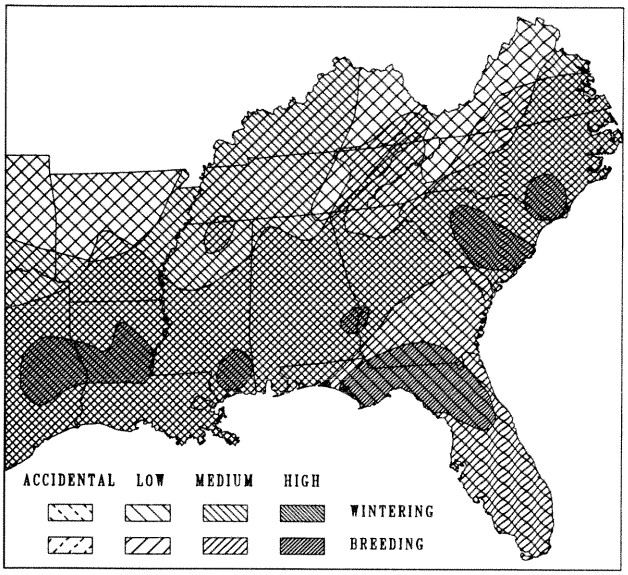
Thryothorus ludovicianus **CARW**

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

C to VC throughout, though somewhat less numerous in the mountains, and generally absent above 4000 feet (1200 m); most numerous in the Coastal Plain. Recent severe winters have reduced the mountain population. Non-migratory.



PRIMARY HABITATS

All seasons— prefer brushy and tangled areas in or near woods. Inhabit many woodland types, particularly broadleaf evergreens; often common in wooded residential areas. A preference shown for moist or bottomland woods rather than dry or upland ones. Also found in overgrown fields and woodland margins.

KEY HABITAT REQUIREMENTS

All seasons— moderate to dense shrub, sapling, or other brushy cover, preferably in a woodland.

SAMPLE BREEDING DENSITIES

1(1) sapling/poletimber longleaf pine-scruboak, 15(3) sapling/poletimber loblolly pine-shortleaf pine, 15(6) sawtimber oak-gum-cypress, 15(30) sawtimber oak-hickory, 22(2) sawtimber live oak maritime, 27(5) sapling/poletimber oak-gum-cypress, 43(3) sapling- poletimber live oak maritime. Recorded on 521 of 888 BBS routes in the region, 1966-1985; maximum route mean 90 birds, overall mean 8.89± 12.78 birds/route, total of route means 7895 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber bay swamp-pocosin, 1(1) sawtimber live oak maritime, 1(1) shrub-seedling Virginia pine-pitch pine, 10(3) sawtimber elm-ash-cottonwood, 20(1) sapling/poletimber sand pine-southern scrub oak, 34(2) sapling/poletimber live oak maritime, 48(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The breeding season extends from early March to mid-July, with the peak from late April to mid-May. Build nests in a wide variety of places, generally in crannies or secluded places. They may be placed at the bases of trees, in upturned roots, in bird boxes or other cavities, on ledges of buildings, even in old hats, coat pockets, and other highly unusual sites. The clutch averages 5 eggs, with 4-6 the usual range of clutch sizes.

FOOD HABITS

Carolina Wrens feed almost entirely within 10 feet (3 m) of the ground, gleaning insects, larvae, and other invertebrates from shrubs, herbs, and the ground.

GUILD

Cavity, ledge, or ground nesting, terrestrial or bush gleaning insectivore.

REFERENCES

Bent 1948:205-218; Burleigh 1958:430-433; DeGraaf and Rudis 1986:272; DeGraaf et al. 1980:346; Ehrlich et al. 1988:440; Forbush and May 1939:362; Imhof 1976:295; James and Neal 1986:257; Lowery 1974:461; Mengel 1965:349; Monroe et al. 1988:42; Oberholser 1974(II):635; Potter et al. 1980:263; Robbins et al. 1986:63; Robinson 1990:158; Root 1988:181; Scott et al. 1977:82; Sprunt 1954:333; Sprunt and Chamberlain 1970:392; Stewart and Robbins 1958:235.

Bewick's Wren

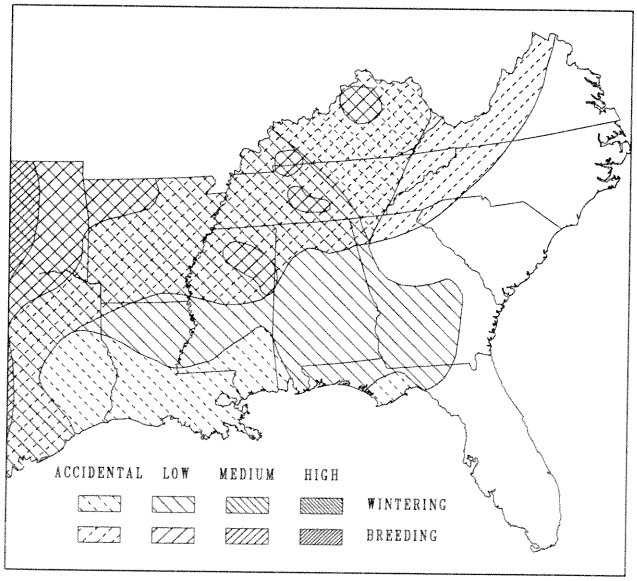
Thryomanes bewickii **BEWR**

PROTECTION STATUS

T. b. altus federally listed as category C1. State listed as Threatened in North Carolina, Tennessee, and Alabama (unofficially); Rare in West Virginia, and Special Concern by Kentucky Academy of Sciences and Kentucky Nature Preserves Commission. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Georgia Freshwater Wetlands and Heritage Inventory Program, Virginia Natural Heritage Program. Forest Service sensitive on Chattahoochee, Cherokee, and George Washington National Forests.

ABUNDANCE STATUS

Breeding— Primary range is west of the region; generally more common in the western part of the region, declining in abundance east of the Mississippi River to R and VR in Virginia; generally above 4000 feet (1200 m). In the early decades of this century, they were C over much of the mountain region, but have declined drastically, and are now virtually extirpated in North Carolina and Georgia. Wintering— now R, essentially only in western Georgia and the Florida panhandle; formerly in small numbers elsewhere in the region. Dependable winter range extends further east than breeding range. Migration mainly from mid-March to mid-April, and early October to early November.



PRIMARY HABITATS

Breeding— formerly mainly in towns and farmyards in mountain valleys now mostly at high elevations in open, brushy country; habitats usually include brush piles, fencerows, and old barns. Wintering— in open, brushy places, especially in tangles and brush near old barns.

KEY HABITAT REQUIREMENTS

Breeding— varied open country, with shrubs, saplings, and/or brush piles. Wintering— brushy places in open country, particularly near sheds or barns.

SAMPLE BREEDING DENSITIES

Recorded on 121 of 888 BBS routes in the region, 1966-1985; maximum route mean 35 birds, overall mean 0.57±3.04 birds/route, total of route means 505 birds.

SAMPLE WINTER DENSITIES

0.5(1) grass/forb loblolly pine-shortleaf pine.

REPRODUCTION

The breeding season extends from mid-April to late June, with the peak from early May to late May. Nests are built in cavities, crannies, or placed on ledges; the cavities are not dug by the birds. Frequent sites are inside a barn or shed, in a knothole, or rarely in a bird box. The clutch size is normally 5-7, with 4, 8, or 9 rare.

FOOD HABITS

Glean insects, insect eggs and larvae, and other invertebrates from shrubs, saplings, and tall herbs, and seldom feed more than 10 feet (3 m) off the ground.

GUILD

Cavity or ledge nesting, bush or herb gleaning insectivore.

REFERENCES

Bent 1948:176-204; Burleigh 1958:428-430; Eagar and Hatcher 1982(A):47; Ehrlich et al. 1988:442; Forbush and May 1939:361; Imhof 1976:294; James and Neal 1986:259; Lowery 1974:461; Mengel 1965:347; Monroe et al. 1988:42; Oberholser 1974(II):633; Potter et al. 1980:262; Robbins et al. 1986:63; Robinson 1990:158; Root 1988:182; Scott et al. 1977:81; Sprunt 1954:332; Sprunt and Chamberlain 1970:390; Stewart and Robbins 1958:233; Verner and Boss 1980:223.

House Wren

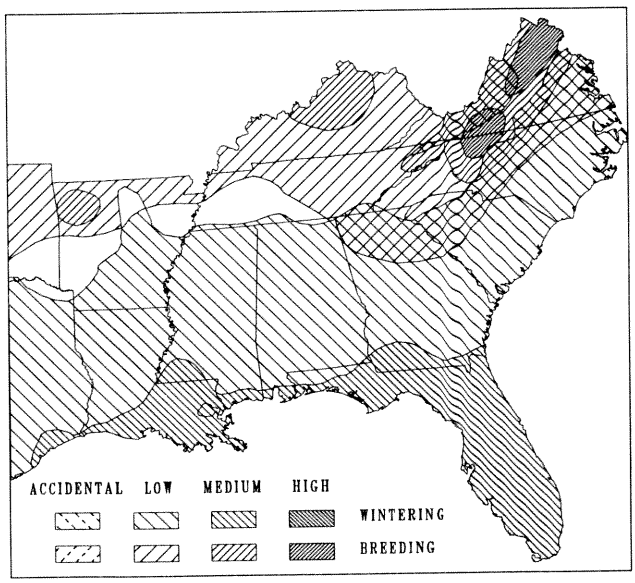
Troglodytes aedon **HOWR**

PROTECTION STATUS

Monitored by Arkansas Natural Heritage Commission.

ABUNDANCE STATUS

Breeding— FC, but rather restricted, in the Piedmont and Coastal Plain portion of the range; C in parts of mountains of Virginia and northern North Carolina. Wintering— C in Florida, and north to southern South Carolina; decreasing in numbers northward, and only U in the Piedmont portion of the winter range. Bulk of migration in April to early May, and late September through October.



PRIMARY HABITATS

Breeding— fairly open country with shrubbery, fencerows, and a few scattered trees is favored; generally House Wrens are found in residential areas and farmyards. In fact, as breeders, they are restricted to towns and suburbs over most of the Piedmont and Coastal Plain. Wintering— widespread in brushy places, and usually away from towns; favored habitats are overgrown fields, hedgerows, thickets, wood margins, and tangles under open pines.

KEY HABITAT REQUIREMENTS

Breeding— a cavity, such as a bird box, in open country with shrubs and/or saplings. Wintering— brushy cover (shrubs, saplings, and tall herbs) in many situations.

SAMPLE BREEDING DENSITIES

1(1) shrub-seedling mixed pine-hardwood, 1(2) shrub-seedling elm-ash-cottonwood, 15(5) sapling/poletimber elm-ash-cottonwood, 16(2) grass/forb mixed pine-hardwood. Recorded on 104 of 888 BBS routes in the region, 1966-1985; maximum route mean 28 birds, overall mean 0.23±1.32 birds/route, total of route means 208 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber sand pine-southern scrub oak, 4.3(3) sawtimber longleaf pine-slash pine, 5(1) sapling/poletimber oak-gum-cypress, 5(1) sapling/poletimber live oak maritime, 5.5(2) sawtimber live oak maritime.

REPRODUCTION

The nesting season extends from mid-April to late July, with a peak from early May to early June. The nest is in a cavity, not dug by the birds, in open country. Usually nest in bird boxes, but the birds also utilize knotholes, old woodpecker holes, and other crannies. The normal clutch size is 6-8, with a range of 5-9.

FOOD HABITS

At all seasons House Wrens glean insects and other small invertebrates from vegetation within 10 feet (3 m) of the ground (shrubs, saplings, or tall herbs).

GUILD

Cavity nesting, bush gleaning insectivore.

REFERENCES

Bent 1948:113-146; Burleigh 1958:422-425; DeGraaf and Rudis 1986:273; DeGraaf et al. 1980:342; Ehrlich et al. 1988:438; Forbush and May 1939:357; Imhof 1976:292; James and Neal 1986:261; Kendeigh 1941; Lowery 1974:460; Mengel 1965:343; Monroe et al. 1988:42; Oberholser 1974(II):630; Potter et al. 1980:260; Rappole et al. 1983:208; Robbins et al. 1986:59; Robinson 1990:159; Root 1988:183; Scott et al. 1977:78; Sprunt 1954: 330; Sprunt and Chamberlain 1970:387; Stewart and Robbins 1958:231; Verner and Boss 1980:222.

Winter Wren

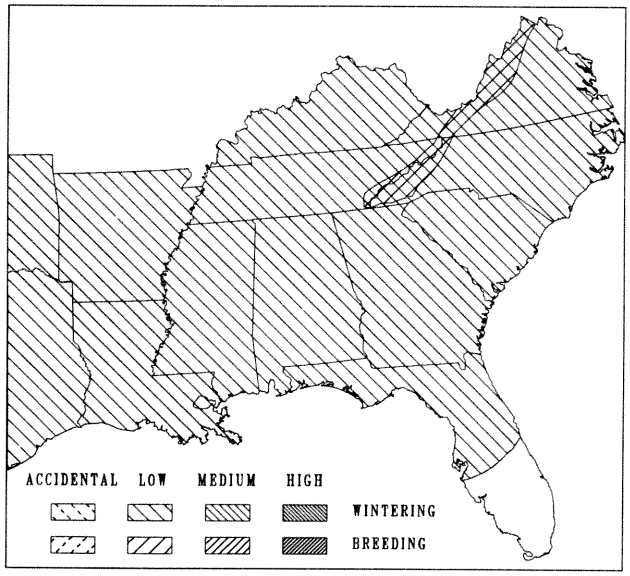
Troglodytes troglodytes **WIWR**

PROTECTION STATUS

Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC to locally C above 4500 feet (1350 m) in the Southern Appalachians. but R to U down to 3500 (1050 m). Wintering— FC over most of the range, but R to U in Florida. Arrive in fall from early October to late October; depart from late March to mid-April.



PRIMARY HABITATS

Breeding— mainly in spruce-fir forests, where they inhabit tangles, uprooted trees, and other cover; away from spruce-fir they favor cool, dark ravines, especially under hemlocks, but also beneath hardwoods. Always in cool, moist, and tangled areas. Wintering— a wide variety of forests, where tangles, fallen logs, uprooted trees, or stream banks are found; not common in broadleaf evergreen woods and bottomlands.

KEY HABITAT REQUIREMENTS

Breeding— cool, moist forests where tangles are present. Wintering— tangles or thickets in woodlands.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sawtimber cove hardwoods, 34(2) sawtimber spruce-fir.

SAMPLE WINTER DENSITIES

1(4) sapling/poletimber Virginia pine-pitch pine, 1(6) sawtimber oak-hickory, 3.2(20) sawtimber mixed pine-hardwood, 5.3(3) sawtimber elm-ash-cottonwood.

REPRODUCTION:

The breeding season is from mid-May to mid-June, with the peak in late May and early June. Nests are built on or very near the ground in forests; sites include among the tangled roots of an upturned tree, along a stream bank, besides a fallen log, and inside a dense tangle. Usually 5-6 is the clutch size, with 4 or 7 rare.

FOOD HABITS

At all seasons Winter Wrens consume insects, other small invertebrates, larvae, or insect eggs. These items are gleaned within 5 feet (1.5 m) of the ground, usually around tangles and stream banks.

GUILD

Ground nesting, terrestrial gleaning insectivore.

REFERENCES

Bent 1948:148-175; Burleigh 1958:426-428; DeGraaf and Rudis 1986:274; DeGraaf et al. 1980:344; Ehrlich et al. 1988:440; Forbush and May 1939:359; Imhof 1976:293; James and Neal 1986:261; Lowery 1974:460; Mengel 1965:346; Monroe et al. 1988:42; Oberholser 1974(II):631; Potter et al. 1980:261; Robbins et al. 1986:63; Robinson 1990:160; Root 1988:184, 285; Scott et al. 1977:80; Sprunt 1954:331; Sprunt and Chamberlain 1970:389; Stewart and Robbins 1958:232; Verner and Boss 1980:221.

Sedge Wren (Short-billed Marsh Wren)

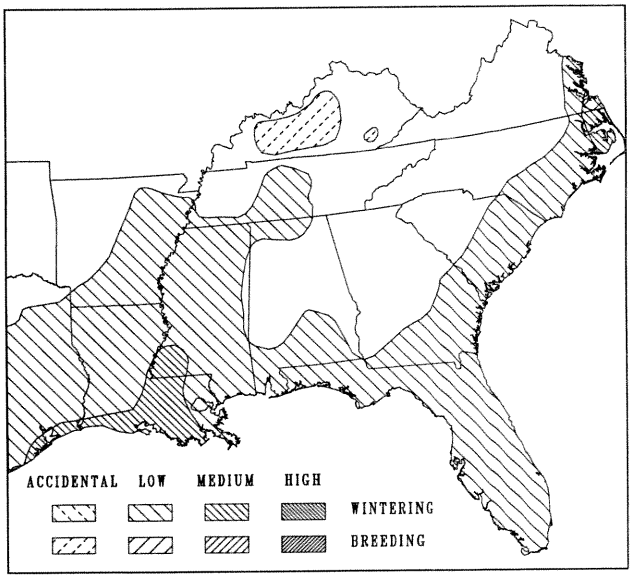
Cistothorus platensis SEWR

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Sciences and Kentucky Nature Preserves Commission, and as Rare in West Virginia. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R and local in tidewater Virginia, only near Saxis and Virginia Beach. Wintering— FC to C in tidewater areas south to central Florida, most common in coastal North Carolina; U inland and in the tidewater section of southern Florida Fall arrival— early September to early October; spring departure— early May to late May.



PRIMARY HABITATS

Breeding— favor brackish marshes, but perhaps in fresh marshes and wet meadows. Wintering— mostly in fresh to brackish marshes, especially in the drier parts where scattered shrubs are present; less frequent in wet meadows and damp grass under open pines (flatwoods).

KEY HABITAT REQUIREMENTS

Breeding— moist herbaceous cover, usually where brackish. Wintering— moist herbaceous cover, either fresh or brackish conditions.

REPRODUCTION

No nest has been found in the South, though they are assumed to breed in Virginia. Data from north of the region suggest that the nesting season extends from late May to mid-August. Most frequent clutch size is 7, with a range of 4-8. Nests are globular structures, with side entrances, attached to reeds in marshes or wet meadows.

FOOD HABITS

The food is solely insects and other small invertebrates, gleaned from herbs, the ground, or mud in a marsh. Feed at times in small shrubs.

GUILD

Ground nesting, herb gleaning insectivore.

REFERENCES

Bent 1948:265; Burleigh 1958:437; DeGraaf and Rudis 1986:275; DeGraaf et al. 1980:350; Ehrlich et al. 1988:444; Forbush and May 1939:366; Imhof 1976:297; James and Neal 1986:262; Lowery 1974:465; Mengel 1965:352; Monroe et al. 1988:42; Oberholser 1974(II):641; Potter et al. 1980:265; Rappole et al. 1983:208; Robbins et al. 1986:67; Robinson 1990:161; Root 1988:184; Sprunt 1954:338; Sprunt and Chamberlain 1970:397; Stewart and Robbins 1958:236.

Marsh Wren (Long-billed Marsh Wren)

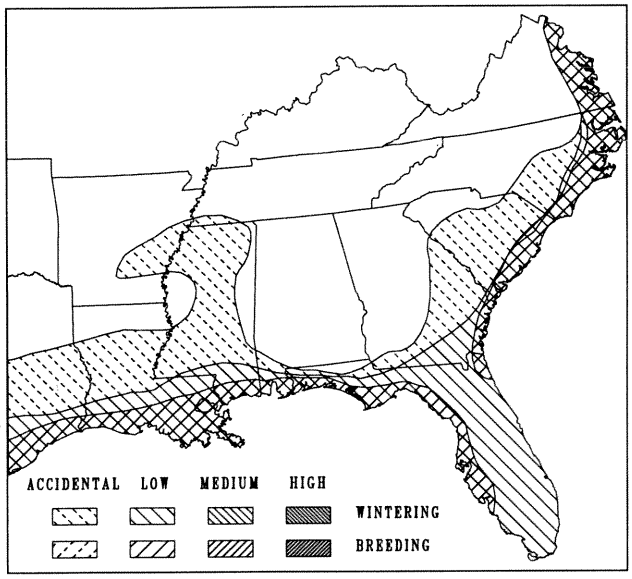
Cistothorus palustris **MAWR**

PROTECTION STATUS

C. p. marianae and *C. p. griseus* state listed as Special Concern in Florida. Monitored by West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— in tidewater areas, C to A, but often quite local; generally R and local inland (in Virginia). Wintering— C in tidewater areas south to central Florida; mostly U in southern Florida, and inland north to southern Georgia; R to U inland farther north (mainly in the Coastal Plain and extreme lower Piedmont). Migration generally from early April to mid-May, and mid-September to late October.



PRIMARY HABITATS

Breeding— marshes, most commonly in brackish ones, but also in fresh or salt marshes. Wintering— prefer brackish marshes, but also salt or fresh marshes, and less frequently in wet meadows and other wet grassy places. Favor herbaceous cover at least 2 feet (.6 m) high.

KEY HABITAT REQUIREMENTS

Breeding— a marsh, preferably an extensive brackish one. Wintering— a marsh or other damp grassy place.

SAMPLE WINTER DENSITIES

5(1) Everglades.

REPRODUCTION

The breeding season extends from late April to mid-August, with the peak from late May to late June. Nests are spherical masses of "grass" with side entrances, attached to marsh vegetation, generally suspended 1 to 3 feet (.3-1) above the ground. The usual clutch size is 5 or 6, with 3, 4, or 7 not rare.

FOOD HABITS

Strictly insects, invertebrates, and the larvae and eggs of these animals, gleaned from the ground, from marsh plants, or from the surface of shallow water near a marsh.

GUILD

Ground nesting, herb gleaning insectivore.

REFERENCES

Bent 1948:235-264; Burleigh 1958:433-437; DeGraaf and Rudis 1986:276; DeGraaf et al. 1980:348; Ehrlich et al. 1988:442; Forbush and May 1939:363; Imhof 1976:296; James and Neal 1986:263; Kale 1965; Kale 1978:102, 103; Lowery 1974:463; Mengel 1965:351; Monroe et al. 1988:43; Oberholser 1974(II):638; Potter et al. 1980:264; Rappole et al. 1983:208; Robinson 1990:162; Root 1988:185; Sprunt 1954:334-338; Sprunt and Chamberlain 1970:393-397; Stewart and Robbins 1958:235; Verner and Boss 1980:224.

Golden-crowned Kinglet

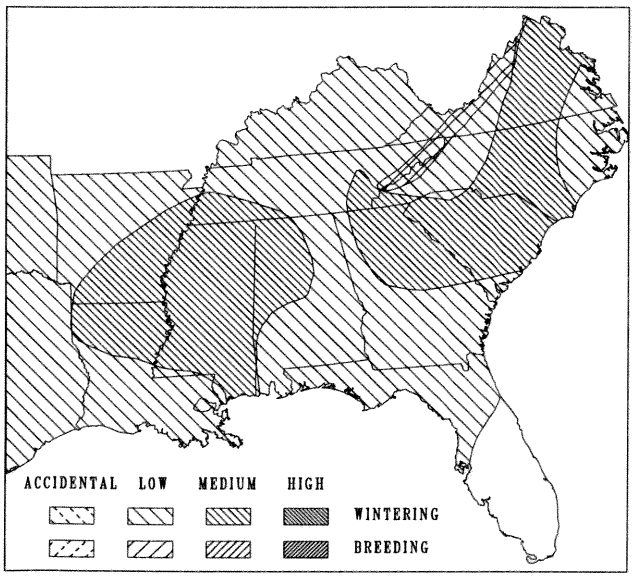
Regulus satrapa **GCKI**

PROTECTION STATUS

State listed as Threatened in North Carolina. Blue Listed by Tate (1981). Monitored by Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C in spruce-fir forests; mostly U and local in hemlocks and white pines; generally absent below 3500 feet (1050 m). Wintering— C to VC in the northern and western parts of the region and Piedmont, but decreasing to FC in most coastal areas; U in Florida, southern Georgia, and southern South Carolina. Fall arrival— early October to late October; spring departure— late March to mid-April.



PRIMARY HABITATS

Breeding— montane coniferous forests; mainly in spruce-fir, and infrequently in hemlocks or white pines; also where hardwoods are mixed with these conifers. Wintering— a wide variety of coniferous or mixed woods; prefer pine-woods, but also in pine-hardwoods, hemlocks, and spruce-fir; seldom occur in pure hardwood stands.

KEY HABITAT REQUIREMENTS

Breeding— mature and cool coniferous forests in the mountains. Wintering— coniferous trees, either in pure stands or mixed with hardwoods.

SAMPLE BREEDING DENSITIES

50(2) sawtimber spruce-fir.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber sand pine-southern scrub oak, 4.4(17) sawtimber oak-hickory, 20(1) sapling/poletimber oak-hickory, 23(7) sapling/poletimber Virginia pine-pitch pine, 28(1) sapling/poletimber loblolly pine-shortleaf pine.

REPRODUCTION

Few nests with eggs have been reported from the South. The breeding season likely occurs from early May to mid-June, with a peak from mid-May to early June. Build small cup nests in conifers, generally over 30 feet (9 m) from the ground. The small size of the nests, plus the very dense foliage of spruce-fir forests, makes them very difficult to locate. The usual clutch size is 8 or 9, with a normal range of 5 to 10.

FOOD HABITS

Glean and hover for small insects, larvae, insect eggs, and other small invertebrates in the foliage of conifers; infrequently forage in hardwoods.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

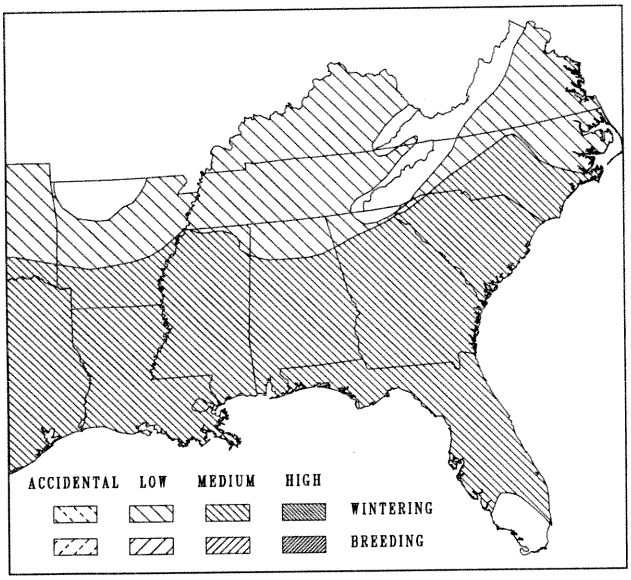
Bent 1949:382-399; Burleigh 1958:465; DeGraaf and Rudis 1986:277; DeGraaf et al. 1980:374; Ehrlich et al. 1988:448; Forbush and May 1939:388; Imhof 1976:312; James and Neal 1986:264; Lowery 1974:480; Mengel 1965:369; Monroe et al. 1988:43; Oberholser 1974(II):680; Potter et al. 1980:282; Robbins et al. 1986:83; Robinson 1990:163; Root 1988:187; Sprunt 1954:355; Sprunt and Chamberlain 1970:414; Stewart and Robbins 1958:254; Verner and Boss 1980:237.

Ruby-crowned Kinglet

Regulus calendula **RCKI**

ABUNDANCE STATUS

Wintering— C to VC over most of the Coastal Plain and adjacent physiographic provinces, decreases to U to the north, as well as in southern Florida; U to FC at low elevations of mountains in the Carolinas and Georgia, and U in Virginia mountains. Breed north of the region. Fall arrival— late September to mid-October; spring departure— mid-April to early May.



PRIMARY HABITATS

Highly varied; prefer evergreen woods or thickets; most common in pinewoods or mixed woods, but also frequent in wood margins, thickets, and brush. Rather infrequent in pure hardwood stands. Both species of kinglets occur in flocks with chickadees, titmice, and other small woodland species in winter.

KEY HABITAT REQUIREMENTS

Woods or thickets, but no essential features other than the presence of woody vegetation.

SAMPLE WINTER DENSITIES

0.5(1) shrub/seedling Virginia pine-pitch pine, 0.7(3) shrub/seedling oak-hickory, 15(19) sawtimber mixed pine-hardwood, 34(2) sapling/poletimber live oak maritime, 70(1) sapling/ poletimber sand pine-southern scrub oak.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Feed extensively on small insects, insect eggs, and larvae; rarely on small seeds. Forage by gleaning or hovering for prey at foliage or twigs in trees, saplings, or shrubs.

GUILD

Tree or bush foliage gleaning insectivore.

REFERENCES

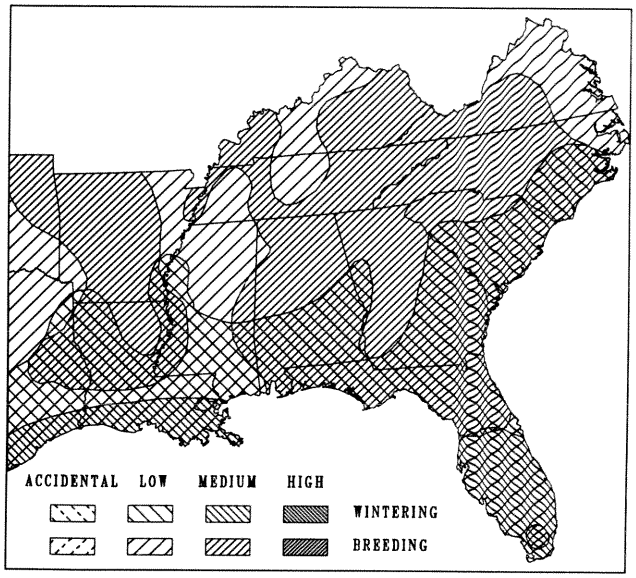
Bent 1949:400-418; Burleigh 1958:466; DeGraaf and Rudis 1986:278; DeGraaf et al. 1980:376; Ehrlich et al. 1988:450; Forbush and May 1939:389; Imhof 1976:312; James and Neal 1986:264; Lowery 1974:480; Mengel 1965:370; Monroe et al. 1988:43; Oberholser 1974(II):682; Potter et al. 1980:282; Rappole et al. 1983:212; Robbins et al. 1986:83; Robinson 1990:164; Root 1988:188; Sprunt 1954:356; Sprunt and Chamberlain 1970:419; Stewart and Robbins 1958:255; Verner and Boss 1980:238.

Blue-gray Gnatcatcher

Polioptila caerulea **BGGN**

ABUNDANCE STATUS

Breeding— C in much of the South; FC at higher elevations, up to 3500 feet (1050 m), rarely to 4000 feet (1200 m). Wintering— C in the Florida peninsula and western Gulf Coast, declining in abundance northward. Spring arrival— early March to early April; fall departure— mid-September to mid-October.



PRIMARY HABITATS

Breeding— primarily in moist deciduous forests, such as bottomland forests and swamps; seldom far from water; avoid coniferous woods. Wintering— more widespread, occurring in many woodland types, frequently with kinglets, chickadees, and titmice; mixed forests and broadleaf evergreen woods preferred.

KEY HABITAT REQUIREMENTS

Breeding— mature and moist hardwood forest. Wintering— forests or thickets; no essential requirements, but mainly in broadleaf evergreens.

SAMPLE BREEDING DENSITIES

0.7(3) sapling/poletimber loblolly pine-shortleaf pine, 8.7(9) sapling/poletimber oak-hickory, 8.7(24) sawtimber oak-hickory, 26(5) sapling/poletimber longleaf pine-southern scrub oak, 30(6) sawtimber oak-gum-cypress, 37(3) sapling/poletimber oak-gum-cypress. Recorded on 461 of 888 BBS routes in the South, 1966-1985; maximum route mean 32 birds, overall mean 2.19 ± 3.79 birds/route, total of route means 1943 birds.

SAMPLE WINTER DENSITIES

1(4) sapling/poletimber pine savanna, 1(2) sawtimber live oak maritime, 52(2) sapling/poletimber live oak maritime, 60(1) sapling/poletimber sand pine-southern scrub oak, 98(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The nesting season extends from mid-April to early June, with the peak from early May to late May. Nests are small cups saddled on branches in deciduous (usually) trees, generally in the canopy. The usual clutch size is 4 or 5, rarely 3 or 6.

FOOD HABITS

Consume small insects at all seasons, even in winter. Most foraging is done in the canopy by gleaning items from leaves, though they frequently hover. Some foraging occurs in saplings and shrubs.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1949:344-368; Burleigh 1958:463; DeGraaf and Rudis 1986:279; DeGraaf et al. 1980:372; Ehrlich et al. 1988:450; Forbush and May 1939:387; Imhof 1976:311; James and Neal 1986:266; Lowery 1974:479; Mengel 1965:368; Monroe et al. 1988:43; Oberholser 1974(II):678; Potter et al. 1980:281; Rappole et al. 1983:211; Robbins et al. 1986:83; Robinson 1990:164; Root 1988:189; Sprunt 1954:353; Sprunt and Chamberlain 1970:413; Stewart and Robbins 1958:253; Verner and Boss 1980:236.

Eastern Bluebird

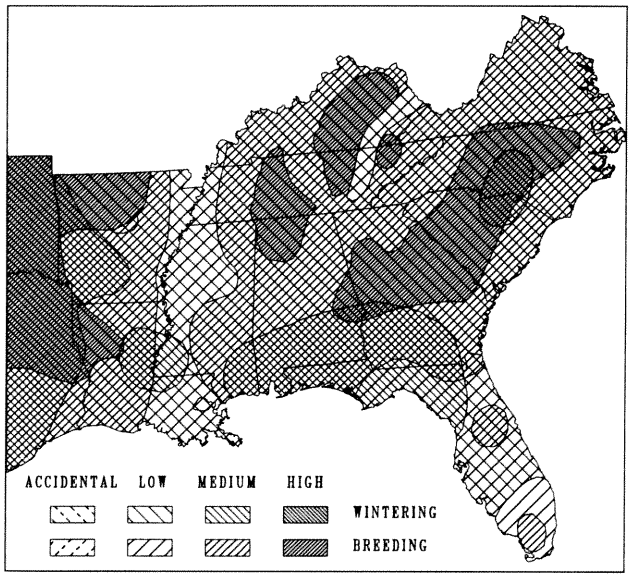
Sialia sialis **EABL**

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

Breeding— FC in many areas, and C in others; most numerous in the Piedmont, interior low plateaus, and Ozark uplift; R in southern Florida. Wintering— generally C over most of the South, but less so to the north and at higher elevations; R to U in southern Florida. In the mountains, seldom occur above 4000 feet (1200 m). Moderate migration into the Southeast in fall and winter; most movement in October and March.



PRIMARY HABITATS

All seasons— prefer open country with scattered trees; orchards, groves, farmyards, roadsides, open residential areas, and open woods. They are particularly partial to open country where telephone lines are present for perching.

KEY HABITAT REQUIREMENTS

Breeding— a cavity (for nesting) in open or semi- open country, usually with a few scattered trees. Wintering— no essential requirements, though usually in open country with conspicuous perches.

SAMPLE BREEDING DENSITIES

0.6(2) sapling/poletimber loblolly pine-shortleaf pine, 5.2(2) grass/forb bay swamp-pocosin, 6(2) shrub/seedling oak-hickory. Recorded on 491 of 888 BBS routes in the region, 1966-1985; maximum route mean 29 birds, overall mean 3.28 ± 4.78 birds/route, total of route means 2910 birds.

SAMPLE WINTER DENSITIES

0.8(10) grass/forb elm-ash-cottonwood, 10(6) grass/forb oak-hickory, 12(2) grass/forb loblolly pine-shortleaf pine, 13(1) shrub/seedling Virginia pine-pitch pine.

REPRODUCTION

The breeding season extends from mid-March to mid-August, with the peak from late March to mid-May. Nests are built in cavities that are not dug by the birds. Most common sites are bird boxes, in the open, and within 10 feet (3 m) of the ground. Other sites include knotholes and old woodpecker holes. Clutch size is generally 4 or 5, rarely 3 or 6.

FOOD HABITS

Bluebirds sit on exposed perches, and drop to the ground when a prey item is spotted. Food is mainly insects and other invertebrates, taken from short grass or bare ground, rarely from trees or shrubs.

GUILD

Cavity nesting, terrestrial pouncing insectivore.

REFERENCES

Bent 1949:233-262; Burleigh 1958:461; DeGraaf and Rudis 1986:280; DeGraaf et al. 1980:370; Ehrlich et al. 1988:452; Forbush and May 1939:385; Imhof 1976:309; James and Neal 1986:267; Lowery 1974:476; Mengel 1965:367; Monroe et al. 1988:43; Oberholser 1974(II):672; Potter et al. 1980:279; Rappole et al. 1983:210; Robbins et al. 1986:78; Robinson 1990:165; Root 1988:191; Scott et al. 1977:83; Sprunt 1954:351; Sprunt and Chamberlain 1970:411; Stewart and Robbins 1958:251.

Veery

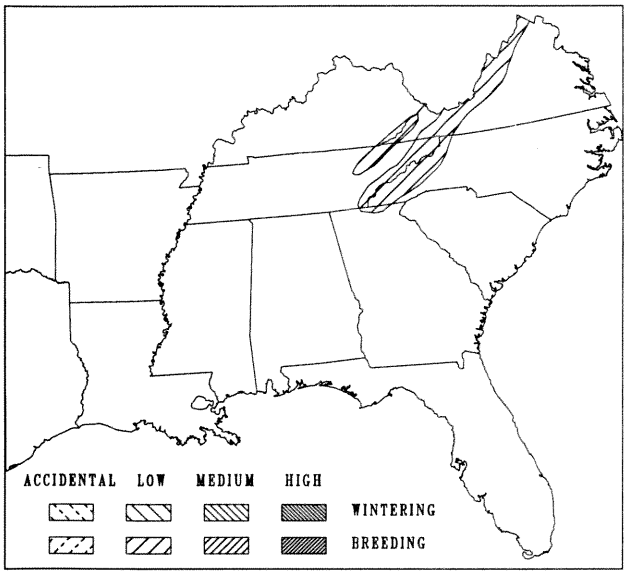
Catharus fuscescens VEER

PROTECTION STATUS

Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program.

ABUNDANCE STATUS

Breeding— C in the Southern Appalachians above 4000 feet (1200 m), but local down to 3000 feet (900 m) in Virginia and 3500 feet (1050 m) in North Carolina. Winter south of the United States. Root(1988) reported only 10 winter records at coastal localities from Christmas Bird Count data. Spring arrival— late April to mid-May; fall departure— late August to late September.



PRIMARY HABITATS

Widespread in many montane forests; most common in mature deciduous forests with much understory. Also occur in numbers in hemlock forests, spruce-fir forests, and mixed forests, but mainly where moist with considerable understory.

KEY HABITAT REQUIREMENTS

Montane forests with moderate understory, mainly above 3500 feet (1050 m).

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sapling/poletimber oak-hickory, 17(2) sawtimber spruce-fir, 18(2) sawtimber mixed pine-hardwood, 20(1) sawtimber oak-hickory.

REPRODUCTION

The breeding season extends from mid-May to late June, with a peak in late May and early June. The usual nest is built on the ground near a tussock, log, or shrub in a forest; at times the nest is placed in a shrub or a sapling. Four is the most common clutch size, with 3 or 5 infrequent.

FOOD HABITS

Veeries feed almost solely on the forest floor, scratching for insects and other invertebrates in leaf litter.

GUILD

Ground nesting, terrestrial gleaning insectivore.

REFERENCES

Bent 1949:217-233; Burleigh 1958:458-461; DeGraaf and Rudis 1986:281; DeGraaf et al. 1980:368; Ehrlich et al. 1988:458; Forbush and May 1939:383; Imhof 1976:308; James and Neal 1986:269; Lowery 1974: 475; Mengel 1965:365; Monroe et al. 1988:43; Noon and Able 1978; Oberholser 1974(II):670; Potter et al. 1980:276; Rappole et al. 1983:210; Robbins et al. 1986:78; Robinson 1990:165; Sprunt 1954:351; Sprunt and Chamberlain 1970:409; Stewart and Robbins 1958:250.

Swainson's Thrush

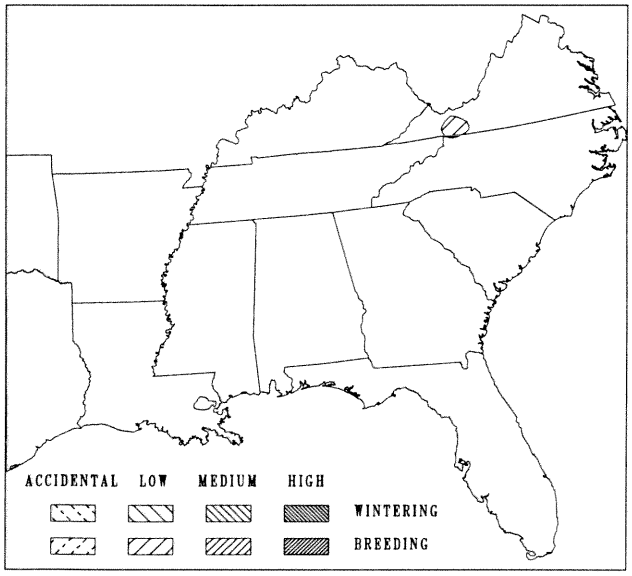
Catharus ustulatus **SWTH**

PROTECTION STATUS

State listed as Rare in West Virginia. Monitored by Virginia Natural Heritage Program. Forest Service sensitive on the Jefferson National Forest.

ABUNDANCE STATUS

Breeding— Breed generally north of the region. One to several pairs have bred or probably bred at Mt. Rogers, Virginia, since 1966; a possible nesting in Rockbridge County, Virginia, in 1969. Winter south of the United States. Spring arrival— late April to mid-May; fall departure— early October to mid-October.



PRIMARY HABITATS

Spruce-fir forests only, apparently where the understory is sparse to moderate.

KEY HABITAT REQUIREMENTS

Spruce or fir forests, but other specifics of the habitat are not well known in this region.

REPRODUCTION

No nest has been found in the South, but the breeding season is probably from mid-May to July. To the north of this region, nests are placed in shrubs or small trees. Clutch size is 3-4, rarely 5, eggs.

FOOD HABITS

These thrushes forage on the ground, as well as in trees and shrubs. They glean insects from foliage and scratch for insects and other invertebrates in dead leaves on the forest floor.

GUILD

Bush nesting, terrestrial or arboreal gleaning insectivore.

REFERENCES

Bent 1949:163-188; Burleigh 1958:454-456; DeGraaf and Rudis 1986:283; DeGraaf et al. 1980:364; Ehrlich et al. 1988:458; Forbush and May 1939:380; Imhof 1976:306; James and Neal 1986:270; Lowery 1974:474; Mengel 1965:363; Monroe et al. 1988:44; Noon and Able 1978; Oberholser 1974(II):668; Potter et al. 1980:275; Rappole et al. 1983:210; Robbins et al. 1986:78; Robinson 1990:167; Root 1988:195, 285; Sprunt 1954:349; Sprunt and Chamberlain 1970:407; Stewart and Robbins 1958:248; Verner and Boss 1980:232.

Hermit Thrush

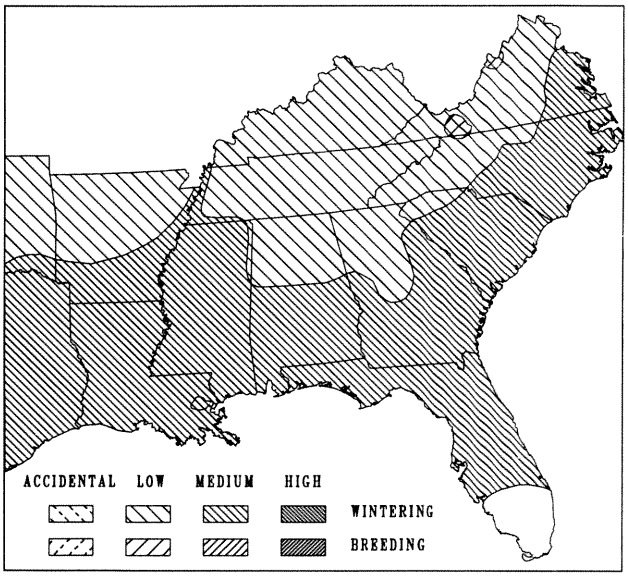
Catharus guttatus **HETH**

PROTECTION STATUS

State listed as Rare in West Virginia, Significantly Rare in North Carolina. Monitored by Virginia Natural Heritage Program. Forest Service sensitive on Jefferson National Forest.

ABUNDANCE STATUS

Breeding— R and local at high elevations in Virginia (above 4000 feet, 1200 m); one noted on territory in 1979 at Roan Mt., North Carolina. Wintering— FC to C over much of the Coastal Plain, though U in southern Florida; FC in the interior; generally U in the lower portion of the mountains. Fall arrival— mid-October to late October; spring departure— early April to early May.



PRIMARY HABITATS

Breeding— spruce and/or fir forests, especially in moist spots, with a light to moderate understory. Wintering— forests of a wide variety, but usually some evergreen cover is present; favor mixed forests, and most numerous where hollies, bays, or other broadleaf evergreens are present in the understory.

KEY HABITAT REQUIREMENTS

Breeding— spruce-fir forests, with a rather open understory. Wintering— woodlands with a moderate understory, especially where broadleaf evergreens are present.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp-pocosin, 2.8(6) sawtimber oak-hickory, 2.8(33) sawtimber mixed pine-hardwood, 8.5(2) sapling/poletimber live oak maritime.

REPRODUCTION

No nest has been found in the Southeast, though the breeding season likely extends from mid-May to July. Based on information gathered north of this region, the nests are usually built on the ground, rarely a few feet from the ground in shrubs or saplings. The usual clutch has 3 or 4 eggs, with 5 or 6 being rare.

FOOD HABITS

In the summer, feed primarily on the ground on insects and other small invertebrates; but in winter, they take berries from trees and shrubs, in addition to some insects from the ground or from foliage.

GUILD

Ground nesting, terrestrial gleaning insectivore (summer), terrestrial or bush gleaning omnivore (winter).

REFERENCES

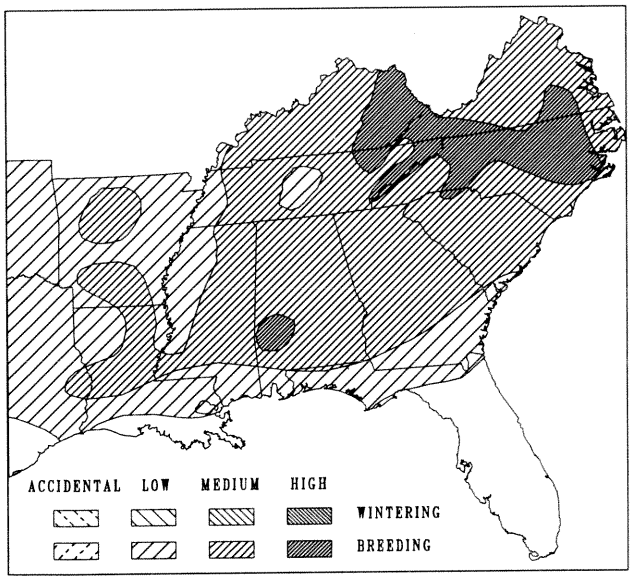
Bent 1949:123-162; Burleigh 1958:451-454; DeGraaf and Rudis 1986:284; DeGraaf et al. 1980:362; Ehrlich et al. 1988:460; Forbush and May 1939:378; Imhof 1976:305; James and Neal 1986:270; Lowery 1974:474; Mengel 1965:362; Monroe et al. 1988:44; Noon and Able 1978; Oberholser 1974(II):665; Potter et al. 1980:275; Rappole et al. 1983:209; Robbins et al. 1986:78; Robinson 1990:167; Root 1988:195; Sprunt 1954:348; Sprunt and Chamberlain 1970:405; Stewart and Robbins 1958:247; Verner and Boss 1980:231.

Wood Thrush

Hylocichla mustelina **WOTH**

ABUNDANCE STATUS

Breeding— C throughout the eastern mountains and Piedmont, but generally U in the Outer Coastal Plain and western parts of the region, except the Ozarks; particularly scarce in southern Georgia and northern Florida. Occur in the mountains to 4000 feet (1200 m), rarely higher. Winter south of the United States. Spring arrival— late March to late April; fall departure— early October to late October.



PRIMARY HABITATS

Favor deciduous or mixed forests with a fairly well-developed deciduous understory, especially where moist. Bottomland and other rich hardwood forests are prime habitats; also frequent in pine forests with a deciduous understory and in well-wooded residential areas.

KEY HABITAT REQUIREMENTS

Woodland understory of deciduous shrubs or saplings, especially where moist.

SAMPLE BREEDING DENSITIES

1(2) sawtimber elm-ash-cottonwood, 15(6) sawtimber oak-gum-cypress, 15(25) sawtimber mixed pine-hardwood, 18(30) sawtimber oak-hickory, 41(3) sawtimber loblolly pine-shortleaf pine. Recorded on 400 of 888 BBS routes in the region, 1966-1985; maximum route mean 53 birds, overall mean 4.16 ± 7.26 birds/route, total of route means 3699 birds.

REPRODUCTION

The breeding season extends from late April to early August, with a peak from mid-May to early June. Nests are built in shrubs, saplings, or trees in wooded areas, mainly 5 to 15 feet (1.5-5 m) from the ground. Clutch size is nearly always 3 or 4.

FOOD HABITS

Glean insects and other invertebrates on the forest floor, often among dead leaves on the ground. Some feeding occurs in shrubs and in low trees.

GUILD

Bush nesting, terrestrial gleaning insectivore.

REFERENCES

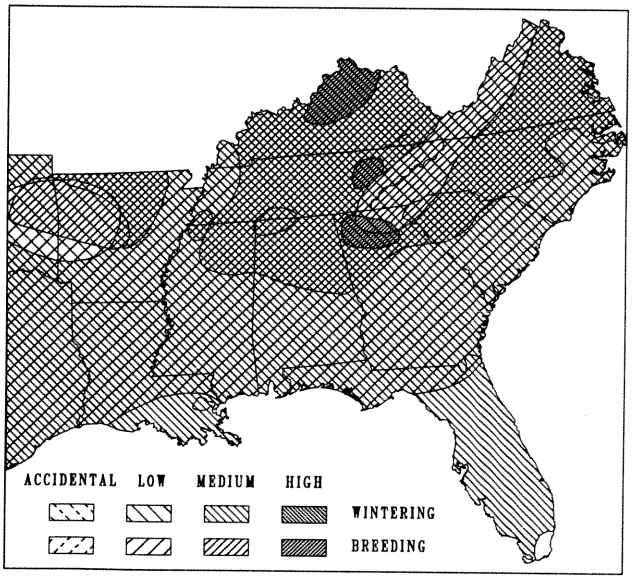
Bent 1949:101; Burleigh 1958:449; DeGraaf and Rudis 1986:285; DeGraaf et al. 1980:360; Ehrlich et al. 1988:456; Forbush and May 1939:377; Imhof 1976:304; James and Neal 1986:273; Lowery 1974:473; Mengel 1965:361; Monroe et al. 1988:44; Noon and Able 1978; Oberholser 1974(II):664; Potter et al. 1980:273; Rappole et al. 1983:209; Robbins et al. 1986:71; Robinson 1990:168; Root 1988:196; Sprunt 1954:347; Sprunt and Chamberlain 1970:404; Stewart and Robbins 1958:245.

American Robin

Turdus migratorius **AMRO**

ABUNDANCE STATUS

Breeding— C to A essentially throughout inland physiographic provinces, FC to C over the Inner Coastal Plain, but U in the Outer Coastal Plain. Wintering— quite erratic in a given area from week to week; may be somewhat scarce one week, but very common a week later; generally C, often A, everywhere except the mountains, where usually only FC in the lower elevations, and probably R above 3500 feet (1050 m). Heavy migration in March and in October and November.



PRIMARY HABITATS

Breeding— generally where lawns and other short grass areas are interspersed with shrubs and trees, such as residential areas, towns, farmyards, and parks. Also breed in spruce-fir forests where openings or grassy areas are nearby, but elsewhere, they tend to occur near human settlements. Wintering— mostly in bottomland woods, and/or near berry-bearing trees; generally in moist woods in early winter, but in late winter occur commonly on lawns, pastures, and other open places.

KEY HABITAT REQUIREMENTS

Breeding— trees or shrubs near lawns or other short grass. Wintering— no essential requirements, but mostly near berry-bearing trees and moist woods.

SAMPLE BREEDING DENSITIES

0.5(16) shrub/seedling elm-ash-cottonwood, 5.3(24) sawtimber mixed pine-hardwood, 8(2) grass/forb mixed pine-hardwood, 12(2) sawtimber spruce-fir. Recorded on 392 of 888 BBS routes in the region, 1966-1985; maximum route mean 156 birds, overall mean 7.47 ± 15.67 birds/route, total of route means 6631 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber sand pine-southern scrub oak, 16(29) sawtimber mixed pine-hardwood, 190(2) sapling/poletimber live oak maritime.

REPRODUCTION

The season extends from late March to late August, with a peak from late April to late May. Nests are usually placed in trees or bushes, often in exposed locations. Occasionally, the nest is built on a ledge of a building, and rarely on the ground. Clutch size is commonly 4, with 3 or 5 frequent and 6 rare.

FOOD HABITS

During the warmer months, robins consume earthworms and a wide variety of other invertebrates, feeding essentially on the ground. In the winter, berries and other fruits are the major food items, but they begin foraging for animal food on the ground in late winter.

GUILD

Tree or bush nesting, terrestrial gleaning insectivore (summer), tree or bush gleaning frugivore (winter).

REFERENCES

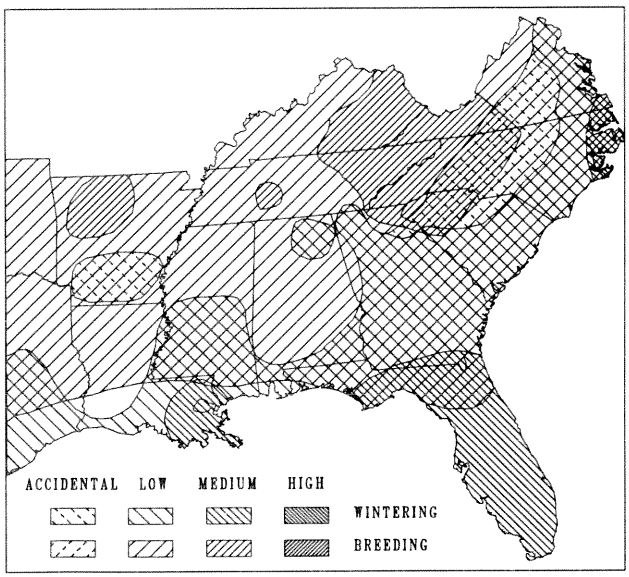
Bent 1949:14-65; Burleigh 1958:445-449; DeGraaf and Rudis 1986:286; DeGraaf et al. 1980:358; Ehrlich et al. 1988:462; Forbush and May 1939:373; Imhof 1976:303; James and Neal 1986:273; Lowery 1974:472; Mengel 1965:358; Monroe et al. 1988:44; Oberholser 1974(II):660; Potter et al. 1980:272; Rappole et al. 1983:209; Robbins et al. 1986:71; Robinson 1990:168; Root 1988:197, 285; Sprunt 1954:345; Sprunt and Chamberlain 1970:401-404; Stewart and Robbins 1958:243; Verner and Boss 1980:229.

Gray Catbird

Dumetella carolinensis **GRCA**

ABUNDANCE STATUS

Breeding— C to VC in mountains; decreasing in abundance toward the coast, where generally U. Wintering— C over most of Florida; FC in the Outer Coastal Plain farther north, but U in the Lower Coastal Plain, and R farther inland. Spring arrival— mid-April to late April; fall departure— early October to late October.



PRIMARY HABITATS

Breeding— dense, dark, tangled vegetation, especially in shrubbery. Favor damp thickets along streams, but common in residential areas with abundant shrubbery. Wintering— mainly in dense tangles in wood margins, thickets, and open woods, especially in broadleaf evergreen cover; generally scarce in residential areas.

KEY HABITAT REQUIREMENTS

Breeding— dense thickets or shrubbery, especially where moist. Wintering— dense tangles and thickets, but not necessarily where moist.

SAMPLE BREEDING DENSITIES

1(1) sawtimber elm-ash-cottonwood, 1(1) sawtimber cove hardwoods, 14(2) sawtimber oak-gum-cypress, 16(2) sawtimber white pine-hemlock, 67(18) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 355 of 888 BBS routes in the region, 1966-1985; maximum route mean 47 birds, overall mean 1.46 ± 3.53 birds/route, total of route means 1298 birds.

SAMPLE WINTER DENSITIES

1(2) sapling/poletimber pine savanna, 29(4) sawtimber longleaf pine-slash pine, 53(1) shrub/seedling live oak maritime.

REPRODUCTION

The season extends from late April to mid-August, with a peak from mid-May to early June. The nests are usually placed 4 to 8 feet (1-2.5 m) from the ground in dense shrubbery or vine tangles. The normal clutch size is 4, but 3 or 5 eggs are frequent.

FOOD HABITS

In the summer, catbirds feed mainly on insects gleaned from shrubs or saplings, but rather infrequently on the ground. They forage mostly on berries, and some seeds, in winter. Most feeding is done within 10 feet (3 m) of the ground.

GUILD

Bush nesting, bush gleaning insectivore-frugivore.

REFERENCES

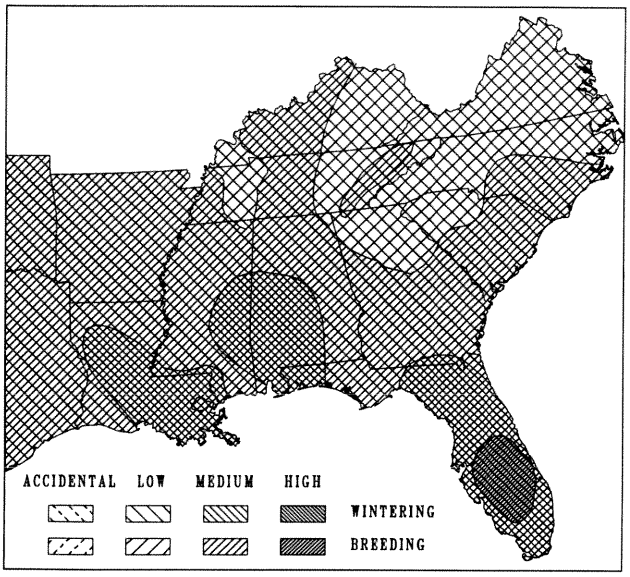
Bent 1948:320; Burleigh 1958:441; DeGraaf and Rudis 1986:287; DeGraaf et al. 1980:354; Ehrlich et al. 1988:468; Forbush and May 1939:369; Imhof 1976:300; James and Neal 1986:275; Lowery 1974:466; Mengel 1965:355; Monroe et al. 1988:44; Oberholser 1974(II):648; Potter et al. 1980:268; Rappole et al. 1983:208; Robbins et al. 1986:67; Robinson 1990:169; Root 1988:198; Sprunt 1954:341; Sprunt and Chamberlain 1970:399; Stewart and Robbins 1958:240.

Northern Mockingbird (Mockingbird)

Mimus polyglottos **NOMO**

ABUNDANCE STATUS

C to A, and conspicuous, nearly everywhere; FC to C in mountain valleys to 2500 feet (750 m), and VR to absent above 3500 feet (1050 m). Generally non-migratory, though there are some localized population changes.



PRIMARY HABITATS

All seasons— mainly in open residential or rural country. Prefer scattered trees or shrubs with telephone wires, fences, and other conspicuous perches. Most common in towns, suburbs, and roadsides.

KEY HABITAT REQUIREMENTS

All seasons— open country with scattered trees and/or shrubs.

SAMPLE BREEDING DENSITIES

0.6(2) shrub/seedling southern scrub oak, 0.6(11) shrub/seedling elm-ash-cottonwood, 15(16) sapling poletimber elm-ash-cottonwood (small plot), 22(1) sawtimber live oak maritime. Recorded on 588 of 888 BBS routes in the region, 1966-1985; maximum route mean 244 birds, overall mean 22.7 ± 29.1 birds/route, total of route means 20,169 birds.

SAMPLE WINTER DENSITIES

0.5(2) grass/forb longleaf pine-slash pine, 0.6(1) shrub/seedling elm-ash-cottonwood, 15(9) sapling/poletimber pine savanna, 17(3) sawtimber live oak maritime, 18(2) shrub/seedling southern scrub oak.

REPRODUCTION

Nesting season extends from late March to mid-August, with the peak from late April to late May. The usual nest is a cup placed in a small tree or shrub, especially where covered with vines or where leaves are dense. Most nests are 5 to 15 feet (1.5-5 m) from the ground. Clutch size is generally 4 or 5, with 3 or 6 infrequent.

FOOD HABITS

Mockingbirds feed mainly on insects in summer, but they feed mainly on berries and other fruits, with some insects, in winter. They forage commonly on the ground, as well as in shrubs or small trees. Most foraging is within 30 feet (9 m) of the ground.

GUILD

Bush nesting, terrestrial or bush gleaning insectivore- omnivore.

REFERENCES

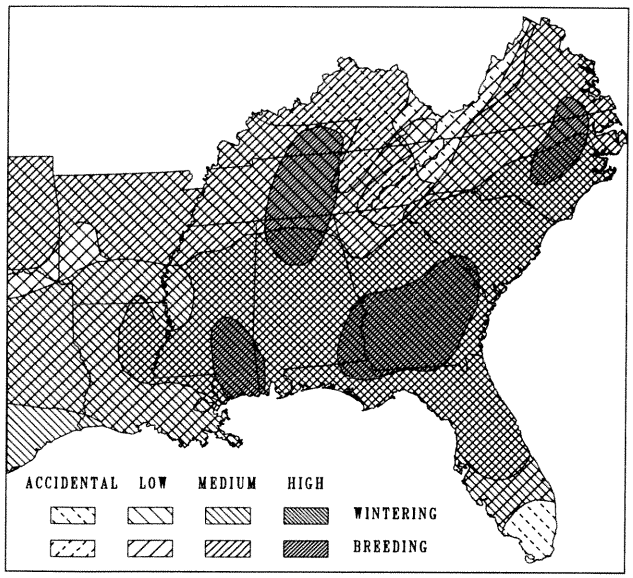
Bent 1948:295-319; Burleigh 1958:439; DeGraaf and Rudis 1986:288; DeGraaf et al. 1980:352; Ehrlich et al. 1988:468; Forbush and May 1939:367; Imhof 1976:299; James and Neal 1986:276; Lowery 1974:466; Mengel 1965:354; Monroe et al. 1988:45; Oberholser 1974(II):646; Potter et al. 1980:267; Robbins et al. 1986:67; Robinson 1990:170; Root 1988:199; Sprunt 1954:339; Sprunt and Chamberlain 1970:398; Stewart and Robbins 1958:238; Verner and Boss 1980:227.

Brown Thrasher

Toxostoma rufum **BRTH**

ABUNDANCE STATUS

Breeding— C nearly throughout, but only FC in much of the Southern Appalachians, occurring sparingly up to 5500 feet (1650 m). Wintering— mostly U in the Southern Appalachians and northern Kentucky; FC over most of the remainder of the region; becoming C in lower Georgia and over Florida. Fall migration mainly in October and November; spring migration most common in March.



PRIMARY HABITATS

All seasons— favor brushy places, usually in drier habitats than those of the Gray Catbird. Frequent overgrown fields, woodland borders, thickets, open woods, and residential areas.

KEY HABITAT REQUIREMENTS

All seasons— moderate to dense cover or shrubs, saplings, and other brush.

SAMPLE BREEDING DENSITIES

0.6(2) sapling/poletimber live oak maritime, 5.9(8) sawtimber oak-hickory, 8(2) sawtimber oak-gum-cypress, 8(2) grass/forb mixed pine-hardwood, 22(13) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 483 of 888 BBS routes in the region, 1966-1985; maximum route mean 28 birds, overall mean 2.97 ± 3.95 birds/route, total of route means 2636 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp-pocosin, 15(1) sapling/poletimber sand pine-southern scrub oak, 15(1) sapling/poletimber longleaf pine-scrub oak, 18(3) sawtimber live oak maritime.

REPRODUCTION

The breeding season extends from late March to late July, with the peak from late April to late May. The usual nest is built in a shrub or small tree in a thicket or hedgerow, and it is generally 3 to 10 feet (1-3 m) from the ground. Four is the most common clutch size, with a range of 3 to 6.

FOOD HABITS

Thrashers take mostly insects in the warmer months, and feed on insects, seeds, nuts, and other items in winter. They forage essentially within 10 feet (3 m) of the ground, commonly on the ground, as well as in low vegetation.

GUILD

Bush nesting, terrestrial or bush gleaning insectivore-omnivore.

REFERENCES

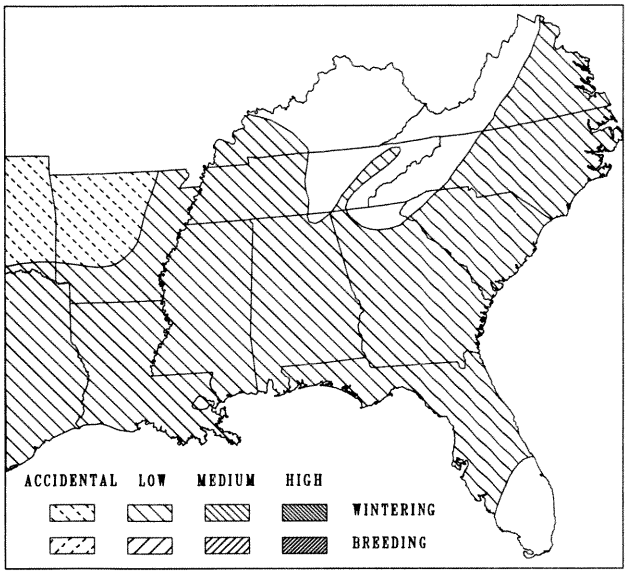
Bent 1948:351-374; Burleigh 1958:443; DeGraaf and Rudis 1986:289; DeGraaf et al. 1980:356; Ehrlich et al. 1988:470; Forbush and May 1939:371; Imhof 1976:301; James and Neal 1986:276; Lowery 1974:469; Mengel 1965:356; Monroe et al. 1988:45; Oberholser 1974(II):650; Potter et al. 1980:270; Robbins et al. 1986:71; Robinson 1990:170; Root 1988:201; Sprunt 1954:342; Sprunt and Chamberlain 1970:400; Stewart and Robbins 1958:241.

Water Pipit

Anthus spinoletta **WAPI**

ABUNDANCE STATUS

Wintering— generally C in the Coastal Plain, south to central Florida; mostly FC farther north; R and irregular in the mountains. Breed north of the region. Fall arrival— late September to early November; spring departure— late March to late April. Winter in flocks of as many as 200 birds, and tend to be erratic from month to month at a given locality.



PRIMARY HABITATS

Always in short grass or bare ground; plowed fields are favored; also in pastures, airports, large lawns, and mudflats.

KEY HABITAT REQUIREMENTS

Extensive areas of bare ground or short grass.

SAMPLE WINTER DENSITIES

0.8(2) grass/forb longleaf pine slash pine, 0.8(2) grass/forb elm-ash-cottonwood, 92(1) grass/forb loblolly pine-shortleaf pine.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Pipits forage solely on the ground, picking insects and other invertebrates from grass or the soil. Some seeds are taken.

GUILD

Terrestrial gleaning insectivore.

REFERENCES

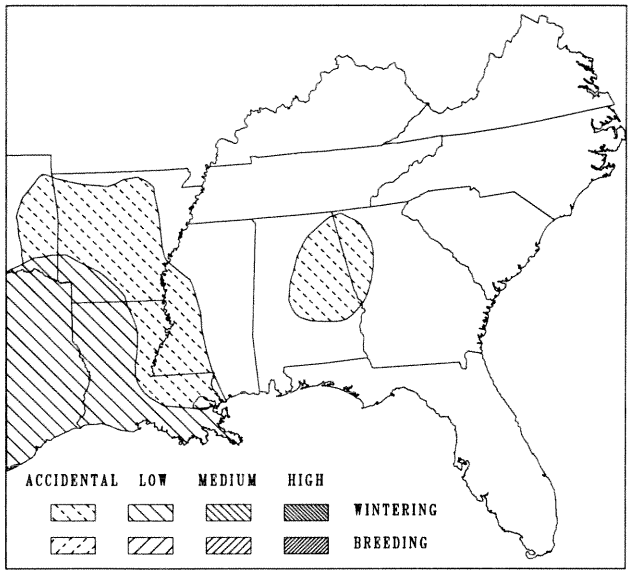
Bent 1950:25-40; Burleigh 1958:467; Ehrlich et al. 1988:478; Forbush and May 1939:390; Imhof 1976:313; James and Neal 1986:278; Lowery 1974:482; Mengel 1965:371; Monroe et al. 1988:45; Oberholser 1974(II):685; Potter et al. 1980:283; Rappole et al. 1983:212; Robinson 1990:170; Root 1988:205; Sprunt 1954:357; Sprunt and Chamberlain 1970:420; Stewart and Robbins 1958:256; Verner and Boss 1980:239.

Sprague's Pipit

Anthus spragueii **SPPI**

ABUNDANCE STATUS

Winter—Uncommon to Scarce in Texas and Oklahoma, Rare and local farther east to the prairie regions of Arkansas, northwestern Mississippi, western Tennessee, and the Gulf Coast into Alabama, late September to early April.



PRIMARY HABITATS

Winter—Very early successional stages of upland forest types, agricultural areas such as pastures, shortgrass prairies, and particularly airports.

KEY HABITAT REQUIREMENTS

Extensive areas of short grass: "Very low turf on dry ground seems to be the favorite feeding ground" [Oberholser 1974 (II):687], "fond of wet spots in alfalfa fields and short-grass prairie" (Sutton 1967:452). They leave the fields when the turf reaches 2.5-3 in (6-8 cm; B. B. Coffey, pers. comm.)

SAMPLE WINTER DENSITIES

3-17 birds/40 ha recorded on a mowed airport, upland site, on 5 censuses in Louisiana.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Insects and weed seeds gleaned from the ground or herbaceous vegetation in a dry grassy field.

GUILD

Terrestrial or herb gleaning omnivore

REFERENCES

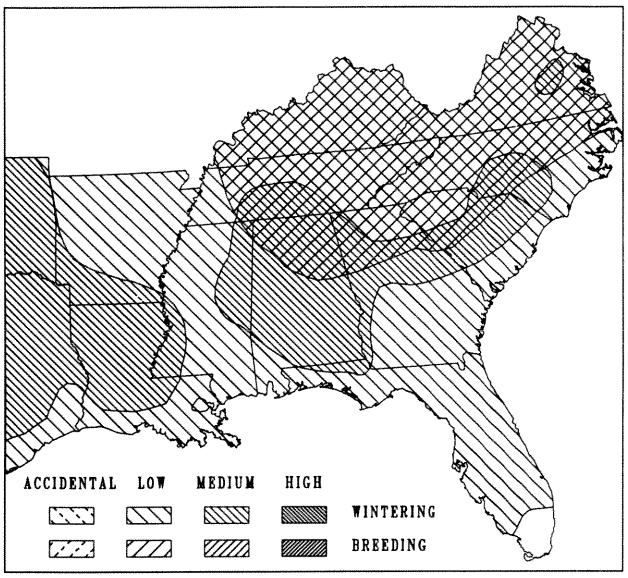
Barbour et al. 1973:64; Bent 1950:52; Burleigh 1958:469; Ehrlich et al. 1988:478; Forbush and May 1939:392; Imhof 1976:314; Jackson, ed., 1981:28; James and Neal 1986:278; King 1981; Lowery 1974:483; Mengel 1965:518; Monroe et al. 1988:63; Oberholser 1974 (II):686; Potter et al. 1980:284; Rappole et al. 1983:212; Robinson 1990:171; Root 1988:205, 286; Sprunt 1954:358; Sprunt and Chamberlain 1970:421, 620; Sutton 1967:452.

Cedar Waxwing

Bombycilla cedrorum **CEDW**

ABUNDANCE STATUS

Breeding— U to FC in the mountains, occurring to the highest elevations; R and erratic in the Piedmont and Appalachian plateaus portion of the breeding range. Wintering— erratic at this season, wandering about in large flocks; generally C over most of the region, though somewhat less numerous in the mountains and in southern Florida. Fall arrival— early September to early November (very erratic); spring departure— early May to late May.



PRIMARY HABITATS

Breeding— prefer open, mature conifers in many situations; openings or margins of spruce-fir forests, hemlock or white pine forests, residential areas with scattered trees, groves, and margins of bogs. Infrequent in hardwoods in summer. Wintering— in many wooded habitats, usually near berry-bearing trees or shrubs; occur in open woods, groves, residential areas, and wooded thickets; rather uncommon in remote or extensive forests, and tend to favor broadleaf trees at this season.

KEY HABITAT REQUIREMENTS

Breeding— scattered trees or open woods, preferably in conifers in the mountains. Wintering— berry-bearing trees or shrubs.

SAMPLE BREEDING DENSITIES

1(2) shrub/seedling mixed pine-hardwood, 15(1) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 77 of 888 BBS routes in the region, 1966-1985; maximum route mean 9 birds, overall mean 0.13 ± 0.66 birds/route, total of route means 119 birds. BBS information was not used in preparation of the map of breeding distribution.

SAMPLE WINTER DENSITIES

3(1) sawtimber oak-hickory, 3(2) sawtimber elm-ash-cottonwood, 48(4) shrub/seedling oak-hickory, 147(3) sawtimber live oak maritime.

REPRODUCTION

The breeding season extends from late May to late August, with the peak from mid-June to late July. Nests are built fairly high up in trees, usually 25 to 50 feet (8-15 m) from the ground. A conifer in the open is a favored site. The clutch size averages 4, with 3, 4, or 5 the usual range.

FOOD HABITS

In the summer, waxwings feed primarily on insects, gleaned from the foliage of trees; in winter they take mainly berries from shrubs and trees.

GUILD

Tree nesting, tree or bush foliage gleaning insectivore-frugivore.

REFERENCES

Bent 1950:79; Burleigh 1958:470; DeGraaf and Rudis 1986:291; DeGraaf et al. 1980:378; Ehrlich et al. 1988:484; Forbush and May 1939:393; Imhof 1976:315; James and Neal 1986:279; Lowery 1974:484; Mengel 1965:372; Monroe et al. 1988:45; Oberholser 1974(II):689; Potter et al. 1980:285; Rappole et al. 1983:212; Robbins et al. 1986:83; Robinson 1990:171; Root 1988:206; Sprunt 1954:359; Sprunt and Chamberlain 1970:421; Stewart and Robbins 1958:257; Verner and Boss 1980:240.

Loggerhead Shrike

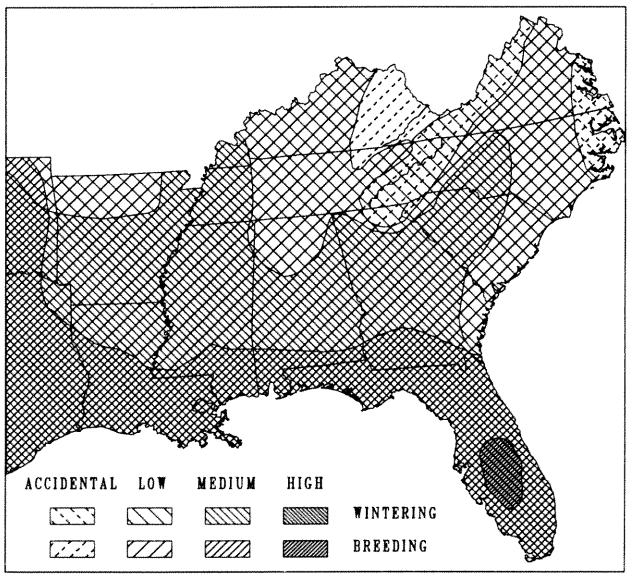
Lanius ludovicianus **LOSH**

PROTECTION STATUS

L. l. migrans federally listed as category C2. State listed as Endangered in Virginia, as Threatened in North Carolina, as Special Concern in Oklahoma, and as Rare in West Virginia. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Kentucky Nature Preserves Commission, South Carolina Heritage Trust Program. Forest Service sensitive on George Washington, Jefferson, and Ouachita National Forests.

ABUNDANCE STATUS

C over most of Florida; FC in the Coastal Plain; mostly U northward, and VR above 2000 feet (600 m). There is an increase in shrike populations over the South in winter. Numbers of this species have slowly, though drastically, declined in the region over the past 2 decades, particularly north of Florida.



PRIMARY HABITATS

All seasons— strictly in open country habitats; usually in open fields, pastures, and cultivated fields where there are scattered trees for nesting and telephone wires of fences for perching.

KEY HABITAT REQUIREMENTS

Open country with scattered trees or shrubs and conspicuous perches; a thorny shrub is a favored nesting site.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in 5 habitats, 5(1) grass/forb oak-hickory. Recorded on 448 of 888 BBS routes in the region, 1966-1985; maximum route mean 32 birds, overall mean 1.55 ± 3.31 birds/route, total of route means 1,374 birds.

SAMPLE WINTER DENSITIES

0.5(10) grass/forb elm-ash-cottonwood, 3.4(5) grass/forb oak-hickory, 6.2(4) sapling/poletimber pine savanna.

REPRODUCTION

The nesting season extends from late February (in Florida) to early July, with a peak from late March to late April. Nests are built in trees or shrubs in open country, usually 5 to 20 feet (1.5-6 m) from the ground, and often in thorny shrubs. The clutch size is usually 4 or 5, with 6 being rare.

FOOD HABITS

Shrikes watch for prey from a conspicuous perch, particularly from a telephone wire, and drop to the ground when a food item is observed. In summer they feed mainly on large insects, but in winter they feed on large insects, rodents, and small birds.

GUILD

Bush or tree nesting, terrestrial pouncing insectivore or carnivore.

REFERENCES

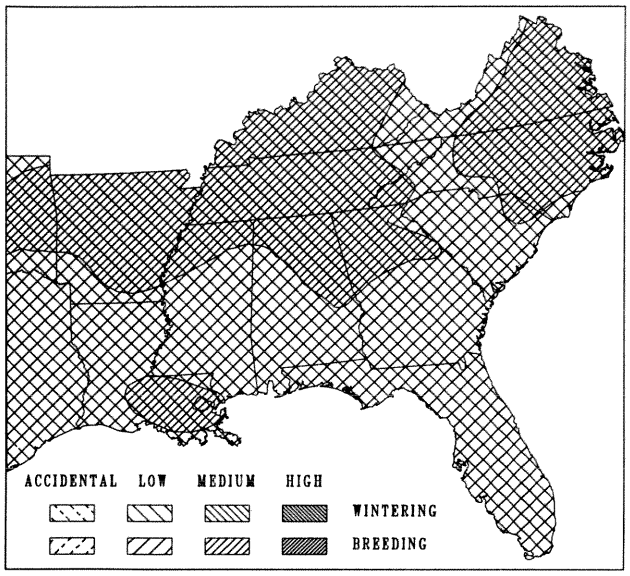
Bent 1950:131-181; Burleigh 1958:473-476; DeGraaf and Rudis 1986:293; DeGraaf et al. 1980:382; Ehrlich et al. 1988:466; Forbush and May 1939:397; Imhof 1976:317; James and Neal 1986:281; Lowery 1974:485; Mengel 1965:374; Monroe et al. 1988:45; Oberholser 1974(II):694; Potter et al. 1980:287; Rappole et al. 1983:213; Robbins et al. 1986:83; Robinson 1990:172; Root 1988:208; Sprunt 1954:360; Sprunt and Chamberlain 1970:422; Stewart and Robbins 1958:259; Verner and Boss 1980:242.

European Starling (Starling)

Sturnus vulgaris **EUST**

ABUNDANCE STATUS

A, essentially everywhere, though not common at higher elevations; generally absent above 5000 feet (1500 m). Occur in tremendous flocks in the non-breeding season, at times roosting in numbers of over a million birds.



PRIMARY HABITATS

All seasons— abundant in cities, towns, open residential areas, farms, and other places where humans live; not common in wooded residential areas. In the winter, forage in various urban and rural open country habitats, but the birds tend to roost in large flocks in woods, especially in moist and dense ones. Swamp forests or dense stands of pines are favored for roosting.

KEY HABITAT REQUIREMENTS

Breeding— a cavity, ledge, or cranny in open country, especially around human habitation. Wintering— no essential requirements, though favor urban areas or farmlands for foraging.

SAMPLE BREEDING DENSITIES

0.7(12) grass/forb elm-ash-cottonwood, 28(2) grass/forb mixed pine-hardwood. Recorded on 561 of 888 BBS routes in the region, 1966-1985; maximum route mean 291 birds, overall mean 17.56 ± 33.60 birds/route, total of route means 15,592 birds.

SAMPLE WINTER DENSITIES

2(1) shrub/seedling Virginia pine-pitch pine, 2(2) sawtimber mixed pine-hardwood, 54(9) grass/forb oak-hickory, 85(3) sawtimber live oak maritime, 148(28) grass/forb elm-ash-cottonwood.

REPRODUCTION

The nesting season extends from mid-March to mid-June, with the peak form early April to early May. Nests are placed in a variety of sites, usually in cavities or crannies of some kind. Common sites are old woodpecker holes, knotholes, crannies in buildings, and ledges on buildings. Clutch size is commonly 4 or 5, but 6 eggs are not unusual.

FOOD HABITS

Starlings forage mainly on insects in the summer, picking or probing into the ground for food. They take insects, berries, other fruits, and many additional items in winter. Human garbage is consumed at all seasons. Some foraging is done in trees or shrubs.

GUILD

Cavity or ledge nesting, terrestrial gleaning or probing omnivore.

REFERENCES

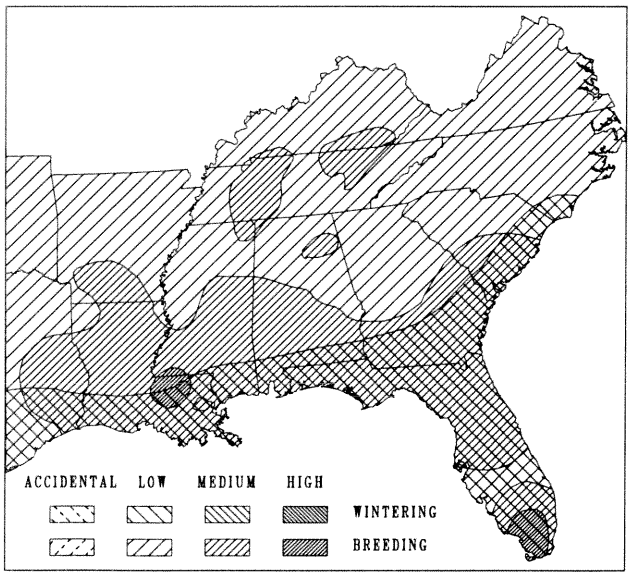
Bent 1950:182; Burleigh 1958:476; Crase and DeHaven 1975; DeGraaf and Rudis 1986:294; DeGraaf et al. 1980:384; Dolbeer and Stehn 1979; Ehrlich et al. 1988:488; Forbush and May 1939:399; Imhof 1976:319; James and Neal 1986:282; Lowery 1974:487; Mengel 1965:376; Monroe et al. 1988:46; Oberholser 1974(II):697; Potter et al. 1980:289; Robbins et al. 1986:87; Robinson 1990:173; Root 1988:209, 286; Scott et al. 1977:86; Sprunt 1954:362; Sprunt and Chamberlain 1970:424; Stewart and Robbins 1958:260; USDI Fish & Wildl. Serv. 1980; Verner and Boss 1980:243.

White-eyed Vireo

Vireo griseus **WEVI**

ABUNDANCE STATUS

Breeding— C nearly throughout; most abundant in the Coastal Plain; FC to C in lower mountains, ranging upward to approximately 4000 feet (1200 m). Wintering— FC to C in the southern half of Florida, decreasing to U in the outer Coastal Plain from Texas to Georgia and South Carolina. Spring arrival— mid-March to mid-April; fall departure— early October to late October.



PRIMARY HABITATS

Breeding— primarily in dense thickets, especially where moist; common habitats are streamside shrubbery, swamp borders and openings, willow thickets, and damp tangles. Wintering— generally in evergreen shrubs and vines in woodland understory, wood margins, or thickets; seldom away from dense cover of shrubs or saplings.

KEY HABITAT REQUIREMENTS

Breeding— dense, and usually moist, thickets. Wintering— dense thickets where cover is mainly evergreen.

SAMPLE BREEDING DENSITIES

2(1) sapling/poletimber live oak maritime, 14(5) sawtimber longleaf pine-slash pine, 28(5) sapling/poletimber oak-gum-cypress. Recorded on 489 of 888 BBS routes in the region, 1966-1985; maximum route mean 82 birds, overall mean 4.37 ± 7.97 birds/route, total of route means 3,882 birds.

SAMPLE WINTER DENSITIES

1(2) sapling/poletimber pine savanna, 1(4) sawtimber mixed pine-hardwood, 6.8(4) sawtimber longleaf pine-slash pine, 10(1) sapling/poletimber sand pine-southern scrub oak, 17(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The season extends from late March to mid-July, with a peak from early May to late May. Nests are placed in shrubs, vine tangles, or small trees, generally 3 to 6 feet (1-2 m) above the ground, and often well hidden in a thicket. Four eggs represent the usual clutch, but 3 or 5 eggs are not rare.

FOOD HABITS

Insects are the major food item throughout the year, though some berries are taken in winter. White-eyed Vireos forage almost exclusively between 3 and 15 feet (1-5 m) of the ground, gleaning insects from leaves and twigs.

GUILD

Bush nesting, bush foliage gleaning insectivore.

REFERENCES

Bent 1950:227-241; Burleigh 1958:478-483; DeGraaf and Rudis 1986:295; DeGraaf et al. 1980:386; Ehrlich et al. 1988:488; Forbush and May 1939:401; Imhof 1976:321; James and Neal 1986:284; Lowery 1974:490; Mengel 1965:377; Monroe et al. 1988:46; Oberholser 1974(II):702; Potter et al. 1980:290; Rappole et al. 1983:213; Robbins et al. 1986:87; Robinson 1990:174; Root 1988:209; Sprunt 1954:364; Sprunt and Chamberlain 1970:426; Stewart and Robbins 1958:262.

Bell's Vireo

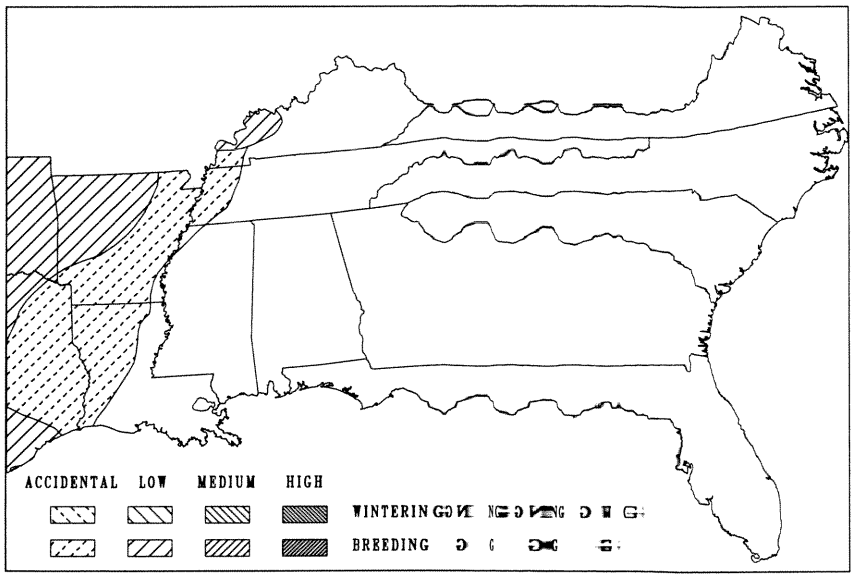
Vireo bellii **BEVI**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Sciences and Nature Preserves Commission, and in Oklahoma. Blue Listed by Tate (1982). Monitored by Louisiana Natural Heritage Program, Tennessee Natural Heritage Program.

ABUNDANCE STATUS

Breeding—Uncommon to Rare in Texas and Oklahoma, late March-early August, Rare to locally Common in northern Arkansas, and Very Rare in southeastern Arkansas and northwestern Louisiana.



PRIMARY HABITATS

Breeding—Shrub/seedling and sapling stands of elms, persimmon, willow, and locust, areas along streams and in bottomlands, such as mesquite (*Prosopis* sp.) thickets, and cottonwood-willow stands. They also breed in upland scrub oak stands, wild plum and sumac thickets, hedgerows, and mulberry shelterbelts.

KEY HABITAT REQUIREMENTS

Breeding—Streamside thickets or upland scrub o stands; shrubby places in open areas.

SAMPLE BREEDING DENSITIES

Recorded densities in the region range from 0.6-2 pairs/ ha on 4 eastern Oklahoma censuses, 1 in virgin tallgr prairie and the rest in open canopy sawtimber elm-ash-c tonwood riparian vegetation. A single record of 1 pair/40 in sawtimber Longleaf Pine-Slash Pine has been publish Recorded on 64 of 888 BBS routes in the region, 1966-19 maximum route mean 48 birds, overall mean 0.21 ± 2 birds/route, total of route means 186 birds.

REPRODUCTION

These western counterparts of White-eyed Vireos *griseus*) hang their typical dangling-cup *Vireo* nest i shrub or small tree usually below 6 ft (2 m). The clutch 3-5, usually 4 eggs, laid in May or June. J. Neal (pe comm.) notes a high incidence of Brown-headed Cowb (*Molothrus ater*) parasitism in Arkansas nests.

FOOD HABITS

Forage at low heights in the interior of shrubs or sm trees, occasionally large trees, where they glean inse particularly grasshoppers, and other small invertebrate a mals.

GUILD

Bush nesting, herb or bush foliage gleaning insectivor

REFERENCES

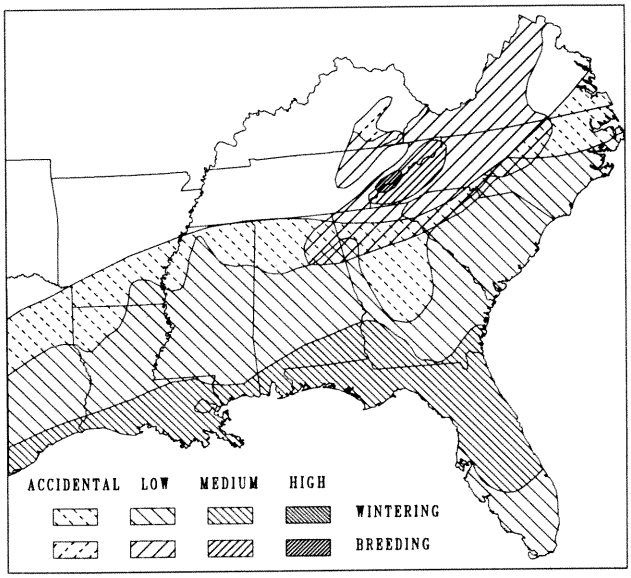
Barbour et al. 1973:66; Bent 1950:253; Eagar and Hatc 1982:A-109; Ehrlich et al. 1988:492; Forbush and M 1939:402; Imhof 1976:321; James and Neal 1986:2 Lowery 1974:490; Mengel 1965:518; Monroe et 1988:46; Oberholser 1974 (II):704; Potter et al. 1980:2 Rappole et al. 1983:213; Robbins et al. 1986:87; Robin 1990:174; Sprunt 1954:501; Sutton 1967:477; Verner Boss 1980:245.

Solitary Vireo

Vireo solitarius **SOVI**

ABUNDANCE STATUS

Breeding— C and widespread in the Southern Appalachians, ranging to the highest elevations (6684 feet, 2018 m); mostly R and local in the Piedmont, though a moderate population exists in central North Carolina. Wintering— C in Florida and the Outer Coastal Plain; FC in the Inner Coastal Plain portion of the range; U to R farther inland. Spring arrival— mid-March to mid-April; fall departure— late October to mid-November.



PRIMARY HABITATS

Breeding— in the mountains, in many forest types, but favor mixed coniferous-hardwood forests; spruce-fir, hemlock, and white pine forests; hardwood forests mainly above 3500 feet (1050 m). In the Piedmont and mountain foothills, they inhabit mature pine forests of many types, but favor loblolly pine. Wintering— usually with chickadees, titmice, and kinglets in mixed woods or pine forests; often found in broadleaf evergreen trees.

KEY HABITAT REQUIREMENTS

Breeding— middle-aged to mature forests, mainly in the mountains. Wintering— woods of many types; no other essential requirements.

SAMPLE BREEDING DENSITIES

3(1) shrub/seedling mixed pine-hardwood, 3.3(8) sawtimber mixed pine-hardwood, 16(3) sawtimber white pine-hemlock, 28(2) sawtimber spruce-fir. Recorded on 30 of 888 BBS routes in the region, 1966-1985; maximum route mean 13 birds, overall mean 0.06 ± 0.61 birds/route, total of route means 51 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber sand pine-southern scrub oak, 9(1) sapling/poletimber live oak maritime.

REPRODUCTION

The breeding season extends from mid-April to early July, with a peak from late April to mid-May. Build nests in saplings or trees, commonly 5 to 10 feet (1.5-3 m) from the ground, but frequently in the canopy. Four is the usual clutch size, but 3 or 5 are also common.

FOOD HABITS

Insects are the main food item in summer; in winter, insects, larvae, and insect eggs are the primary items. The birds glean their food from leaves or twigs, mainly in the canopies of hardwoods and conifers.

GUILD

Tree or bush nesting, tree foliage gleaning insectivore.

REFERENCES

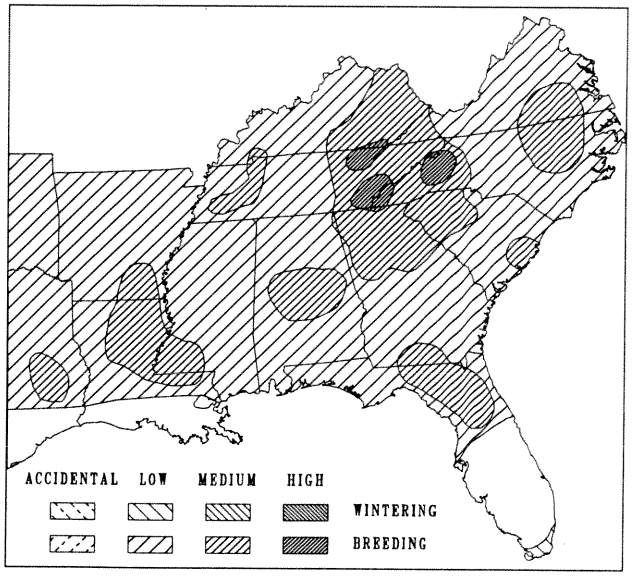
Bent 1950:290-308; Burleigh 1958:485-489; DeGraaf and Rudis 1986:296; DeGraaf et al. 1980:390; Ehrlich et al. 1988:494; Forbush and May 1939:404; Imhof 1976:324; James and Neal 1986:286; Lowery 1974:492; Mengel 1965:380; Monroe et al. 1988:46; Oberholser 1974(II):708; Potter et al. 1980:292; Rappole et al. 1983:214; Robbins et al. 1986:89; Robinson 1990:175; Root 1988:210; Sprunt 1954:367; Sprunt and Chamberlain 1970:429, 430; Stewart and Robbins 1958:264; Verner and Boss 1980:246.

Yellow-throated Vireo

Vireo flavifrons **YTVI**

ABUNDANCE STATUS

Breeding— generally FC over nearly all its range; U over much of Florida; in the mountains, range up to 3500 feet (1050 m). Wintering— R to U in extreme southern Florida. Spring arrival— mid- March to mid-April; fall departure— late September to mid-October.



PRIMARY HABITATS

Breeding— a wide variety of woodlands, favor mature deciduous trees in a fairly open setting, especially where moist. Habitats include streamside groves, parks, open hardwoods, woodland borders, and rather open bottomlands; avoid pure coniferous forests. Wintering— usually in mature, open to medium-growth broadleaf evergreen woods (hammocks).

KEY HABITAT REQUIREMENTS

Breeding— tall deciduous trees, usually near water and in a fairly open stand. Wintering— mature or medium-sized trees, usually broadleaf evergreens.

SAMPLE BREEDING DENSITIES

0.3(2) sawtimber loblolly pine- shortleaf pine, 9(5) sawtimber cove hardwoods, 9.8(4) sawtimber oak-gum-cypress. Recorded on 343 of 888 BBS routes in the region, 1966-1985; maximum route mean 16 birds, overall mean 0.74 ± 1.67 birds/route, total of route means 655 birds.

REPRODUCTION

The breeding season extends from late April to mid-July, with the peak from mid-May to early June. Typical nest is suspended inside the fork of two twigs of a tree, usually a deciduous one and generally 15-50 feet (5-15 m) from the ground. The most common clutch size is 4, with 3 or 5 infrequent.

FOOD HABITS

Feed almost solely on insects, gleaned from leaves and twigs of hardwood trees at least 20 feet (6 m) from the ground. Almost never seen below 15 feet (5 m) from the ground.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1950:276; Burleigh 1958:483; DeGraaf and Rudis 1986:297; DeGraaf et al. 1980:388; Ehrlich et al. 1988:490; Forbush and May 1939:403; Imhof 1976:322; James and Neal 1986:286; Lowery 1974: 492; Mengel 1965:379; Monroe et al. 1988:46; Oberholser 1974(II):707; Potter et al. 1980:292; Rappole et al. 1983:214; Robbins et al. 1986:89; Robinson 1990:176; Root 1988:210; Sprunt 1954:366; Sprunt and Chamberlain 1970:428; Stewart and Robbins 1958:263.

Warbling Vireo

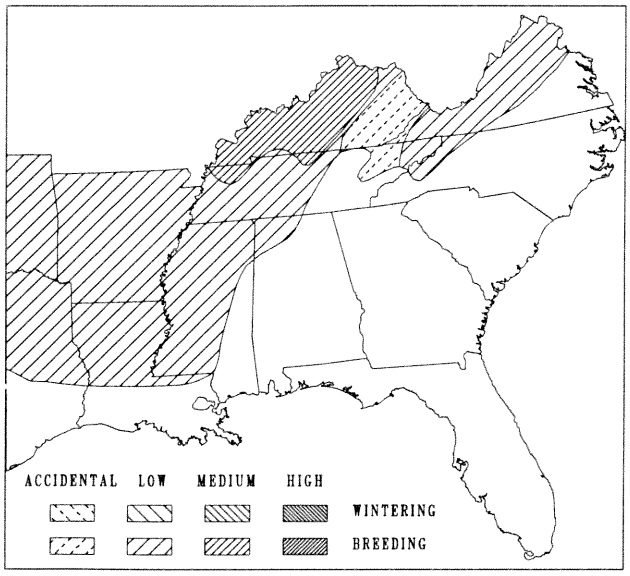
Vireo gilvus **WAVI**

PROTECTION STATUS

State listed as Significantly Rare in North Carolina, as Poorly Known in Alabama. Monitored by Louisiana Natural Heritage Program, Tennessee Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC to C in western Kentucky; U to locally FC in the western parts of the range, along large streams and rivers; C in a few areas. Winter south of the United States. Spring arrival— mid-April to late April; fall departure— mid-September to late September.



PRIMARY HABITATS

Strictly in open mature hardwoods; restricted in the South to open hardwoods along rivers and large streams; do not occur in forests, but only where hardwoods line streams and rivers in open country.

KEY HABITAT REQUIREMENTS

Scattered hardwoods in open country, especially near a stream or river.

SAMPLE BREEDING DENSITIES

Recorded on 97 of 888 BBS routes in the region, 1966-1985; maximum route mean 9 birds, overall mean 0.13 ± 0.67 birds/route, total of route means 118 birds.

REPRODUCTION

The breeding season extends from mid-May to late June, with the peak probably from late May to early June. Nests are built in hardwood trees, usually in the canopy and well out on branches. The clutch size is most commonly 4, with 3 or 5 less frequent.

FOOD HABITS

The food is generally insects, with a few other invertebrates taken. The prey are gleaned from leaves and twigs in the canopy of deciduous trees.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

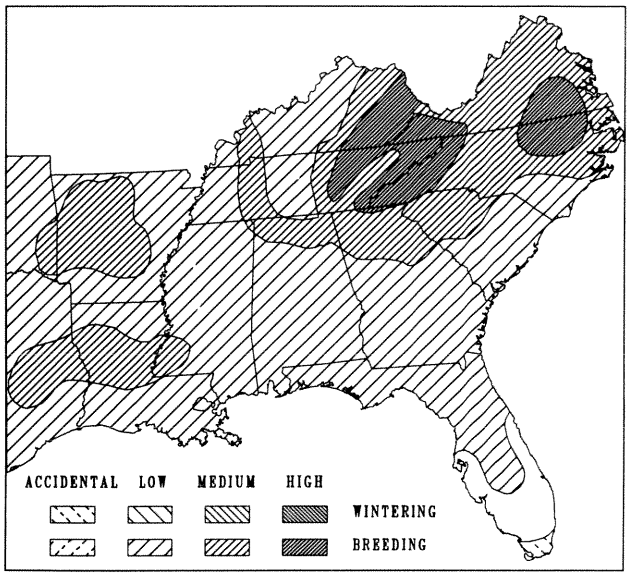
Bent 1950:362-378; DeGraaf and Rudis 1986:298; DeGraaf et al. 1980:396; Eagar and Hatcher 1982(A):111; Ehrlich et al. 1988:498; Forbush and May 1939:408; Imhof 1976:327; James and Neal 1986:287; Lowery 1974:496; Mengel 1965:385; Monroe et al. 1988:46; Oberholser 1974(II):714; Potter et al. 1980:296; Rappole et al. 1983:215; Robbins et al. 1986:89; Robinson 1990:176; Sprunt 1954:373; Stewart and Robbins 1958:268; Verner and Boss 1980:247.

Red-eyed Vireo

Vireo olivaceus **REVI**

ABUNDANCE STATUS

Breeding— C to VC over most of the South; somewhat less numerous in the Outer Coastal Plain; range up to 5000 feet (1500 m) in the mountains. Winter south of the United States. Spring arrival— late March to late April; fall departure— early October to late October.



PRIMARY HABITATS

Deciduous forests of many types; favor mature hardwood forests, both in uplands and bottomlands; also found in mixed woods, even in the deciduous understory of pine-woods. Not common in open woods, such as parks or groves.

KEY HABITAT REQUIREMENTS

Deciduous forests.

SAMPLE BREEDING DENSITIES

1(1) shrub/seedling elm-ash-cottonwood, 1.6(2) shrub/seedling mixed pine-hardwood, 29(34) sawtimber oak-hickory, 31(6) sawtimber oak-gum-cypress, 32(2) sapling/poletimber live oak maritime, 60(11) sawtimber cove hardwoods. Recorded on 447 of 888 BBS routes in the region, 1966-1985; maximum route mean 83 birds, overall mean 4.23 ± 9.31 birds/route, total of route means 3,760 birds.

REPRODUCTION

The nesting season extends from early May to late July, with the peak from late May to mid-June. The nest is a typical *Vireo* one, suspended from twigs in a tree at a moderate height; usually in a deciduous tree. Four is the most common clutch size, with 3 infrequent and 5 rare.

FOOD HABITS

Glean insects and other small invertebrates from leaves and twigs in the canopy of hardwood trees. Seldom forage in conifers or in saplings.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1950:335; Burleigh 1958:489; DeGraaf and Rudis 1986:300; DeGraaf et al. 1980:392; Ehrlich et al. 1988:496; Forbush and May 1939:406; Imhof 1976:325; James and Neal 1986:289; Lowery 1974:494; Mengel 1965:382; Monroe et al. 1988:47; Oberholser 1974(II):711; Potter et al. 1980:294; Rappole et al. 1983:215; Robbins et al. 1986:89; Robinson 1990:177; Root 1988:211; Sprunt 1954:370; Sprunt and Chamberlain 1970:431; Stewart and Robbins 1958:265.

Black-whiskered Vireo

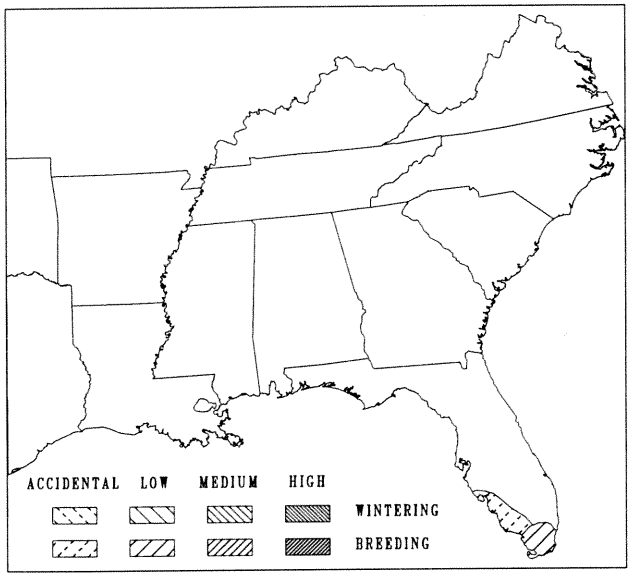
Vireo altiloquus **BWVI**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

Breeding— C in the Florida Keys; FC or C in most of the remainder of its range in the region. Winter to the south of the United States. Spring arrival— late March to late April; fall departure— mid-September to early October.



PRIMARY HABITATS

Primarily in dense mangroves, also in other fairly dense, broadleaf woods (such as hammocks); seldom far from the coast.

KEY HABITAT REQUIREMENTS

Broadleaf, usually evergreen, woods or thickets in the vicinity of the coast.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sapling/poletimber live oak maritime. Recorded on 6 of 888 BBS routes in the region, 1966-1985; maximum route mean 80 birds, overall mean 0.16 ± 3.02 birds/route, total of route means 143 birds.

REPRODUCTION

The breeding season apparently extends from late May to late June, but the peak is not certain, as rather few nests with eggs have been reported from Florida. Nests are built in trees or shrubs, in dense cover, generally 5 to 15 feet (1.5-5 m) from the ground. The clutch size is usually 3, but frequently 2.

FOOD HABITS

These vireos feed mainly on insects, with a few berries or other fruits taken. Foraging is by gleaning items from foliage of trees or saplings, mainly over 10 feet (3 m) from the ground.

GUILD

Tree or bush nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1950:316; Ehrlich et al. 1988:496; Forbush and May 1939:405; Imhof 1976:324; Kale 1978:59; Lowery 1974:493; Oberholser 1974(II):710; Potter et al. 1980:293; Rappole et al. 1983:214; Sprunt 1954:368.

Bachman's Warbler

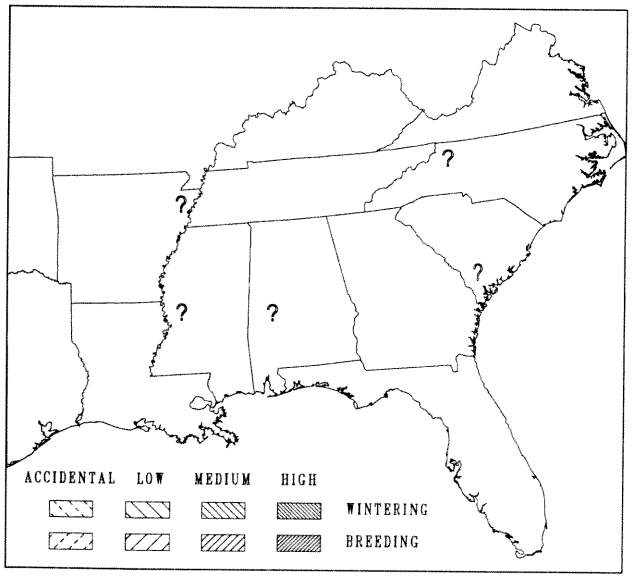
Vermivora bachmanii **BAWA**

PROTECTION STATUS

Federally listed as Endangered. State listed as Endangered in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Texas, and Virginia. Monitored by Tennessee Natural Heritage Program.

ABUNDANCE STATUS

Breeding— extremely R, possibly even extinct; a few recent sight reports, mainly from Francis Marion National Forest, South Carolina, but the last confirmed report was in the early 1960's. In the past breeding has been most frequent in I'On Swamp in that forest. These birds have always been rare and local, though considerably more numerous at the turn of the century. Winter in Cuba. Spring arrival— late February to mid-March; fall departure— late July to early September (departure dates poorly known).



PRIMARY HABITATS

Bottomland forests or swamps with dense shrub layer, particularly in the vicinity of openings or internal edges. Almost always in hardwood forests; a preference for areas with blackberries or cane.

KEY HABITAT REQUIREMENTS

Moist deciduous forests with dense shrub layer, especially where openings in the canopy are present.

REPRODUCTION

The season extends from late March to mid-June, with the peak from late March to early April. Nests are generally less than 3 feet (1 m) from the ground, placed in dense shrub or vine tangles in swamps or bottomlands. The clutch size is usually 3 or 4, rarely 5.

FOOD HABITS

These warblers feed primarily in the middle and lower portions of hardwood trees and in shrubs, gleaning insects from leaves and twigs.

GUILD

Bush nesting, bush or tree foliage gleaning insectivore.

REFERENCES

Bent 1953:67; Burleigh 1958:504; Eagar and Hatcher 1982(A):13; Ehrlich et al. 1988:504, 505; Forbush and May 1939:416; Hamel 1981; Hamel 1986; Hamel 1988; Hooper and Hamel 1977; Imhof 1976:337; James and Neal 1986:290; Kale 1978:13; Lowery 1974:498; Mengel 1965:396; Monroe et al. 1988:47; Oberholser 1974(II):724; Potter et al. 1980:305; Rappole et al. 1983:217; Sprunt 1954:382; Sprunt and Chamberlain 1970:439.

Blue-winged Warbler

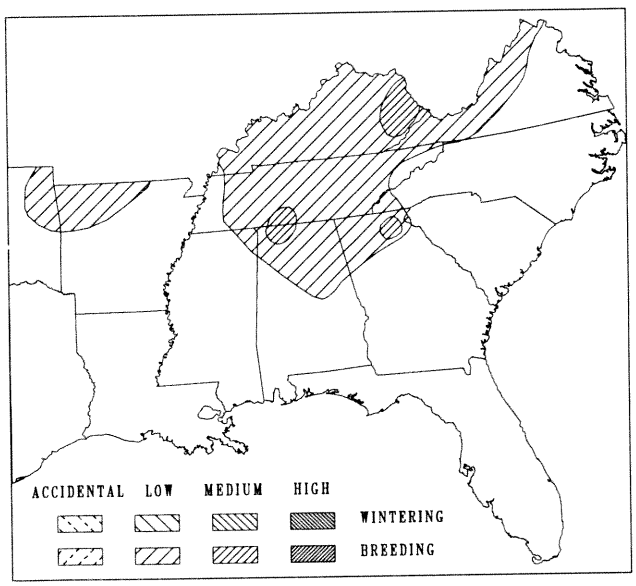
Vermivora pinus **BWWA**

PROTECTION STATUS

State listed as Significantly Rare in North Carolina. Monitored by Arkansas Natural Heritage Commission.

ABUNDANCE STATUS

Breeding— R to U in the Ozarks and much of the interior low plateaus; mostly U in the mountains of Georgia and extreme southwestern North Carolina, but R and local in the Virginia mountains; primarily occur below 2000 feet (600 m), and absent above 2500 feet (750 m); VR to R, and local, in the Piedmont portion of the range. Winter to the south of the United States. Spring arrival— mid-April to early May; fall departure— early September to mid-September.



PRIMARY HABITATS

Favor overgrown fields or thickets, on fairly level ground. Often occur in moist situations, such as streamside shrubbery, but are not birds of dense thickets.

KEY HABITAT REQUIREMENTS

Deciduous shrubs or saplings in a variety of situations (in open country).

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sawtimber oak-gum-cypress. Recorded on 54 of 888 BBS routes in the region, 1966-1985; maximum route mean 8 birds, overall mean 0.06 ± 0.48 birds/route, total of route means 56 birds.

REPRODUCTION

The nesting season extends from mid-May to late June, with a peak from late May to early June. Build nests on or near the ground, in grass clumps or other dense herbaceous cover in old fields or thickets. The clutch size is most commonly 5, with 6 being frequent; 4 or 7 are rare.

FOOD HABITS

Habits are very similar to those of Golden-winged Warblers. Forage mainly on insects, gleaned from the vegetation of shrubs or saplings, and less commonly in herbaceous cover.

GUILD

Ground nesting, bush gleaning insectivore.

REFERENCES

Bent 1953:58; Burleigh 1958:502; DeGraaf and Rudis 1986:301; DeGraaf et al. 1980:406; Ehrlich et al. 1988:500; Forbush and May 1939:415; Imhof 1976:335; James and Neal 1986:290; Lowery 1974:501; Mengel 1965:394; Monroe et al. 1988:47; Oberholser 1974(II):723; Potter et al. 1980:303; Rappole et al. 1983:217; Robbins et al. 1986:92; Robinson 1990:178; Sprunt 1954:381; Sprunt and Chamberlain 1970:439; Stewart and Robbins 1958:276.

Golden-winged Warbler

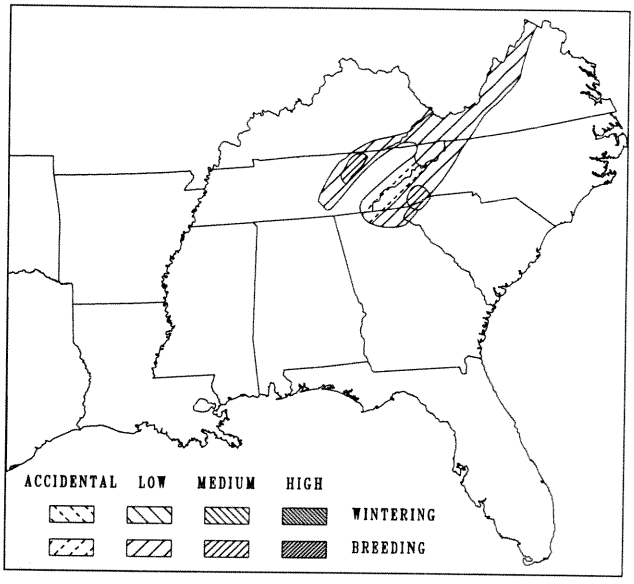
Vermivora chrysoptera **GWWA**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Science and Kentucky Nature Preserves Commission. Blue Listed by Tate (1981).

ABUNDANCE STATUS

Breeding— U over most of the Southern Appalachians, but FC in southwestern North Carolina and the Cumberland Plateau; range from 1000-5000 feet (300-1500 m), but most numerous between 2000-4000 feet (600-1200 m). Winter south of the United States. Spring arrival— mid-April to early May; fall departure— mid-September to late September.



PRIMARY HABITATS

Favor abandoned fields with scattered deciduous saplings up to 25 feet (8 m) high; occasionally in open woods; also in woodland borders where saplings are present. Generally on hillsides rather than in valleys.

KEY HABITAT REQUIREMENTS

Deciduous saplings in the mountains, especially in black locust (*Robinia pseudo-acacia.*)

SAMPLE BREEDING DENSITIES

14(2) shrub/seedling mixed pine-hardwood. Recorded on 17 of 888 BBS routes in the region, 1966-1985; maximum route mean 9 birds, overall mean 0.02 ± 0.32 birds/route, total of route means 18 birds.

REPRODUCTION

The breeding season extends from mid-May to late June, with the peak from late May to early June. Nests are built on or near the ground in abandoned fields or wood margins, and are well hidden in tall grasses or near the bases of saplings. The clutch size is usually 4 or 5; 6 or 7 eggs are rare.

FOOD HABITS

These birds glean insects and other small invertebrates from the leaves and twigs of deciduous shrubs and saplings; only infrequently forage on the ground in tall grasses.

GUILD

Ground nesting, bush gleaning insectivore.

REFERENCES

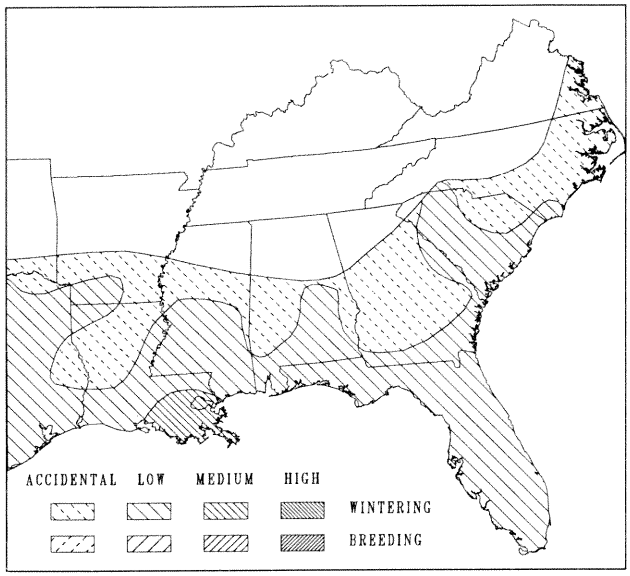
Bent 1953:47; Burleigh 1958:501; DeGraaf and Rudis 1986:302; DeGraaf et al. 1980:404; Ehrlich et al. 1988:502; Forbush and May 1939:413; Imhof 1976:334; James and Neal 1986:292; Lowery 1974:500; Mengel 1965:394; Monroe et al. 1988:47; Oberholser 1974(II):721; Potter et al. 1980:302; Rappole et al. 1983:216; Robbins et al. 1986:92; Robinson 1990:179; Sprunt 1954:380; Sprunt and Chamberlain 1970:438; Stewart and Robbins 1958:275.

Orange-crowned Warbler

Vermivora celata **OCWA**

ABUNDANCE STATUS

Wintering— FC over most of Florida and the Outer Coastal Plain, east to southeastern South Carolina; mostly U over the remainder of the Wintering range. Breed north and west of the region. Fall arrival— early October to early November; spring departure— early April to early May.



PRIMARY HABITATS

Various types of thickets or brush; favor waxmyrtle thickets, wood margins, abandoned fields, hedgerows, and other shrubby areas; frequently in rather open woods, especially in broadleaf evergreens; also in weedy fields with sparrows.

KEY HABITAT REQUIREMENTS

Dense cover of shrubs, saplings, or herbs preferred, though no strict requirements.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber pine savanna, 1(1) sapling/poletimber bay swamp-pocosin, 1(1) sapling/poletimber longleaf pine-slash pine, 1(1) sawtimber longleaf pine-slash pine, 1(3) sawtimber live oak maritime, 1(2) sawtimber mixed pine-hardwood, 5(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

The food items consist both of insects and berries, gleaned from leaves or twigs from shrubs or saplings (primarily), trees, or from herbaceous vegetation.

GUILD

Bush or herb gleaning omnivore.

REFERENCES

Bent 1953:89-104; Burleigh 1958:506; Ehrlich et al. 1988:504; Forbush and May 1939:417; Imhof 1976:339; James and Neal 1986:293; Lowery 1974:503; Mengel 1965:397; Monroe et al. 1988:48; Oberholser 1974(II):725; Potter et al. 1980:307; Rappole et al. 1983:217; Robbins et al. 1986:92; Robinson 1990:181; Root 1988:212; Sprunt 1954:385; Sprunt and Chamberlain 1970:443; Stewart and Robbins 1958:279; Verner and Boss 1980:248.

Nashville Warbler

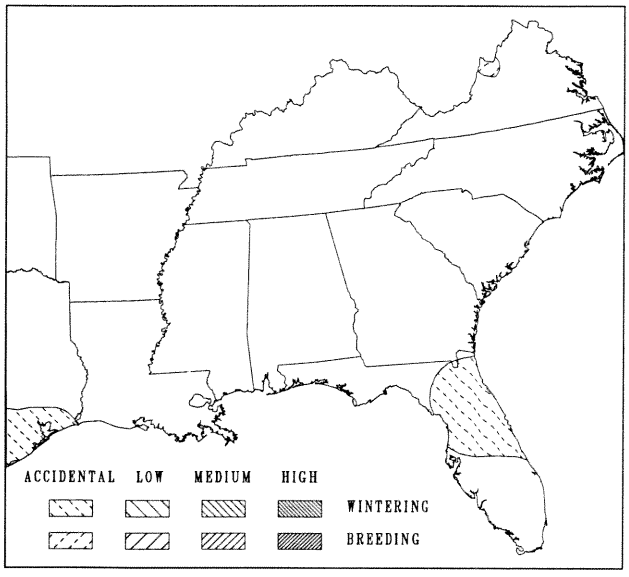
Vermivora ruficapilla **NAWA**

PROTECTION STATUS

Monitored by Virginia Natural Heritage Program, West Virginia Natural Heritage Program. Forest Service sensitive on the George Washington National Forest.

ABUNDANCE STATUS

Breeding— R and local, at high elevations in Virginia (mainly over 4000 feet, 1200 m); exact status is poorly known. Winter to the south of the United States. Spring arrival— late April to early May; fall departure— early October to mid-October.



PRIMARY HABITATS

Mainly in small to medium-sized spruce or fir trees, such as along the margins of high elevation bogs and in spruce-fir forests and margins.

KEY HABITAT REQUIREMENTS

Spruce or fir trees or saplings.

REPRODUCTION

Apparently, no nest has been discovered in the South, though they are presumed to breed in Virginia. The season probably extends from mid- May to late June. Build nests on the ground, well hidden in mossy hummocks, tall grasses, or at the bases of trees or shrub. The clutch size is almost always 4 or 5.

FOOD HABITS

Feed almost entirely on insects, larvae, and other small invertebrates. These items are gleaned from the leaves and twigs of shrubs and saplings, both hardwood and coniferous.

GUILD

Ground nesting, bush gleaning insectivore.

REFERENCES

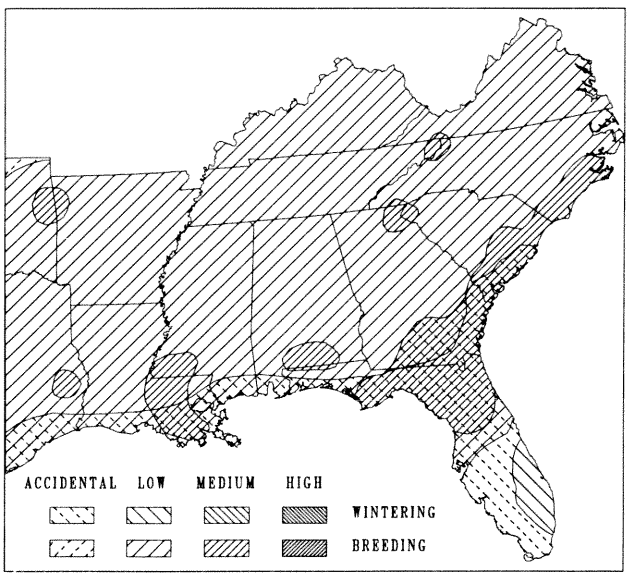
Bent 1953:105-118; Burleigh 1958:507; DeGraaf and Rudis 1986:304; DeGraaf et al. 1980:410; Ehrlich et al. 1988:506; Forbush and May 1939:418; Imhof 1976:340; James and Neal 1986:293; Lowery 1974:503; Mengel 1965:398; Monroe et al. 1988:48; Oberholser 1974(II):727; Potter et al. 1980:308; Rappole et al. 1983:218; Robbins et al. 1986:92; Robinson 1990:182; Root 1988:211, 287; Sprunt 1954:386; Sprunt and Chamberlain 1970:445; Stewart and Robbins 1958:279; Verner and Boss 1980:249.

Northern Parula

Parula americana **NOPA**

ABUNDANCE STATUS

Breeding C to VC in most of the Coastal Plain, especially in the Outer Coastal Plain; generally FC to C in the mountains; mostly U elsewhere. Wintering— U over most of Florida range, but FC in the extreme south. Spring arrival— mid-March to mid-April; fall departure— early October to late October.



PRIMARY HABITATS

Breeding— in the Coastal Plain and Piedmont, mainly in swamps and bottomland forests, especially where Spanish moss (*Tillandsia usneoides*) and *Usnea* are common. In the mountains, favor hemlock or mixed hemlock-hardwood forest, particularly along streams, but occur in pure hardwood forests and other forests also. Wintering— in woodlands or forests, mainly in broadleaf evergreens.

KEY HABITAT REQUIREMENTS

Breeding— forests of many types, but usually mature and moist ones where Spanish moss or *Usnea* grow. Wintering— woodlands, mainly broadleaf evergreen ones.

SAMPLE BREEDING DENSITIES

3.4(5) sapling/poletimber oak- hickory, 34(2) sapling/poletimber live oak maritime, 36(5) sawtimber oak-gum-cypress, 44(2) sapling/poletimber oak-gum-cypress. Recorded on 352 of 888 BBS routes in the region, 1966-1985; maximum route mean 47 birds, overall mean 1.31 ± 3.66 birds/route, total of route means 1,164 birds.

SAMPLE WINTER DENSITIES

10(1) sapling/poletimber oak-gum-cypress, 12(1) sapling/poletimber live oak maritime.

REPRODUCTION

The breeding season extends from early April to late June, with the peak from late April to mid-May. Build nests in trees, generally at medium heights, and especially in clumps of Spanish moss or Usnea. The clutch size is usually 4 or 5, with a range of 3 to 7.

FOOD HABITS

At all seasons the primary items are insects, insect eggs, and larvae. These foods are gleaned from the vegetation of hardwood or coniferous trees, mainly in the canopy. Seldom forage within 25 feet (8 m) of the ground.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1953:135-148; Burleigh 1958:509; DeGraaf and Rudis 1986:305; DeGraaf et al. 1980:412; Ehrlich et al. 1988:510; Forbush and May 1939:419; Imhof 1976:340; James and Neal 1986:294; Lowery 1974:504; Mengel 1965:398; Monroe et al. 1988:48; Oberholser 1974(II):731; Potter et al. 1980:308; Rappole et al. 1983:219; Robbins et al. 1986:92; Robinson 1990:182; Root 1988:213; Sprunt 1954:387; Sprunt and Chamberlain 1970:445, 446; Stewart and Robbins 1958:280.

Yellow Warbler

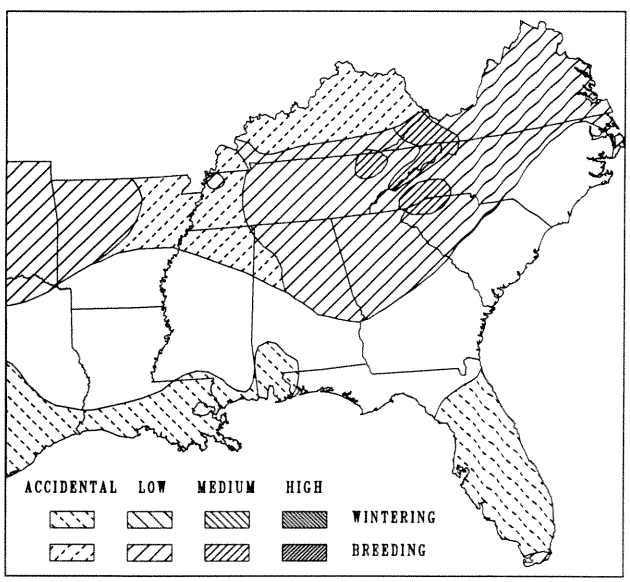
Dendroica petechia **YWAR**

PROTECTION STATUS

D. p. gundlachi listed as Special Concern in Florida. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C in the Southern Appalachians and parts of the upper Piedmont, interior low plateaus, and Ozarks; mostly U in the lower Piedmont and Coastal Plain portions of the range, though FC to C over nearly all of Virginia; a separate race occurs in extreme southern Florida. Majority of the breeding population winters south of the United States. Spring arrival— early April to late April; fall departure— early September to mid-October, but most of the migration occurs in July and August.



PRIMARY HABITATS

Breeding— favor willow thickets along streams, ponds, and lakes; in the mountains, also common in shrubs and saplings in farmyards and other open places; essentially only in mangrove thickets in Florida. Wintering— hammocks, mangroves, or other shrubby places.

KEY HABITAT REQUIREMENTS

Breeding— broadleaf saplings or shrubs in open country. Wintering— broadleaf evergreen shrubs or saplings.

SAMPLE BREEDING DENSITIES

1(1) shrub/seedling elm-ash-cottonwood, 57(18) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 149 of 888 BBS routes in the region, 1966-1985; maximum route mean 27 birds, overall mean 0.35 ± 1.76 birds/route, total of route means 309 birds.

REPRODUCTION

The breeding season extends from early May to mid-June, with a peak from mid-May to late May. Nests are built in shrubs or small trees, usually 3 to 10 feet (1-3 m) off the ground. They are usually in areas of scattered trees or shrubs, and not often in thickets. Clutch size is 3-6, usually 4-5.

FOOD HABITS

Insects and other small invertebrates form the bulk of the diet. They glean, and occasionally flycatch, food in the vegetation of hardwood shrubs and saplings, generally within 20 feet (6 m) of the ground.

GUILD

Bush nesting, bush gleaning insectivore.

REFERENCES

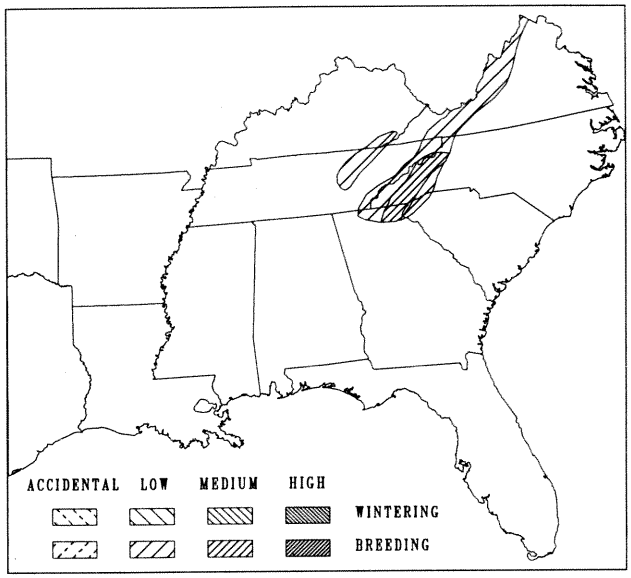
Bent 1953:160-194; Burleigh 1958:512-515; DeGraaf and Rudis 1986:306; DeGraaf et al. 1980:414; Ehrlich et al. 1988:532; Forbush and May 1939:421; Imhof 1976:341; James and Neal 1986:294; Kale 1978:61; Lowery 1974:506; Mengel 1965:400; Monroe et al. 1988:48; Oberholser 1974(II):734; Potter et al. 1980:309; Rappole et al. 1983:219; Robbins et al. 1986:94; Robinson 1990:183; Root 1988:214, 287; Sprunt 1954:389-391; Sprunt and Chamberlain 1970:447; Stewart and Robbins 1958:282; Verner and Boss 1980:250.

Chestnut-sided Warbler

Dendroica pensylvanica CSWA

ABUNDANCE STATUS

Breeding— C to VC in the mountains over 3500 feet (1050 m); occur sparingly down to 2000 feet (600 m). Winter to the south of the United States. Spring arrival— mid-April to early May; fall departure— late September to mid-October.



PRIMARY HABITATS

Favor second growth woods and overgrown fields; most numerous in abandoned fields with scattered saplings, but also common along woodland edges and in open, parklike woods. Generally in hardwoods.

KEY HABITAT REQUIREMENTS

Deciduous (usually) saplings or open, middle-aged woods.

SAMPLE BREEDING DENSITIES

6(1) sawtimber cove hardwoods, 36(2) shrub/seedling mixed pine-hardwood. Recorded on 19 of 888 BBS routes in the South, 1966-1985; maximum route mean 30 birds, overall mean 0.07 ± 1.14 birds/route, total of route means 61 birds.

REPRODUCTION

The nesting season extends from mid-May to early July, with the peak from late May to early June. The typical nest is located 1-4 feet (m) from the ground in a sapling or shrub, in an overgrown field or thicket. The usual clutch size is 4, with 3 being rare and 5 very rare.

FOOD HABITS

This species feeds essentially on insects gleaned from leaves and twigs. Most foraging is done in saplings, shrubs, and low in trees; mainly in deciduous vegetation.

GUILD

Bush nesting, bush gleaning insectivore.

REFERENCES

Bent 1953:367; Burleigh 1958:532; DeGraaf and Rudis 1986:307; DeGraaf et al. 1980:430; Ehrlich et al. 1988:516; Forbush and May 1939:433; Imhof 1976:352; James and Neal 1986:297; Lowery 1974:507; Mengel 1965:413; Monroe et al. 1988:48; Oberholser 1974(II):761; Potter et al. 1980:319; Rappole et al. 1983:223; Robbins et al. 1986:96; Robinson 1990:184; Sprunt 1954:402; Sprunt and Chamberlain 1970:463; Stewart and Robbins 1958:293.

Magnolia Warbler

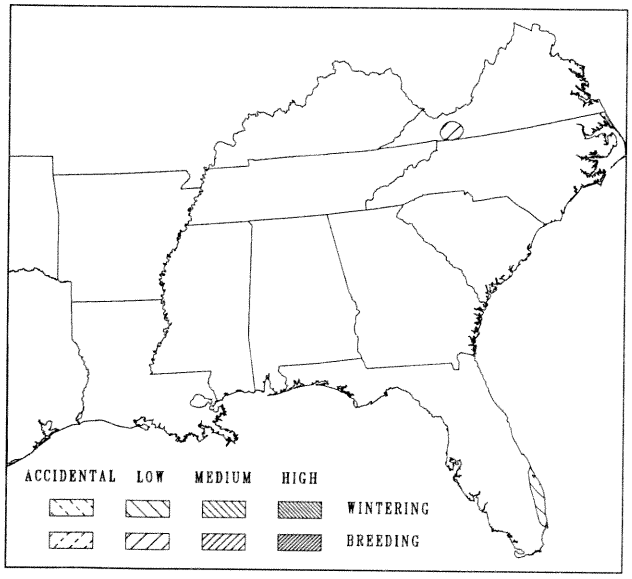
Dendroica magnolia **MAWA**

PROTECTION STATUS

State listed as Significantly Rare in North Carolina. Monitored by Virginia Natural Heritage Program. Forest Service sensitive, Jefferson and George Washington National Forests.

ABUNDANCE STATUS

Breeding— C in northwestern Highland County, Virginia; R to U elsewhere at high elevations in Virginia; VR to R in extreme northwestern North Carolina, where breeding status is unclear; occur south to Roan Mountain. Wintering— R to U in extreme southern Florida. Spring arrival— late April to early May; fall departure— early October to mid-October.



PRIMARY HABITATS

Breeding— favor spruce or fir forests, both mature stands or fairly young ones; also around the edges of bogs where spruce or fir occur; probably occur sparingly in hemlock forests; avoid pure hardwood forests, but may occur in mixed forests. Wintering— hammocks or other broadleaf evergreen woods.

KEY HABITAT REQUIREMENTS

Breeding— spruce and/or fir trees, in several situations; rarely in hemlocks. Wintering— broadleaf evergreen woods.

REPRODUCTION

The breeding season extends from late May to late June, with a probable peak in early June and mid-June. Nests are usually built in conifers, mostly 3-10 feet (1-3 m) off the ground, but occasionally over 30 feet (9 m) from the ground. Four is the usual clutch size, rarely 3 or 5. As only one nest with eggs has been reported for the Southeast, data in this section are based on those gathered from elsewhere in the breeding range.

FOOD HABITS

Magnolia Warblers glean insects from the foliage of trees and saplings, usually in conifers. Forage at variable heights, but seldom on the ground.

GUILD

Bush or tree nesting, bush or tree foliage gleaning insectivore.

REFERENCES

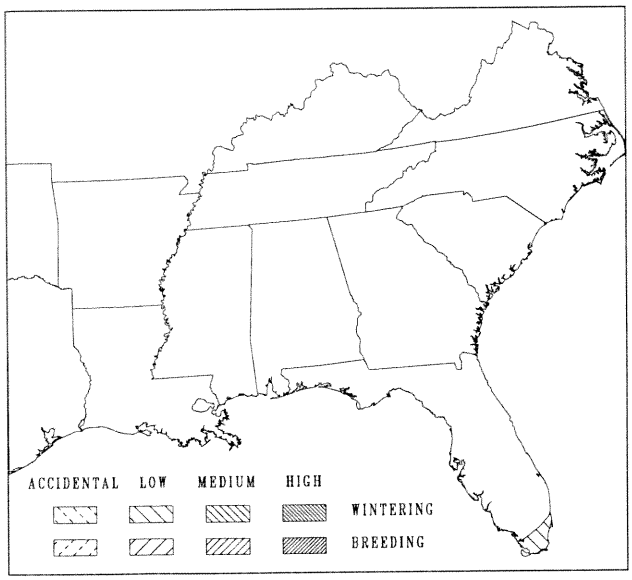
Bent 1953:195; Burleigh 1958:515; DeGraaf and Rudis 1986:308; DeGraaf et al. 1980:416; Ehrlich et al. 1988:518; Forbush and May 1939:422; Imhof 1976:343; James and Neal 1986:297; Lowery 1974:514; Mengel 1965:401; Monroe et al. 1988:48; Oberholser 1974(II):737; Potter et al. 1980:311; Rappole et al. 1983:219; Robbins et al. 1986:94; Robinson 1990:184; Root 1988:215; Sprunt 1954:391; Sprunt and Chamberlain 1970:449; Stewart and Robbins 1958:283.

Cape May Warbler

Dendroica tigrina **CMWA**

ABUNDANCE STATUS

Wintering— U in extreme southern Florida. Breed to the north of the region, and the bulk of the nesting population winters south of the United States. Fall arrival— late September; spring departure— early May.



PRIMARY HABITATS

Mainly in coastal hammocks; probably also occur in other broadleaf evergreen woods or thickets.

KEY HABITAT REQUIREMENTS

Broadleaf evergreen woods.

REPRODUCTION

Do not breed in the Southeast.

FOOD HABITS

Primarily insectivorous. In the fall and winter, fruit, such as grapes and berries, and nectar, are eaten as well.

GUILD

Tree or bush foliage gleaning omnivore.

REFERENCES

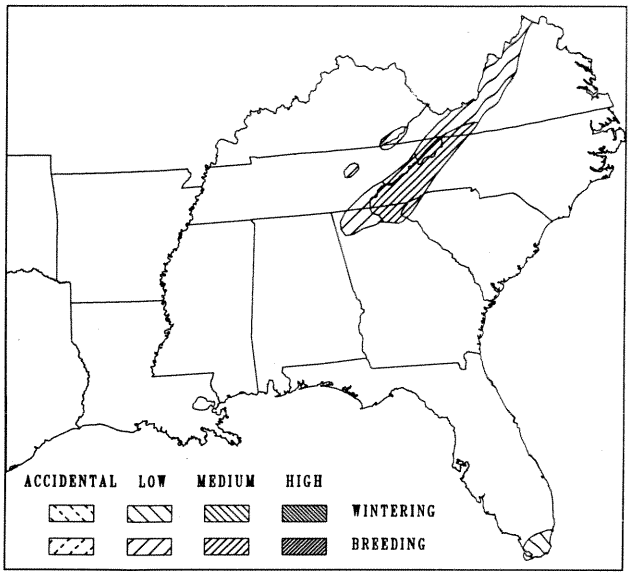
Bent 1953:212; Burleigh 1958:516; DeGraaf and Rudis 1986:309; DeGraaf et al. 1980:418; Ehrlich et al. 1988:514; Forbush and May 1939:423; Imhof 1976:343; James and Neal 1986:297; Lowery 1974:513; Mengel 1965:402; Monroe et al. 1988:48; Oberholser 1974(II):739; Potter et al. 1980:312; Rappole et al. 1983:220; Robbins et al. 1986:94; Robinson 1990:185; Root 1988:215; Sprunt 1954:392; Sprunt and Chamberlain 1970:451; Stewart and Robbins 1958:284.

Black-throated Blue Warbler

Dendroica caerulescens **BTBW**

ABUNDANCE STATUS

Breeding— C and widespread throughout the Southern Appalachians, over 3500 feet (1050 m); less numerous down to 2500 feet (750 m) and on Cumberland Plateau in Kentucky and Tennessee. Wintering— U in extreme southern Florida. Spring arrival— mid-April to late April; fall departure— early October to mid-October.



PRIMARY HABITATS

Breeding— a wide variety of forest types; favor medium-growth forests with a moderate to dense understory, especially rhododendron or mountain laurel; inhabit mixed forest, pure hardwoods, and even spruce-fir. Wintering— essentially in broadleaf evergreen woods (hammocks).

KEY HABITAT REQUIREMENTS

Breeding— montane forests with a moderate to rich understory. Wintering— broadleaf evergreen woods.

SAMPLE BREEDING DENSITIES

3(1) shrub/seedling mixed pine-hardwood, 49(3) sawtimber white pine-hemlock, 56(2) sawtimber mixed pine-hardwood. Recorded on 14 of 888 BBS routes in the region, 1966-1985; maximum route mean 16 birds, overall mean 0.05 ± 0.70 birds/route, total of route means 49 birds.

REPRODUCTION

The nesting season extends from mid-May to late June, with the peak from late May to early June. Nests are generally placed 1 to 4 feet (<1.5 m) from the ground in shrubs or small trees and are usually not well hidden. Rhododendrons are the favored sites for nests. The usual clutch size is 4, with 3 infrequent and 5 rare.

FOOD HABITS

Glean insects from twigs and leaves of hardwoods or conifers. Forage commonly from the middle of the crown down to the shrub and sapling layer.

GUILD

Bush nesting, tree or bush foliage gleaning insectivore.

REFERENCES

Bent 1953:224-238; Burleigh 1958:517-520; DeGraaf and Rudis 1986:310; DeGraaf et al. 1980:420; Ehrlich et al. 1988:512; Forbush and May 1939:424, 425; Imhof 1976:344; James and Neal 1986:298; Lowery 1974:508; Mengel 1965:402; Monroe et al. 1988:49; Oberholser 1974(II):740; Potter et al. 1980:312; Rappole et al. 1983:220; Robbins et al. 1986:94; Robinson 1990:186; Root 1988:216; Sprunt 1954:393-394; Sprunt and Chamberlain 1970:452, 453; Stewart and Robbins 1958:285.

Yellow-rumped (Myrtle) Warbler

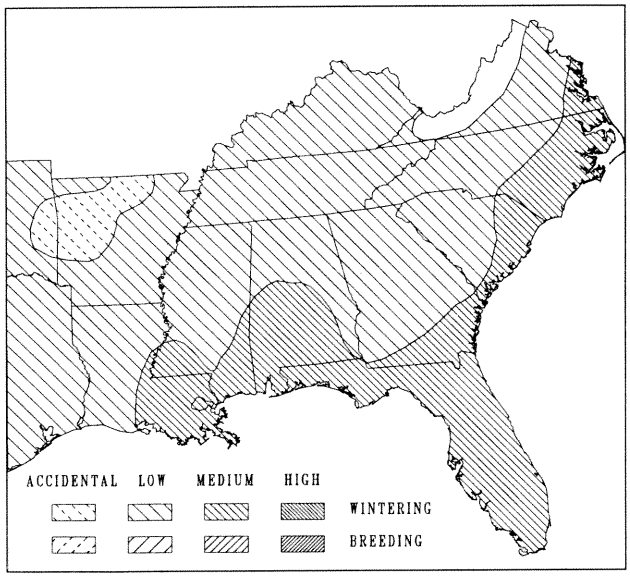
Dendroica coronata **YRWA (MYWA)**

PROTECTION STATUS

Monitored by West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Wintering— A in the Coastal Plain, particularly along the coast; mostly C in the remainder of Georgia and South Carolina; declining in numbers northward, and only U to FC in northern parts of the region; R to U at higher elevations. Breed to the north. Fall arrival— late September to mid-October; spring departure— early May to mid-May.



PRIMARY HABITATS

Extremely widespread in wooded habitats; especially common in coastal waxmyrtle thickets; also common in bottomland hardwoods and swamps, woodland borders, pinewoods, overgrown fields, and thickets. Generally prefer moist habitats to dry and upland ones.

KEY HABITAT REQUIREMENTS

Trees or shrubs; no specific requirements.

SAMPLE WINTER DENSITIES

1(1) shrub/seedling elm-ash-cottonwood, 1(3) grass/forb oak-hickory, 110(4) sawtimber longleaf pine-slash pine, 203(1) sapling/poletimber oak-gum-cypress, 413(1) shrub/seedling live oak maritime.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Myrtle Warblers commonly take berries and seeds, as well as large numbers of insects, insect eggs, and larvae. They glean food from leaves and twigs, ranging from the canopy of mature trees to shrubs and saplings; infrequently forage on the ground. Some flycatching is also done.

GUILD

Bush or tree foliage gleaning omnivore.

REFERENCES

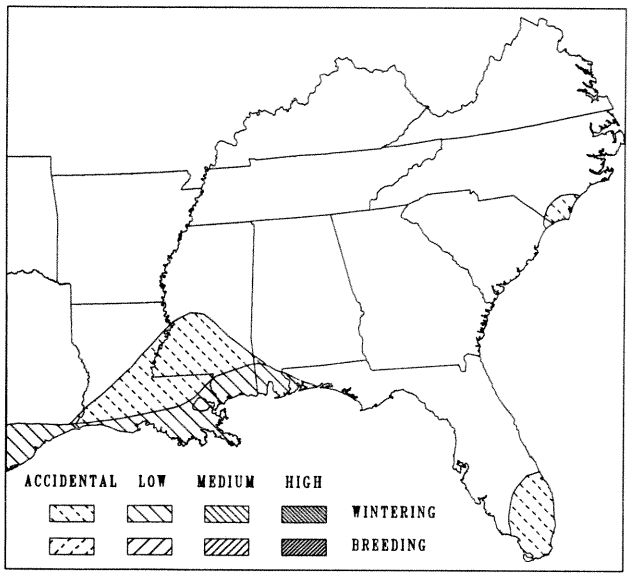
Bent 1953:239-274; Burleigh 1958:520; DeGraaf and Rudis 1986:311; DeGraaf et al. 1980:422; Ehrlich et al. 1988:518; Forbush and May 1939:426; Imhof 1976:345; James and Neal 1986:298; Lowery 1974:514; Mengel 1965:404; Monroe et al. 1988:49; Oberholser 1974(II):741-745; Potter et al. 1980:314; Rappole et al. 1983:220; Robbins et al. 1986:94; Robinson 1990:187; Root 1988:214; Sprunt 1954:395; Sprunt and Chamberlain 1970:454; Stewart and Robbins 1958:286; Verner and Boss 1980:251.

Black-throated Gray Warbler

Dendroica nigrescens **BTYW**

ABUNDANCE STATUS

Winter—Very Rare, late November-mid-April along the Texas coast, in southern Louisiana, Mississippi, and western Tennessee.



PRIMARY HABITATS

Winter—live oak thickets, mottes, and chenieres.

KEY HABITAT REQUIREMENTS

Winter—evergreen thickets; requirements poorly known.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

These birds forage patiently at all heights through the foliage of shrubs and trees, where they glean a variety of insect prey, such as lepidopterans, beetles, grasshoppers, bugs, and ants, as well as other invertebrates, e.g. spiders.

GUILD

Bush or arboreal gleaning insectivore

REFERENCES

Barbour et al. 1973:74; Bent 1953:275; Ehrlich et al. 1988:520; Forbush and May 1939:428; Imhof 1976:346; Lowery 1974:510; Mengel 1965:518; Monroe et al. 1988:49; Oberholser 1974 (II):745; Potter et al. 1980:315; Rappole et al. 1983:220; Robinson 1990:187; Root 1988:216, 288; Sprunt 1954:396; Sprunt and Chamberlain 1970:455; Sutton 1967:504; Verner and Boss 1980:252.

Black-throated Green Warbler

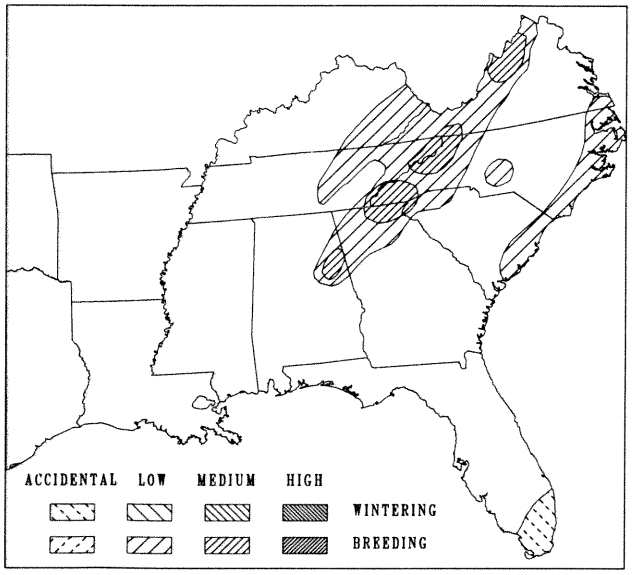
Dendroica virens **BTNW**

PROTECTION STATUS

Monitored by South Carolina Heritage Trust Program.

ABUNDANCE STATUS

Breeding— generally FC to C, but quite local, in the Southern Appalachians (mainly from 2000 feet (600 m) to the highest elevations); R and local in a few isolated mountain ranges extending into the western Piedmont. In the Coastal Plain, generally U to FC, but C in a few places; quite local. Wintering— U in extreme southern Florida. Spring arrival— mid-March to mid-April; fall departure— early October to mid-October.



PRIMARY HABITATS

Breeding— in the mountains, occur mainly in coniferous or mixed forests; favor hemlocks and white pines, but also in spruce-fir and other species of pines; generally scarce in pure hardwood forest. In the Coastal Plain, inhabit swamps and bottomlands, commonly in cypress and white cedar (*Chamaecyparis thyoides*), but often in pure stands of hardwoods and mixed pine-hardwood areas. Wintering— mostly in broadleaf evergreen woods, such as hammocks.

KEY HABITAT REQUIREMENTS

Breeding— forests of many types, usually moist ones with conifers present. Wintering— broadleaf evergreen woods.

SAMPLE BREEDING DENSITIES

7(2) sawtimber oak-hickory, 44(2) sawtimber spruce-fir. Recorded on 28 of 888 BBS routes in the region, 1966-1985; maximum route mean 8 birds, overall mean 0.04 ± 0.452 birds/route, total of route means 37 birds.

REPRODUCTION

The breeding season extends from late April to late June, with a peak from mid-May to early June. Nests are built in trees, usually at middle heights; conifers are preferred. The clutch size is most commonly 4, with 5 also frequent.

FOOD HABITS

Glean insects and other small invertebrates from leaves and twigs of trees, spending most of the time in the crowns of conifers, but also in hardwoods.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1953:291-315; Burleigh 1958:522-524; DeGraaf and Rudis 1986:312; DeGraaf et al. 1980:424; Ehrlich et al. 1988:522; Forbush and May 1939:429; Imhof 1976:347; James and Neal 1986:299; Lowery 1974:511; Mengel 1965:405; Monroe et al. 1988:49; Oberholser 1974(II):749; Potter et al. 1980:315; Rappole et al. 1983:221; Robbins et al. 1986:96; Robinson 1990:188; Root 1988:217; Sprunt 1954:397; Sprunt and Chamberlain 1970:456,457; Stewart and Robbins 1958:287.

Blackburnian Warbler

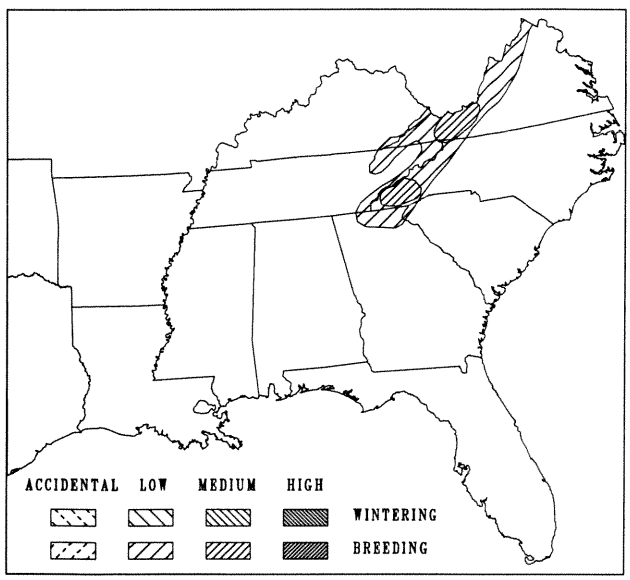
Dendroica fusca **BLBW**

PROTECTION STATUS

State listed as Threatened by Kentucky Academy of Science and Kentucky Nature Preserves Commission. Monitored by Virginia Natural Heritage Program. Forest Service sensitive, George Washington National Forest.

ABUNDANCE STATUS

Breeding— FC over most of the Southern Appalachians and Cumberland Mountains, above 3500 feet (1050 m); much less numerous down to 1600 feet (480 m). Winter south of the United States. Spring arrival— mid-April to early May; fall departure— early October to mid-October.



PRIMARY HABITATS

Favor rather mature forests of many types; with a slight preference for hardwoods mixed with hemlock, spruce, or fir; numerous in pure spruce-fir forests or hemlock forests, but less common in pure hardwood stands.

KEY HABITAT REQUIREMENTS

Mature mountain forests.

SAMPLE BREEDING DENSITIES

6(2) sapling/poletimber oak-hickory, 6(1) sawtimber oak-hickory, 6(1) sawtimber cove hardwoods, 19(2) sawtimber spruce-fir, 20(2) sawtimber mixed pine-hardwood, 44(2) sawtimber white pine-hemlock. Recorded on 9 of 888 BBS routes in the region, 1966-1985; maximum route mean 6 birds, overall mean 0.01 ± 0.22 birds/route, total of route means 12 birds.

REPRODUCTION

The nesting season extends from mid-May to late June, with a peak from early June to mid-June. Place nests at various heights in trees, usually fairly high in conifers. The normal clutch size is 4, with 5 fairly uncommon.

FOOD HABITS

Feed almost entirely on insects, gleaned from leaves and twigs of hardwood or coniferous trees. Most foraging is done in the crowns of the trees.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

Bent 1953:337; Burleigh 1958:525; DeGraaf and Rudis 1986:313; DeGraaf et al. 1980:428; Ehrlich et al. 1988:516; Forbush and May 1939:431; Imhof 1976:350; James and Neal 1986:300; Lowery 1974:513; Mengel 1965:410; Monroe et al. 1988:49; Oberholser 1974(II):756; Potter et al. 1980:317; Rappole et al. 1983:222; Robbins et al. 1986:96; Robinson 1990:188; Sprunt 1954:399; Sprunt and Chamberlain 1970:459; Stewart and Robbins 1958:290.

Yellow-throated Warbler

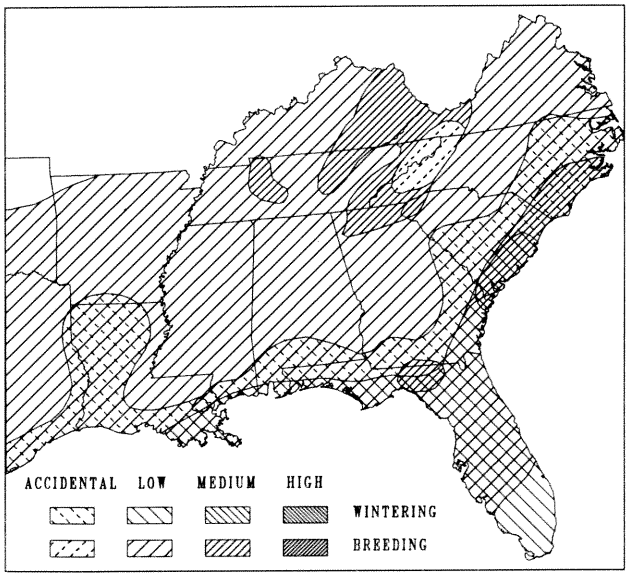
Dendroica dominica **YTWA**

PROTECTION STATUS

D. d. stoddardi federally listed as category C2, monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

Breeding— C to VC in most of the Coastal Plain; variously U to absent inland; FC to C in the lower mountains of Georgia, South Carolina, and southern North Carolina, but scarce to absent farther northward in the mountains. The near absence of these warblers over much of the Piedmont is a complete mystery. Wintering— FC over most of the range, becoming U at the northern edge of the range. Spring arrival— early March to mid-April; fall departure— early September to mid-October.



PRIMARY HABITATS

Breeding— outside mountains, favor broadleaf evergreen woods or bottomland forests, especially where some pines or cypresses are present; most common where Spanish moss is present. In the mountains usually found in pinewoods or mixed pine-hardwood forests, generally below 2000 feet (600 m). Wintering— in pinewoods, mixed hardwood-pine forest, or in broadleaf evergreens.

KEY HABITAT REQUIREMENTS

Breeding— mature forests, often where moderately open and moist; few essential requirements. Wintering— woods with pines or broadleaf evergreens.

SAMPLE BREEDING DENSITIES

1.7(3) sawtimber longleaf pine-slash pine, 19(1) sawtimber elm-ash-cottonwood, 25(1) sawtimber live oak maritime. Recorded on 256 of 888 BBS routes in the region, 1966-1985; maximum route mean 17 birds, overall mean 0.40 ± 1.30 birds/route, total of route means 353 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp-pocosin, 10(1) sapling/poletimber longleaf pine-scrub oak, 20(1) sapling/poletimber sand pine-southern scrub oak.

REPRODUCTION

The nesting season extends from early April to early June, with a peak from mid-April to early May. Nests are often built in clumps of Spanish moss, where water present; usually fairly high in conifers or hardwoods. Four is the normal clutch size, with 5 being uncommon.

FOOD HABITS

The primary food items are insects, with some larvae and insect eggs also taken in winter. Much of the food is gleaned from leaves and twigs, fairly high up in both conifers and hardwoods; however, they frequently creep on large limbs, and rarely trunks, for food.

GUILD

Tree nesting, tree foliage or trunk gleaning insectivore.

REFERENCES

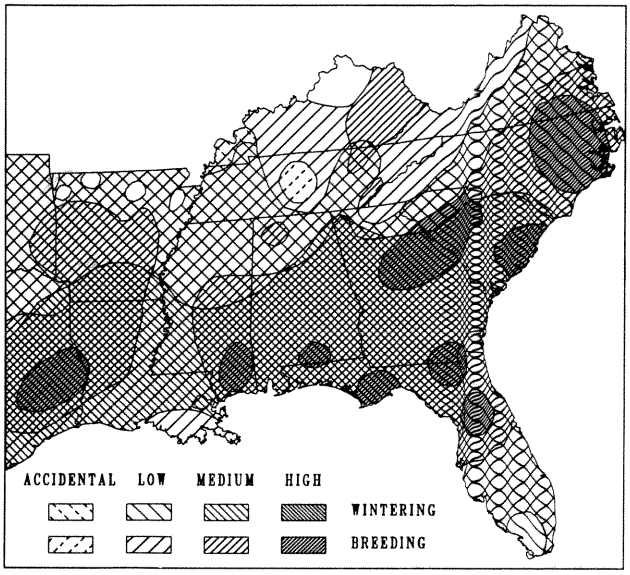
Bent 1953:349-362; Burleigh 1958:527-532; Ehrlich et al. 1988:524; Forbush and May 1939:432; Imhof 1976:351; James and Neal 1986:300; Kale 1978:62; Lowery 1974:509; Mengel 1965:411; Monroe et al. 1988:49; Oberholser 1974 (II):758; Potter et al. 1980:318; Rappole et al. 1983:222; Robbins et al. 1986:94; Robinson 1990:189; Root 1988:217; Sprunt 1954:400; Sprunt and Chamberlain 1970:460; Stewart and Robbins 1958:292.

Pine Warbler

Dendroica pinus **PIWA**

ABUNDANCE STATUS

Breeding— C and widespread in the Coastal Plain and Piedmont; mostly U northward in the lower mountains, and absent over 3000 feet (900 m). Wintering—C in the Coastal Plain north to southeastern North Carolina; mostly FC in the Piedmont; U over most of Virginia, but VR to absent in the Southern Appalachians.



PRIMARY HABITATS

All seasons— middle-aged to mature pine forest; seldom in hardwoods; occur in open pinewoods and residential pinewoods, as well as in fairly dense stands of pines.

KEY HABITAT REQUIREMENTS

All seasons— pine woods in a variety of situations.

SAMPLE BREEDING DENSITIES

1(1) sapling/poletimber oak-gum-cypress, 12(8) sawtimber longleaf pine-slash pine, 14(1) sawtimber live oak maritime, 25(3) sawtimber loblolly pine-shortleaf pine, 30(3) sapling/poletimber loblolly pine-shortleaf pine. Recorded on 353 of 888 BBS routes in the region, 1966-1985; maximum route mean 40 birds, overall mean 2.83 ± 5.91 birds/route, total of route means 2517 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber pine savanna, 1(1) shrub/seedling southern scrub oak, 1(2) sawtimber longleaf pine-slash pine, 1(1) sawtimber elm-ash-cottonwood, 1(1) sawtimber oak-hickory, 16(9) sawtimber mixed pine-hardwood, 25(1) sapling/poletimber longleaf pine-slash pine, 34(1) grass/forb loblolly pine-shortleaf pine, 35(1) sapling/poletimber sand pine-southern scrub oak.

REPRODUCTION

The breeding season extends from mid-March to early June, with the peak from mid-April to early May. Nests are built in pines, usually at medium heights from the ground. The usual clutch size is 4, rarely 3 or 5.

FOOD HABITS

In the summer, Pine Warblers take essentially insects, but they forage on insects, berries, and small seeds in winter. They glean insects and berries from twigs and pine needles, and occasionally forage on the ground for seeds and insects. Most foraging is done in the crowns of pine trees.

GUILD

Tree nesting, tree foliage gleaning insectivore-omnivore.

REFERENCES

Bent 1953:408-416; Burleigh 1958:537; DeGraaf and Rudis 1986:314; DeGraaf et al. 1980:436; Ehrlich et al. 1988:530; Forbush and May 1939:437; Imhof 1976:354; James and Neal 1986:301; Lowery 1974:509; Mengel 1965:416; Monroe et al. 1988:50; Oberholser 1974(II):765; Potter et al. 1980:321; Rappole et al. 1983:223; Robbins et al. 1986:96; Robinson 1990:190; Root 1988:218; Sprunt 1954:405-407; Sprunt and Chamberlain 1970:466; Stewart and Robbins 1958:296.

Prairie Warbler

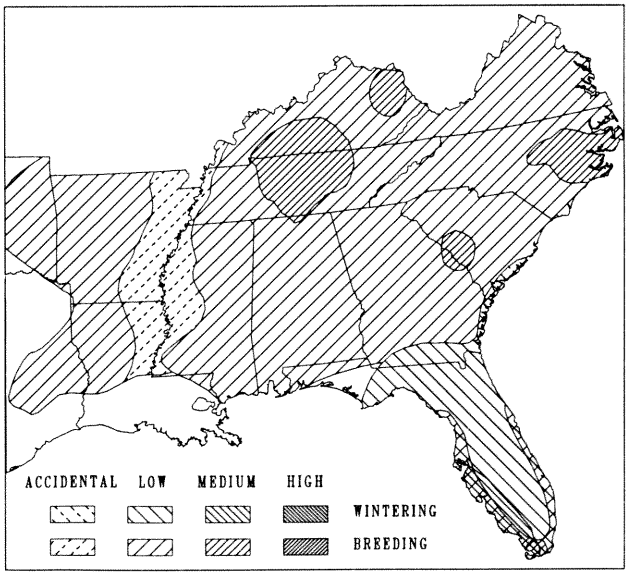
Dendroica discolor **PRAW**

PROTECTION STATUS

D. p. paludicola monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

Breeding— C over most of the Piedmont, and the Coastal Plain of Virginia and North Carolina; decreasing in abundance westward and southward in the Coastal Plain (mostly U south to southern Georgia); generally only U to FC in the lower mountains; in Florida, mainly confined to coastal areas, where they inhabit mangroves and are locally C; accidental in the Mississippi Alluvial Plain. Wintering— C in southern Florida, but decreasing greatly northward; R to U in coastal South Carolina. Spring arrival— mid-March to mid-April; fall departure— mid-September to mid-October.



PRIMARY HABITATS

Breeding— abandoned fields with scattered saplings, scrubby thickets, cut-over or burned-over woods, woodland margins, and other sapling-shrub growth, generally in poor and dry soil; occur in mangrove thickets in Florida. Wintering— more widespread than in summer; in thickets, old fields, wood margins, and in open woods of many types.

KEY HABITAT REQUIREMENTS

Breeding— saplings or shrubs, usually in open country and in poor soil. Wintering— saplings, shrubs, or open woods; very few essential features.

SAMPLE BREEDING DENSITIES

1(2) sapling/poletimber loblolly pine-shortleaf pine, 18(1) shrub/seedling loblolly pine-shortleaf pine, 24(2) shrub/seedling oak-hickory, 43(5) shrub/seedling mixed pine-hardwood. Recorded on 314 of 888 BBS routes in the region, 1966-1985; maximum route mean 66 birds, overall mean 1.06 ± 3.36 birds/route, total of route means 939 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber live oak maritime, 5(1) sapling/poletimber longleaf pine-scrub oak.

REPRODUCTION

Breeding season extends from late April to early July, with the peak from mid-May to early June. Nests are generally placed 2 to 5 feet (m) from the ground in saplings or shrubs, in an overgrown fields or thickets. Four is the usual clutch size, with 3 or 5 eggs rare.

FOOD HABITS

Insects and other small invertebrates are the primary food items, gleaned from leaves and twigs of hardwoods or conifers. Most foraging occurs from 1-10 feet (.3-3 m) from the ground.

GUILD

Bush nesting, bush gleaning insectivore.

REFERENCES

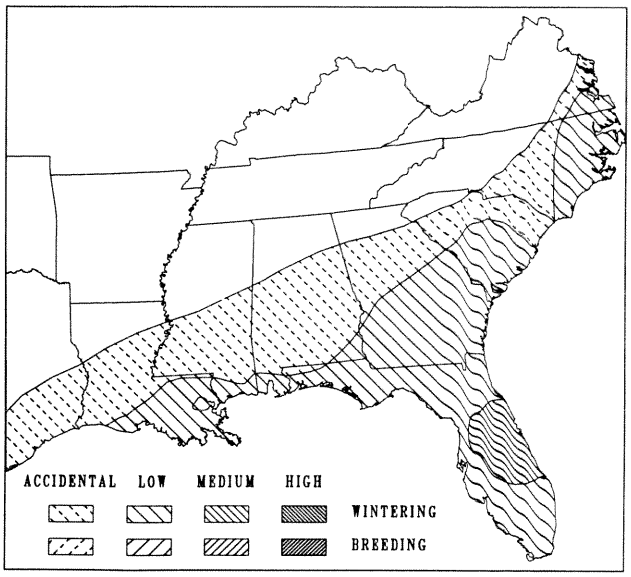
Bent 1953:428-438; Burleigh 1958:539; DeGraaf and Rudis 1986:315; DeGraaf et al. 1980:438; Ehrlich et al. 1988:528; Forbush and May 1939:439; Imhof 1976:356; James and Neal 1986:301; Kale 1978:105; Lowery 1974:512; Mengel 1965:418; Monroe et al. 1988:50; Nolan 1978; Oberholser 1974(II):767; Potter et al. 1980:323; Rappole et al. 1983:224; Robbins et al. 1986:96; Robinson 1990:191; Root 1988:219; Sprunt 1954:408-410; Sprunt and Chamberlain 1970:468; Stewart and Robbins 1958:298.

Palm Warbler

Dendroica palmarum **PAWA***

ABUNDANCE STATUS

Wintering— C to A in the Florida peninsula; generally FC in the remainder of the Coastal Plain, though U in severe winters; U in the Piedmont (mainly in Georgia and South Carolina). Breed north of the region. Fall arrival— early September to late September; spring departure— mid-April to early May.



PRIMARY HABITATS

Highly varied, but usually in open country; overgrown fields with pine saplings, woodland margins, weedy fields, residential shrubbery, thickets, and open woods. Commonly seen on the ground.

KEY HABITAT REQUIREMENTS

No essential features, though usually associated with saplings, shrubs, or herbaceous cover in open country.

SAMPLE WINTER DENSITIES

0.5(1) sawtimber oak-hickory, 0.8(2) grass/forb longleaf pine-slash pine, 20(1) shrub/seedling live oak maritime, 33(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

Palm Warblers forage mainly within 10 feet (3 m) of the ground, commonly in saplings, weeds, or on the ground. Insects are the chief food item, but some berries and seeds are taken.

GUILD

Terrestrial, herb, or bush gleaning insectivore.

REFERENCES

Bent 1953:439-456; Burleigh 1958:541-543; DeGraaf and Rudis 1986:316; DeGraaf et al. 1980:440; Ehrlich et al. 1988:532; Forbush and May 1939:441; Imhof 1976:357; James and Neal 1986:303; Lowery 1974:516; Mengel 1965:419; Monroe et al. 1988:50; Oberholser 1974(II):769; Potter et al. 1980:324; Rappole et al. 1983:224; Robinson 1990:191; Root 1988:220; Sprunt 1954:410-412; Sprunt and Chamberlain 1970:470; Stewart and Robbins 1958:299.

Cerulean Warbler

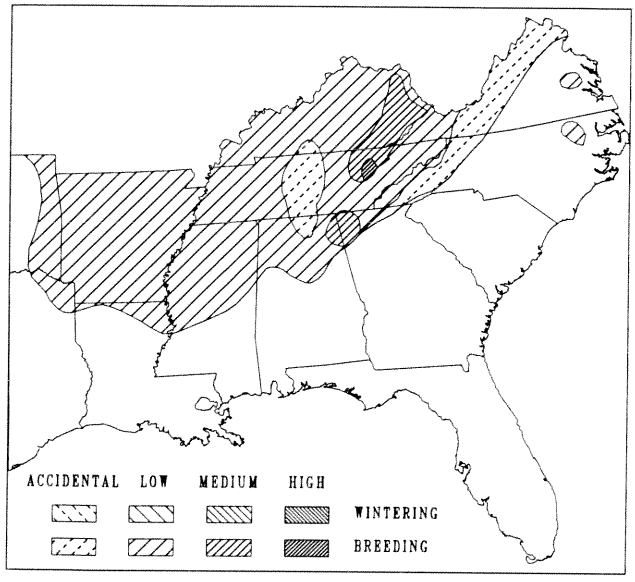
Dendroica cerulea **CERW**

PROTECTION STATUS

State listed as Significantly Rare in North Carolina. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— generally R and local in the decreasing breeding range, numbers apparently most concentrated in extensive tracts of forests along the Cumberland Mountains and certain locations in the Mississippi Alluvial Plain. Winter south of the United States. Spring arrival— mid-April to late April; fall departure— August to early September.



PRIMARY HABITATS

Favor mature and somewhat open hardwoods; in the mountains, mostly on hilly to steep slopes that have little understory. In the Coastal Plain, found in bottomlands where there is little understory. Always breed in mature hardwoods; never in conifers.

KEY HABITAT REQUIREMENTS

Mature hardwood forests with a sparse understory.

SAMPLE BREEDING DENSITIES

9.8(6) sawtimber oak-hickory. Recorded on 41 of 888 BBS routes in the region, 1966-1985; maximum route mean 12 birds, overall mean 0.08 ± 0.68 birds/route, total of route means 67 birds.

REPRODUCTION

The season extends from mid-May to late June, with a probable peak in late May and early June. Nests are built in hardwoods, well out from the trunks, and usually fairly high in the trees. Four is the most common clutch size, with 3 or 5 rather infrequent.

FOOD HABITS

Feed in the crown of deciduous trees, gleaning insects from leaves and twigs.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

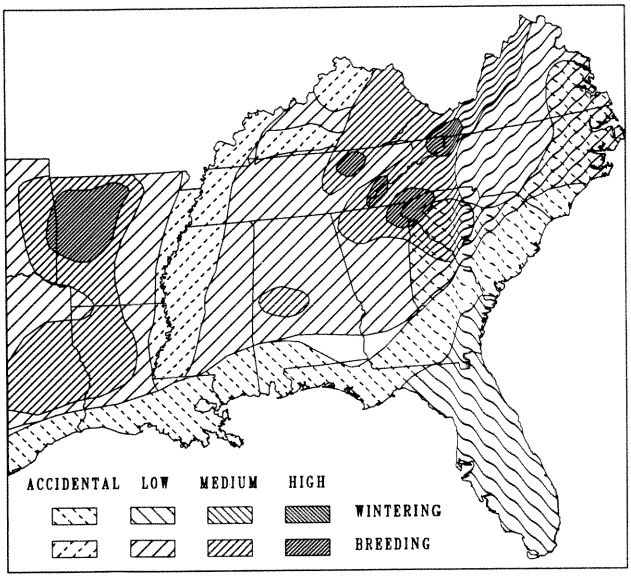
Bent 1953:329; Burleigh 1958:524; DeGraaf and Rudis 1986:319; DeGraaf et al. 1980:426; Ehrlich et al. 1988:514; Forbush and May 1939:430; Imhof 1976:348; James and Neal 1986:304; Lowery 1974:507; Lynch 1981; Mengel 1965:408; Monroe et al. 1988:51; Oberholser 1974(II):755; Potter et al. 1980:316; Rappole et al. 1983:222; Robinson 1990:193;Robbins et al. in press; Sprunt 1954:398; Sprunt and Chamberlain 1970:459; Stewart and Robbins 1958:289.

Black-and-White Warbler

Mniotilta varia **BAWW**

ABUNDANCE STATUS

Breeding— C over most of the mountains; R to U over the Piedmont and Coastal Plain, VR in Mississippi Alluvial Plain, except FC in northern Piedmont of Virginia; Wintering— FC in much of Florida, decreasing to U in northeastern South Carolina and adjacent North Carolina. Spring arrival— mid-March to early April; fall departure— early October to late October.



PRIMARY HABITATS

Breeding— in the mountains, generally in mature hardwood forests; cove forests, northern hardwoods, and other types; away from the mountains mainly in swamps or bottomland hardwoods, not numerous in upland hardwoods, except in foothills. Wintering— hardwood forests, such as bottomlands, broadleaf evergreen woods, and hammocks; infrequent in conifers.

KEY HABITAT REQUIREMENTS

Breeding— mature hardwood forests. Wintering— hardwood forests, less so in mixed forests.

SAMPLE BREEDING DENSITIES

1(3) sawtimber oak-gum-cypress, 9.8(5) sawtimber mixed pine-hardwood, 13(10) sapling/poletimber oak-hickory, 19(11) sawtimber cove hardwoods. Recorded on 188 of 888 BBS routes in the region, 1966-1985; maximum route mean 11 birds, overall mean 0.30 ± 1.06 birds/route, total of route means 269 birds.

SAMPLE WINTER DENSITIES

1(1) Everglades, 1(1) sawtimber longleaf pine-slash pine, 1(2) sawtimber live oak maritime, 10(2) sapling/poletimber live oak maritime, 10(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

The nesting season extends from late April to mid-June, with the peak from early May to late May. Nest on the ground in forests, and usually at the bases of trees, shrubs, or logs. Five is the most common clutch size, with 4 also common.

FOOD HABITS

In summer feed entirely on insects, and in winter take insect eggs and larvae. The birds climb along trunks and limbs and pick food items from the bark, usually on hardwoods.

GUILD

Ground nesting, tree trunk gleaning insectivore.

REFERENCES

Bent 1953:5; Burleigh 1958:492; DeGraaf and Rudis 1986:320; DeGraaf et al. 1980:398; Ehrlich et al. 1988:512; Forbush and May 1939:410; Imhof 1976:328; James and Neal 1986:305; Lowery 1974:498; Mengel 1965:386; Monroe et al. 1988:51; Oberholser 1974(II):716; Potter et al. 1980:297; Rappole et al. 1983:215; Robbins et al. 1986:89; Robinson 1990:194; Root 1988:222; Sprunt 1954:375; Sprunt and Chamberlain 1970:432; Stewart and Robbins 1958:269.

American Redstart

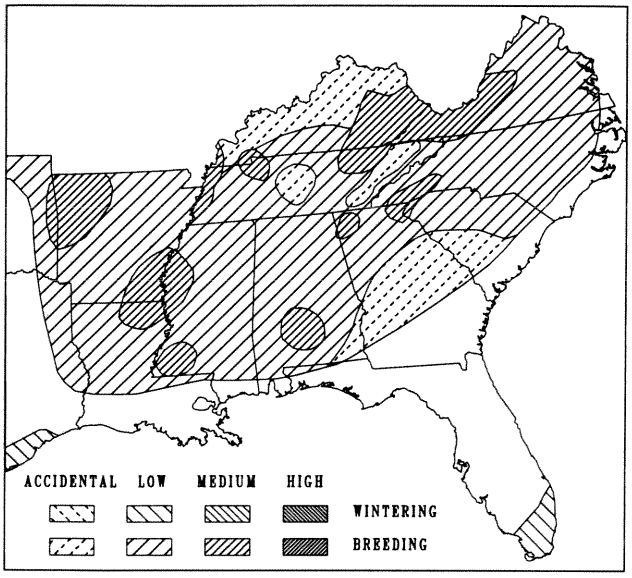
Setophaga ruticilla **AMRE**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory.

ABUNDANCE STATUS

Breeding— mostly FC to locally C in the lower elevations of the Southern Appalachians and Ozarks; FC to C in the Piedmont; locally FC to C in parts of the Coastal Plain; seldom in the mountains above 4000 feet (1200 m). Wintering— U in southern Florida. Spring arrival— early April to late April; fall departure— early October to mid-October.



PRIMARY HABITATS

Breeding— in the Piedmont and Coastal Plain, favor bottomland hardwoods and swamps, especially in extensive stands; in the mountains they occur in hardwoods along streams, usually where open and not heavily wooded; less frequent in medium-growth hardwood forests away from water. Wintering— mainly in broadleaf evergreen woods and thickets, such as hammocks and mangroves.

KEY HABITAT REQUIREMENTS

Breeding— hardwood forests, usually near water. Wintering— broadleaf evergreen woods or thickets.

SAMPLE BREEDING DENSITIES

2.7(5) sawtimber mixed pine-hardwood, 16(8) sapling/poletimber elm-ash-cottonwood, 87(1) sawtimber elm-ash-cottonwood. Recorded on 98 of 888 BBS routes in the region, 1966-1985; maximum route mean 10 birds, overall mean 0.12 ± 0.62 birds/route, total of route means 107 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber live oak maritime, 4(1) sawtimber longleaf pine-slash pine.

REPRODUCTION

Breeding season extends from early May to late June, with the peak in late May to early June. Cup nests are built 6-25 feet (2-8 m) up in trees. Clutch size 3-5, usually 4.

FOOD HABITS

Glean and hawk insect and other invertebrate prey in and below tree canopies at 10-50 feet (3-15 m).

GUILD

Tree nesting, tree foliage gleaning or hawking insectivore.

REFERENCES

Bent 1953:656-681; Burleigh 1958:569-573; DeGraaf and Rudis 1986:321; DeGraaf et al. 1980:460; Ehrlich et al. 1988:548; Forbush and May 1939:455; Imhof 1976:367; Kale 1978:64; James and Neal 1986:305; Lowery 1974:519; Mengel 1965:434; Monroe et al. 1988:51; Oberholser 1974(II):795; Potter et al. 1980:335; Rappole et al. 1983:227; Robbins et al. 1986:98; Robinson 1990:195; Root 1988:220; Sprunt 1954:427; Sprunt and Chamberlain 1970:486; Stewart and Robbins 1958:315.

Prothonotary Warbler

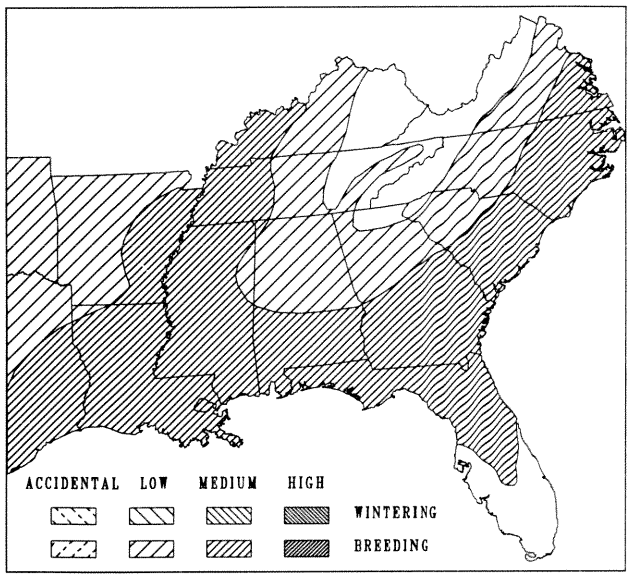
Protonotaria citrea **PROW**

PROTECTION STATUS

Monitored by West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C in the Coastal Plain, lower Piedmont, and parts of the Interior Low Plateaus, Ozarks, and Ouachitas; generally FC but somewhat restricted in suitable habitat in the remainder of the Piedmont; a few breed in Virginia valleys. Winter to the south of the United States. Spring arrival— late March to mid-April; fall departure— mid-August to mid-September.



PRIMARY HABITATS

Almost always near standing water; prefer swamps that are somewhat open with scattered dead stumps; bottomland forests; extensive willow thickets near lakes or ponds.

KEY HABITAT REQUIREMENTS

Swamps or bottomlands with standing water and cavities in stumps, stubs, or dead trees.

SAMPLE BREEDING DENSITIES

6(2) sawtimber elm-ash-cottonwood, 28(4) sawtimber oak-gum-cypress. Recorded on 276 of 888 BBS routes in the region, 1966-1985; maximum route mean 50 birds, overall mean 0.83 ±2.98 birds/route, total of route means 740 birds.

REPRODUCTION

The season extends from mid-April to mid-June, with the peak from early May to late May. Nests are nearly always in cavities in dead trees, in stubs, or in cypress knees. They are not dug by the birds, and are usually 3 to 10 feet (1-3 m) above the ground (mainly over water). The clutch size is mostly 5 or 6, with 4 or 7 infrequent.

FOOD HABITS

Generally forage within 15 feet (5 m) of the ground or water surface, gleaning insects and other small invertebrates from leaves, twigs, stubs, and other places in a swamp or bottomland.

GUILD

Cavity nesting, bush gleaning insecitvore.

REFERENCES

Bent 1953:17; Burleigh 1958:493; DeGraaf and Rudis 1986:322; DeGraaf et al. 1980:400; Ehrlich et al. 1988:500; Forbush and May 1939:411; Imhof 1976:330; James and Neal 1986:306; Lowery 1974:525; Mengel 1965:387; Monroe et al. 1988:51; Oberholser 1974(II):718; Potter et al. 1980:299; Rappole et al. 1983:216; Robbins et al. 1986:92; Robinson 1990:195; Scott et al. 1977:88; Sprunt 1954:376; Sprunt and Chamberlain 1970:433; Stewart and Robbins 1958:271.

Worm-eating Warbler

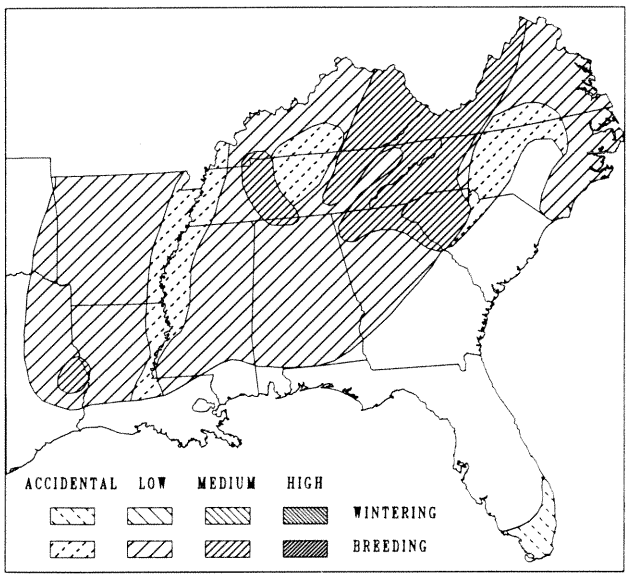
Helmitheros vermivorus **WEWA**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— U to FC in the Southern Appalachians between 1800 and 3000 feet (540-900 m); ranges up to 4000 feet (1200 m); R to U in mountains below 1800 feet (540 m); R and local in the Piedmont and Coastal Plain parts of the range; VR in the Mississippi Alluvial Plain. Most numerous near the junction of Georgia, South Carolina, and North Carolina. Wintering— R to U in extreme southern Florida. Spring arrival— mid-April to late April; fall departure— mid-September to early October.



PRIMARY HABITATS

Breeding— occur in ravines and mountainsides in the mountains and Piedmont, in deciduous or mixed forests with a rich understory (especially of rhododendron or mountain laurel); in the Coastal Plain found in bottomland hardwoods with a rich understory of broadleaf evergreen shrubs or saplings. Wintering— mainly in dense hammocks, particularly with a dense understory layer.

KEY HABITAT REQUIREMENTS

Breeding— forests with a dense and usually broadleaf evergreen understory, mainly on steep slopes. Wintering— forests with a dense understory, in broadleaf evergreen cover.

SAMPLE BREEDING DENSITIES

2.9(4) sawtimber mixed pine-hardwood, 30(10) sawtimber cove hardwoods. Recorded on 119 of 888 BBS routes in the region, 1966-1985; maximum route mean 8 birds, overall mean 0.13 ± 0.62 birds/route, total of route means 116 birds.

REPRODUCTION

The breeding season extends from mid-May to late June, with a peak from late May to early June. Nests are well hidden in leaf litter on the forest floor. The usual clutch size is 4 or 5, rarely 3 or 6.

FOOD HABITS

Feed primarily on insects and other invertebrates, but rarely on worms (as the common name suggests). Glean their prey from the forest floor or from shrub or sapling vegetation.

GUILD

Ground nesting, terrestrial or bush gleaning insectivore.

REFERENCES

Bent 1953:38; Burleigh 1958:500; DeGraaf and Rudis 1986:323; DeGraaf et al. 1980:402; Ehrlich et al. 1988:540; Forbush and May 1939:412; Imhof 1976:333; James and Neal 1986:308; Kale 1978:104; Lowery 1974:524; Mengel 1965:392; Monroe et al. 1988:51; Oberholser 1974(II):720; Potter et al. 1980:301; Rappole et al. 1983:216; Robbins et al. 1986:92; Robinson 1990:196; Root 1988:212; Sprunt 1954:379; Sprunt and Chamberlain 1970:437; Stewart and Robbins 1958:273;.

Swainson's Warbler

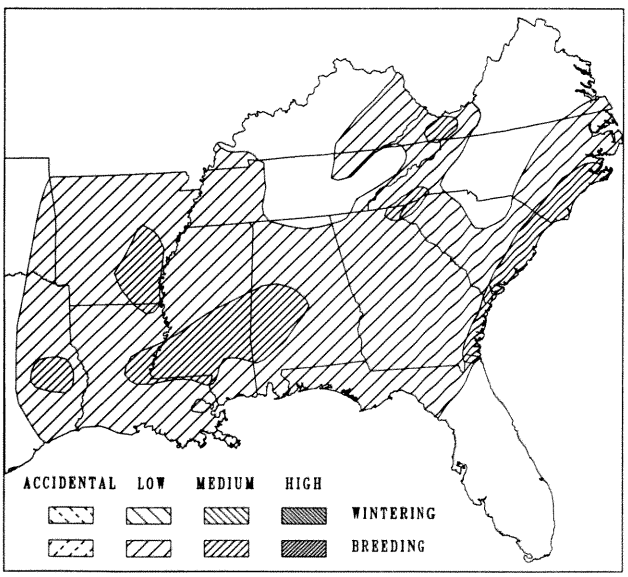
Limnothlypis swainsonii SWWA

PROTECTION STATUS

State listed as Endangered in Missouri, "in need of management" in Tennessee, and Special Concern in Alabama (unofficially). Monitored by Arkansas Natural Heritage Commission, Oklahoma Natural Heritage Inventory, South Carolina Heritage Trust Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— U, perhaps locally FC, in the Coastal Plain; FC to locally C in the mountains of South Carolina, northeastern Georgia, and adjacent North Carolina, but VR farther northward in the mountains; VR to R in the remainder of the range in the South. Winter to the south of the United States. Spring arrival— late March to late April; fall departure— mid-September to mid-October.



PRIMARY HABITATS

Coastal Plain and Piedmont— favor bottomland hardwoods, where rather damp with a good growth of cane; less numerous in swamps; in the mountains, occur in rhododendron or mountain laurel (*Kalmia latifolia*) tangles, generally in ravines in a hardwood or mixed forest. At all locations found in woods with a fairly dense understory.

KEY HABITAT REQUIREMENTS

Coastal Plain and Piedmont— bottomland forests with a rich understory. Mountains— forests with rhododendron (usually) or mountain laurel understory.

SAMPLE BREEDING DENSITIES

3(2) sawtimber oak-gum-cypress, 8.8(9) sawtimber cove hardwoods, 17(2) sapling/poletimber oak-gum-cypress. Recorded on 74 of 888 BBS routes in the region, 1966-1985; maximum route mean 3 birds, overall mean 0.05 ± 0.24 birds/route, total of route means 45 birds.

REPRODUCTION

The breeding season extends from early May to early July, with a peak from mid-May to mid-June. Nests are large, bulky structures placed in saplings, shrubs, or vine tangles, and usually 2 to 10 feet (.6-3 m) above ground. Three is the usual clutch size, with 4 or 5 eggs rare.

FOOD HABITS

Glean insects and other invertebrates from the ground and leaf litter, or infrequently from the vegetation of shrubs, saplings, or vines.

GUILD

Bush nesting, terrestrial gleaning insectivore.

REFERENCES

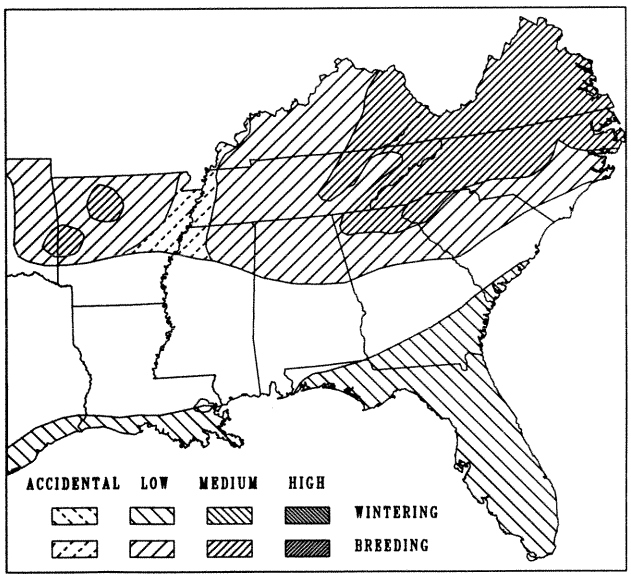
Bent 1953:30; Burleigh 1958:495-499; Eddleman 1978; Eagar and Hatcher 1982(A):73; Ehrlich et al. 1988:542; Forbush and May 1939:412; Imhof 1976:331; James and Neal 1986:308; Lowery 1974:522; Meanley 1969b; Mengel 1965:389; Monroe et al. 1988:51; Oberholser 1974(II):719; Potter et al. 1980:300; Rappole et al. 1983:216; Robbins et al. 1986:92; Robinson 1990:196; Sprunt 1954:378; Sprunt and Chamberlain 1970:435; Stewart and Robbins 1958:272.

Ovenbird

Seiurus aurocapillus **OVEN**

ABUNDANCE STATUS

Breeding— C to VC over most of the mountains and upper Piedmont, becoming only FC near the southern edge of the range; occur to highest elevations in the Ozarks and to 5000 feet (1500 m) in the Southern Appalachians. Wintering— hard to determine, as the birds are secretive; apparently FC in southern Florida, but U elsewhere. Spring arrival— late March to mid-April; fall departure— early October to mid-October.



PRIMARY HABITATS

Breeding— favor rather dry deciduous forests, where the understory is moderate in density; also prefer a hilly terrain. Occur in mixed forests, in pinewoods with a deciduous understory, and to an extent in hardwood bottomlands. Wintering— in mixed or broadleaf evergreen forests with moderate understory.

KEY HABITAT REQUIREMENTS

Breeding— deciduous or mixed forests (rarely pure pinewoods) with moderate understory, preferably in uplands. Wintering— broadleaf evergreen woods.

SAMPLE BREEDING DENSITIES

1.5(2) sawtimber elm-ash-cottonwood, 2(2) sawtimber white pine-hemlock, 13(24) sawtimber mixed pine-hardwood, 13(25) sawtimber oak-hickory, 23(1) shrub/seedling loblolly pine-shortleaf pine, 23(1) sapling/poletimber loblolly pine-shortleaf pine, 23(11) sapling/poletimber oak-hickory, 24(3) sawtimber loblolly pine-shortleaf pine. Recorded on 149 of 888 BBS routes in the region, 1966-1985; maximum route mean 34 birds, overall mean 0.78 ± 3.03 birds/route, total of route means 696 birds.

SAMPLE WINTER DENSITIES

2.5(2) sawtimber longleaf pine-slash pine, 6(2) sapling/poletimber live oak maritime.

REPRODUCTION

Breeding season extends from early May to early July, peaking in mid-May to early June. The domed nests with side entrances are placed on the ground in dead leaves, usually at the bases of trees or shrubs. Clutch size is 3-6, typically 4-5, eggs.

FOOD HABITS

Typically glean prey from leaf litter or soil; seldom forage in trees. Summer food primarily insects and other invertebrates; in winter some seeds and berries are also eaten.

GUILD

Ground nesting, terrestrial gleaning insectivore.

REFERENCES

Bent 1953:457-477; Burleigh 1958:543-548; DeGraaf and Rudis 1986:324; DeGraaf et al. 1980:442; Ehrlich et al. 1988:542; Forbush and May 1939:442; Imhof 1976:358; James and Neal 1986:311; Lowery 1974:520; Mengel 1965:421; Monroe et al. 1988:52; Oberholser 1974(II):770; Potter et al. 1980:325; Rappole et al. 1983:224; Robbins et al. 1986:96; Robinson 1990:197; Root 1988:212, 287; Sprunt 1954:413; Sprunt and Chamberlain 1970:471; Stewart and Robbins 1958:301.

Northern Waterthrush

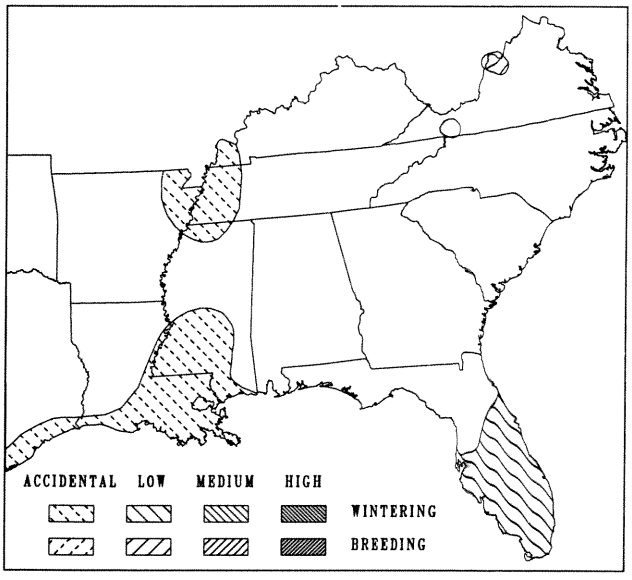
Seiurus noveboracensis NOWA

PROTECTION STATUS

State listed as Rare in West Virginia. Monitored by Virginia Natural Heritage Program. Forest Service sensitive on Jefferson and George Washington National Forests.

ABUNDANCE STATUS

Breeding— R and local, at high elevations in Virginia (mainly above 4000 feet, 1200 m); Wintering— U to FC in the southern portion of Florida. The bulk of the population of this species breeds north of the region and winters south of the United States. Spring arrival— late April to early May; fall departure— poorly known, but probably early September to early October.



PRIMARY HABITATS

Breeding— favor edges of bogs, but also in shrubs and thickets at the edges of ponds or lakes. Wintering— in thickets near water, such as mangroves and the shores of streams or ponds.

KEY HABITAT REQUIREMENTS

Breeding— shrubs or thickets near bogs or ponds in the higher mountains. Wintering— thickets near water.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber live oak maritime.

REPRODUCTION

No nest has been reported from Virginia, but the season probably extends from late May to late June. Based on information gathered to the north of the region, the usual nest is built on the ground in a damp or boggy place, especially in sphagnum moss, and often at the base of a tree or log. The clutch size is usually 4 or 5.

FOOD HABITS

Glean insect and other aquatic invertebrate prey from the shores of streams, ponds, etc. Almost strictly terrestrial.

GUILD

Ground nesting, terrestrial or aquatic gleaning insectivore.

REFERENCES

Bent 1953:477-492; Burleigh 1958:548-552; DeGraaf and Rudis 1986:325; DeGraaf et al. 1980:444; Ehrlich et al. 1988:544; Forbush and May 1939:444; Imhof 1976:359; James and Neal 1986:313; Lowery 1974:520; Mengel 1965:422; Monroe et al. 1988:52; Oberholser 1974(II):772; Potter et al. 1980:326; Rappole et al. 1983:225; Robbins et al. 1986:96; Robinson 1990:198; Root 1988:213, 287; Sprunt 1954:414; Sprunt and Chamberlain 1970:473; Stewart and Robbins 1958:302.

Louisiana Waterthrush

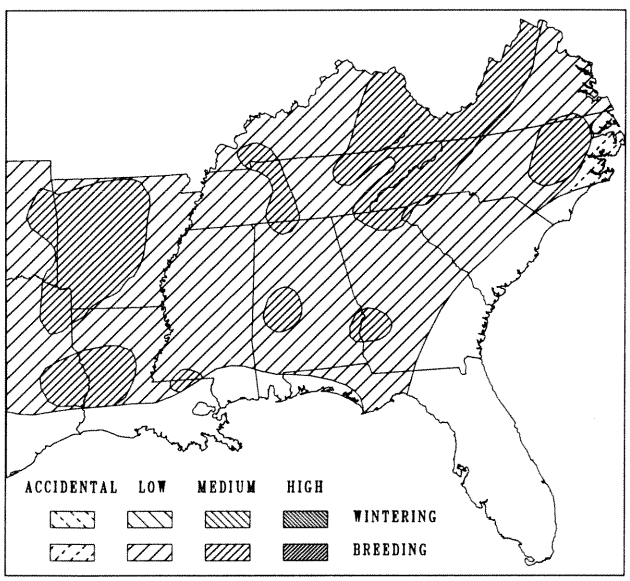
Seiurus motacilla **LOWA**

PROTECTION STATUS

Monitored by Florida Natural Areas Inventory, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC in the mountains and Piedmont, though in a somewhat restricted habitat; generally U in the Coastal Plain, being more numerous in Virginia and Louisiana and somewhat R in southern Georgia and Florida; rarely to 4000 feet (1200 m) in the mountains. Winter to the south of the United States. Spring arrival— mid-March to early April; fall departure— very early for a warbler, usually mid-July to mid-September.



PRIMARY HABITATS

Favor deciduous or mixed forests with rocky streams, but also occur along sluggish streams and rivers, and infrequently in swamps. Always near streams or other small bodies of water, preferably with scattered rocks, in woodlands or forests.

KEY HABITAT REQUIREMENTS

Forest near a stream or river, usually where rocks project from the water.

SAMPLE BREEDING DENSITIES

3(1) sawtimber mixed pine-hardwood, 4.6(22) sawtimber oak-hickory, 10(2) sawtimber oak-gum-cypress, 15(4) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 180 of 888 BBS routes in the region, 1966-1985; maximum route mean 4 birds, overall mean 0.14 ± 0.40 birds/route, total of route means 122 birds.

REPRODUCTION

Breeding season extends from mid-April to early June; peak occurs late April to mid-May. Nests are built on the ground in forested habitats, generally in the sides of stream banks, but often among the roots of trees or stumps. Clutch size 4-6, usually 5, eggs.

FOOD HABITS

Forage on the ground, always near streams, where insects and other small invertebrates are gleaned from the surface of rocks, mud, or water.

GUILD

Ground nesting, terrestrial or aquatic gleaning insectivore.

REFERENCES

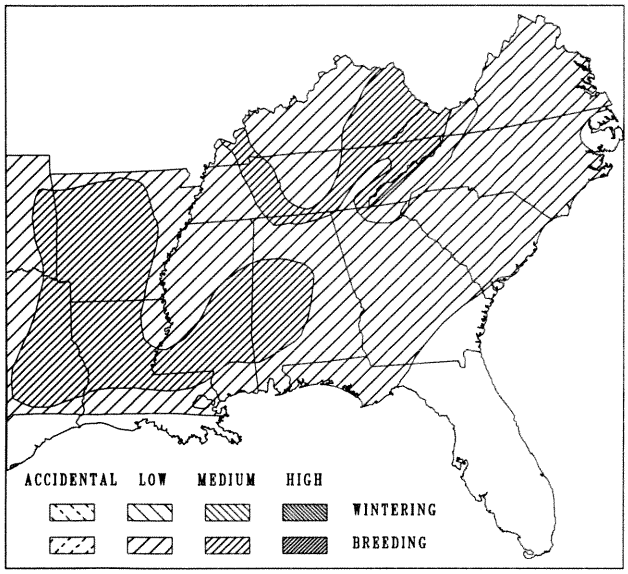
Bent 1953:493; Burleigh 1958:552; DeGraaf and Rudis 1986:326; DeGraaf et al. 1980:446; Ehrlich et al. 1988:544; Forbush and May 1939:445; Imhof 1976:360; James and Neal 1986:313; Kale 1978:63; Lowery 1974:521; Mengel 1965:423; Monroe et al. 1988:52; Oberholser 1974(II):773; Potter et al. 1980:326; Rappole et al. 1983:225; Robbins et al. 1986:96; Robinson 1990:199; Root 1988:213; Sprunt 1954:415; Sprunt and Chamberlain 1970:475; Stewart and Robbins 1958:303.

Kentucky Warbler

Oporornis formosus **KEWA**

ABUNDANCE STATUS

Breeding— mainly FC at lower elevations in the Southern Appalachians and Piedmont, sparingly up to 3500 feet (1050 m); FC in much of the Coastal Plain of Virginia , northern North Carolina, as well as in the Coastal Plain from Alabama west, but generally U elsewhere in this section. Winter to the south of the United States. Spring arrival— early April to late April; fall departure— early September to late September.



PRIMARY HABITATS

Favor rich, moist deciduous forests; bottomland forests, rich woods near streams, and other moist hardwood types. Seldom in conifers; a rich understory of hardwoods is essential.

KEY HABITAT REQUIREMENTS

Moist deciduous forests with an abundant understory layer.

SAMPLE BREEDING DENSITIES

1(1) sapling/poletimber mixed pine-hardwood, 5.8(16) sawtimber mixed pine-hardwood, 7.5(2) sawtimber elm-ash-cottonwood, 8.5(2) sawtimber oak-gum-cypress. Recorded on 297 of 888 BBS routes in the region, 1966-1985; maximum route mean 20 birds, overall mean 0.82 ± 2.08 birds/route, total of route means 731 birds.

REPRODUCTION

Breeding season extends from early May to mid-July; peak period is late May to early June. Cup nests are built on the ground usually in dense vegetation, such as the bases of shrubs or clumps of herbaceous vegetation. Usual clutch size is 4-5, rarely 3 or 6, eggs.

FOOD HABITS

Forage usually on the ground, sometimes in shrubs to 10 feet (3 m), gleaning insects from herbaceous vegetation, leaf litter, or soil.

GUILD

Ground nesting, terrestrial gleaning insectivore.

REFERENCES

Bent 1953:503; Burleigh 1958:554; Ehrlich et al. 1988:536; Forbush and May 1939:446; Imhof 1976:361; James and Neal 1986:314; Lowery 1974:527; Mengel 1965:424; Monroe et al. 1988:52; Oberholser 1974(II):775; Potter et al. 1980:327; Rappole et al. 1983:225; Robbins et al. 1986:98; Robinson 1990:199; Sprunt 1954:416; Sprunt and Chamberlain 1970:476; Stewart and Robbins 1958:304.

Mourning Warbler

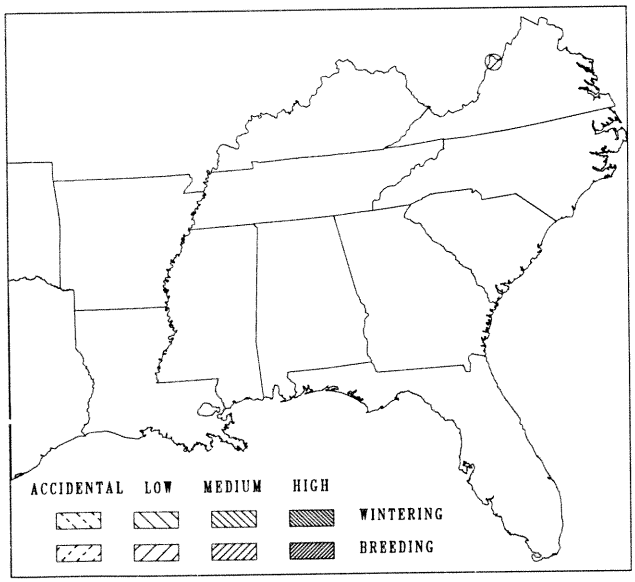
Oporornis philadelphia **MOWA**

PROTECTION STATUS

State listed as Rare in West Virginia. Monitored by Virginia Natural Heritage Program, West Virginia Natural Heritage Program. Forest Service sensitive, George Washington National Forest.

ABUNDANCE STATUS

Breeding— R in northwestern Highland County, Virginia, above 3000 feet (900 m). Winter south of the United States. Spring arrival— mid-May to late May; fall departure— poorly known, but probably late August to late September.



PRIMARY HABITATS

Fairly dense thickets; generally in the shrubby margins of bogs, but also in thickets in old fields or woodland edges, favoring blackberry (*Rubus* spp.) thickets.

KEY HABITAT REQUIREMENTS

Dense thickets at high elevations.

REPRODUCTION

No nest has been found in the region. Breeding season apparently extends from late May to early July; possible peak in early to mid-June. Nest always in dense vegetation, usually on the ground, or in shrubs up to 3 feet (1 m). Clutch size 3-5, most commonly 4, eggs.

FOOD HABITS

Glean insect and other small invertebrate prey from shrubs, saplings, or herbs.

GUILD

Ground nesting, bush or herb gleaning insectivore.

REFERENCES

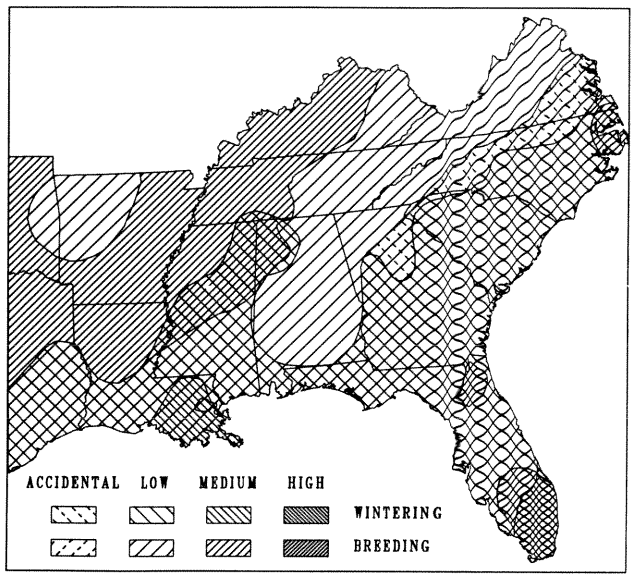
Bent 1953:524; Burleigh 1958:557; DeGraaf and Rudis 1986:327; DeGraaf et al. 1980:448; Ehrlich et al. 1988:534; Forbush and May 1939:448; Imhof 1976:363; James and Neal 1986:315; Lowery 1974:529; Mengel 1965:426; Monroe et al. 1988:52; Oberholser 1974(II):778; Potter et al. 1980:329; Rappole et al. 1983:226;Robbins et al. 1986:98; Robinson 1990:200; Sprunt 1954:418; Sprunt and Chamberlain 1970:478; Stewart and Robbins 1958:307.

Common Yellowthroat

Geothlypis trichas **COYE**

ABUNDANCE STATUS

Breeding— C to VC nearly throughout, but only FC to C in the higher mountains. Wintering— C throughout Florida and southeastern Lousiana; mostly FC in the remainder of the Coastal Plain; generally U farther inland. Spring arrival— late March to mid-April; fall departure— mid-October to early November.



PRIMARY HABITATS

Breeding— in shrubby, brushy places; abandoned fields, shrubby marshes, thickets, woodland borders, and swamp edges are typical; favor moist habitats, but frequently in uplands as well. Wintering— typically occur in damp places, such as brushy tangles, marsh edges, and damp thickets; inhabit fresh and brackish marshes, usually near shrubs.

KEY HABITAT REQUIREMENTS

Breeding— shrubs, saplings, or tall herbs, generally in open country. Wintering— moist places with shrubs, saplings, or tall herbaceous cover.

SAMPLE BREEDING DENSITIES

0.6(2) shrub/seedling southern scrub oak, 0.7(6) shrub/seedling elm-ash-cottonwood, 18(4) grass/forb oak-hickory, 29(3) sawtimber oak-gum-cypress, 41(18) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 476 of 888 BBS routes in the region, 1966-1985; maximum route mean 170 birds, overall mean 5.47 ± 10.70 birds/route, total of route means 4861 birds.

SAMPLE WINTER DENSITIES

0.5(1) grass/forb longleaf pine-slash pine, 27(1) sapling/poletimber live oak maritime, 49(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

Breeding season extends from late April to late July, with peak period in early to late May. Build nests on or near the ground in moist thickets, in dense grasses or reeds, occasionally in shrubs. Clutch size 3-6, most commonly 4.

FOOD HABITS

Glean insects from reeds, grasses, and other vegetation, usually on or within 3 feet (1 m) of the ground.

GUILD

Ground or bush nesting, bush or herb gleaning insectivore.

REFERENCES

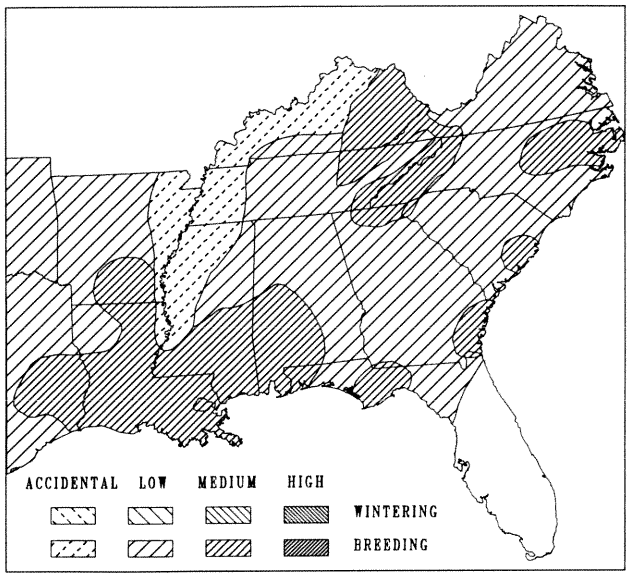
Bent 1953:542-584; Burleigh 1958:557-562; DeGraaf and Rudis 1986:328; DeGraaf et al. 1980:450; Ehrlich et al. 1988:546; Forbush and May 1939:449; Imhof 1976:363; James and Neal 1986:315; Lowery 1974:526; Mengel 1965:427; Monroe et al. 1988:53; Oberholser 1974(II):781; Potter et al. 1980:329; Rappole et al. 1983:226; Robbins et al. 1986:98; Robinson 1990:201; Root 1988:221; Sprunt 1954:419-421; Sprunt and Chamberlain 1970:479-482; Stewart and Robbins 1958:308; Verner and Boss 1980:256.

Hooded Warbler

Wilsonia citrina **HOWA**

ABUNDANCE STATUS

Breeding— FC to C nearly throughout, even in the mountains, but rarely above 4000 feet (1200 m), strangely R in the Mississippi Alluvial Plain where formerly C in the early part of this century. Winter south of the United States. Spring arrival— late March to late April; fall departure— mid-September to mid-October.



PRIMARY HABITATS

Primarily in deciduous forests, but also in mixed forests; favor moist forests with a fairly dense understory, such as bottomlands, rich woods, and ravines. Sometimes in the deciduous understory of mature pine forests.

KEY HABITAT REQUIREMENTS

Forests (usually deciduous) with a rich understory layer.

SAMPLE BREEDING DENSITIES

2(2) sapling/poletimber loblolly pine-shortleaf pine, 24(3) sapling/poletimber oak-gum-cypress, 25(1) shrub/seedling loblolly pine-shortleaf pine, 47(10) sawtimber cove hardwoods. Recorded on 287 of 888 BBS routes in the region, 1966-1985; maximum route mean 24 birds, overall mean 0.96 ± 2.57 birds/route, total of route means 853 birds.

REPRODUCTION

Breeding season extends from late April to late June, with peak activity occurring in early to late May. The nests, often poorly concealed, are built 2-5 feet (.6-1.5 m) off the ground in shrubs or saplings. Clutch size is usually 3-4, occasionally 5.

FOOD HABITS

Forage primarily in shrubs within 15 feet (5 m) of the ground, by gleaning and hawking insect and other invertebrate prey.

GUILD

Bush nesting, bush or tree gleaning or hawking insectivore.

REFERENCES

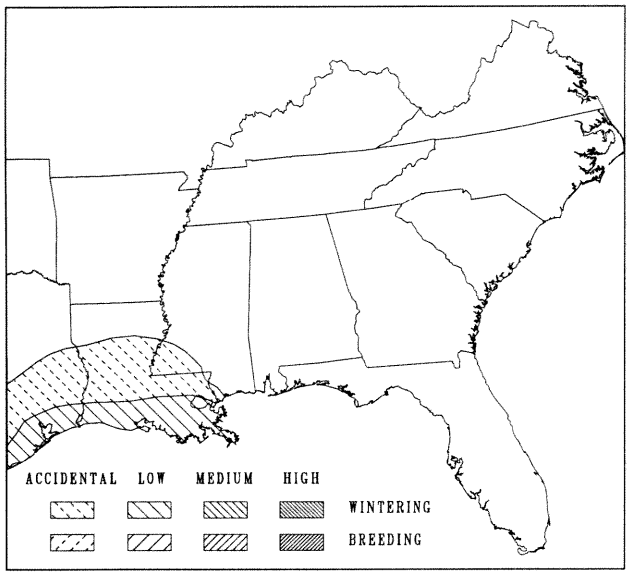
Bent 1953:610; Burleigh 1958:565; DeGraaf and Rudis 1986:329; DeGraaf et al. 1980:454; Ehrlich et al. 1988:540; Forbush and May 1939:453; Imhof 1976:365; James and Neal 1986:316; Lowery 1974: 530; Mengel 1965:429; Monroe et al. 1988:53; Oberholser 1974(II):790; Potter et al. 1980:332; Rappole et al. 1983:227; Robbins et al. 1986:98; Robinson 1990:202; Sprunt 1954:423; Sprunt and Chamberlain 1970:483; Stewart and Robbins 1958:311.

Wilson's Warbler

Wilsonia pusilla **WIWA**

ABUNDANCE STATUS

Winter—Uncommon to Rare, in varying numbers, in southern Louisiana and along the Texas coast, occasional farther east. In certain years the birds are much more numerous than in others.



PRIMARY HABITATS

Winter—Thickets, lush stands of herbs, dense shrub/seedling stands in a variety of forest types, forest edges, often near water.

KEY HABITAT REQUIREMENTS

Winter—Dense low, shrubby vegetation.

REPRODUCTION

Do not breed in the South.

FOOD HABITS

These birds actively glean small invertebrates from foliage or hawk for flying insects from the foliage of shrubs or small trees.

GUILD

Bush or tree foliage gleaning or hawking insectivore

REFERENCES

Barbour et al. 1973:83; Bent 1953:626, 639, 642; Burleigh 1958:567; DeGraaf et al. 1980:456; DeGraaf and Rudis 1986:330; Ehrlich et al. 1988:538; Forbush and May 1939:454; Imhof 1976:366; James and Neal 1986:317; Lowery 1974:530; Mengel 1965:432; Monroe et al. 1988:53; Oberholser 1974 (II):791; Potter et al. 1980:333; Rappole et al. 1983:227, 477; Robbins et al. 1986:98; Robinson 1990:202; Root 1988:220, 288; Sprunt 1954:425; Sprunt and Chamberlain 1970:484, 626; Stewart and Robbins 1958:313; Sutton 1967:525; Verner and Boss 1980:258.

Canada Warbler

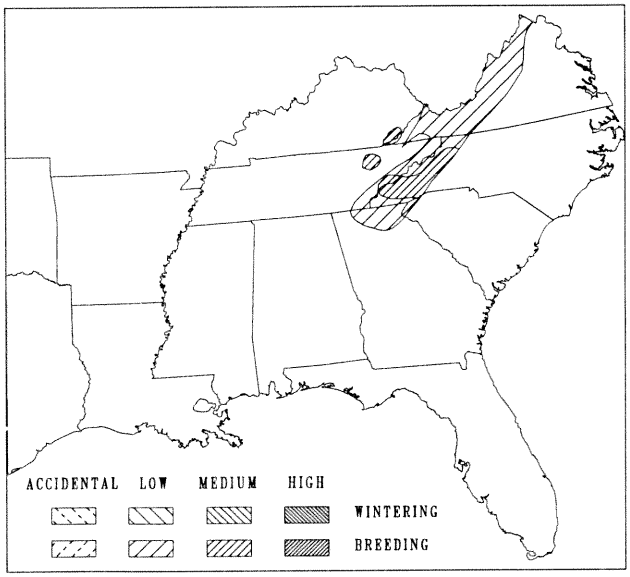
Wilsonia canadensis **CAWA**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Science and Kentucky Nature Preserves Commission.

ABUNDANCE STATUS

Breeding— C in most areas of the North Carolina and Virginia mountains: FC in the Georgia mountains, but R to U in adjacent South Carolina; seldom occur below 3000 feet (900 m). Winter to the south of the United States. Spring arrival— late April to early May; fall departure mid-September to late September.



PRIMARY HABITATS

Dense understory or shrub layers in a variety of forests; prefer rhododendron or mountain laurel tangles; the canopy over the tangles may be spruce-fir, hemlocks, or pure hardwoods; ravines or other cool slopes are favored.

KEY HABITAT REQUIREMENTS

Montane forests with a dense shrub or understory layer, showing a preference for rhododendron.

SAMPLE BREEDING DENSITIES

5(1) sawtimber spruce-fir, 22(3) sawtimber white pine-hemlock, 47(1) sawtimber oak-hickory, 60(2) sawtimber mixed pine-hardwood. Recorded on 3 of 888 BBS routes in the region, 1966-1985; maximum route mean 8 birds, overall mean 0.01 ± 0.26 birds/route, total of route means 10 birds.

REPRODUCTION

Breeding season extends from late May to early July, peaking in late May to early June. Ground nests are generally well-hidden near root tangles, bases of trees, in stream banks, etc. Clutch size 3-5, commonly 4.

FOOD HABITS

Glean or hawk insect prey, usually below 10 feet (3 m) in low vegetation or on the ground.

GUILD

Ground nesting, bush gleaning or hawking insectivore.

REFERENCES

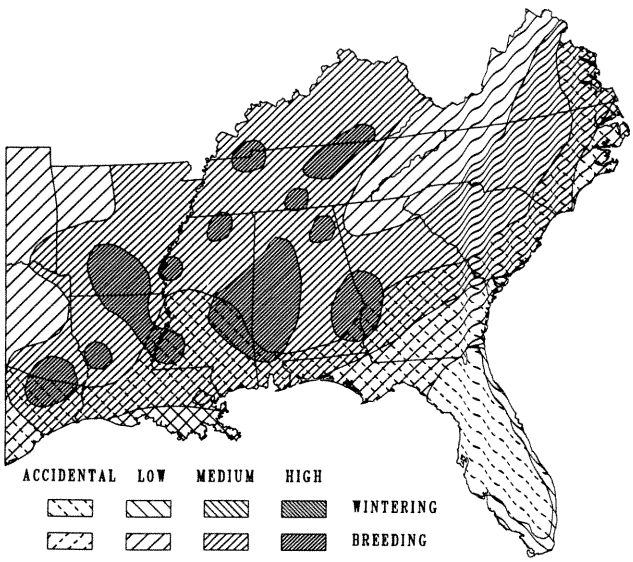
Bent 1953:646; Burleigh 1958:568; DeGraaf and Rudis 1986:331; DeGraaf et al. 1980:458; Ehrlich et al. 1988:538; Forbush and May 1939:454; Imhof 1976:367; James and Neal 1986:317; Lowery 1974: 531; Mengel 1965:432; Monroe et al. 1988:53; Oberholser 1974(II):792; Potter et al. 1980:334; Rappole et al. 1983:227; Robinson 1990:203; Sprunt 1954:426; Sprunt and Chamberlain 1970:485.

Yellow-breasted Chat

Icteria virens **YBCH**

ABUNDANCE STATUS

Breeding— C over most of the South, less so at higher elevations and on the Outer Coastal Plain. Wintering— R to U, and secretive, along the coast; occur sporadically in peninsular Florida; scattered winter records from nearly throughout the Southeast. Spring arrival— mid-April to late April; fall departure— early September to late September.



PRIMARY HABITATS

Breeding— overgrown fields, hedgerows, thickets, and woodland margins; generally in dry situations, particularly in briar thickets. Wintering— dense tangles, usually to broadleaf evergreens; hedgerows and thickets, especially in Japanese honeysuckle (*Lonicera japonica*) and privet (*Ligustrum* spp.).

KEY HABITAT REQUIREMENTS

Breeding— dense cover of shrubs or saplings. Wintering— thickets, mainly in broadleaf evergreen cover.

SAMPLE BREEDING DENSITIES

1(3) shrub/seedling elm-ash-cottonwood, 28(6) shrub/seedling mixed pine-hardwood, 32(17) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 435 of 888 BBS routes in the region, 1966-1985; maximum route mean 63 birds, overall mean 5.11 ± 8.95 birds/route, total of route means 4538 birds.

REPRODUCTION

Breeding season extends from mid-May to early July, with peak occurring in mid-May to early June. Nests are generally built 2-8 feet (.6-2.5 m) up in dense vegetation such as vine tangles, Rubus thickets, etc. Difficult to find. Clutch size 3-6, usually 4-5.

FOOD HABITS

Forage in low vegetation, usually below 10 feet (3 m), occasionally on the ground. Glean prey from vegetation. Summer diet is insects and other small invertebrates; in winter berries are also eaten.

GUILD

Bush nesting, bush foliage gleaning insectivore-omnivore.

REFERENCES

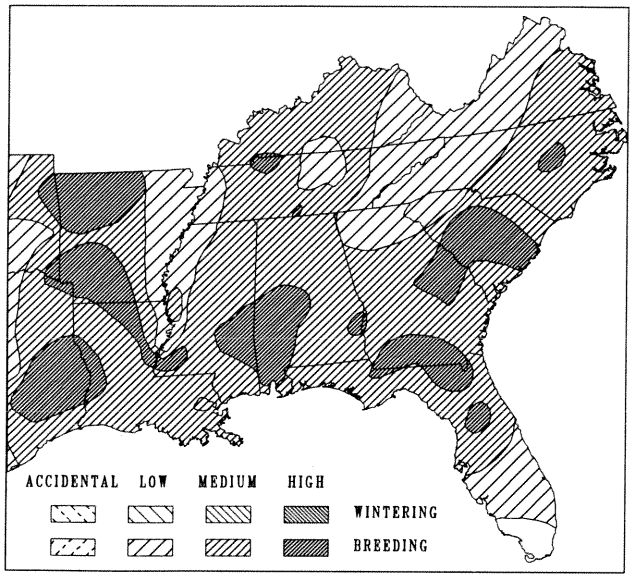
Bent 1953:587-601; Burleigh 1958:563-565; DeGraaf and Rudis 1986:332; DeGraaf et al. 1980:452; Ehrlich et al. 1988:548; Forbush and May 1939:451; Imhof 1976:364; James and Neal 1986:317; Lowery 1974:533; Mengel 1965:428; Monroe et al. 1988:53; Oberholser 1974(II):787; Potter et al. 1980:330; Rappole et al. 1983:226; Robbins et al. 1986:98; Robinson 1990:203; Root 1988:221, 288; Sprunt 1954:421; Sprunt and Chamberlain 1970:482; Stewart and Robbins 1958:310; Verner and Boss 1980:257.

Summer Tanager

Piranga rubra **SUTA**

ABUNDANCE STATUS

Breeding— C over most of the region, less so in the Mississippi Alluvial Plain; generally U in northern Virginia, and in mountain valleys; seldom above 2500 feet (750 m). Winter to the south of the United States. Spring arrival— late March to late April; fall departure— mid-September to mid-October.



PRIMARY HABITATS

Prefer open to medium-growth woods, usually in dry soil; favor mixed woods or hardwoods, but frequently in pine-woods; also in wooded residential areas and bottomlands.

KEY HABITAT REQUIREMENTS

Forests of many types, with a preference for dry sites.

SAMPLE BREEDING DENSITIES

0.6(2) sawtimber elm-ash-cottonwood, 8.3(3) sapling/poletimber oak-gum-cypress, 22(5) sapling/poletimber longleaf pine-scrub oak. Recorded on 468 of 888 BBS routes in the region, 1966-1985; maximum route mean 28 birds, overall mean 2.61 ± 4.24 birds/route, total of route means 2322 birds.

REPRODUCTION

Breeding season extends from early May to mid-July, with peak in mid- to late May. Nests are built in trees, 20-40 feet (6-12 m) above the ground. Clutch size 3-4, sometimes 5.

FOOD HABITS

Glean and hawk insects, particularly bees, wasps, and other flying forms; mostly in tree canopies.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

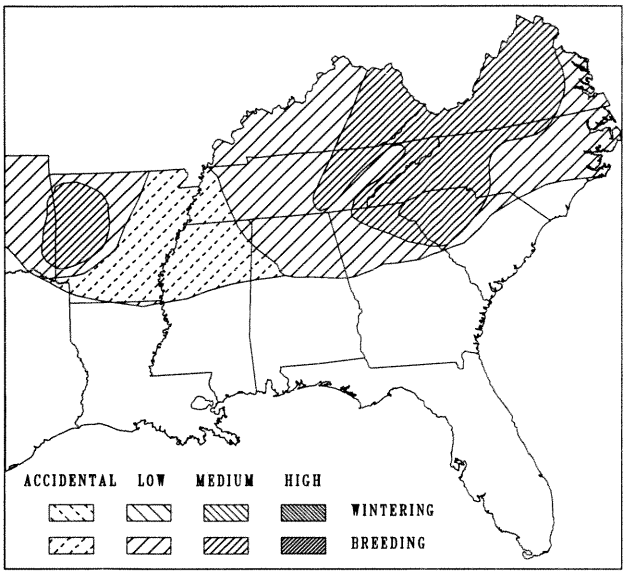
Bent 1958:496-509; Burleigh 1958:605; Ehrlich et al. 1988:630; Forbush and May 1939:482; Imhof 1976:385; James and Neal 1986:318; Lowery 1974:555; Mengel 1965:459; Monroe et al. 1988:53; Oberholser 1974(II):850; Potter et al. 1980:354; Rappole et al. 1983:232; Robbins et al. 1986:106; Robinson 1990:204; Root 1988:222; Sprunt and Chamberlain 1970:508; Sprunt 1954: 448; Stewart and Robbins 1958:332.

Scarlet Tanager

Piranga olivacea **SCTA**

ABUNDANCE STATUS

Breeding— C in the lower and middle elevations in the Ozarks, Ouachitas, and Southern Appalachians and Interior Low Plateaus (up to 4000 feet, 1200 m), but essentially absent above 5000 feet (1500 m); FC over most of the Piedmont and Cumberland Plateau. Generally U in the Coastal Plain section of the range. Winter south of the United States. Spring arrival— mid-April to late April; fall departure— early October to mid-October.



PRIMARY HABITATS

Favor mature deciduous forests, especially in uplands; also breed in bottomlands; less numerous in mixed forests.

KEY HABITAT REQUIREMENTS

Mature deciduous forests.

SAMPLE BREEDING DENSITIES

1(1) shrub/seedling loblolly pine-shortleaf pine, 1(1) shrub/seedling mixed pine-hardwood, 6.9(25) sawtimber mixed pine-hardwood, 9.8(23) sawtimber oak-hickory, 13(11) sawtimber cove hardwoods, 19(3) sawtimber white pine-hemlock. Recorded on 178 of 888 BBS routes in the region, 1966-1985; maximum route mean 21 birds, overall mean 0.59 ± 2.07 birds/route, total of route means 528 birds.

REPRODUCTION

Breeding season extends from mid-May to early August, with peak from late May to mid-June. Nest at moderate heights, commonly 20-50 feet (6-15 m), in a hardwood tree. Clutch size 3-5, most commonly 4.

FOOD HABITS

Glean insects from leaves and twigs, usually 30 feet (9 m) or higher in tree canopies. Also eat berries, especially in the fall.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

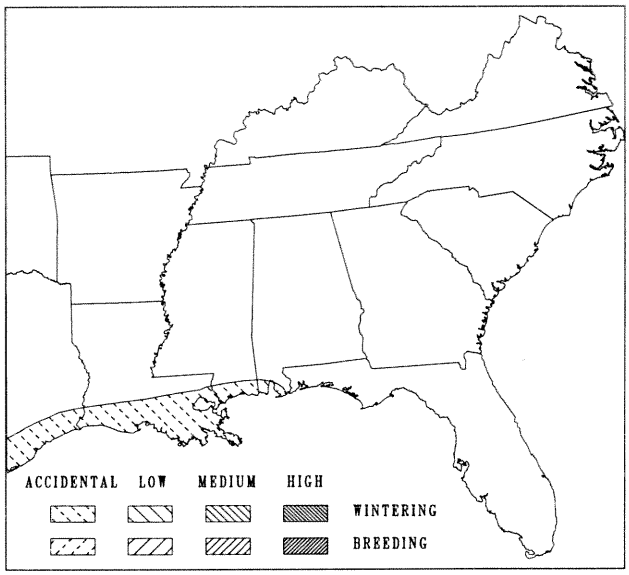
Bent 1958:479; Burleigh 1958:603; DeGraaf and Rudis 1986:333; DeGraaf et al. 1980:480; Ehrlich et al. 1988:628; Forbush and May 1939:480; Imhof 1976:383; James and Neal 1986:319; Lowery 1974:554; Mengel 1965:457; Monroe et al. 1988:53; Oberholser 1974(II):847; Potter et al. 1980:353; Rappole et al. 1983:231; Robbins et al. 1986:106; Robinson 1990:205; Sprunt 1954:447; Sprunt and Chamberlain 1970:507; Stewart and Robbins 1958:330.

Western Tanager

Piranga ludoviciana **WETA**

ABUNDANCE STATUS

Winter— Very Rare, late December-late March, along the Gulf Coast from Alabama west to Texas; occasional elsewhere, including the Atlantic Coast.



PRIMARY HABITATS

Winter— Coastal woodlands, such as live oak thickets, mottes, and chenieres. Often visit bird feeders in winter.

KEY HABITAT REQUIREMENTS

Winter— Not well known; possibly feeders or evergreen woods.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

These tanagers forage by gleaning from twigs and foliage of trees, as well as on the ground; and by hawking. Fruits, insects and some seeds are the primary foods. Insects form a major part of the summer diet; fruits and seeds the bulk of that in winter. They may depend on feeders for survival during winter cold spells in the region.

GUILD

Terrestrial, bush, or arboreal foliage gleaning omnivore

REFERENCES

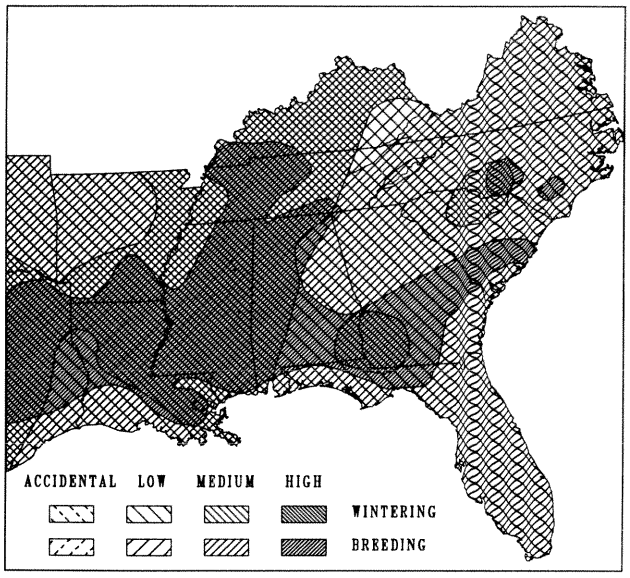
Barbour et al. 1973:90; Bent 1958:466; Burleigh 1958:602; Ehrlich et al. 1988:628; Forbush and May 1939:479; Imhof 1976:383; James and Neal 1986:321; Lowery 1974:553; Monroe et al. 1988:63; Oberholser 1974 (II):845; Potter et al. 1980:353; Rappole et al. 1983:231; Robbins et al. 1986:106; Robinson 1990:205; Root 1988:222; Sprunt 1954:503; Sprunt and Chamberlain 1970:629; Sutton 1967:563; Verner and Boss 1980:267.

Northern Cardinal

Cardinalis cardinalis **NOCA**

ABUNDANCE STATUS

All seasons— C to A nearly everywhere, though not common in the mountains at middle elevations, and absent above 4500 feet (1350 m). Essentially non-migratory; there are local movements, with many individuals leaving woodlands and flocking loosely in open habitats.



PRIMARY HABITATS

Widespread in wooded or shrubby habitats; favor open woods, margins, and thickets, being most common in wooded residential areas where shrubs abound. Generally not common in deep forests, but present in nearly all forest types except for high mountain ones.

KEY HABITAT REQUIREMENTS

Few specific requirements; generally in woodland understory, saplings, or shrubs.

SAMPLE BREEDING DENSITIES

0.5(1) sapling/poletimber sand pine-southern scrub oak. Average density above 20 in 11 habitats; sawtimber longleaf pine-slash pine, sapling/poletimber oak-gum-cypress, sapling/poletimber and sawtimber live oak maritime, sapling/poletimber and sawtimber (max. 41 pairs/40 ha on 2 plots) elm-ash-cottonwood, sawtimber loblolly pine-shortleaf pine, sapling/poletimber and sawtimber mixed pine-hardwood, sawtimber oak-hickory, sawtimber cove hardwoods. Recorded on 581 of 888 BBS routes in the region, 1966-1985; maximum route mean 139 birds, overall mean 23.4 ± 24.2 birds/route, total of route means 20,828 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber sand pine-southern scrub oak. Average density above 15 birds/40 ha in 6 habitats; sawtimber longleaf pine-slash pine, max. 54(1) sapling/poletimber oak-gum-cypress and 54(2) sapling/poletimber live oak maritime, sawtimber live oak maritime, grass/forb oak-hickory, shrub/seedling oak-hickory.

REPRODUCTION

Breeding occurs from late March to early August, with peak occurring throughout May. Nest in a variety of situations, usually below 10 feet (3 m). Clutch size 3-4, rarely 5.

FOOD HABITS

Forage most often on the ground, commonly also in shrubs and understory, occasionally higher. Cardinals glean insects, seeds, and berries; winter diet primarily vegetable matter.

GUILD

Bush nesting, terrestrial or bush foliage gleaning omnivore-granivore.

REFERENCES

Bent and Austin 1968a:1-22; Burleigh 1958:607-609; DeGraaf and Rudis 1986:334; DeGraaf et al. 1980:482; Ehrlich et al. 1988:554; Forbush and May 1939:483; Imhof 1976:386; James and Neal 1986:321; Lowery 1974:557; Mengel 1965:461; Monroe et al. 1988:54; Oberholser 1974(II):853; Potter et al. 1980:356; Robbins et al. 1986:106; Robinson 1990:206; Root 1988:223; Sprunt 1954:450; Sprunt and Chamberlain 1970:509; Stewart and Robbins 1958:333.

Rose-breasted Grosbeak

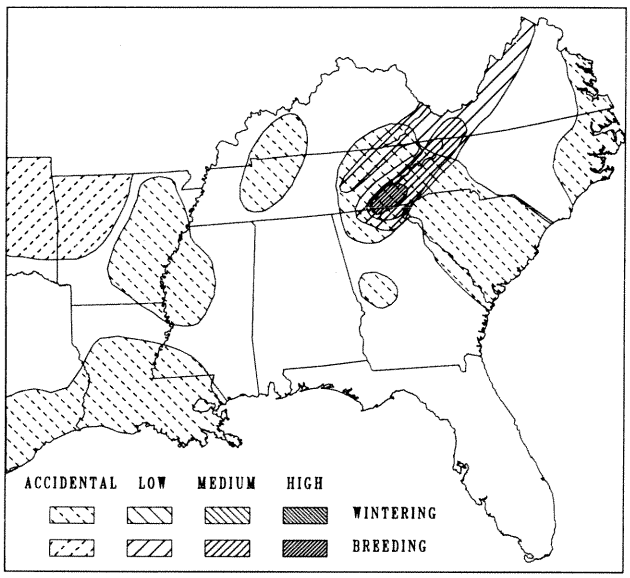
Pheucticus ludovicianus **RBGR**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Science and Kentucky Nature Preserves Commission.

ABUNDANCE STATUS

Breeding— C in the Southern Appalachians above 3500 feet (1050 m); less numerous down to 2500 feet (750 m). Winter south of the United States. Spring arrival— late April to early May; fall departure— early October to mid-October.



PRIMARY HABITATS

Almost strictly in hardwood forests; medium-growth and mature hardwoods are favored; also occur in open hardwoods in residential areas; rather uncommon in hardwoods mixed with spruce, fir, or hemlock.

KEY HABITAT REQUIREMENTS

Mature hardwood forests in the mountains.

SAMPLE BREEDING DENSITIES

2.7(3) sawtimber white pine-hemlock, 43(1) sawtimber cove hardwoods. Recorded on 19 of 888 BBS routes in the region, 1966-1985; maximum route mean 9 birds, overall mean 0.03 ± 0.34 birds/route, total of route means 26 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber longleaf pine-slash pine.

REPRODUCTION

Breeding season extends from mid-May to late June, with peak in late May to early June. Nests built at 5-25 feet (1.6-8 m) in shrubs, saplings, or lower portions of trees; often in rhododendron. Clutch size 3-5, most commonly 4.

FOOD HABITS

Forage primarily above 20 feet (6 m) in tree canopies, where they glean insects, seeds, and berries from twigs and leaves.

GUILD

Bush or tree nesting, tree foliage gleaning omnivore.

REFERENCES

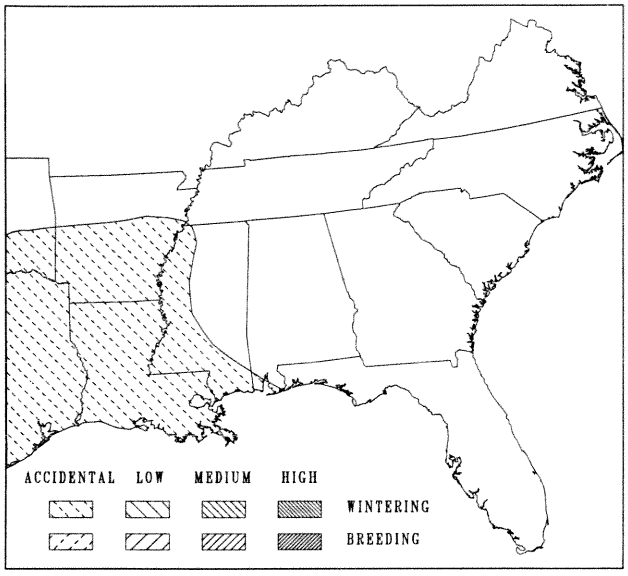
Bent and Austin 1968a:36; Burleigh 1958:609; DeGraaf and Rudis 1986:335; DeGraaf et al. 1980:484; Ehrlich et al. 1988:552; Forbush and May 1939:484; Imhof 1976:388; James and Neal 1986:322; Lowery 1974:558; Mengel 1965:463; Monroe et al. 1988:54; Oberholser 1974(II):856; Potter et al. 1980:358; Rappole et al. 1983:232; Robbins et al. 1986:106; Robinson 1990:207; Root 1988:225, 288; Sprunt 1954:451; Sprunt and Chamberlain 1970:511; Stewart and Robbins 1958:334.

Black-headed Grosbeak

Pheucticus melanocephalus **BHGR**

ABUNDANCE STATUS

Winter— Occasional and Rare in the western part of the region, early October-late April in Louisiana, late December-late February in Texas. Winter records exist for Alabama, Arkansas, Tennessee, and other states farther east as well.



PRIMARY HABITATS

Winter— Coastal woodlands, live oak thickets, mottes, and chenieres. About half of the Louisiana observations, and probably a similar portion of those elsewhere in the region, have been in residential areas associated with feeders.

KEY HABITAT REQUIREMENTS

Winter— Evergreen woodlands and possibly feeders.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

These birds are primarily insectivorous during the early summer, eating leaf beetles and scale insects particularly; and frugivorous and granivorous at other seasons; cherries are a favorite food. Their winter diet is a varied one.

GUILD

Tree foliage gleaning omnivore

REFERENCES

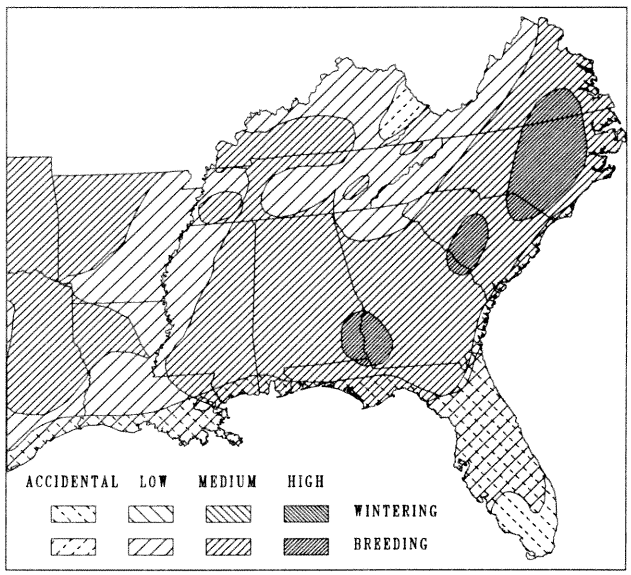
Bent and Austin 1968a:55, 58; Ehrlich et al. 1988:554; Imhof 1976:389; James and Neal 1986:322; Lowery 1974:559; Monroe et al. 1988:54; Oberholser 1974 (II):858; Potter et al. 1980:359; Rappole et al.1983:232; Robbins et al. 1986:106; Robinson 1990:207; Root 1988:225; Sprunt and Chamberlain 1970:630; Sutton 1967:575; Verner and Boss 1980:268.

Blue Grosbeak

Guiraca caerulea **BLGR**

ABUNDANCE STATUS

Breeding— C in most of the Piedmont and Coastal Plain, and Ozark and Ouachita Uplifts, but U to FC in northern Virginia and parts of Kentucky; U in the lower mountains, and seldom over 2500 feet (750 m). Winter to the south of the United States. Spring arrival— early April to late April; fall departure— late September to mid-October.



PRIMARY HABITATS

Favor abandoned fields with plenty of saplings, wood margins, dry thickets, and other brushy places; not as numerous in damp thickets as in uplands.

KEY HABITAT REQUIREMENTS

Deciduous saplings or shrubs.

SAMPLE BREEDING DENSITIES

0.3(5) shrub/seedling elm-ash-cottonwood, 4(1) grass/forb loblolly pine-shortleaf pine, 4(4) shrub/seedling mixed pine-hardwood, 5.4(5) sawtimber oak-hickory, 10(7) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 493 of 888 BBS routes in the region, 1966-1985; maximum route mean 40 birds, overall mean 3.15 ± 4.91 birds/route, total of route means 2800 birds.

REPRODUCTION

Breeding season extends from late May to early August, with peak in late May to mid-June. Build nests usually 3-12 feet (1-4m) from the ground, in shrubs, saplings, or other vegetation in thickets. Clutch size 3-5, most often 4.

FOOD HABITS

Glean insects, as well as weed and grain seeds, on or near the ground.

GUILD

Bush nesting, herb or bush gleaning omnivore.

REFERENCES

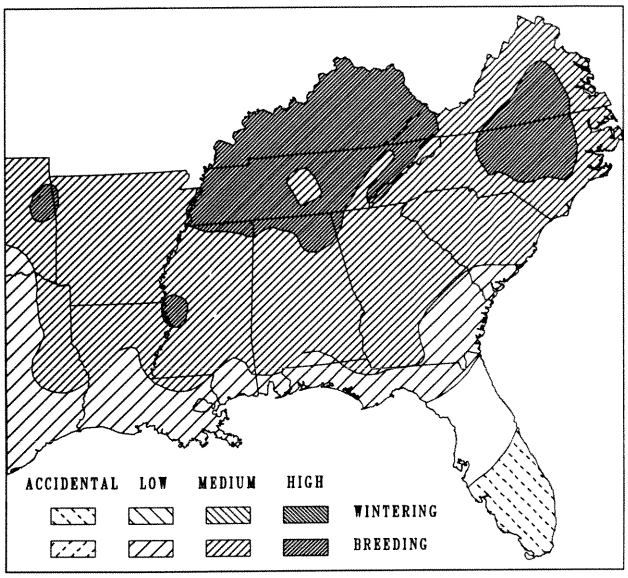
Bent and Austin 1968a:67-80; Burleigh 1958:613; Ehrlich et al. 1988:556; Forbush and May 1939:486; Imhof 1976:390; James and Neal 1986:323; Lowery 1974:560; Mengel 1965:465; Monroe et al. 1988:54; Oberholser 1974(II):860; Potter et al. 1980:360; Rappole et al. 1983:233; Robbins et al. 1986:106; Robinson 1990:208; Root 1988:225; Sprunt 1954:452; Sprunt and Chamberlain 1970:512; Stewart and Robbins 1958:335; Verner and Boss 1980:269.

Indigo Bunting

Passerina cyanea **INBU**

ABUNDANCE STATUS

Breeding— C to VC in most of the region, but less numerous toward the coast; occur infrequently above 5000 feet (1500 m). Wintering— U to FC, in the southern half of Florida. Spring arrival— mid-April to early May; fall departure— early October to late October.



PRIMARY HABITATS

Breeding— prefer wood margins, openings and clearings in woods, overgrown fields, and groves; not as common in shrubby thickets and hedgerows, because males favor a few trees within their territories; deciduous vegetation highly favored over conifers. Wintering— woodland edges, open woods, bushy edges, overgrown fields, and thickets.

KEY HABITAT REQUIREMENTS

Breeding— deciduous saplings or trees in an open or partly open situation, particularly along woodland edges. Wintering— trees or shrubs in many situations, often in brushy places and thick cover.

SAMPLE BREEDING DENSITIES

0.7(3) sawtimber loblolly pine-shortleaf pine. 0.7(9) shrub/seedling elm-ash-cottonwood, 21(2) sapling/poletimber mixed pine-hardwood. Recorded on 476 of 888 BBS routes in the region, 1966-1985; maximum route mean 125 birds, overall mean 13.3 ± 19.1 birds/route, total of route means 11,798 birds.

SAMPLE WINTER DENSITIES

1(1) grass/forb oak-hickory, 10(4) sawtimber longleaf pine-slash pine.

REPRODUCTION

Breeding season extends from mid-May to mid-August, peaking from late May to mid-June. Nests placed in variety of sites in vegetation, usually 3-12 feet (1-4 m) above the ground. Clutch size 2-5, usually 3-4.

FOOD HABITS

Glean insects, as well as seeds, grains, berries. Forage on the ground or in vegetation, generally below 15 feet (5 m).

GUILD

Bush nesting, herb or bush gleaning omnivore-granivore.

REFERENCES

Bent and Austin 1968a:80; Burleigh 1958:615; DeGraaf and Rudis 1986:336; DeGraaf et al. 1980:486; Ehrlich et al. 1988:558; Forbush and May 1939:486; Imhof 1976:390; James and Neal 1986:323; Lowery 1974:561; Mengel 1965:466; Monroe et al. 1988:54; Oberholser 1974(II):863; Potter et al 1980:361; Rappole et al. 1983:233; Robbins et al. 1986:106; Robinson 1990:208; Root 1988:225; Sprunt 1954:453; Sprunt and Chamberlain 1970:513; Stewart and Robbins 1958:337;.

Painted Bunting

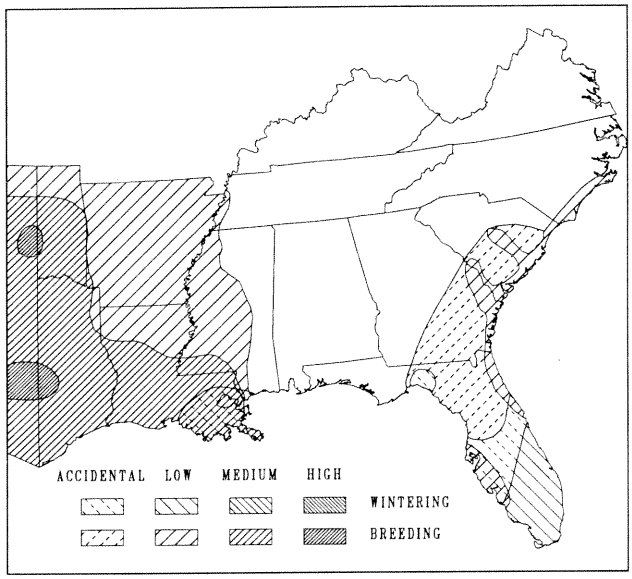
Passerina ciris **PABU**

PROTECTION STATUS

Monitored by Tennessee Natural Heritage Program.

ABUNDANCE STATUS

Breeding— generally C in eastern part of the region along the immediate coast; locally FC inland along a few of the larger rivers, such as the Savannah; mainly R to U at most inland sites within the range. In western parts, FC in Lousiana, Texas, and Oklahoma; U to R east to the Mississippi River into Mississippi and Tennessee. Wintering— U to locally FC, in southern Florida.



PRIMARY HABITATS

Breeding— dense thickets, wood margins, hedgerows, and other dense shrubby areas; often common in residential areas with dense shrubbery; frequent dense stands of second-growth woods, but usually along the edges or openings. Wintering— dense shrubbery or second-growth woods, primarily in broadleaf evergreens; always in thick cover.

KEY HABITAT REQUIREMENTS

All seasons— dense thickets of shrubs, saplings, or second-growth trees, primarily near the coast.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sawtimber longleaf pine-slash pine and sawtimber mixed pine-hardwood, 5.2(4) sapling/poletimber mixed pine-hardwood, 9(2) sawtimber live oak maritime. Recorded on 192 of 888 BBS routes in the region, 1966-1985; maximum route mean 51 birds, overall mean 1.81 ± 5.58 birds/route, total of route means 1610 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber live oak maritime, 23(4) sawtimber longleaf pine-slash pine.

REPRODUCTION

Breeding occurs in early May to late July, with peak from mid-May to early June. Nests built always in thick cover, generally 3-6 feet (1-2 m) from the ground. Clutch size 3-4, rarely 5.

FOOD HABITS

Forage usually below 10 feet (3 m) in shrubs, saplings, and herbaceous vegetation. Glean insects and seeds in summer, insects and a variety of plant food in winter.

GUILD

Bush nesting, herb or bush gleaning omnivore.

REFERENCES

Bent and Austin 1968a:137-155; Burleigh 1958:617; Eagar and Hatcher 1982(A):101; Ehrlich et al. 1988:560; Forbush and May 1939:487; Imhof 1976:392; James and Neal 1986:324; Lowery 1974:562; Monroe et al. 1988:63; Oberholser 1974(II):868; Potter et al. 1980:362; Rappole et al. 1983:234; Robbins et al. 1986:108; Robinson 1990:209; Root 1988:225, 289; Sprunt 1954:455; Sprunt and Chamberlain 1970:514.

Dickcissel

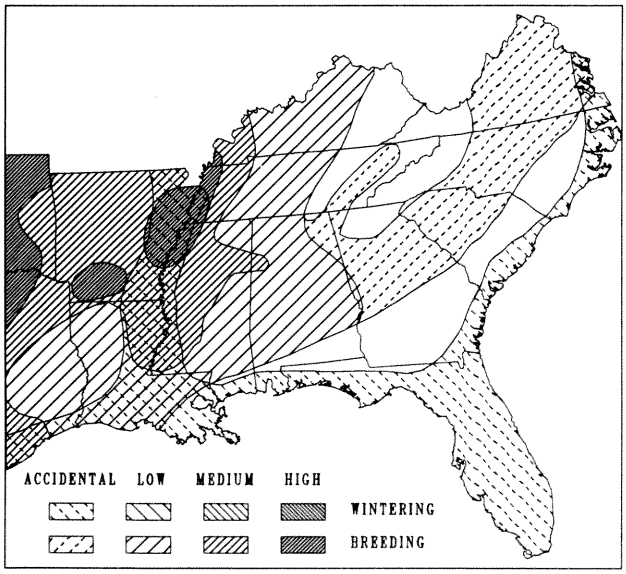
Spiza americana **DICK**

PROTECTION STATUS

State listed as Rare in West Virginia. Blue Listed by Tate (1981). Monitored by Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— C to A in western part of the region, including cleared lands in Mississippi Alluvial Plains, decreasing to U in middle Tennessee and Alabama. R and very sporadic further east; primarily in the Piedmont, and in valleys of the Virginia mountains; most numerous in northern Virginia, but erratic even there. One to several pairs may occur, or perhaps breed, in a given field one summer, only to disappear completely the next summer. In the 19th Century, Dickcissels were C in much of this area. Wintering— VR to R, and erratic, at scattered locations in the Piedmont and Coastal Plain, but generally near the coast; mainly near feeders. The bulk of the population breeds to the west of the region and winters south of the United States. Spring arrival— late April to late May, sometimes not arriving until July; fall departure— probably late August to mid-September.



PRIMARY HABITATS

Breeding— always in open "grassy" areas; usually in weedy fields or grain fields; also in meadows. Wintering— seldom in grassy areas, but occur with other native sparrows or with House Sparrows in hedgerows, weedy tangles, wood margins, and thickets; often at feeders in open residential areas where thickets or weedy cover is nearby.

KEY HABITAT REQUIREMENTS

Breeding— herbaceous cover where vegetation is at least 2 feet (.6 m) high. Wintering— few specific requirements, but mainly in shrubs, saplings, or tall forbs (such as composites).

SAMPLE BREEDING DENSITIES

Recorded on 229 of 888 BBS routes in the region, 1966-1985; maximum route mean 115 birds, overall mean 3.98 ± 13.3 birds/route, total of route means 3539 birds.

REPRODUCTION

Breeding season extends from mid-May to early August, peaking probably in early to mid-June. Nest on the ground in dense grasses in a field. Clutch size 3-5, most often 4.

FOOD HABITS

Glean insects and seeds (summer) from the ground and herbaceous vegetation; mainly seeds in winter.

GUILD

Ground nesting, herb gleaning omnivore-granivore.

REFERENCES

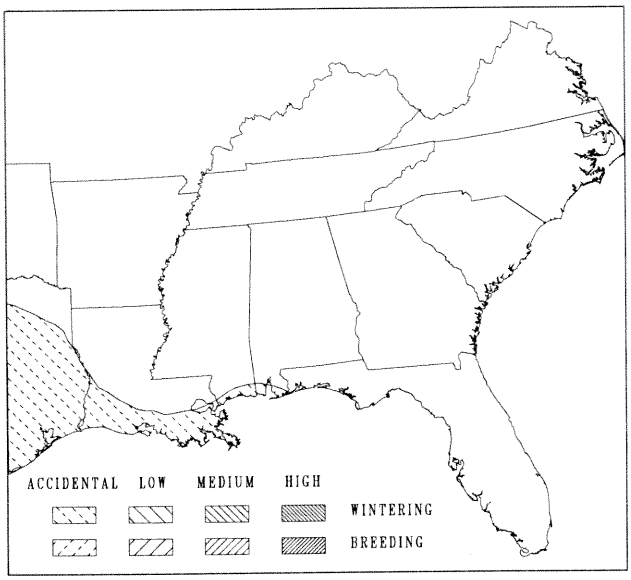
Bent and Austin 1968a:158; Burleigh 1958:618; DeGraaf et al. 1980:488; Ehrlich et al. 1988:606; Forbush and May 1939:488; Imhof 1976:392; James and Neal 1986:326; Lowery 1974:562; Mengel 1965:467; Monroe et al. 1988:54; Oberholser 1974(II):870; Potter et al. 1980:363; Rappole et al. 1983:234; Robbins et al. 1986:108; Robinson 1990:209; Root 1988:225, 289; Sprunt 1954:458; Sprunt and Chamberlain 1970:516; Stewart and Robbins 1958:338.

Green-tailed Towhee

Pipilo chlorurus **GTTO**

ABUNDANCE STATUS

Winter— Irregular and Very Rare in east Texas, decreasing in abundance along the Gulf Coast into Louisiana and Alabama.



PRIMARY HABITATS

Winter— Shrubby or brushy areas, such as live oak thickets, mottes, chenieres, woods edge.

KEY HABITAT REQUIREMENTS

Winter— Dense thickets and edge.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

The winter diet consists primarily of weed seeds and grains, with some fruits and insects. The birds forage on the ground, in leaf litter, about the bases of shrubs, where they scratch through the debris with both feet, exposing prey beneath. Their habit of running along the ground frequently misleads observers into thinking the bird is a chipmunk.

GUILD

Terrestrial, herb, or bush gleaning omnivore

REFERENCES

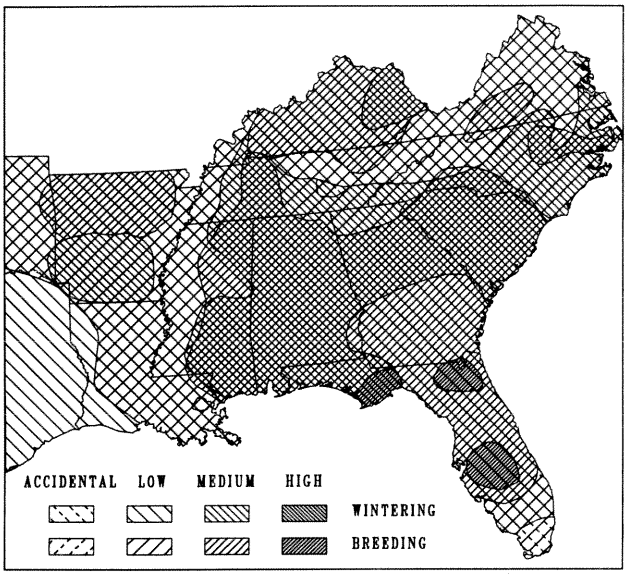
Bent and Austin 1968a:547; Burleigh 1958:635; Ehrlich et al. 1988:564; Imhof 1976:402; James and Neal 1986:327; Lowery 1974:568; Oberholser 1974 (II):892; Potter et al. 1980:374; Rappole et al.1983:235; Robinson 1990:210; Root 1988:226; Sprunt and Chamberlain 1970:522; Sutton 1967:598; Verner and Boss 1980:282.

Rufous-sided Towhee

Pipilo erythrophthalmus **RSTO**

ABUNDANCE STATUS

Breeding— C to VC nearly throughout, even in the higher mountains. Wintering— C to VC nearly throughout, but mostly U in northern and western Virginia, and FC in the North Carolina mountains; not common in extreme southern Florida. There is some migration of birds into the region in winter, but it is hardly noticeable at most localities.



PRIMARY HABITATS

All seasons— very widespread; mainly in brushy places; woodland margins, overgrown fields, thickets, woodland understory, cutover woods, and shrubbery in residential areas.

KEY HABITAT REQUIREMENTS

Shrubs, saplings, or understory trees in a wide variety of situations, usually where a thicket is present.

SAMPLE BREEDING DENSITIES

2(2) sawtimber live oak maritime, 2(2) grass/forb mixed pine-hardwood, 45(1) sapling/poletimber sand pine-southern scrub oak, 48(2) shrub/seedling southern scrub oak, 50(1) sapling/poletimber longleaf pine-scrub oak, 65(2) shrub/seedling oak-hickory. Recorded on 438 of 888 BBS routes in the region, 1966-1985; maximum route mean 138 birds, overall mean 9.56 ± 15.3 birds/route, total of route means 8487 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber oak-gum-cypress, 0.8(11) grass/forb elm-ash-cottonwood, 75(2) shrub/seedling southern scrub oak, 75(1) sapling/poletimber sand pine-southern scrub oak, 85(1) sapling/poletimber longleaf pine-scrub oak.

REPRODUCTION

Breeding season extends from mid-April to mid-August with peak from early May to early June. Nest in thickets or brushy places on the ground or in shrubs or saplings to 5 feet (1.5m) high. Clutch size 2-6, usually 3-5.

FOOD HABITS

Forage on the ground in leaf litter, or in shrubs. Scratch in leaf litter to expose insects, seeds, and fruits which they glean. Winter diet more vegetarian than summer diet.

GUILD

Ground or bush nesting, terrestrial or bush gleaning omnivore.

REFERENCES

Bent and Austin 1968a:562-602; Burleigh 1958:635-641; DeGraaf and Rudis 1986:337; DeGraaf et al. 1980:508; Ehrlich et al. 1988:562; Forbush and May 1939:502; Imhof 1976:403; James and Neal 1986:327; Lowery 1974:569; Mengel 1965:476; Monroe et al. 1988:55; Oberholser 1974(II):894; Potter et al. 1980:374; Rappole et al. 1983:235; Robbins et al. 1986:111; Robinson 1990:210; Root 1988:227; Sprunt 1954:463-466; Sprunt and Chamberlain 1970:522-524; Stewart and Robbins 1958:348; Verner and Boss 1980:283.

Bachman's Sparrow

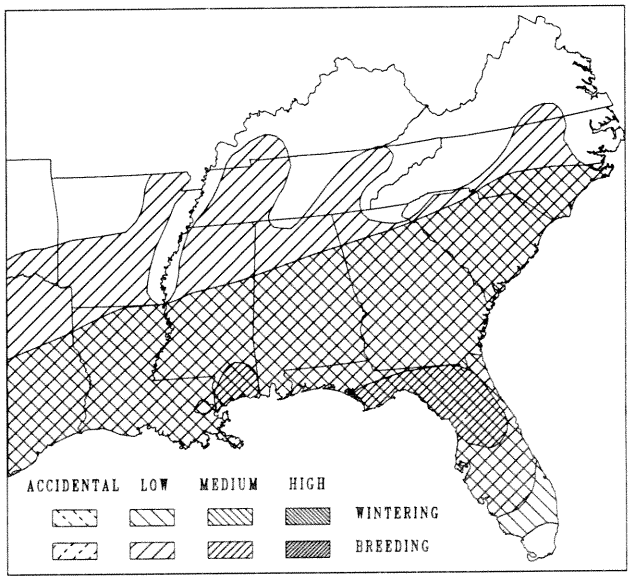
Aimophila aestivalis **BACS**

PROTECTION STATUS

Federally listed as category C2. State listed as Endangered in Tennessee; Threatened in North Carolina, Oklahoma, and by Kentucky Academy of Science and Kentucky Nature Preserves Commission. Monitored by Alabama Natural Heritage Program, Arkansas Natural Heritage Commission, Florida Natural Areas Inventory, Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program, South Carolina Heritage Trust Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program. Forest Service sensitive on Jefferson, Kisatchie, Ozark-St. Francis, Ouachita National Forests and National Forests in North Carolina, Mississippi, and Texas.

ABUNDANCE STATUS

Breeding— FC, but local, in the outer Coastal Plain; U in the Inner Coastal Plain; R in the Piedmont. Wintering— very secretive; actual abundance poorly known at this season; apparently FC in the Outer Coastal Plain; U in the Inner Coastal Plain. The species has declined in numbers in recent decades.



PRIMARY HABITATS

Breeding— in the Coastal Plain, usually in open pinewoods, especially where there is a thick cover of grasses or saw palmetto (*Serenoa repens*). In the Piedmont, mainly in overgrown fields with scattered saplings, occasionally in open woods with thick grass cover. Wintering— mostly in thick grasses under open pinewoods; also in grassy fields, such as broomsedge.

KEY HABITAT REQUIREMENTS

Breeding— dense grassy places where scattered trees or saplings are present, usually in pines. Wintering— similar to breeding habitats; always in thick grassy cover.

SAMPLE BREEDING DENSITIES

2(2) sawtimber longleaf pine-slash pine. 10(2) sapling/poletimber longleaf pine-slash pine. Recorded on 135 of 888 BBS routes in the region, 1966-1985; maximum route mean 36 birds, overall mean 0.43 ± 2.10 birds/route, total of route means 383 birds.

SAMPLE WINTER DENSITIES

1(1) shrub/seedling southern scrub oak.

REPRODUCTION

Breeding season extends from late April to mid-July, with peak during May. Build domed nests with side entrances on the ground in dense cover, such as under brush, saw palmettos, or saplings. Clutch size 3-5.

FOOD HABITS

Forage strictly on the ground, in dense grass, palmettos, or shrubs. Glean insects and seeds in summer; winter diet probably seeds.

GUILD

Ground nesting, herb gleaning insectivore-granivore.

REFERENCES

Bent and Austin 1968b:956-975; Burleigh 1958:664-668; Eagar and Hatcher 1982(A):15; Ehrlich et al. 1988:580; Forbush and May 1939:519; Imhof 1976:411; James and Neal 1986:330; Lowery 1974:578; Mengel 1965:490; Monroe et al. 1988:55; Oberholser 1974(II):917; Potter et al. 1980:382; Robbins et al. 1986:118; Robinson 1990:211; Root 1988:229, 289; Sprunt 1954:484; Sprunt and Chamberlain 1970:537, 538; Stewart and Robbins 1958:358.

Rufous-crowned Sparrow

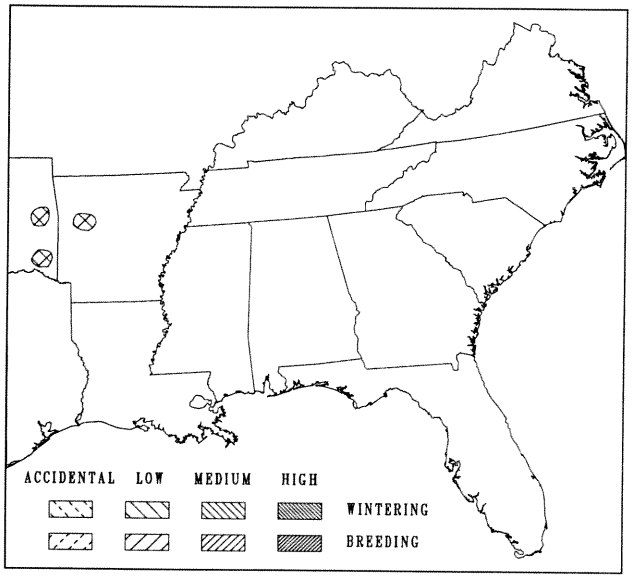
Aimophila ruficeps **RCSP**

PROTECTION STATUS

Monitored by Arkansas Natural Heritage Commission.

ABUNDANCE STATUS

Permanent resident— A very small population occurs on Mt. Magazine, Logan Co., Arkansas. More common west of the region, the birds may be expanding their range into eastern sections of Oklahoma. Sutton (1967) reported the birds nesting in Latimer and Cherokee Counties in eastern Oklahoma at that time. Because they are sedentary, these birds may suffer extensive mortality in abnormally cold winters, after which they may be absent from parts of the range for unpredictable periods of time.



PRIMARY HABITATS

All seasons— Dry shrub/seedling stands in upland situations with much bare ground, sparse grasses, and only scattered shrubs. Scrub oak types may be preferred.

KEY HABITAT REQUIREMENTS

All seasons— Rocky or gravelly south-facing slopes, with considerable bare, rocky ground, sparse herbaceous cover, with widely scattered shrubs and small trees.

SAMPLE DENSITIES

Bent and Austin (1968b) report densities of 2-5 pairs/40 ha as recorded in several parts of the range, all west of the region.

REPRODUCTION

The birds build open nests of grasses on or very near the ground, in herbaceous cover or a shrub, or under a rock ledge, during mid-March to mid-August. Clutch is 2-5, usually 3 or 4 eggs.

FOOD HABITS

Rufous-crowned Sparrows include a wide assortment of seeds and insects in their diets. The pattern of more than 90% animal food in the summer, more than 90% seeds in the winter, and nearly equal amounts of the two in spring and fall depicts a classic insectivore-granivore diet. The secretive birds find these foods during patient foraging on the ground, in leaf litter beneath shrubs, or around clumps of herbaceous vegetation.

GUILD

Ground nesting, terrestrial gleaning insectivore-granivore

REFERENCES

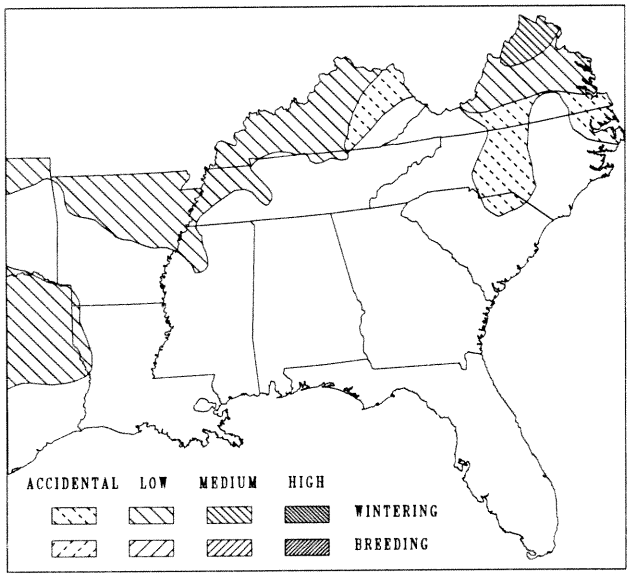
Bent and Austin 1968b:919-956; Ehrlich et al. 1988:584; James and Neal 1986:331; Oberholser 1974 (II):916; Rappole et al.1983:236; Root 1988:229; Sutton 1967:614; Wolf 1977.

American Tree Sparrow

Spizella arborea **ATSP**

ABUNDANCE STATUS

Wintering— FC to occasionally C in the northern half of the Virginia mountains and Piedmont; generally U elsewhere in Virginia; R over the North Carolina portion of the range. Usually are more numerous in severe winters than mild ones. Breed north of the region. Fall arrival— early November to late November; spring departure— mid-March to late March.



PRIMARY HABITATS

Favor weedy fields, hedgerows, and other brushy areas, generally with Field Sparrows.

KEY HABITAT REQUIREMENTS

Weedy or brushy cover in open country.

SAMPLE WINTER DENSITIES

0.5(1) sawtimber oak-hickory, 20(1) shrub/seedling Virginia pine-pitch pine, 45(1) grass/forb oak-hickory.

REPRODUCTION

Do not breed in this region.

FOOD HABITS

Glean seeds, particularly those of grasses and composites, from the ground, herbaceous vegetation, and occasionally from shrubs.

GUILD

Herb gleaning granivore.

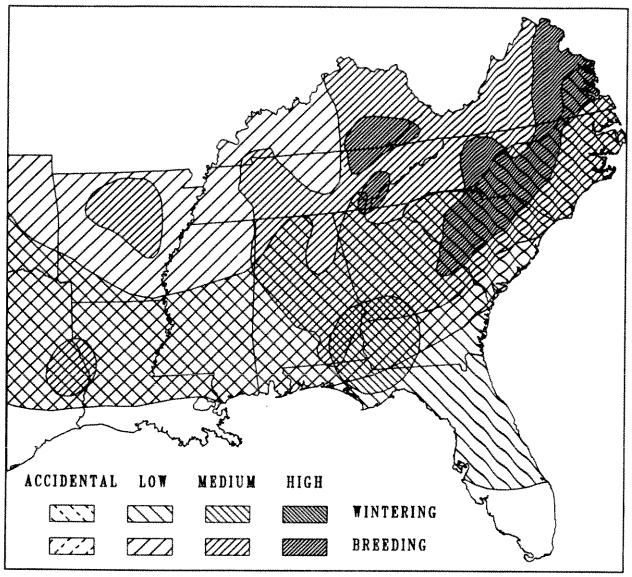
REFERENCES

Bent and Austin 1968b:1137; DeGraaf and Rudis 1986:338; DeGraaf et al. 1980:524; Ehrlich et al. 1988:584; Forbush and May 1939:522; Imhof 1976:413; James and Neal 1986:332; Lowery 1974:580; Mengel 1965:496; Monroe et al. 1988:55; Oberholser 1974(II):933; Potter et al. 1980:384; Robinson 1990:211; Root 1988:232; Stewart and Robbins 1958:361.

Chipping Sparrow
Spizella passerina **CHSP**

ABUNDANCE STATUS OF SPECIES

Breeding— C in the mountains and Piedmont; FC over much of the Coastal Plain, but U near the coast. Wintering— C from southern South Carolina to central Florida and across the Coastal Plain to Texas and Oklahoma; decreasing to U northward, as well as in southern Florida.



PRIMARY HABITATS

Breeding— favor scattered trees with short grass nearby; wooded residential areas, rural groves, farmyards, golf courses, and open woods are primary habitats. Wintering— generally in short grass areas; favor weedy fields, plowed fields, golf courses, hedgerows, and lawns. Tend to occur in more open habitats in winter than in summer.

KEY HABITAT REQUIREMENTS

Breeding— scattered trees and short grass, mainly in pines. Wintering— various short grass habitats.

SAMPLE BREEDING DENSITIES

1(1) sawtimber oak-gum-cypress, 1(1) shrub/seedling elm-ash-cottonwood, 1(1) sawtimber elm-ash-cottonwood, 1(2) sawtimber loblolly pine-shortleaf pine, 14(7) sawtimber oak-hickory, 26(2) grass/forb mixed pine-hardwood. Recorded on 323 of 888 BBS routes in the region, 1966-1985; maximum route mean 46 birds, overall mean 2.41 ± 5.33 birds/route, total of route means 2144 birds.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber pine savanna, 1(1) sapling/poletimber oak-gum-cypress, 25(1) grass/forb loblolly pine-shortleaf pine.

REPRODUCTION

Breeding season extends from mid-April to mid-August, with peak in May. Nests are placed in shrubs, saplings, or trees, often pines, usually from 5-25 feet (1.5-8 m) up, and not far from lawns or other short grass areas. Clutch size is 2-5, usually 4.

FOOD HABITS

Forage on the ground, particularly in short grasses. Glean insects and some seeds in summer; seeds are primary winter diet.

GUILD

Bush or tree nesting, terrestrial gleaning insectivore-granivore.

REFERENCES

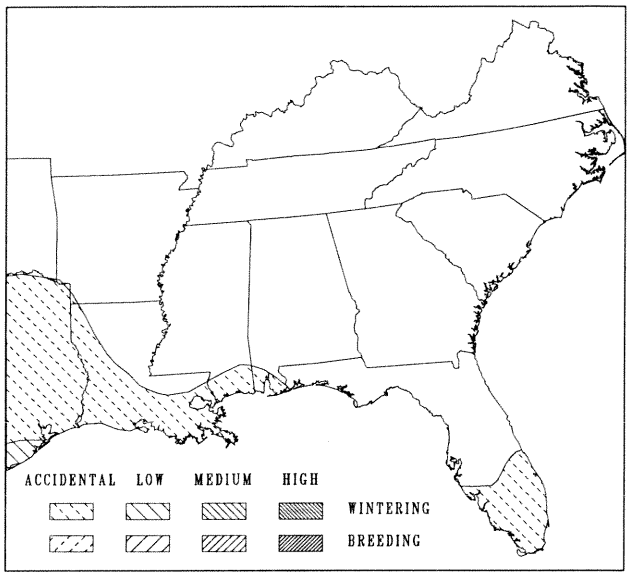
Bent and Austin 1968b:1166-1186; Burleigh 1958:673; DeGraaf and Rudis 1986:339; DeGraaf et al. 1980:526; Ehrlich et al. 1988:586; Forbush and May 1939:523; Imhof 1976:414; James and Neal 1986:333; Lowery 1974:582; Mengel 1965:497; Monroe et al. 1988:55; Oberholser 1974(II):934; Potter et al. 1980:385; Rappole et al. 1983:237; Robbins et al. 1986:115; Robinson 1990:212; Root 1988:233; Sprunt 1954:486; Sprunt and Chamberlain 1970:541; Stewart and Robbins 1958:362; Verner and Boss 1980:293.

Clay-colored Sparrow

Spizella pallida **CCSP**

ABUNDANCE STATUS

Winter-- Primary range is west of 97° W; farther east, these birds are Rare and irregular, mid-October-April, from east Texas to Alabama.



PRIMARY HABITATS

Winter— Open brushland, large woods openings, woodland borders, grass/forb and shrub/seedling stands in upland types. In many respects their habitats are similar to those of Field Sparrows (*S. pusilla*).

KEY HABITAT REQUIREMENTS

Winter— Early successional stages of upland types, especially where the vegetation is not very dense.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

These birds forage on the ground, in herbaceous vegetation, or low in shrubs, where they feed on a wide variety of seeds and insects, as well as some buds, catkins, and berries.

GUILD

Terrestrial, herb, or bush gleaning omnivore.

REFERENCES

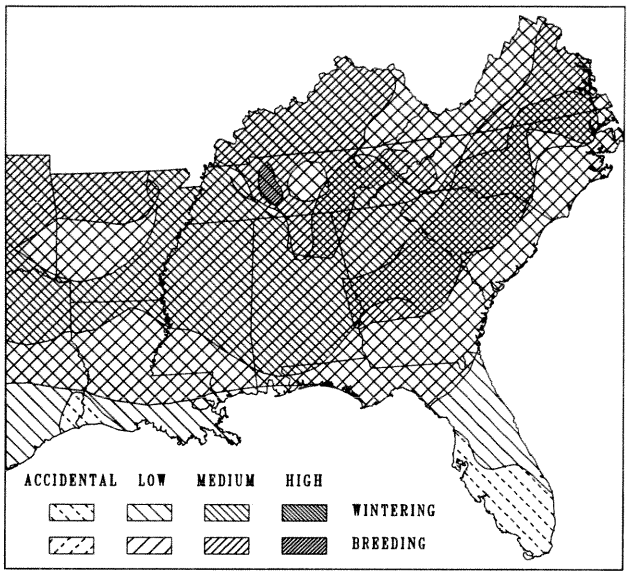
Bent and Austin 1968b:1186; Burleigh 1958:702; Ehrlich et al. 1988:588; Forbush and May 1939:524; Imhof 1976:415; James and Neal 1986:334; Lowery 1974:583; Mengel 1965:523; Monroe et al. 1988:55; Oberholser 1974 (II):936; Potter et al. 1980:385; Robbins et al. 1986:115; Robinson 1990:212; Root 1988:230; Sprunt 1954:487; Sprunt and Chamberlain 1970:542, 637; Sutton 1967:626.

Field Sparrow

Spizella pusilla **FISP**

ABUNDANCE STATUS OF SPECIES

Breeding— C to VC over most of the region, but U in southern and coastal Georgia and parts of the Gulf Coastal Plain. Wintering— C to A in most areas, but U to FC in the southern half of Florida.



PRIMARY HABITATS

Breeding— favor scattered saplings or shrubs in weedy habitats; overgrown fields, woods margins, hedgerows, and thickets. Wintering— more numerous in open fields than summer; prime habitats are weedy fields, broomsedge fields, hedgerows, wood margins, and thickets.

KEY HABITAT REQUIREMENTS

Breeding— scattered saplings, shrubs, and tall herbaceous cover. Wintering— dense cover of herbs, particular tall composites.

SAMPLE BREEDING DENSITIES

1.1(13) shrub/seedling elm-ash-cottonwood, 19(6) grass/forb oak-hickory (peculiar plot, wooded pasture). Recorded on 388 of 888 BBS routes in the region, 1966-1985; maximum route mean 108 birds, overall mean 4.10 ± 8.09 birds/route, total of route means 3638 birds.

SAMPLE WINTER DENSITIES

3.2(11) sawtimber mixed pine-hardwood, 19(6) grass/forb oak-hickory.

REPRODUCTION

Breeding season extends from early April to mid-August, peaking in May. Nests are placed on the ground or in shrubs or saplings in thickets or old fields. Early nests are often on the ground; later ones are often placed in shrubs. Clutch size 2-5, usually 3-4.

FOOD HABITS

Forage on the ground, especially in grasses and forbs about 3 feet (1 m) tall, where they glean insects and seeds in summer, and seeds in winter.

GUILD

Bush or ground nesting, herb gleaning omnivore-granivore.

REFERENCES

Bent and Austin 1968b:1217-1235; Burleigh 1958:676; DeGraaf and Rudis 1986:340; DeGraaf et al. 1980:528; Ehrlich et al. 1988:586; Forbush and May 1939:525; Imhof 1976:415; James and Neal 1986:334; Lowery 1874:584; Mengel 1965:499; Monroe et al. 1988:55; Oberholser 1974(II):939; Potter et al. 1980:386; Rappole et al. 1983:237; Robbins et al. 1986:118; Robinson 1990:213; Root 1988:234; Sprunt 1954:488; Sprunt and Chamberlain 1970:543; Stewart and Robbins 1958:363.

Vesper Sparrow

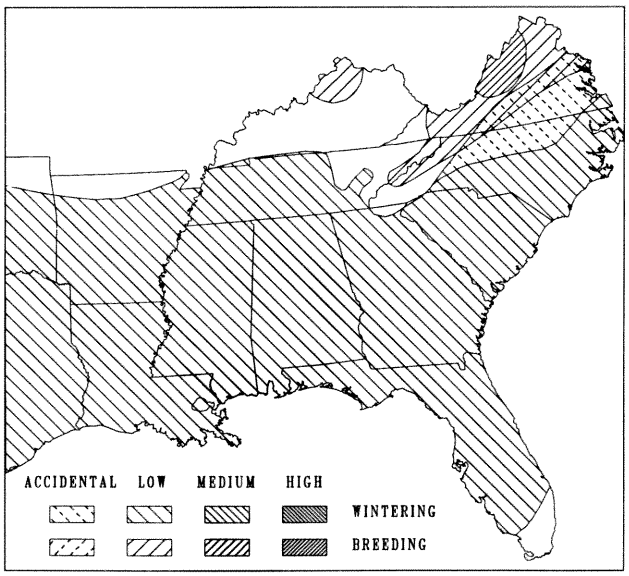
Pooecetes gramineus **VESP**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Science and Kentucky Nature Preserves Commission, as "In need of management" in Tennessee. Forest Service sensitive on the Cherokee National Forest.

ABUNDANCE STATUS

Breeding— somewhat local, but generally FC at higher elevations in the Southern Appalachians, but U at lower elevations; mainly over 3000 feet (900 m); R in the Piedmont and Coastal Plain of Virginia and in northern Kentucky. Wintering— FC to C in southern Georgia and northern Florida; less numerous elsewhere. Fall arrival— early October to early November; spring departure— early April to late April.



PRIMARY HABITATS

Breeding— pastures, meadows, and grassy fields are preferred, generally where hilly and rocky; ideal habitat has a few rocks, shrubs, or fence posts for singing perches. Wintering— most numerous in sandy grasslands; sandy fields, pastures, airports, plowed fields; usually where herbaceous cover is less than 1 foot (3 dm) high.

KEY HABITAT REQUIREMENTS

Breeding— fields where grass is short to medium in height, usually in hilly areas, with scattered singing perches. Wintering— short grass or bare ground, preferably in sandy soil.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in grass/forb loblolly pine-shortleaf pine and grass/forb mixed pine-hardwood, 1(2) sapling/poletimber oak-hickory. Recorded on 16 of 888 BBS routes in the region, 1966-1985; maximum route mean 7 birds, overall mean 0.01 ± 0.21 birds/route, total of route means 12 birds.

SAMPLE WINTER DENSITIES

1(1) grass/forb elm-ash-cottonwood, 23(2) grass/forb loblolly pine-shortleaf pine.

REPRODUCTION

Breeding season extends from late April to early August, with peak in mid-to-late May. Nests are placed on the ground in fields or pastures, often in or near clumps or tussocks of grass. Clutch size 3-5.

FOOD HABITS

Forage by gleaning almost strictly on the ground. Summer diet mostly insects, with many seeds; winter diet is primarily grass and other seeds.

GUILD

Ground nesting, herb or terrestrial gleaning insectivore-granivore.

REFERENCES

Bent and Austin 1968b:868-885; Burleigh 1958:662-664; DeGraaf and Rudis 1986:341; DeGraaf et al. 1980:520; Eagar and Hatcher 1982(A):79; Ehrlich et al. 1988:572; Forbush and May 1939:516; Imhof 1976:409; James and Neal 1986:335; Lowery 1974:577; Mengel 1965:487; Monroe et al. 1988:56; Oberholser 1974(II):912; Potter et al. 1980:380; Rappole et al. 1983:236; Robbins et al. 1986:111; Robinson 1990:213; Root 1988:235; Sprunt 1954:481; Sprunt and Chamberlain 1970:535; Stewart and Robbins 1958:356; Verner and Boss 1980:287.

Lark Sparrow

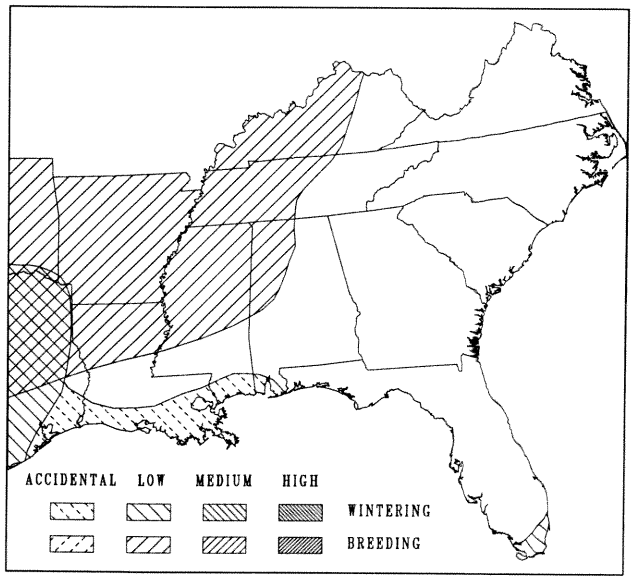
Chondestes grammacus **LASP**

PROTECTION STATUS

State listed as Threatened by Kentucky Academy of Sciences and Nature Preserves Commission, as Rare in West Virginia, "In need of management" in Tennessee, Significantly Rare in North Carolina. Monitored by Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— Common in much of Texas and Oklahoma, Fairly Common in east Texas, northcentral Louisiana and Arkansas, and Rare in western Alabama, Tennessee, and Kentucky. The season extends from late March to mid-September. Winter—Rare in eastern Texas and southern Louisiana.



PRIMARY HABITATS

All seasons— Parklike habitats, oak savannah, abandoned fields, brush-lined pastures, prairies; the birds inhabit early successional stages in a variety of upland types, suburban areas, agricultural areas, hedgerows at field edges, shrub-sapling areas, as well as openings in woods, and roadsides.

KEY HABITAT REQUIREMENTS

All seasons— Lark Sparrows may require some bare, rocky ground in an old-field situation or a low basal area forest stand with well-developed grass/forb understory and scattered shrubs. Mengel (1965) indicates that in Kentucky these birds frequent various disturbance features such as rock outcrops, sandhills, and erosion gullies, that provide sparse groundcover interspersed with bare substrate. An important Tennessee habitat are some of the larger limestone cedar glades and pastures in cedar glade country in the Central Basin of the state. Barbour et al. (1973) suggest that strip mine reclamation may provide a suitable habitat for them. R. B. Hamilton (pers. comm.) associates them in winter with gravel roads in coastal marshes.

SAMPLE BREEDING DENSITIES

1 pair/40 ha on 2 eastern Oklahoma censuses of open canopy sawtimber Oak-hickory, Visitor to 1 pair/40 ha on 4 eastern Oklahoma censuses of open canopy sawtimber elm-ash-cottonwood riparian woodland.

SAMPLE WINTER DENSITIES

Not recorded on a census in the region.

REPRODUCTION

Open cup nests are placed on the ground or in small shrubs or trees in hedgerows, old-fields, or clearings in forest, 6-30 ft (2-10 m) up. The clutch is 3-6, often 4, laid in April-July.

FOOD HABITS

Lark Sparrows eat seeds of a variety of forbs and grasses, as well as small invertebrates. Oberholser (1974, vol. II) notes that these birds walk and hop with apparently equal facility as they forage on the ground.

GUILD

Terrestrial, herb, or bush nesting, herb or terrestrial gleaning omnivore-granivore

REFERENCES

Barbour et al. 1973:98; Bent and Austin 1968b:886; Burleigh 1958:664; Eagar and Hatcher 1982:A-69; Ehrlich et al. 1988:574; Forbush and May 1939:518; Imhof 1976:410; James and Neal 1986:335; Lowery 1974:577; McNair 1982; Mengel 1965:489; Monroe et al. 1988:56; Oberholser 1974 (II):914; Potter et al. 1980:381; Rappole et al. 1983:236, 437; Robbins et al. 1986:111; Robinson 1990:214; Root 1988:236; Sprunt 1954:482, 483; Sprunt and Chamberlain 1970:536, 635; Stewart and Robbins 1958:357; Sutton 1967:612; Verner and Boss 1980:288.

Lark Bunting

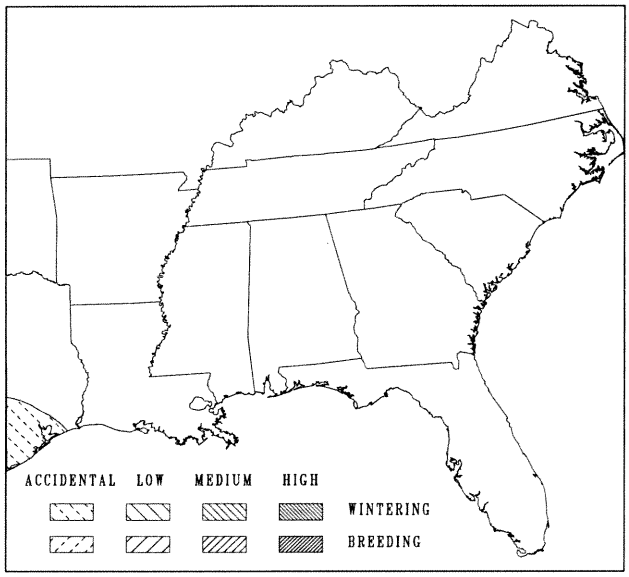
Calamospiza melanocorys **LARB**

PROTECTION STATUS

Tate and Tate (1982) list as Special Concern on basis of 60% decline in reported sightings.

ABUNDANCE STATUS

Winter— Of marginal occurrence in the region, Lark Buntings are Rare to Very Rare, erratically occurring winter residents in Oklahoma, Texas, southern Louisiana, and east into Alabama, mid-October-early April. The primary wintering grounds are to the southwest of the region.



PRIMARY HABITATS

Winter— Grass/forb successional stages in a variety of mesic to xeric forest types.

KEY HABITAT REQUIREMENTS

Winter— Extensive open areas with flat topography and short vegetation.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

In the winter, Lark Buntings glean seeds of a variety of weed and forb species, as well as such small invertebrates as they find while foraging on the ground.

GUILD

Terrestrial or herb gleaning granivore

REFERENCES

Bent and Austin 1968b:638; Burleigh 1958:641; Ehrlich et al. 1988:606; Forbush and May 1939:504; Imhof 1976:404; Lowery 1974:571; Oberholser 1974 (II):899; Pleszczynska 1978; Potter et al. 1980:376; Rappole et al.1983:235; Robbins et al. 1986:111; Robinson 1990:215; Root 1988:246, 291; Sprunt and Chamberlain 1970:525, 634; Sutton 1967:603.

Savannah Sparrow

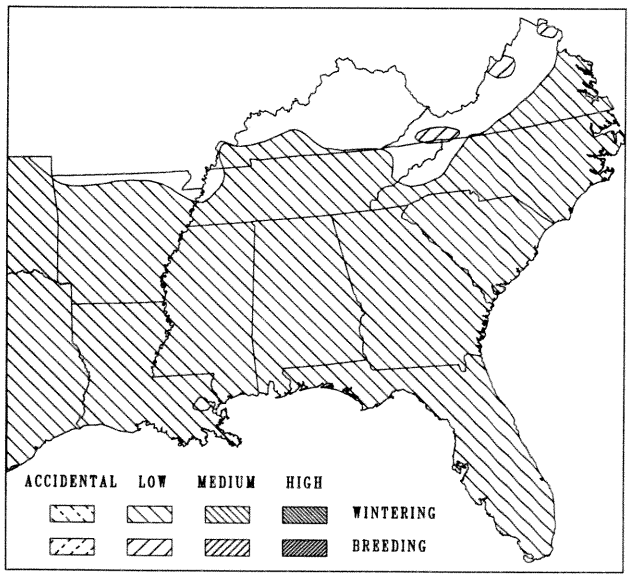
Passerculus sandwichensis **SAVS**

PROTECTION STATUS

Ipswich Sparrow (*P. s. princeps*) listed as Endangered in South Carolina. State listed as Special Concern by Kentucky Academy of Science and Kentucky Nature Preserves Commission, as Significantly Rare in North Carolina. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Tennessee Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R and local in mountain valleys in Virginia, and in the extreme northern Piedmont of that state. Wintering— C to A in most of the Coastal Plain; decreasing northward; U in mountain valleys, but VR to R in northwestern Virginia. Fall arrival— mid-September to early October; spring departure —late April to mid-May.



PRIMARY HABITATS

Breeding— grassy fields or meadows, preferably where the vegetation is 1-2 feet (.6 m) high; in moist or dry ground. Wintering— prefer grassy areas, but in shorter grass than in summer; pastures, short-grass fields, airports, dunes, and weedy fields.

KEY HABITAT REQUIREMENTS

Breeding— grasslands with vegetation generally 1-2 feet (.6 m) high. Wintering— grasses or forbs, usually where less than 6 inches (.2 m) in height.

SAMPLE WINTER DENSITIES

1.2(6) grass/forb elm-ash-cottonwood, 22(2) grass/forb loblolly pine-shortleaf pine, 47(1) shrub/seedling live oak maritime.

REPRODUCTION

Breeding season apparently extends from early May to late July, with probable peak from late May to mid-June. Nests are placed on the ground in tall grasses. Clutch size 3-6, usually 4-5.

FOOD HABITS

Forage on the ground in grasses usually less than 3 feet (1 m) tall, where they glean insects and seeds. Primary diet is seeds, to which insects are added in summer.

GUILD

Ground nesting, herb or terrestrial gleaning omnivore-granivore.

REFERENCES

Bent and Austin 1968b:657-724; Burleigh 1958:643-647; DeGraaf and Rudis 1986:342; DeGraaf et al. 1980:510; Eagar and Hatcher 1982(A):99; Ehrlich et al. 1988:574; Forbush and May 1939:505, 507; Imhof 1976:404; James and Neal 1986:336; Lowery 1974:572; Mengel 1965:478; Monroe et al. 1988:56; Oberholser 1974(II):901-903; Potter et al. 1980:376; Rappole et al. 1983:235; Robbins et al. 1986:111; Robinson 1990:215; Root 1988:239; Sprunt 1954:466-468; Sprunt and Chamberlain 1970:525-527; Stewart and Robbins 1958:349-352; Verner and Boss 1980:285.

Grasshopper Sparrow

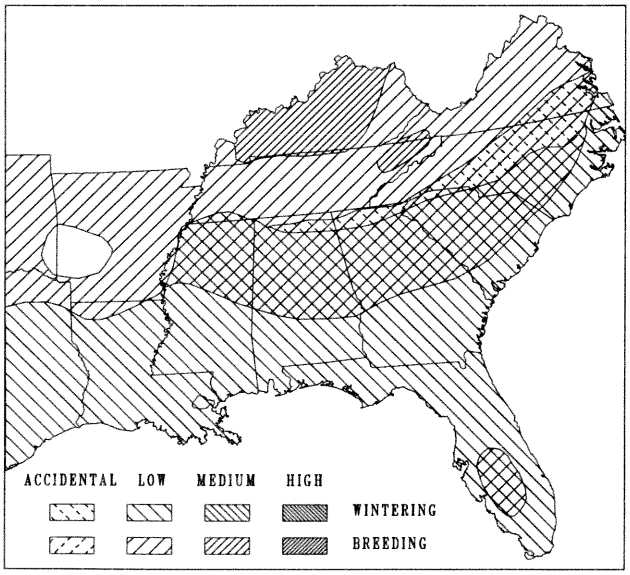
Ammodramus savannarum **GRSP**

PROTECTION STATUS

A. s. floridanus federally listed as Endangered, state listed as Endangered in Florida. State listed as Threatened in Tennessee. Blue Listed by Tate (1981). Monitored by Arkansas Natural Heritage Commission, Louisiana Natural Heritage Program.

ABUNDANCE STATUS

Breeding— FC in the northern parts of the region, particularly the Interior Low Plateaus and Ridge and Valley, decreasing southward. Wintering— very secretive at this season, and easily overlooked; probably FC in southern Florida, U in the remainder of the Coastal Plain, and R in the Piedmont. Spring arrival— early April to mid-April; fall departure— early October to late October.



PRIMARY HABITATS

Breeding— favor grassy fields; less numerous in weedy fields, pastures, and grain fields. Wintering— broomsedge (*Andropogon* spp.) fields are preferred; also in other grasses, weedy fields, and in herbs under open pinewoods.

KEY HABITAT REQUIREMENTS

Breeding— fields of several types, preferably where vegetation is approximately 1 foot (.3 m) high. Wintering— a wide variety of fields or grassy habitats.

SAMPLE BREEDING DENSITIES

2(2) grass/forb mixed pine-hardwood, 16(4) shrub/seedling mixed pine-hardwood. Recorded on 227 of 888 BBS routes in the region, 1966-1985; maximum route mean 58 birds, overall mean 0.78 ± 2.95 birds/route, total of route means 691 birds.

REPRODUCTION

Breeding season extends from early April (in Florida) to mid-August. Peak occurs late April to early May in Florida, late May to early June elsewhere. Nests are placed on the ground in tall grasses. Clutch size 3-6, commonly 4-5.

FOOD HABITS

Forage on the ground in grasses usually about 1 foot (0.3 m) tall, where they glean insects. Winter diet also includes seeds. Grasshopper Sparrows are more insectivorous than most other sparrows.

GUILD

Ground nesting, herb gleaning insectivore-omnivore.

REFERENCES

Bent and Austin 1968b:725; Burleigh 1958:647-650; DeGraaf and Rudis 1986:343; DeGraaf et al. 1980:512; Eagar and Hatcher 1982(A):41; Ehrlich et al. 1988:566; Forbush and May 1939:508; Imhof 1976:405; James and Neal 1986:336; Kale 1978:15; Lowery 1974:572; Mengel 1965:481; Monroe et al. 1988:56; Oberholser 1974(II):903; Potter et al. 1980:377; Rappole et al. 1983:236; Robbins et al. 1986:111; Robinson 1990:215; Root 1988:240, 290; Sprunt 1954:468; Sprunt and Chamberlain 1970:527; Stewart and Robbins 1958:352; Verner and Boss 1980:286.

Henslow's Sparrow

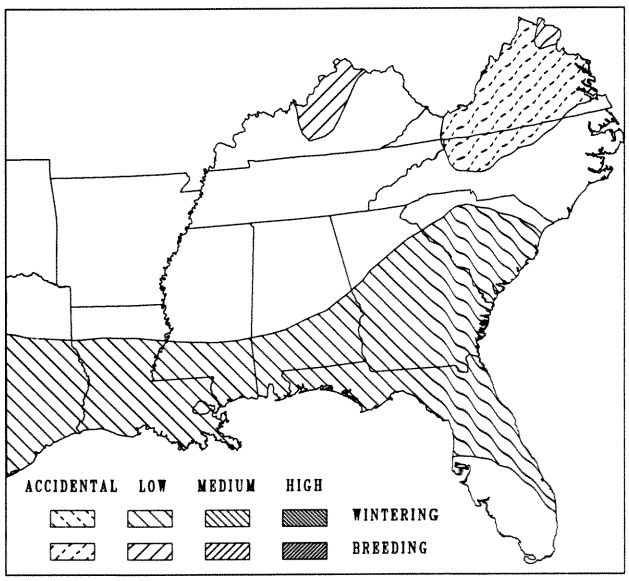
Ammodramus henslowii **HESP**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Science and Kentucky Nature Preserves Commission, as Rare in West Virginia, as Significantly Rare in North Carolina, and as Poorly Known in Alabama. Blue Listed by Tate (1981). Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program, Louisiana Natural Heritage Program, Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R and local, in addition to being erratic from year to year; at the present, in northern and central Kentucky and in mountain valleys and the extreme northern Virginia; formerly more numerous. Wintering— very secretive at this season, and thus difficult to determine population size; generally U throughout the range. Fall arrival—late October to early November; spring departure— late March to early April.



PRIMARY HABITATS

Breeding— wet meadows; less numerous in marsh borders or dry fields. Wintering— favor moist grassy spots under open pinewoods; also in broomsedge or other grasses, usually where moist.

KEY HABITAT REQUIREMENTS

Breeding— moist grassy areas, generally where extensive in area. Wintering— grassy areas, both under open pinewoods and away from trees.

SAMPLE BREEDING DENSITIES

1(1) grass/forb elm-ash-cottonwood.

REPRODUCTION

Breeding season extends from mid-May to early July, probably peaking from late May to mid-June. Nests are built on the ground among grasses or forbs, generally in damp places. Clutch size 3-5, usually 4.

FOOD HABITS

Glean insects (summer) and seeds (winter) from the ground in grasses usually 2 feet (0.5 m) or more tall.

GUILD

Ground nesting, herb gleaning insectivore-granivore.

REFERENCES

Bent and Austin 1968b:776-788; Burleigh 1958:651-653; DeGraaf and Rudis 1986:344; DeGraaf et al. 1980:514; Ehrlich et al. 1988:568; Forbush and May 1939:510; Imhof 1976:407; James and Neal 1986:337; Lowery 1974:573; Mengel 1965:484; Monroe et al. 1988:56; Oberholser 1974(II):907; Potter et al. 1980:378; Robbins et al. 1986:115; Robinson 1990:216; Root 1988:241; Sprunt 1954:470; Sprunt and Chamberlain 1970:529, 530; Stewart and Robbins 1958:353.

Le Conte's Sparrow

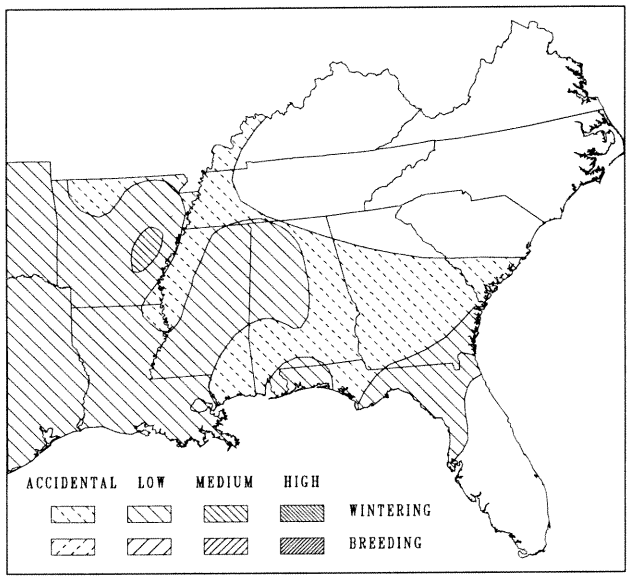
Ammospiza leconteii **LCSP**

PROTECTION STATUS

State listed as Poorly Known in Alabama.

ABUNDANCE STATUS

Wintering— very secretive, thus undoubtedly more numerous than records indicate; R to U in the Coastal Plain portion of the range; especially in the western part of the region; R in the Piedmont of Georgia. Breed to the northwest of the region. Fall arrival— late October to mid-November; spring departure— early April to late April.



PRIMARY HABITATS

Favor medium height to tall grasses often where matted; occur in broomsedge fields, old rice fields, open pinewoods, and dry edges of marshes.

KEY HABITAT REQUIREMENTS

Herbaceous cover, preferably where vegetation is at least 2 feet (0.6 m) high.

REPRODUCTION

Breed to the northwest of this region.

FOOD HABITS

Glean seeds and occasionally insects from the ground in dense grass.

GUILD

Herb gleaning granivore.

REFERENCES

Bent and Austin 1968b:765; Burleigh 1958:650; 570; Forbush and May 1939:510; Imhof 1976:407; James and Neal 1986:337; Lowery 1974:574; Mengel 1965:485; Monroe et al. 1988:57; Oberholser 1974(II):906; Potter et al. 1980:379; Robbins et al. 1986:115; Robinson 1990:217; Root 1988:242, 290; Sprunt 1954:470; Sprunt and Chamberlain 1970:529.

Sharp-tailed Sparrow

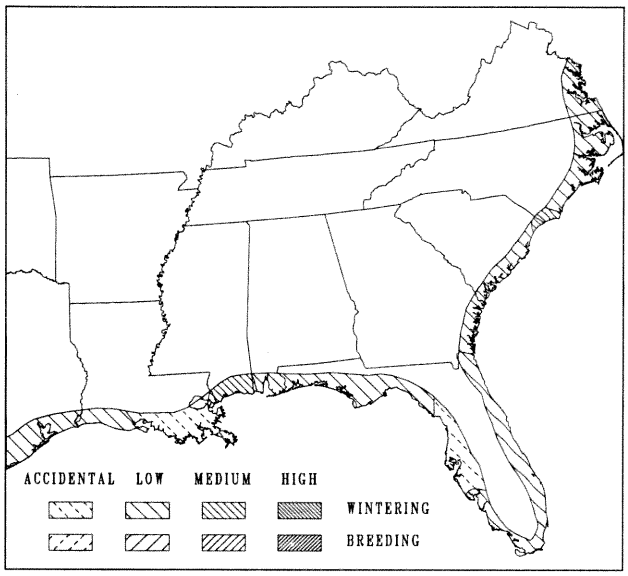
Ammospiza caudacuta **STSP**

PROTECTION STATUS

Monitored by Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— locally C on the northern coast of Virginia; possibly a R breeder elsewhere on the Virginia coast. Wintering— C along the coast, except only U to FC in southern Florida. Fall arrival— early September to late September; spring departure— early May to late May.



PRIMARY HABITATS

All seasons— brackish or salt marshes; a slight preference for brackish marshes for breeding and salt marshes for wintering.

KEY HABITAT REQUIREMENTS

Brackish or salt marshes.

REPRODUCTION

Breeding occurs in May, with peak in late May (Virginia). Nests are placed near the ground above the high tide line in salt marsh grasses. Clutch size is 3-6, usually 4.

FOOD HABITS

Forage on the ground, such as on the mud of a salt marsh, where they glean a variety of small animal prey (all year) and seeds (winter).

GUILD

Ground nesting, herb or terrestrial gleaning insectivore-omnivore.

REFERENCES

Bent and Austin 1968b:789-818; Burleigh 1958:653-656; DeGraaf et al. 1980:516; Ehrlich et al. 1988:572; Forbush and May 1939:511, 513; Imhof 1976:408; James and Neal 1986:339; Lowery 1974:575; Monroe et al. 1988:57; Oberholser 1974(II):908; Potter et al. 1980:379; Robinson 1990:217; Root 1988:240; Sprunt 1954:471-473; Sprunt and Chamberlain 1970:531-533; Stewart and Robbins 1958:353.

Seaside Sparrow

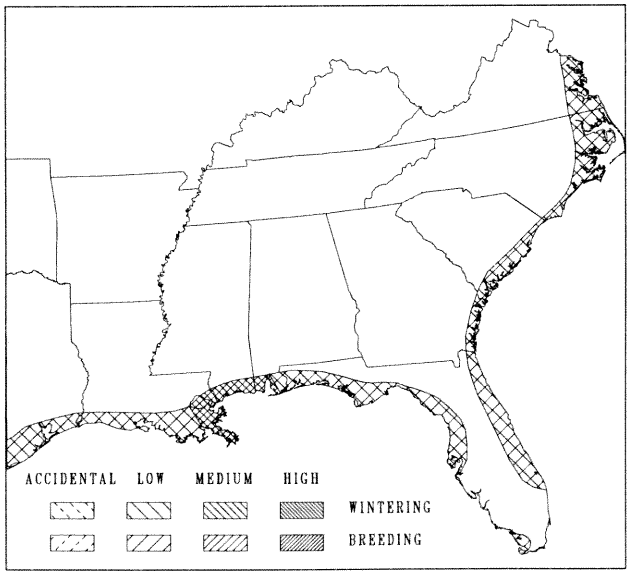
Ammospiza maritima **SESP**

PROTECTION STATUS

A. m. mirabilis federally listed as Endangered, state listed as Endangered in Florida. *A. m. juncicolus* federally listed as category C2, state listed as Special Concern in Florida. *A. m. peninsula* state listed as Special Concern in Florida. *A. m. pelonotus* federally listed as category C2, monitored by Florida Natural Areas Inventory. *A. m. fisheri* monitored by Florida Natural Areas Inventory. Monitored by Georgia Freshwater Wetlands and Heritage Inventory Program.

ABUNDANCE STATUS

C in most coastal areas, though R in central and southern Florida. There is some migration of birds from Virginia and farther north to areas along the Atlantic coast from North Carolina southward.



PRIMARY HABITATS

All seasons— occur strictly in brackish or salt marshes; generally more common in summer in brackish marshes, and in winter more numerous in salt marshes.

KEY HABITAT REQUIREMENTS

All seasons— salt or brackish marshes.

REPRODUCTION

Breeding season extends from mid-April to late June, peaking in late April to late May. Nests are placed on or near the ground above the high water line in dense grasses or marshes. Clutch size 3-5.

FOOD HABITS

Forage on the ground, such as on the mud of marshes, or on grasses. Glean primarily invertebrates and insects in summer; many seeds are also taken in winter.

GUILD

Ground nesting, herb or terrestrial gleaning insectivore-omnivore.

REFERENCES

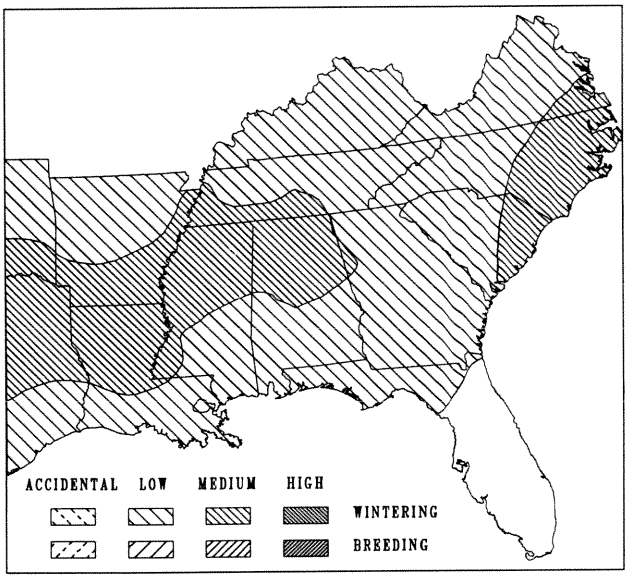
Bent and Austin 1968b:819-868; Burleigh 1958:656-662; DeGraaf et al. 1980:518; Ehrlich et al. 1988:570; Forbush and May 1939:513-516; Imhof 1976:409; Kale 1978:16,19,47, 106,107,115; Lowery 1974:576; Oberholser 1974(II):910; Potter et al. 1980:380; Root 1988:241; Sprunt 1954:473-481; Sprunt and Chamberlain 1970:533; Stewart and Robbins 1958:355; Sykes 1980.

Fox Sparrow

Passerella iliaca **FOSP**

ABUNDANCE STATUS

Wintering— FC over most of the Piedmont and Coastal Plain; FC to C in the Outer Coastal Plain from Virginia to South Carolina and the Inner Coastal Plain from Alabama west; U at lower elevations mountains; R in Florida. Breed to the north of the region. Fall arrival— late October to late November; spring departure— early March to late March.



PRIMARY HABITATS

Dense cover of thickets or woodland understory; favor evergreen cover, particularly in broadleaf evergreen shrubs under pines of broadleaf evergreen trees; also in dense shrub-sapling thickets, woodland margins, and shrubbery; generally scarce in herbaceous cover of open fields.

KEY HABITAT REQUIREMENTS

Dense woodland understory or thickets, usually in evergreen cover.

SAMPLE WINTER DENSITIES

1(1) grass/forb oak-hickory, 10(1) sawtimber live oak maritime, 18(9) sawtimber mixed pine-hardwood.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Forage primarily by scratching in dead leaves for food, gleaning for seeds, berries, and other fruits. Occasionally forage in trees and shrubs.

GUILD

Terrestrial gleaning granivore or frugivore.

REFERENCES

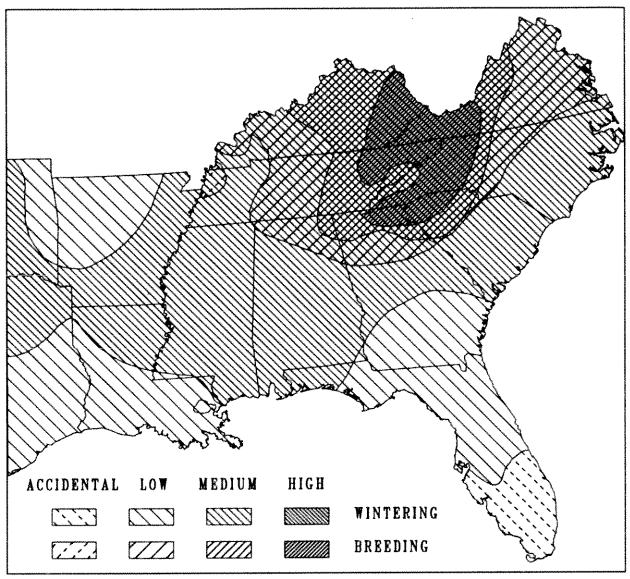
Bent and Austin 1968c:1392-1433; Burleigh 1958:683-685; DeGraaf and Rudis 1986:345; DeGraaf et al. 1980:532; Ehrlich et al. 1988:596; Forbush and May 1939:529; Imhof 1976:419; James and Neal 1986:339; Lowery 1974:588; Mengel 1965:504; Monroe et al. 1988:57; Oberholser 1974(II):951; Potter et al. 1980:389; Robbins et al. 1986:118; Robinson 1990:218; Root 1988:242; Sprunt 1954:490; Sprunt and Chamberlain 1970:547; Stewart and Robbins 1958:368; Verner and Boss 1980:298.

Song Sparrow

Melospiza melodia **SOSP**

ABUNDANCE STATUS

Breeding— C to A in the Southern Appalachians, ranging to the highest elevations; FC to C in the upper Piedmont; mostly U in the lower Piedmont and in the Coastal Plain of Virginia; C along the Virginia coast, expanding northward across Kentucky and Tennessee. Wintering— A over most of the region though less numerous in the mountains; U in southern Florida. Fall arrival— early October to mid-October; spring departure— mid-April to late April.



PRIMARY HABITATS

Breeding— favor shrubby areas in open country; residential shrubbery, farmyards, streamside thickets, hedgerows, and edges of ponds are frequent habitats. Wintering— occur in the same habitats as for breeding, but in many other habitats; most common in weedy fields, marshes and marshy edges, thickets, and other brushy places; usually in somewhat moist habitats.

KEY HABITAT REQUIREMENTS

Breeding— shrubs or saplings in open country, in a wide variety of situations. Wintering— thick herbaceous cover or shrubby thickets.

SAMPLE BREEDING DENSITIES

1.1(5) sapling/poletimber oak-hickory, 10(2) grass/forb mixed pine-hardwood, 10(4) grass/forb oak-hickory, 35(18) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 150 of 888 BBS routes in the region, 1966-1985; maximum route mean 82 birds, overall mean 2.51 ± 9.04 birds/route, total of route means 2234 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber live oak maritime, 1(1) sapling/poletimber oak-hickory, 11(4) shrub/seedling oak-hickory, 28(8) grass/forb oak-hickory.

REPRODUCTION

Breeding season extends from early April to mid-August, with peak in late April to early June. First nests are often placed on the ground, later ones in shrubs or saplings. Clutch size usually 4-5, sometimes 3.

FOOD HABITS

Forage primarily on the ground, often also in shrubs, or saplings. Glean insects and some seeds in summer and mainly weed seeds in winter.

GUILD

Ground or bush nesting, terrestrial or herb gleaning insectivore-granivore.

REFERENCES

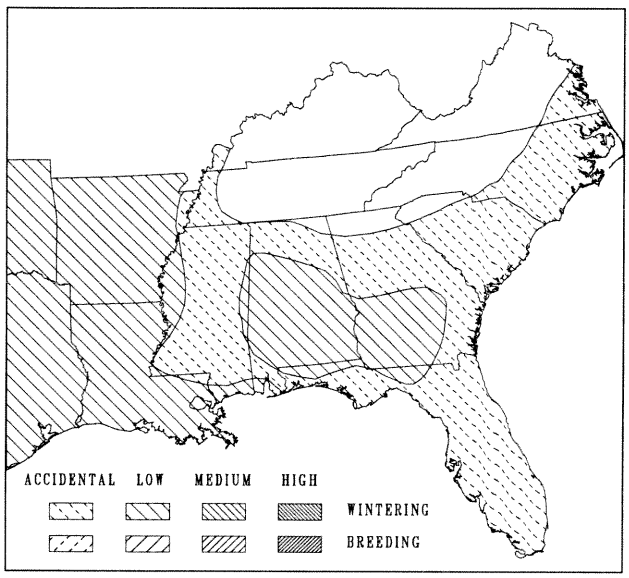
Bent and Austin 1968c:1491-1563; Burleigh 1958:689-694; DeGraaf and Rudis 1986:346; DeGraaf et al. 1980:538; Ehrlich et al. 1988:576; Forbush and May 1939:533; Imhof 1976:422; James and Neal 1986:339; Lowery 1974:589; Mengel 1965:508; Monroe et al. 1988:57; Oberholser 1974(II):956; Potter et al. 1980:390; Robbins et al. 1986:118; Robinson 1990:218; Root 1988:243; Sprunt 1954:493; Sprunt and Chamberlain 1970:549-552; Stewart and Robbins 1958:371; Verner and Boss 1980:300.

Lincoln's Sparrow

Melospiza lincolnii **LISP**

ABUNDANCE STATUS

Wintering— secretive at this season, so the status is poorly known; R to U across parts of the region (west of the Mississippi River); R, though probably regular, over most of Alabama, Georgia, western South Carolina, and the northern half of Florida; R to perhaps U in coastal Virginia at least in December; VR elsewhere. Most records are birds seen on Christmas Bird Counts, in December; thus, the January and February status is little known. Breed to the north of the region. Fall arrival— late September to late October; spring departure— late April to mid-May.



PRIMARY HABITATS

Favor damp, brushy places; shrubs or saplings along a stream, pond margin, or marsh edge are the usual habitats; also in old fields, hedgerows, and weedy spots, usually where moist; commonly associate with Song and Swamp sparrows.

KEY HABITAT REQUIREMENTS

Shrubs and tall grass in moist places.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Glean primarily weed seeds, also berries and insects, from the ground and herbaceous vegetation; occasionally forage in shrubs.

GUILD

Herb gleaning granivore.

REFERENCES

Bent and Austin 1968c:1434-1473; Burleigh 1958:685; DeGraaf and Rudis 1986:347; DeGraaf et al. 1980:534; Ehrlich et al. 1988:598; Forbush and May 1939:530; Imhof 1976:420; James and Neal 1986:340; Lowery 1974:588; Mengel 1965:505; Monroe et al. 1988:57; Oberholser 1974(II):953; Potter et al. 1980:390; Rappole et al. 1983:238; Robbins et al. 1986:118; Robinson 1990:219; Root 1988:244; Sprunt 1954:491; Stewart and Robbins 1958:369; Verner and Boss 1980:299.

Swamp Sparrow

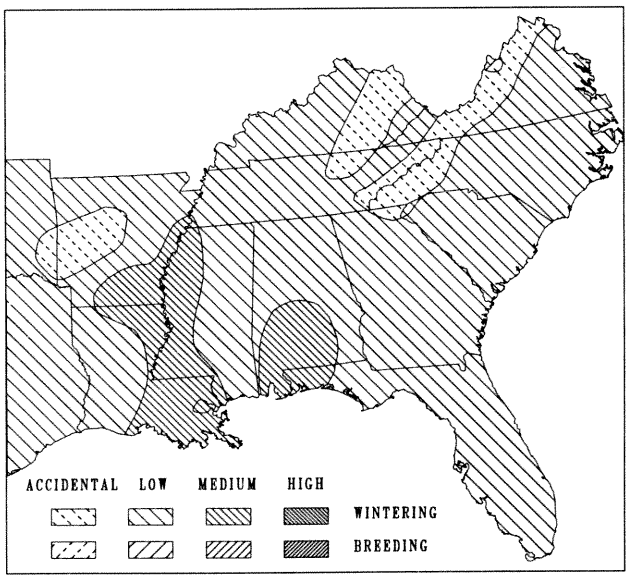
Melospiza georgiana **SWSP**

PROTECTION STATUS

Monitored by Virginia Natural Heritage Program. Forest Service sensitive on the George Washington National Forest.

ABUNDANCE STATUS

Breeding— R in northwestern Highland County, Virginia. Wintering— C to A in the Coastal Plain, Mississippi Alluvial Plateau, and in the Piedmont north to southern Virginia; U in the mountains and in southern Florida. Most Swamp Sparrows breed north of the region. Fall arrival— early October to mid-October; spring departure— late April to mid-May.



PRIMARY HABITATS

Breeding— essentially only in high elevation bogs, especially the shrubby margins of bogs. Wintering— in fresh or brackish marshes, marshy edges, stream and pond margins, damp fields, and hedgerows; usually in wet or damp spots where herbaceous cover is present.

KEY HABITAT REQUIREMENTS

Breeding— mountain bogs, usually in shrubby spots. Wintering— marshes or other damp herbaceous cover.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber oak-gum-cottonwood, 47(1) shrub/seedling live oak maritime.

REPRODUCTION

Breeding season extends from mid-May to late June, probably peaking in mid- to late May, although no nest has been found in the region. Nests are usually placed just off the ground in grass tussocks or small shrubs. Clutch size 3-6, usually 4-5.

FOOD HABITS

Forage on the ground or in marsh vegetation, where they glean insects and some seeds in summer, and insects and seeds in winter.

GUILD

Ground or bush nesting, herb gleaning insectivore-omnivore.

REFERENCES

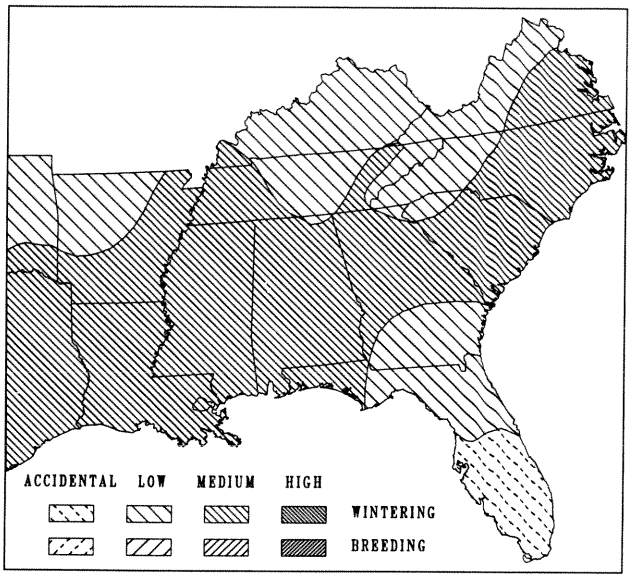
Bent and Austin 1968c:1474-1490; Burleigh 1958:687-689; DeGraaf and Rudis 1986:348; DeGraaf et al. 1980:536; Ehrlich et al. 1988:598; Forbush and May 1939:532; Imhof 1976:421; James and Neal 1986:342; Lowery 1974:589; Mengel 1965:506; Monroe et al. 1988:58; Oberholser 1974(II):954; Potter et al. 1980:390; Rappole et al. 1983:238; Robbins et al. 1986:118; Robinson 1990:219; Root 1988:245; Sprunt 1954:492; Sprunt and Chamberlain 1970:548; Stewart and Robbins 1958:369.

White-throated Sparrow

Zonotrichia albicollis **WTSP**

ABUNDANCE STATUS

Wintering— A over most of the region; C in the lower mountains and much of Kentucky and Central Tennessee; but not numerous at the higher elevations; U in central Florida. Breed north of the region. Fall arrival— early October; spring departure— early May to mid-May.



PRIMARY HABITATS

Favor woodland thickets; generally in low or moist deciduous or broadleaf evergreen woods; not common in open fields; primary habitats are open woods, bottomlands, wood margins, thickets, and shrubbery in residential areas.

KEY HABITAT REQUIREMENTS

Leafy ground and thickets within or near woodlands.

REPRODUCTION

Do not breed in the region.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber longleaf pine-slash pine, 1(1) shrub/seedling Virginia pine-pitch pine, 31(5) grass/forb oak-hickory, 100(3) sawtimber live oak maritime.

FOOD HABITS

Forage mainly on the ground, especially in dead leaves; occasionally in shrubs or trees. Scratch in dead leaves for seeds; also glean berries and buds from shrubs or trees.

GUILD

Terrestrial gleaning granivore.

REFERENCES

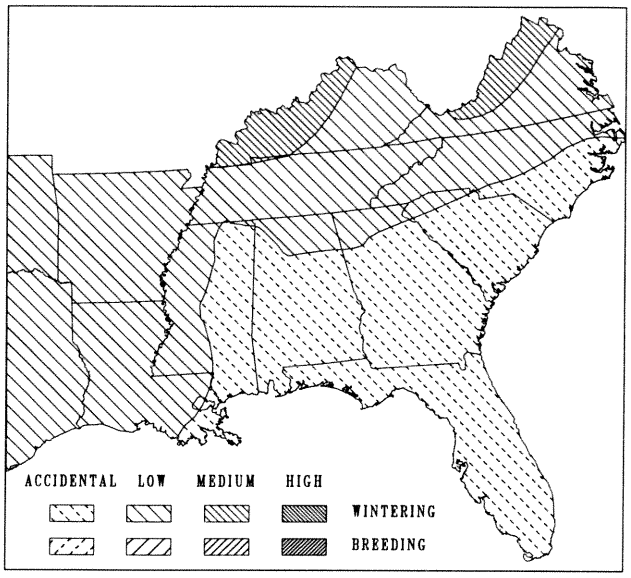
Bent and Austin 1968c:1364; Burleigh 1958:681; DeGraaf and Rudis 1986:349; DeGraaf et al. 1980:530; Ehrlich et al. 1988:596; Forbush and May 1939:528; Imhof 1976:418; James and Neal 1986:342; Lowery 1974:587; Mengel 1965:503; Monroe et al. 1988:58; Oberholser 1974(II)949; Potter et al. 1980:388; Robbins et al. 1986:118; Robinson 1990:220; Root 1988:246; Sprunt 1954:489; Sprunt and Chamberlain 1970:545; Stewart and Robbins 1958:366.

White-crowned Sparrow

Zonotrichia leucophrys **WCSP**

ABUNDANCE STATUS

Wintering— tend to occur in small flocks, and thus are rather local; C west of the Mississippi River, northern Kentucky and Virginia mountain valleys; mostly U to FC across Tennessee and North Carolina; R to U across remainder of the region.



PRIMARY HABITATS

Open, weedy fields with some brushy tangles; hedgerows, briar thickets, and overgrown fields are principal habitats. Do not usually occur along woodland margins; favor extensive open country.

KEY HABITAT REQUIREMENTS

Weedy fields, generally with scattered shrubs or other tangles among the herbaceous cover.

SAMPLE WINTER DENSITIES

Recorded as Visitor in grass/forb oak-hickory, 0.8(8) shrub/seedling elm-ash-cottonwood.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Glean seeds from the ground or herbaceous vegetation.

GUILD

Terrestrial or herb gleaning granivore.

REFERENCES

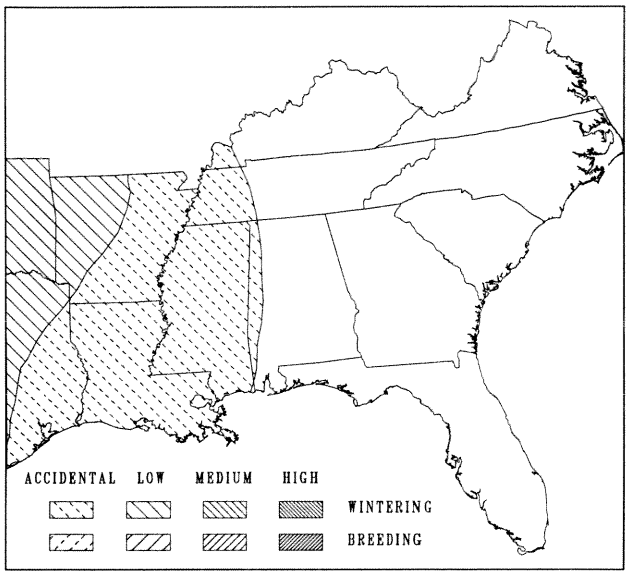
Bent and Austin 1968c:1273-1351; Burleigh 1958:679-681; Ehrlich et al. 1988:594; Forbush and May 1939:527; Imhof 1976:417; James and Neal 1986:343; Lowery 1974:585; Mengel 1965:501; Monroe et al. 1988:58; Oberholser 1974(II):944; Potter et al. 1980:388; Rappole et al. 1983:238; Robbins et al. 1986:118; Robinson 1990:220; Root 1988:248; Sprunt 1954:488; Sprunt and Chamberlain 1970:544; Stewart and Robbins 1958:365; Verner and Boss 1980:296.

Harris' Sparrow

Zonotrichia querula **HASP**

ABUNDANCE STATUS

Winter— Primary winter range of these birds is west of the region in the southern Great Plains west of 96° W. They occur regularly and are Uncommon to Scarce in eastern Oklahoma, east Texas, northwestern Arkansas, and northwestern Louisiana. They are Occasional and Rare farther east into Alabama, Tennessee, and western Kentucky.



PRIMARY HABITATS

Winter— Preferred habitats include riparian woodland, shrub/seedling and sapling stands in mesic uplands near streams, usually in hardwood types. They are commonly found in open fields with tangles of shrubs, where they occur with White-crowned Sparrows (*Z. leucophrys*).

KEY HABITAT REQUIREMENTS

Winter— Dense shrub cover along creeks and at woods edges. Harris' Sparrows are apparently partial to thickets with vine-covered trees, and "areas where streams, hedgerows, and shelterbelts carry some eastern-style trees and bushes westward into open prairie country" (Oberholser 1974, vol. II).

SAMPLE WINTER DENSITIES

0.5-9 birds/40 ha on 3 eastern Oklahoma censuses of a single plot of open canopy sawtimber elm-ash-cottonwood riparian vegetation.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Primarily vegetarian, these sparrows consume seeds of a variety of agricultural weeds, as well as those of fruits, waste grain, and grasses. In winter they also eat buds and fruits of early blooming trees such as elm (*Ulmus* sp.).

GUILD

Terrestrial, gleaning granivore or omnivore; or bush or arboreal gleaning folivore.

REFERENCES

Barbour et al. 1973:100; Bent and Austin 1968c:1249; Burleigh 1958:678; Ehrlich et al. 1988:592; Forbush and May 1939:526; Imhof 1976:416; Jackson, ed., 1981; James and Neal 1986:345; Lowery 1974:585; Mengel 1965:501; Monroe et al. 1988:58; Oberholser 1974 (II):943; Potter et al. 1980:387; Robinson 1990:221; Root 1988:249; Sprunt 1954:503; Sprunt and Chamberlain 1970:637; Stewart and Robbins 1958:365; Sutton 1967:630.

Dark-eyed Junco

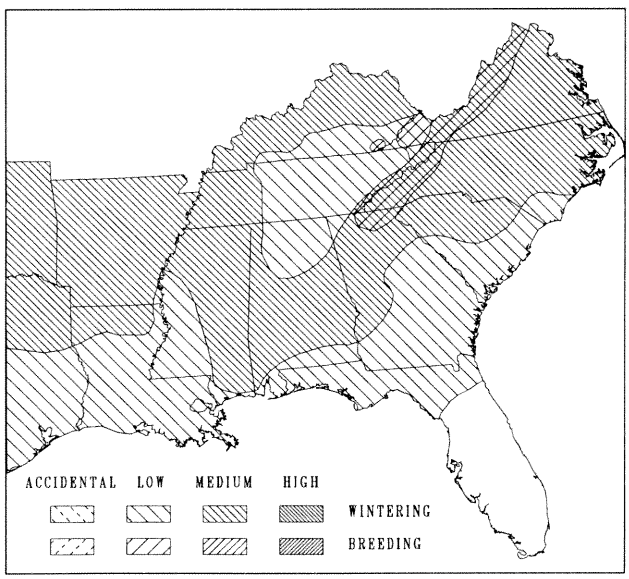
Junco hyemalis **DEJU, SCJU***

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Science and Kentucky Nature Preserves Commission.

ABUNDANCE STATUS

Breeding— C to A in the mountains, mostly over 3500 feet (1050 m). Wintering— C to A in most areas; decreasing to U along the Gulf Coast and in southern Georgia and northern Florida. Fall arrival— late September to late October; spring departure— late March to late April.



PRIMARY HABITATS

Breeding— widespread at high elevations; usually in woods with short grass or lawns nearby; spruce-fir forest; various mixed forests; hardwood forests, preferably where cool and moist; even in residential areas with trees, shrubs, and lawns. Wintering— generally near pinewoods or mixed woods where short grass is nearby; commonly feed on lawns and grassy roadsides, with a wooded area nearby; also in open woods, wooded residential areas, and wood margins; infrequent in weedy fields and thickets.

KEY HABITATS REQUIREMENTS

Breeding— cool and moist habitats with trees and short grass or open ground, only in the mountains. Wintering— short grass or bare ground near a woodland, usually associated with conifers.

SAMPLE BREEDING DENSITIES

6(1) sawtimber oak-hickory, 47(1) sawtimber cove hardwoods, 71(2) sawtimber spruce-fir.

SAMPLE WINTER DENSITIES

1(1) sawtimber live oak maritime, 1(1) sawtimber elm-ash-cottonwood, 11(13) sawtimber oak-hickory, 15(1) grass/forb loblolly pine-shortleaf pine, 83(1) shrub/seedling Virginia pine-pitch pine.

REPRODUCTION

Usually rear 2 broods during breeding from mid-April to mid-August; peak for first brood in mid-May to early June; for second brood in July. Nests are generally placed on the ground in forests, especially along stream banks, uprooted trees, or trails. Occasionally nest in trees and shrubs, seldom above 5 feet (1.5 m). Clutch size 3-4.

FOOD HABITS

Forage primarily on the ground, often scratching in leaf litter. In summer glean insects and seeds; winter diet consists of seeds.

GUILD

Ground nesting, terrestrial gleaning omnivore-granivore.

REFERENCES

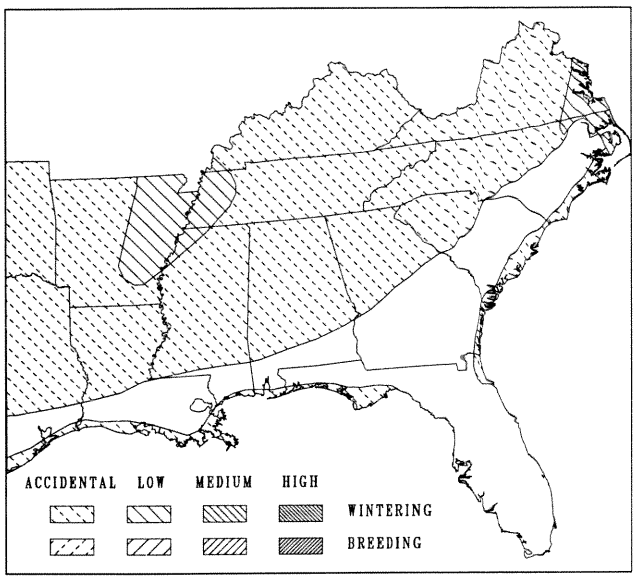
Bent and Austin 1968b:1021-1098; Burleigh 1958:669-673; DeGraaf and Rudis 1986:350; DeGraaf et al. 1980:522; Ehrlich et al. 1988:590; Forbush and May 1939:520; Imhof 1976:412; James and Neal 1986:347; Lowery 1974:578; Mengel 1965:493; Monroe et al. 1988:58; Oberholser 1974(II):925-930; Potter et al. 1980:392; Robbins et al. 1986:115; Robinson 1990:222; Root 1988:251; Sprunt 1954:485; Sprunt and Chamberlain 1970:539, 540; Stewart and Robbins 1958:359-361; Verner and Boss 1980:292.

Lapland Longspur

Calcarius lapponicus **LALO**

ABUNDANCE STATUS

Wintering— U and erratic, as well as local, in extreme eastern Virginia and northeastern North Carolina and the northern parts of the Coastal Plain in Arkansas and western Tennessee; generally VR and erratic elsewhere. Breed north of the region. Fall arrival— late October to late November; spring departure— early March to early April.



PRIMARY HABITATS

Along the coast, prefer low dunes and very short grass habitats; inland, they favor extensive plowed fields, but also at airports, and with larks or Snow Buntings along the coast.

KEY HABITAT REQUIREMENTS

Bare ground or short grass, in extensive open country.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Forage on the ground in short grass or bare areas, where they glean grass and forb seeds.

GUILD

Terrestrial gleaning granivore.

REFERENCES

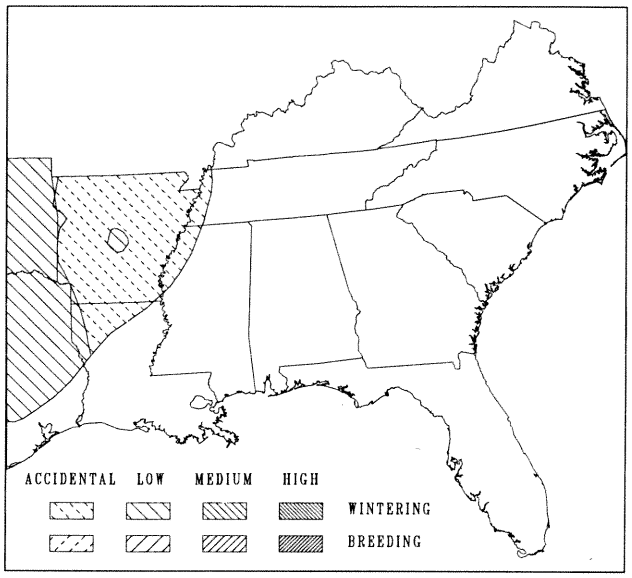
Bent and Austin 1968c:1597-1627; Burleigh 1958:694; DeGraaf and Rudis 1986:351; DeGraaf et al. 1980:540; Ehrlich et al. 1988:602; Forbush and May 1939:536; Imhof 1976:424; James and Neal 1986:348; Lowery 1974:590; Mengel 1965:514; Monroe et al. 1988:58; Oberholser 1974(II):961; Potter et al. 1980:392; Robinson 1990:222; Root 1988:253, 291; Sprunt 1954:494; Sprunt and Chamberlain 1970:552; Stewart and Robbins 1958:373.

Smith's Longspur

Calcarius pictus **SMLO**

ABUNDANCE STATUS

Winter— These longspurs are Rare, mid-November-early April, in eastern Oklahoma, east Texas, most of Arkansas, northwestern Louisiana, western Tennessee, and northwestern Mississippi. Farther east they are occasionally found in Alabama.



PRIMARY HABITATS

Winter— They inhabit very early successional stages of mesic to slightly hydric forest types, such as plowed fields, heavily grazed pastures, and airports.

KEY HABITAT REQUIREMENTS

Winter— Extensive grassy pastures, airports, and moist meadows where vegetation is low (1 dm, 4 in) and sparse. Smith's Longspurs are partial to fields of three-awn grass (*Aristida* sp.; Jeter 1953).

SAMPLE WINTER DENSITIES

Recorded 0.5 birds/40 ha on a single Alabama census of an abandoned, mowed airport, upland site, with 0.2-0.8 m (0.5-2.5 ft) tall grasses.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

During the winter these birds glean seeds of grasses and forbs, and lesser amounts of animal food, particularly insects and spiders, from the ground and low vegetation.

GUILD

Terrestrial or herb gleaning omnivore.

REFERENCES

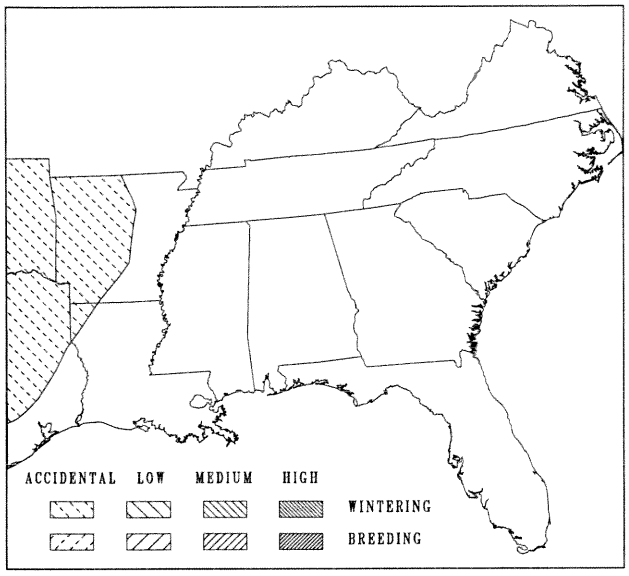
Bent and Austin 1968c:1628; Ehrlich et al. 1988:602; Forbush and May 1939:536; Imhof 1976:425; Jackson, ed., 1981:47; James and Neal 1986:349; Jeter 1953; Lowery 1974:592; Oberholser 1974 (II):963; Potter et al. 1980:393; Robinson 1990:223; Root 1988:253; Sprunt and Chamberlain 1970:553; Sutton 1967:640.

Chestnut-collared Longspur

Calcarius ornatus **CCLO**

ABUNDANCE STATUS

Winter— Primary range is west of the region in the southern Great Plains. The birds are Casual to Rare, late October-mid-April, in Oklahoma, east Texas, northwestern Louisiana, and prairie areas in Arkansas.



PRIMARY HABITATS

Winter— They inhabit agricultural lands and very early successional stages of mesic forest types.

KEY HABITAT REQUIREMENTS

Winter— Extensive areas of short grass and forbs, approx. 1 dm (4 in) tall, often where moist or low-lying, such as airports, pastures, and wet meadows.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

The winter diet includes primarily plant foods, such as waste grain, and seeds of grasses, sedges, and forbs. The birds glean these as they travel in flocks across the landscape.

GUILD

Terrestrial or herb gleaning granivore

REFERENCES

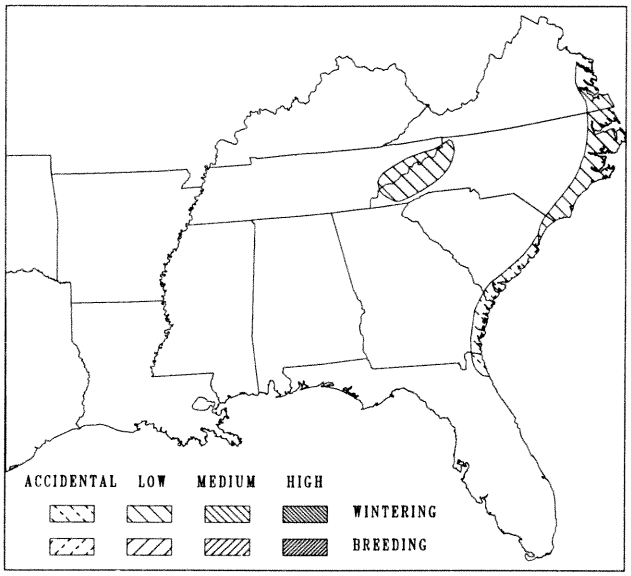
Bent and Austin 1968c:1635; Ehrlich et al. 1988:600; Forbush and May 1939:537; James and Neal 1986:350; Lowery 1974:593; Oberholser 1974 (II):965; Robbins et al. 1986:121; Root 1988:253; Stewart and Robbins 1958:374; Sutton 1967:640.

Snow Bunting

Plectrophenax nivalis **SNBU**

ABUNDANCE STATUS

Wintering— U, and somewhat erratic, along the Virginia coast, often numerous at Craney Island near Norfolk; R to U along the North Carolina coast; R on the South Carolina coast, and on high elevation balds along the North Carolina - Tennessee border; VR elsewhere, mainly in northern Virginia. Breed north of the region. Fall arrival— early November to late November; spring departure— late February to mid-March.



PRIMARY HABITATS

Mainly in dunes, especially rather low and extensive ones; also on grassy balds in the high mountains. Seldom found in plowed fields or short grass habitats.

KEY HABITAT REQUIREMENTS

Primarily in sand dunes; otherwise in short grass of bare ground.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Glean seeds of grasses and forbs on the ground, usually in sand dunes.

GUILD

Terrestrial gleaning granivore.

REFERENCES

Bent and Austin 1968c:1652-1677; Burleigh 1958:695; DeGraaf and Rudis 1986:352; DeGraaf et al. 1980:541; Ehrlich et al. 1988:604; Forbush and May 1939:537; James and Neal 1986:350; Lowery 1974:593; Mengel 1965:515; Monroe et al. 1988:59; Potter et al. 1980:393; Robinson 1990:224; Root 1988:245, 290; Sprunt 1954:494; Sprunt and Chamberlain 1970:553; Stewart and Robbins 1958:374.

Bobolink

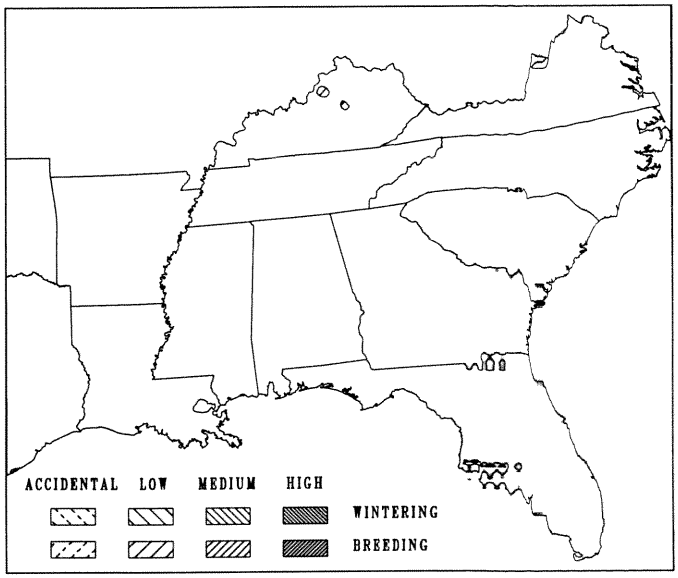
Dolichonyx oryzivorus: **BOBO**

PROTECTION STATUS

State listed as Special Concern by Kentucky Academy of Science and Kentucky Nature Preserves Commission. Monitored by Virginia Natural Heritage Program, West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— R in Highland County, Virginia; have occurred in summer and possibly nested at several sites in Virginia and isolated locations in the Bluegrass region of Kentucky. The majority of the breeding population nests north of the region and winters south of the United States. Spring arrival— late April to early May; fall departure— mid-September to late September.



PRIMARY HABITATS

Areas of tall grasses or other herbs; meadows, hay fields, or weedy fields, always where extensive.

KEY HABITAT REQUIREMENTS

Tall grassy places in open country.

SAMPLE BREEDING DENSITIES

1(3) grass/forb elm-ash-cottonwood.

REPRODUCTION

Breeding season, poorly known in the Southeast, late May to late June, probably peaking in early in mid-June. Nest on the ground, well-concealed in grasses. Clutch size 4-7, usually 5-6.

FOOD HABITS

Glean insects from grasses or other herbaceous cover near the ground; in the fall, diet is primarily grain seeds. Formerly made serious depredations of rice crops in the coastal Carolinas.

GUILD

Ground nesting, herb gleaning insectivore.

REFERENCES

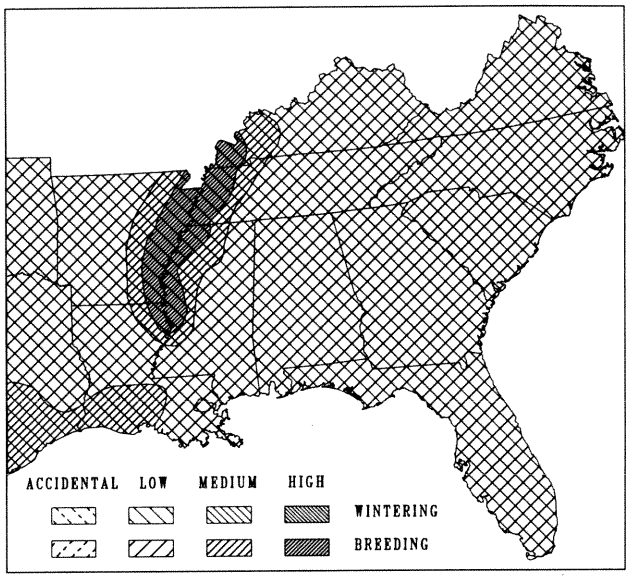
Bent 1958:28; Burleigh 1958:574; DeGraaf and Rudis 1986:353; DeGraaf et al. 1980:464; Ehrlich et al. 1988:608; Forbush and May 1939:459; Imhof 1976:370; James and Neal 1986:350; Lowery 1974:537; Mengel 1965:437; Monroe et al. 1988:59; Oberholser 1974(II):802; Potter et al. 1980:338; Rappole et al. 1983:228; Robbins et al. 1986:98; Robinson 1990:224; Sprunt 1954:429; Sprunt and Chamberlain 1970:489; Stewart and Robbins 1958:318.

Red-winged Blackbird

Agelaius phoeniceus **RWBL**

ABUNDANCE STATUS

Breeding— C to A in most of the region; C at higher elevations, but habitat somewhat more restricted. Wintering— VC to A everywhere except the mountains, where only U to FC at most places.



PRIMARY HABITATS

Breeding— favor freshwater marshes, but also common in wet thickets, grassy fields, borders of lakes and ponds, and openings and edges of swamps, among other habitats. Wintering— forage in marshes, grain fields, cropland, edges of ponds, streams, and swamps, and in moist woodlands; roost in large flocks, often in marshes, but commonly with other blackbirds in thick woodlands.

KEY HABITAT REQUIREMENTS

Breeding— shrubs, saplings, or herbaceous vegetation, usually where moist or wet, but few essential requirements. Wintering— no essential features, but most foraging in varied open habitats.

SAMPLE BREEDING DENSITIES

0.5(15) shrub/seedling elm-ash-cottonwood, 24(2) grass/forb mixed pine-hardwood, 34(2) sawtimber oak-gum-cypress. Recorded on 581 of 888 BBS routes in the region, 1966-1985; maximum route mean 983 birds, overall mean 31.5 ± 75.8 birds/route, total of route means 27,972 birds.

SAMPLE WINTER DENSITIES

1(2) sawtimber elm-ash-cottonwood, 27(18) grass/forb elm-ash-cottonwood, 29(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

Breeding season mid-April to mid-August; peak occurs in early to late May. Nests are placed in reeds, shrubs, or saplings, usually 1-3 feet (.3-1 m) above ground or water. Clutch size usually 3-4, sometimes 5.

FOOD HABITS

In summer glean insects and other small invertebrates from the ground or low vegetation. In winter feed primarily on grain and weed seeds on the ground.

GUILD

Bush or ground nesting, herb or terrestrial gleaning insectivore-omnivore.

REFERENCES

Bent 1958:123-178; Burleigh 1958: 580-584; Crase and DeHaven 1975; DeGraaf and Rudis 1986:354; DeGraaf et al. 1980:468; Dolbeer and Stehn 1979; Ehrlich et al. 1988:612; Forbush and May 1939:465; Imhof 1976:374; James and Neal 1986:350; Lowery 1974:541; Mengel 1965:442; Monroe et al. 1988:59; Oberholser 1974(II):809; Potter et al. 1980:341; Rappole et al. 1983:229; Robbins et al. 1986:100; Robinson 1990:225; Root 1988:255, 291; Sprunt 1954:433-436; Sprunt and Chamberlain 1970:493; Stewart and Robbins 1958:321; USDI Fish & Wildl. Serv. 1980; Verner and Boss 1980:262.

Eastern Meadowlark

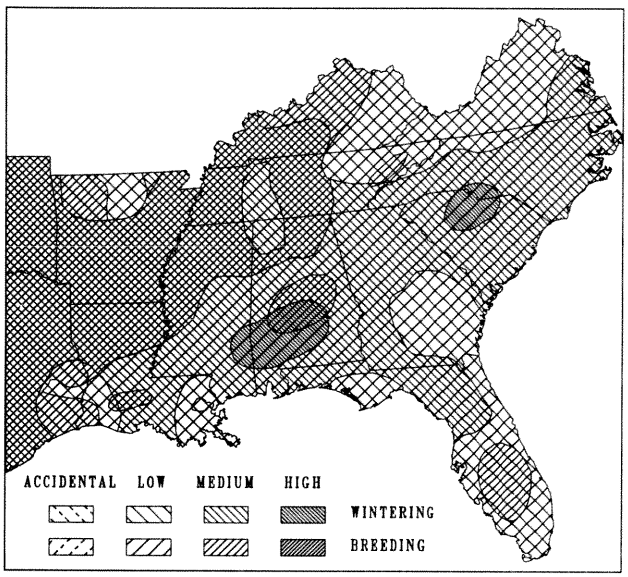
Sturnella magna **EAME**

PROTECTION STATUS

Blue Listed by Tate (1981).

ABUNDANCE STATUS

Breeding— C to VC in most of the region, though somewhat less numerous near the coast and in the mountains; seldom occur over 5000 feet (1500 m); Wintering— a noticeable increase in numbers in most areas, becoming A at many localities. Partly migratory.



PRIMARY HABITATS

All seasons— prefer short to medium-height grasses; fields, pastures, and other grassy places. Favor somewhat taller grasses (up to 2 feet high, .6 m) for nesting than for foraging.

KEY HABITAT REQUIREMENTS

Grassy places in a wide variety of situations.

SAMPLE BREEDING DENSITIES

0.6(2) sawtimber longleaf pine-slash pine, 20(2) grass/forb mixed pine-hardwood. Recorded on 567 of 888 BBS routes in the region, 1966-1985; maximum route mean 467 birds, overall mean 22.4 ± 37.5 birds/route, total of route means 19,856 birds.

SAMPLE WINTER DENSITIES

2.5(2) sawtimber longleaf pine-slash pine, 13(25) grass/forb elm-ash-cottonwood, 16(2) grass/forb loblolly pine-shortleaf pine, 18(1) sawtimber longleaf pine-scrub oak, 29(11) grass/forb oak-hickory.

REPRODUCTION

Breeding season extends from mid-April to mid-July, peaking in early to late May. Domed ground nests with side entrances well-hidden in grass. Clutch size 3-7, usually 4-6.

FOOD HABITS

Glean and probe ground and grasses. Summer diet primarily consists of insects; in winter considerable amounts of grain and grass seeds are also taken.

GUILD

Ground nesting, terrestrial or herb probing or gleaning insectivore-omnivore.

REFERENCES

Bent 1958:53-83; Burleigh 1958:576-579; DeGraaf and Rudis 1986:355; DeGraaf et al. 1980:466; Ehrlich et al. 1988:610; Forbush and May 1939:461; Imhof 1976:371; James and Neal 1986:352; Lanyon 1957; Lowery 1974:538; Mengel 1965:438; Monroe et al. 1988:59; Oberholser 1974(II):804; Potter et al. 1980:339; Rappole et al. 1983:228; Robbins et al. 1986:100; Robinson 1990:225; Root 1988:254; Sprunt 1954:430; Sprunt and Chamberlain 1970:491; Stewart and Robbins 1958:319.

Western Meadowlark

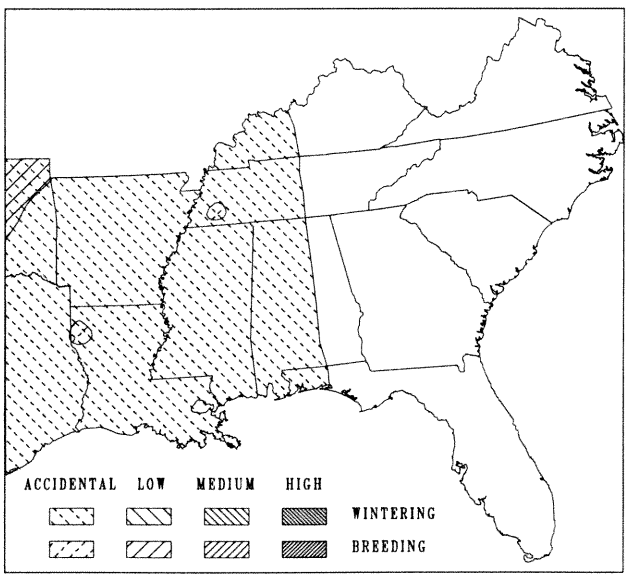
Sturnella neglecta **WEME**

PROTECTION STATUS

Monitored by Louisiana Natural Heritage Program, Tennessee Natural Heritage Program.

ABUNDANCE STATUS

Breeding— Common outside the region in Texas and Oklahoma, these birds may occasionally breed in northwestern Louisiana or in southwestern Tennessee. They are far more widespread and numerous in the region in the winter. Winter—Uncommon to Rare, mid-October-early April, in east Texas, Louisiana, and Arkansas, Rare farther east into Alabama, central Kentucky, central Tennessee, and the western part of the Florida panhandle.



PRIMARY HABITATS

All seasons— Grass/forb successional stage in upland forest types, agricultural areas, pastures; similar to the habitats selected by Eastern Meadowlarks (*S. magna*).

KEY HABITAT REQUIREMENTS

All seasons— Extensive areas of short grass, similar to Eastern Meadowlarks. During the breeding season, these birds occupy areas that are slightly drier, with shorter and less dense grass than those occupied by the latter species, particularly where the 2 species occur together.

SAMPLE BREEDING DENSITIES

Not recorded in the region.

SAMPLE WINTER DENSITIES

Recorded as 47 birds/40 ha, combined with Eastern Meadowlarks, on a single census in open canopy sawtimber elm-ash-cottonwood riparian vegetation in eastern Oklahoma.

REPRODUCTION

Meadowlarks build covered, dome-shaped nests of grass on the ground in dense grass in open grassy fields. Clutch size 3-7, typically 5. The season extends from May-July.

FOOD HABITS

These birds glean their food from the ground or herbaceous vegetation. They also probe into the ground or mats of vegetation with their bills, which they then forcibly open to expose such potential prey as insect eggs or larvae. During the breeding season, insects form the staple diet; a variety of seeds are also eaten in the winter.

GUILD

Herb nesting, terrestrial or herb gleaning or probing insectivore-omnivore.

REFERENCES

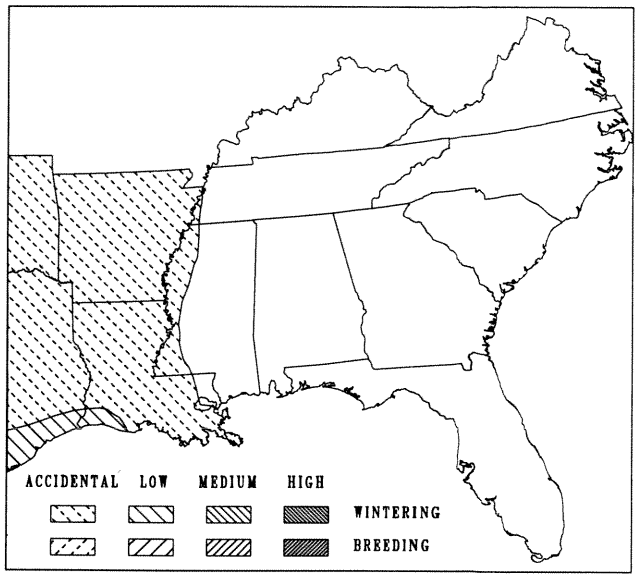
Barbour et al. 1973:86; Bent 1958:84; Burleigh 1958:579; Eagar and Hatcher 1982:A-107; Ehrlich et al. 1988:608; Forbush and May 1939:463; Imhof 1976:373; James and Neal 1986:353; Lowery 1974:538; Mengel 1965:441; Monroe et al. 1988:59; Oberholser 1974 (II):806; Potter et al. 1980:341; Rappole et al.1983:228; Robbins et al. 1986:100; Robinson 1990:226; Root 1988:255; Sprunt and Chamberlain 1970:627; Sutton 1967:539; Verner and Boss 1980:260.

Yellow-headed Blackbird

Xanthocephalus xanthocephalus **YHBL**

ABUNDANCE STATUS

Winter— Occasional and Very Rare along the Gulf Coast of Texas and adjacent Louisiana; scattered winter records elsewhere in region.



PRIMARY HABITATS

Winter— Marshes, pastures, livestock pens, agricultural areas. The birds are usually found with other blackbirds.

KEY HABITAT REQUIREMENTS

Breeding— Yellow-heads are primarily marsh dwellers. Winter— Like other blackbirds, they flock and wander widely in search of grain and other seed foods. Roosting sites for flocks of birds in dense sheltered vegetation are an important requirement during fall, winter, and spring.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

They eat grain, weed seeds, and a variety of insects gleaned while walking along the ground.

GUILD

Terrestrial or herb gleaning omnivore

REFERENCES

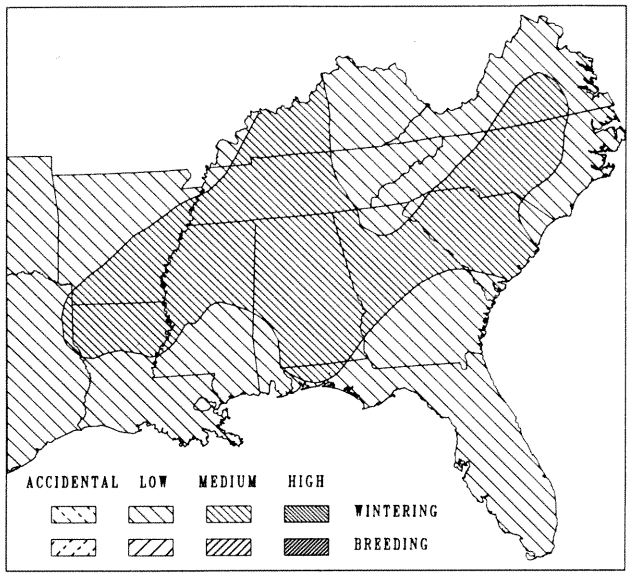
Barbour et al. 1973:86; Bent 1958:99; Burleigh 1958:580; Ehrlich et al. 1988:612; Forbush and May 1939:464; Imhof 1976:374; James and Neal 1986:353; Lowery 1974:540; Mengel 1965:441; Monroe et al. 1988:59; Oberholser 1974 (II):808; Potter et al. 1980:341; Rappole et al.1983:229,433; Robbins et al. 1986:100; Robinson 1990:226; Root 1988:256, 292; Sprunt 1954:432; Sprunt and Chamberlain 1970:492, 627; Stewart and Robbins 1958:320; Sutton 1967:541; Verner and Boss 1980:261.

Rusty Blackbird

Euphagus carolinus **RUBL**

ABUNDANCE STATUS

Wintering— FC to C in most of the region though scarce in most of Florida; FC in the Piedmont; U at higher elevations, mostly in mountain valleys. Occur in large flocks, and are thus often C in one locality and quite scarce in a nearby area. Breed north of the region. Fall arrival— mid-October to mid-November; spring departure— early April to late April.



PRIMARY HABITATS

Favor damp, wooded places; swamps, swamp margins, and wet thickets are the primary habitats, but they are frequently found in croplands and lawns with other blackbirds.

KEY HABITAT REQUIREMENTS

No strict requirements, though usually found in moist or wet areas where hardwood trees are present.

SAMPLE WINTER DENSITIES

1(1) sawtimber elm-ash-cottonwood, 1(1) sawtimber oak-hickory, 3.1(9) shrub/seedling elm-ash-cottonwood.

REPRODUCTION

Do not breed in this region.

FOOD HABITS

Glean insects, small invertebrates, seeds, and berries, primarily on the ground in damp places.

GUILD

Terrestrial gleaning omnivore.

REFERENCES

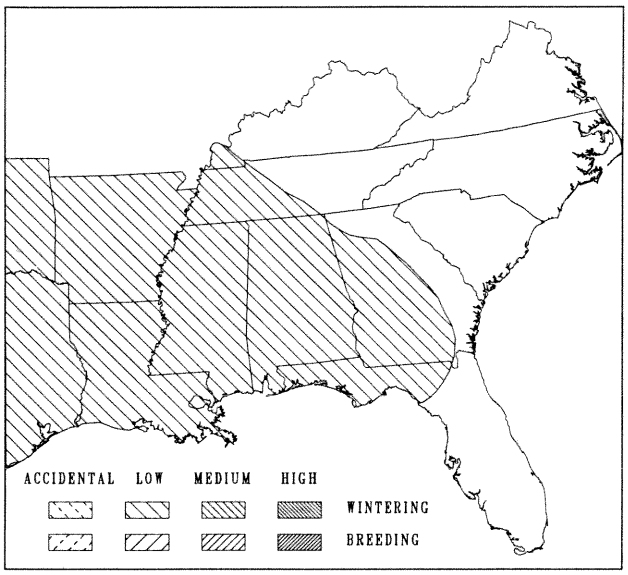
Bent 1958:282-301; Burleigh 1958:590; DeGraaf and Rudis 1986:356; DeGraaf et al. 1980:474; Ehrlich et al. 1988:614; Forbush and May 1939:471; Imhof 1976:378; James and Neal 1986:354; Lowery 1974:545; Mengel 1965:448; Monroe et al. 1988:60; Oberholser 1974(II):829; Potter et al. 1980:347; Robinson 1990:227; Root 1988:256, 292; Sprunt 1954:441; Sprunt and Chamberlain 1970:499; Stewart and Robbins 1958:324.

Brewer's Blackbird

Euphagus cyanocephalus **BRBL**

ABUNDANCE STATUS

Wintering— occur locally, in flocks, thus not widespread; R to U at most localities, but FC in a few areas. Breed west of the region. Fall arrival— early November to late November; spring departure— late March to early April.



PRIMARY HABITATS

Open farming country; favor cattle pastures and feedlots, plowed fields, lawns, and other short grass areas.

KEY HABITAT REQUIREMENTS

Open country in agricultural habitats.

REPRODUCTION

Do not breed in this region.

FOOD HABITS

Glean insects and grain seeds almost strictly from the ground.

GUILD

Terrestrial gleaning omnivore.

REFERENCES

Bent 1958:302; Burleigh 1958:592; Ehrlich et al. 1988:614; Forbush and May 1939:472; Imhof 1976:378; James and Neal 1986:354; Lowery 1974:545; Mengel 1965:449; Monroe et al. 1988:60; Oberholser 1974(II):830; Potter et al. 1980:348; Robbins et al. 1986:100; Robinson 1990:227; Root 1988:256, 292; Sprunt 1954:442; Sprunt and Chamberlain 1970:500; Stewart and Robbins 1958:325; Verner and Boss 1980:265.

Great-tailed Grackle

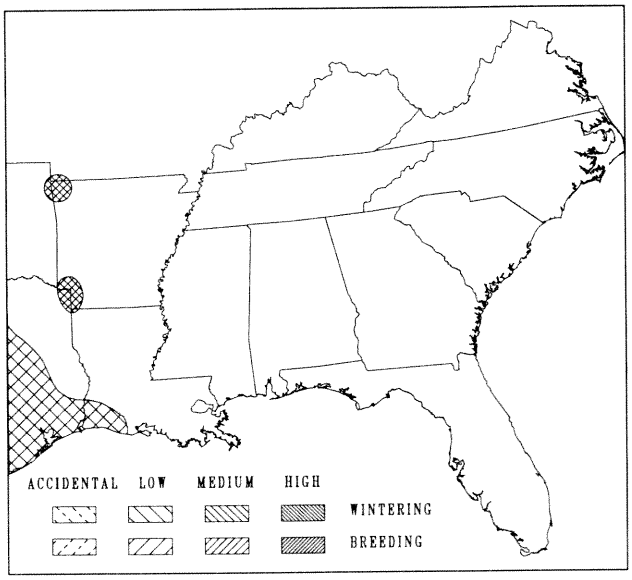
Quiscalus mexicanus **GTGR**

PROTECTION STATUS

Monitored by Arkansas Natural Heritage Commission.

ABUNDANCE STATUS

Permanent Residents— Common breeders along the Gulf Coast of Texas and southwestern Louisiana (Cameron and Calcasieu Parishes), early March-late September. In the winter they retreat south and west along the Gulf Coast and are much less numerous than in the breeding season. The birds are Uncommon residents inland in Texas and Oklahoma along the western edge of the forests of those states. Their range is presently expanding in human-dominated habitats in the southern Great Plains and Southwest (Faanes and Norling 1981); a breeding record exists for extreme southwest Arkansas (Jackson 1982:988). This expansion is apparently taking place at the expense of the smaller Common Grackles (*Q. quiscula*, Pruitt and McGowan 1975).



PRIMARY HABITATS

All seasons— In Mexico and farther south "more than any other bird of northern Central America, they seek the neighborhood of man." (Bent 1958:335). Originally in the region these were birds of south Texas brush country and coastal marshes. During the present century some of them have begun to utilize human-dominated landscapes such as residential areas, agricultural areas, parks, gardens, and orchards. This adaptation has permitted a range expansion through much of Texas, Oklahoma, and into Arkansas, Kansas, Colorado, and Nebraska [Oberholser 1974(II)].

KEY HABITAT REQUIREMENTS

All seasons— Open parkland, marshes, agricultural land, towns. Increasingly the range expansion of these birds appears to reflect the birds' adaptation to modification of the landscape by people. They do not penetrate closed canopy forest to any appreciable extent.

REPRODUCTION

These are colonial birds; males have harems, and the females build their large, bulky cup nests usually between 5-15 ft (2-5 m) up, in a variety of locations. Marshes, arid lands, coastal thickets, towns, ornamental grounds, and other sites are used. Clutch size is 3-5, usually 4.

FOOD HABITS

Truly omnivorous birds, Great-tailed Grackles eat a variety of foods from grain through insects, invertebrates, frogs, lizards, and fish, to carrion, dog food, and human table scraps.

GUILD

Herb, bush, or tree nesting, herb, terrestrial, or aquatic gleaning omnivore

REFERENCES

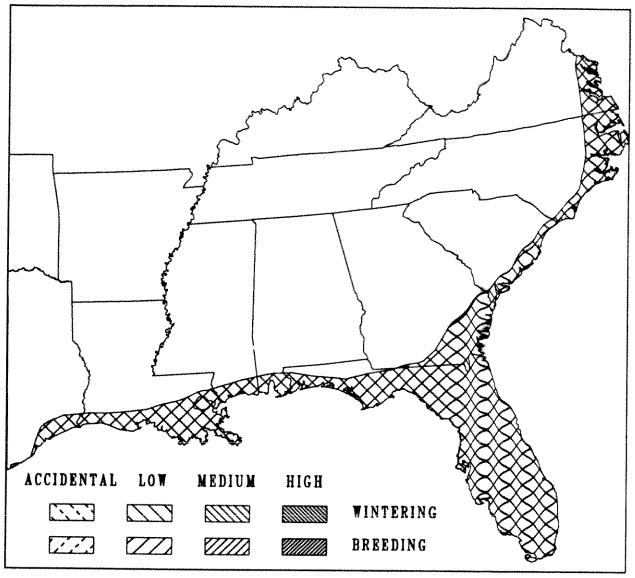
Bent 1958:335, 351, 352; Ehrlich et al. 1988:620; Jackson 1982; James and Neal 1986:355; Lowery 1974:546; Oberholser 1974 (II):832; Pruitt and McGowan 1975; Robbins et al. 1986:100; Root 1988:256, 292; Sutton 1967:553.

Boat-tailed Grackle

Quiscalus major **BTGR**

ABUNDANCE STATUS

All seasons— C to A essentially throughout the range. Some migratory movements occur, but little change in abundance at a given locality from season to season.



PRIMARY HABITATS

Seldom far from water. Occur in thickets, open woods, residential areas, and other habitats near large bodies of water, generally near salt water. Most common in thickets adjacent to salt marshes and estuaries. Feed in marshes, lawns, and on shores.

KEY HABITAT REQUIREMENTS

Trees or shrubs, particularly thickets, in close proximity to large bodies of water.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sapling/poletimber oak-gum-cypress, and sapling/poletimber mixed pine-hardwood, 5(1) Everglades.

SAMPLE WINTER DENSITIES

1(1) sawtimber longleaf pine-slash pine, 44(2) grass/forb longleaf pine-slash pine.

REPRODUCTION

Breeding season extends from early March to late June, with peak occurring in late March to mid-May. Nests are built typically 3-10 feet (1-3 m) from the ground in shrubs or trees, often on the edges of woods or thickets, not far from water. Clutch size usually 3 in southern part of the region, 4 farther north.

FOOD HABITS

Wide variety of animal and plant foods taken primarily by gleaning from the ground. Summer diet includes primarily animal prey; in winter seeds and grain are commonly eaten. Boat-tails scavenge throughout the year as well.

GUILD

Bush or tree nesting, terrestrial gleaning omnivore.

REFERENCES

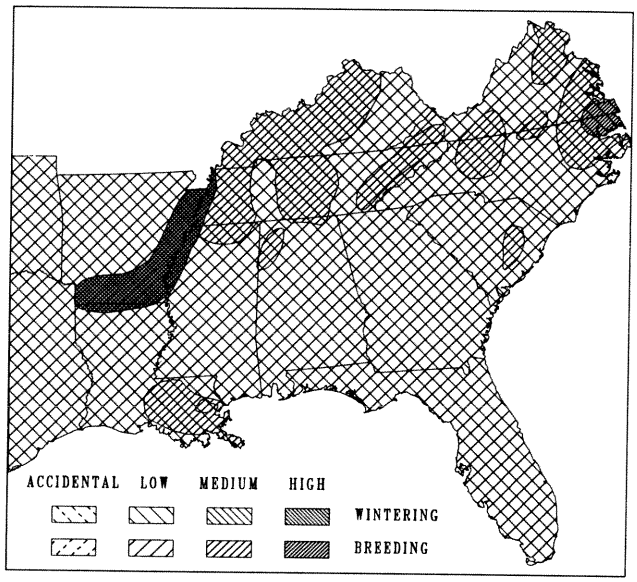
Bent 1958:357-374; Burleigh 1958:593; Ehrlich et al. 1988:618; Forbush and May 1939:473; Imhof 1976:38 ???; Lowery 1974:548; Oberholser 1974(II):836; Potter et al. 1980:348; Robbins et al. 1986:100; Root 1988:256, 292; Sprunt 1954:443; Sprunt and Chamberlain 1970:501; Stewart and Robbins 1958:326.

Common Grackle

Quiscalus quiscula **COGR**

ABUNDANCE STATUS

Breeding— VC to A nearly everywhere, except C in the mountains; seldom occur above 4500 feet (1350 m). Wintering— generally A in the Coastal Plain; C to locally A inland ; U in most of the mountains. Roost in huge flocks in the fall and winter, with the flocks of grackles and other blackbirds frequently numbering over one million birds.



PRIMARY HABITATS

Breeding— usually nest in conifers, particularly in open stands; favored sites are groves of pines in residential areas or in farmyards; seldom nest in deep forests. Wintering— roost in huge flocks in woodlands, generally in dense woods, swamps, or pinewoods. At all seasons forage in open areas; favorite sites are croplands, pastures, lawns, and plowed fields; infrequently feed in woodlands.

KEY HABITAT REQUIREMENTS

Breeding— scattered trees or groves in open country, mainly in pines. Wintering— no essential requirements, but usually in open, agricultural areas.

SAMPLE BREEDING DENSITIES

0.2(15) shrub/seedling elm-ash-cottonwood, 28(1) sawtimber live oak maritime, 28(2) grass/forb mixed pine-hardwood, 82(16) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 559 of 888 BBS routes in the region, 1966-1985; maximum route mean 788 birds, overall mean 32.3 ± 56.4 birds/route, total of route means 28,711 birds.

SAMPLE WINTER DENSITIES

0.8(2) sawtimber oak-hickory, 1(1) sapling/poletimber bay swamp-pocosin, 1(1) sawtimber mixed pine-hardwood, 16(5) shrub/seedling elm-ash-cottonwood, 87(1) sapling/poletimber oak-gum-cypress.

REPRODUCTION

Breeding season extends from late March to early August; peak in mid- to late April. Place nests often near tops of trees 20 feet (6 m) or more high, in a variety of locations, including swamps, pine groves, etc. Clutch size 4-7, commonly 5.

FOOD HABITS

Typically forage on the ground, gleaning insects and other animal food in summer, and grain and other seeds in winter.

GUILD

Bush or tree nesting, terrestrial gleaning insectivore-granivore.

REFERENCES

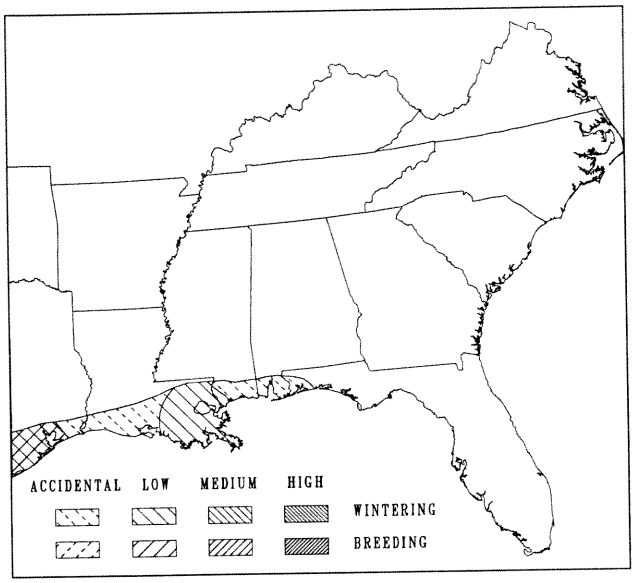
Bent 1958:374-420; Burleigh 1958:596-599; Crase and DeHaven 1975; DeGraaf and Rudis 1986:357; DeGraaf et al. 1980:476; Dolbeer and Stehn 1979; Ehrlich et al. 1988:618; Forbush and May 1939:474, 475; Imhof 1976:380; James and Neal 1986:355; Lowery 1974:549; Mengel 1965:449; Monroe et al. 1988:60; Oberholser 1974(II):838-841; Potter et al. 1980:349; Robbins et al. 1986:104; Robinson 1990:228; Root 1988:256, 293; Sprunt 1954:445; Sprunt and Chamberlain 1970:503-505; Stewart and Robbins 1958:326; USDI Fish & Wildl. Serv. 1980.

Bronzed Cowbird

Molothrus aeneus **BROC**

ABUNDANCE STATUS

All seasons— Uncommon-Rare along Texas coast, more common south of the region, Accidental along Gulf Coast east into Alabama. These birds are expanding their range into the region in agricultural areas. Most of the birds withdraw from the U. S. parts of the range in the winter.



PRIMARY HABITATS

All seasons— Agricultural areas, cattle feedlots, pastures, open areas with scattered perches. They may also occur in suburban areas.

KEY HABITAT REQUIREMENTS

All seasons— "Optimum habitat for this cowbird includes mostly open country with occasional trees and patches of tall brush in a fairly humid, hot climate; cattle in the landscape are helpful" (Oberholser 1974 (II):844).

REPRODUCTION

These are parasitic breeders that lay their eggs in the nests of other birds. In the past, their primary hosts appear to have been orioles (*Icterus* sp.) of a number of different species. In south Texas, however, they victimize a wider variety of small passerine species. Their range expansion is likely to continue, and may pose problems for populations of some small host species.

FOOD HABITS

Bronzed Cowbirds forage on the ground where they glean a variety of weed seeds, grain, and insects. When they follow cattle they take insects exposed by the latter as well as pick ticks from those animals. In winter they eat grain and seeds, flocking in company with other blackbirds.

GUILD

Tree or bush nesting, terrestrial gleaning omnivore

REFERENCES

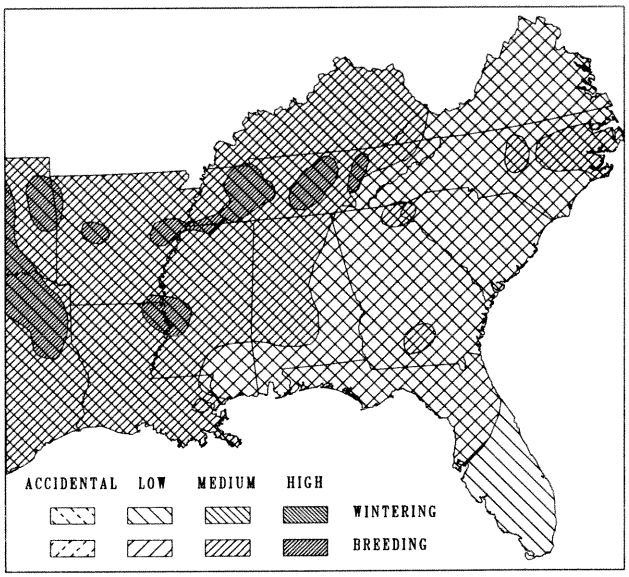
Bent 1958:455; Ehrlich et al. 1988:616; Friedmann 1929:320; Lowery 1974:552; Oberholser 1974 (II):843; Rappole et al.1983:231, 435; Root 1988:256.

Brown-headed Cowbird

Molothrus ater **BHCO**

ABUNDANCE STATUS

Breeding— C over most of the South, perhaps decreasing across the region from northwest to southeast, U in southern Georgia and Florida. Wintering— C over most of the region, but U in the mountains; erratic in occurrence in winter, and move about in large flocks. Roost with other blackbirds and Starlings in winter.



PRIMARY HABITATS

Breeding— as females lay eggs in other species nests, they roam from habitat to habitat. Cowbirds are usually found in open woods, margins, thickets, farmyards, and residential areas. Wintering— mainly in open country for foraging; favor cattle pastures and feedlots, but also in plowed fields, lawns, and other open places. Roost in forests or thickets.

KEY HABITAT REQUIREMENTS

Breeding— no essential requirements. Wintering— open country, generally in pastures or feedlots; woods or thickets required for roosting.

SAMPLE BREEDING DENSITIES

0.4(3) shrub/seedling mixed pine-hardwood, 15(2) sapling/poletimber elm-ash-cottonwood (small plot), 19(1) sawtimber elm-ash-cottonwood. Recorded on 561 of 888 BBS routes in the region, 1966-1985; maximum route mean 94 birds, overall mean 7.4 ± 10.6 birds/route, total of route means 6565 birds.

SAMPLE WINTER DENSITIES

2(1) sawtimber oak-hickory, 9(3) grass/forb elm-ash-cottonwood, 9.5(2) grass/forb longleaf pine-slash pine.

REPRODUCTION

Breeding season extends from early April to late July, with peak in mid-May to early June. Build no nest; female cowbirds lay usually 1, sometimes 2, eggs in the nests of other species. Clutch size probably 4-5.

FOOD HABITS

Glean insects, invertebrates, seeds, grain, and berries, mainly on the ground. Occasionally pick insects from cattle. Winter food primarily seeds and grain.

GUILD

Tree or bush nesting, terrestrial gleaning omnivore.

REFERENCES

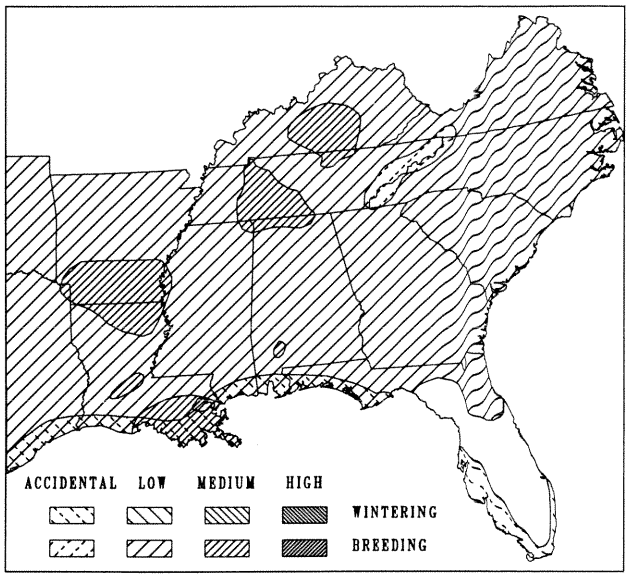
Bent 1958:421-455; Burleigh 1958:599; Crase and DeHaven 1975; DeGraaf and Rudis 1986:358; DeGraaf et al. 1980:478; Dolbeer and Stehn 1979; Ehrlich et al. 1988:616, 619; Forbush and May 1939:477; Friedmann 1929:145; Imhof 1976:381; James and Neal 1986:357; Lowery 1974:550; Mengel 1965:452; Monroe et al. 1988:60; Oberholser 1974(II):841; Potter et al. 1980:351; Rappole et al. 1983:231; Robbins et al. 1986:104; Robinson 1990:228; Root 1988:256, 293; Sprunt 1954:446; Sprunt and Chamberlain 1970:505; Stewart and Robbins 1958:328; USDI Fish & Wildl. Serv. 1980; Verner and Boss 1980:266.

Orchard Oriole

Icterus spurius **OROR**

ABUNDANCE STATUS

Breeding— C over the region, north of Florida; generally only U to FC in the mountains, mainly confined to valleys; scarce over 2500 feet (750 m). Winter primarily south of the United States. Spring arrival— late March to late April; fall departure— early for a songbird, mainly early August to early September.



PRIMARY HABITATS

Scattered hardwoods in open country; favored orchards, groves, roadside or creekside trees, farmyards, and woodland margins.

KEY HABITAT REQUIREMENTS

Scattered hardwood trees in open country.

SAMPLE BREEDING DENSITIES

1(2) sapling/poletimber mixed pine-hardwood, 12(1) grass/forb loblolly pine-shortleaf pine, 15(4) sapling/poletimber elm-ash-cottonwood (small plot). Recorded on 506 of 888 BBS routes in the region, 1966-1985; maximum route mean 138 birds, overall mean 3.45 ± 7.53 birds/route, total of route means 3062 birds.

REPRODUCTION

Breeding season extends from mid-May to late June, peaking in mid- to late May. Nests generally placed 1-30 feet (3-9 m) up in the canopies of hardwood trees.

FOOD HABITS

Glean insects and other small invertebrates from leaves and twigs at middle canopy levels of trees. Occasionally eat berries.

GUILD

Tree nesting, tree foliage gleaning insectivore.

REFERENCES

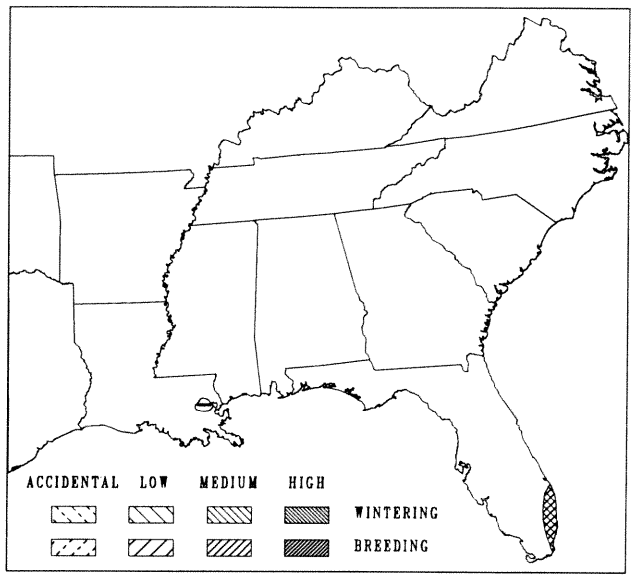
Bent 1958:191; Burleigh 1958:584; DeGraaf and Rudis 1986:359; DeGraaf et al. 1980:470; Ehrlich et al. 1988:622; Forbush and May 1939:468; Imhof 1976:375; James and Neal 1986:359; Lowery 1974:541; Mengel 1965:445; Monroe et al. 1988:60; Oberholser 1974(II):813; Potter et al. 1980:344; Rappole et al. 1983:229; Robbins et al. 1986:104; Robinson 1990:229; Root 1988:256; Sprunt 1954:436; Sprunt and Chamberlain 1970:495; Stewart and Robbins 1958:322.

Spot-breasted Oriole

Icterus pectoralis **SPOO**

ABUNDANCE STATUS

All seasons— FC to locally C, but only in cities and residential areas; not numerous in rural areas. Introduced from Central America in 1949. Non-migratory.



PRIMARY HABITATS

Scattered trees in open, urban or residential areas; commonly in palms or palmettos, but also in other broadleaf trees.

KEY HABITAT REQUIREMENTS

Scattered trees in residential areas.

SAMPLE WINTER DENSITIES

1.8(5) sapling/poletimber pine savanna, 2.5(2) sawtimber longleaf pine-slash pine.

REPRODUCTION

Little is known of the breeding habits, especially on the timing of egg-laying. The typical nest is a bag or cup structure placed at a moderate height in a tree, often in a palm. The clutch is generally 3 or 4 eggs.

FOOD HABITS

These orioles feed mainly on various fruits and nectar, and presumably some insects and small berries.

GUILD

Tree nesting, tree foliage gleaning frugivore or nectarivore.

REFERENCES

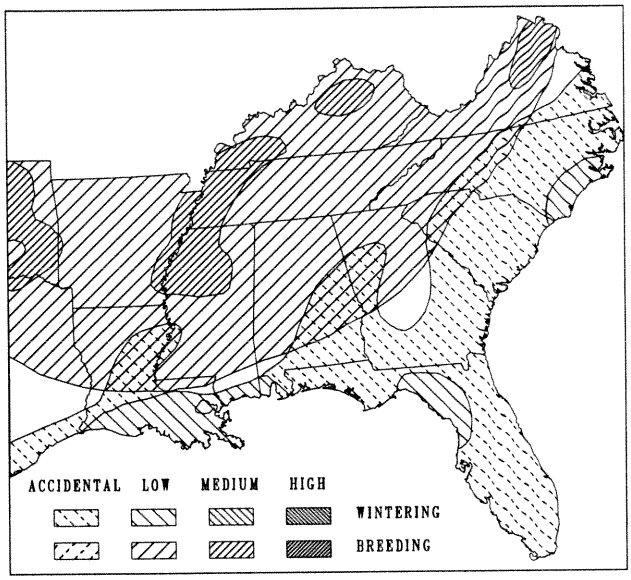
Ehrlich et al. 1986:626; Root 1988:256; Sprunt 1954:440.

Northern (Baltimore) Oriole

Icterus galbula NOOR, (BAOR*)

ABUNDANCE STATUS

Breeding— R over much of the range,FC to C in Southern Appalachian valleys valleys south to northwestern North Carolina, the Mississippi Alluvial Plain, and eastern Oklahoma; generally R and erratic elsewhere. Wintering— essentially restricted to towns and residential areas in open country; U over most of the range, though FC in the eastern half or North Carolina. Spring arrival— mid-April to early May; fall departure— early September to late September.



PRIMARY HABITATS

Breeding— scattered hardwoods, usually along a stream or river, but also along roadsides, in farmyards, and other open country habitats. Wintering— almost always near feeders in towns, primarily with a good cover of evergreen shrubs and a scattering of hardwood trees; almost never in pines.

KEY HABITAT REQUIREMENTS

Breeding— scattered hardwoods in open country. Wintering— near feeders in towns or residential areas.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in shrub/seedling, sapling/poletimber, and sawtimber oak-hickory, 4(2) grass/forb mixed pine-hardwood. Recorded on 189 of 888 BBS routes in the region, 1966-1985; maximum route mean 17 birds, overall mean 0.39 ± 1.38 birds/route, total of route means 344 birds.

REPRODUCTION

Breeding season extends from mid-May to mid-June, probably peaking in mid- to late May. Usual nest, a deep bag, is built in the canopy of a hardwood tree, usually above 30 feet (9 m). Clutch size 4, occasionally 5 or 6.

FOOD HABITS

In summer glean insects from twigs and leaves in canopies of hardwood trees. Winter foods include berries, insects, and items from feeders such as suet. fruits, and nuts.

GUILD

Tree nesting, tree foliage gleaning insectivore-omnivore.

REFERENCES

Bent 1958:247-282; Burleigh 1958:586-590; DeGraaf and Rudis 1986:360; DeGraaf et al. 1980:472; Ehrlich et al. 1988:624; Forbush and May 1939:469; Imhof 1976:376; James and Neal 1986:361; Lowery 1974:543; Mengel 1965:446; Oberholser 1974(II):823-827; Monroe et al. 1988:61; Potter et al. 1980:346; Rappole et al. 1983:230; Robbins et al. 1986:104; Robinson 1990:229; Root 1988:257; Sprunt 1954:438, 439; Sprunt and Chamberlain 1970:497; Stewart and Robbins 1958:323; Verner and Boss 1980:264.

Purple Finch

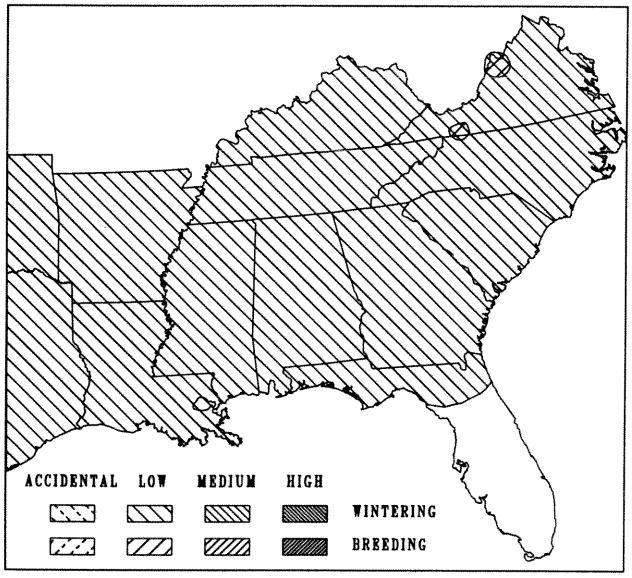
Carpodacus purpureus **PUFI**

PROTECTION STATUS

Monitored by Virginia Natural Heritage Program. Forest Service sensitive on Jefferson National Forest.

ABUNDANCE STATUS

Breeding— R to U at high elevations in Virginia, essentially only in Highland County and at Mt. Rogers. Wintering— somewhat variable in numbers from winter to winter, but present every year; C to VC over most of the region in some winters, only FC in others (usually in alternating years). On the whole, less numerous in the Coastal Plain than elsewhere, and seldom C in southern Georgia and Florida. Fall arrival— early October to early November; spring departure— late March to late April.



PRIMARY HABITATS

Breeding— spruce-fir forests, or bogs where spruce or fir is present. Wintering— favor hardwood forests, especially in trees with winter fruits or buds present; often in pine or mixed woods, and commonly occur in wooded residential areas. Infrequent in thickets and other brush places.

KEY HABITAT REQUIREMENTS

Breeding— spruce or fir trees. Wintering— woodlands of many types, both in hardwoods and conifers, generally where seeds, buds, or dry fruits are present.

SAMPLE WINTER DENSITIES

0.6(2) grass/forb oak-hickory, 112(19) grass/forb elm-ash-cottonwood, 15(3) sawtimber elm-ash-cottonwood.

REPRODUCTION

Breeding season apparently extends from mid-May to early July, with probable peak from late May to mid-June. Nests placed mainly in spruces, at heights of 15-25 feet (5-8 m). Clutch size 3-6, commonly 4-5.

FOOD HABITS

Forage mainly in tree canopies, occasionally on the ground where they glean insects, fruits, and berries in summer. Winter diet primarily seeds and buds.

GUILD

Tree nesting, tree foliage gleaning omnivore (summer) and granivore or folivore (winter).

REFERENCES

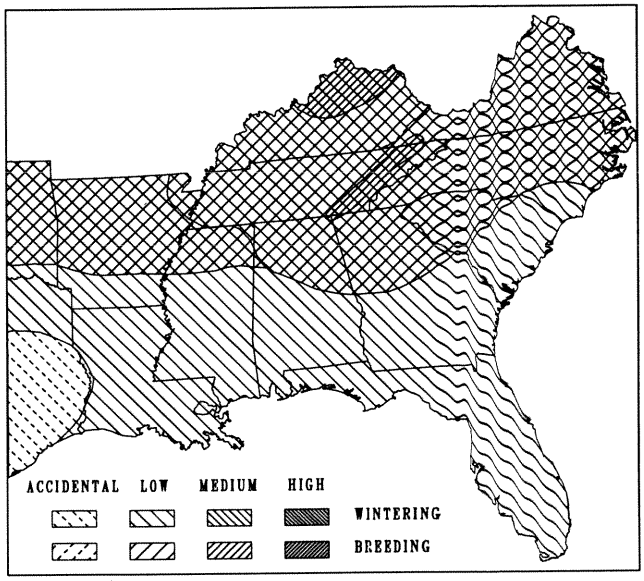
Bent and Austin 1968a:263-279; Burleigh 1958:622-624; DeGraaf and Rudis 1986:362; DeGraaf et al. 1980:492; Ehrlich et al. 1988:644; Forbush and May 1939:491; Imhof 1976:396; James and Neal 1986:362; Lowery 1974:564; Mengel 1965:471; Monroe et al. 1988:61; Oberholser 1974(II):874; Potter et al. 1980:365; Robbins et al. 1986:108; Robinson 1990:230; Root 1988:258, 294; Sprunt 1954:459; Sprunt and Chamberlain 1970:517; Stewart and Robbins 1958:341; Verner and Boss 1980:272.

House Finch

Carpodacus mexicanus **HOFI**

ABUNDANCE STATUS

Breeding— numbers increasing rapidly, but only in cities and towns; U to locally C in northern parts of the region, across Virginia, North Carolina, Kentucky, and Tennessee into northern South Carolina, Georgia, and Alabama. Wintering— both in urban and rural habitats at this season; FC to C over similar areas with wider occurrence across Arkansas, Texas, and Oklahoma than during the breeding season. These western birds were introduced in the New York City area several decades ago and have spread tremendously in the last decade. Fall arrival— mid-October to early November; spring departure— mid-March to early April.



PRIMARY HABITATS

Breeding— essentially limited to urban and suburban areas; thicket, residential shrubbery, and dense trees (often introduced conifers), usually near homes. Wintering— most common in suburban areas, but moderately widespread in open, rural country; shrubbery, weedy tangles, hedgerows, and brushy thickets. Frequently associate with House Sparrows or native sparrows, but only infrequently with Purple Finches.

KEY HABITAT REQUIREMENTS

Breeding— dense shrubs or trees in open residential areas. Wintering— thickets and brushy places in open country, both suburban and rural.

SAMPLE BREEDING DENSITIES

Recorded on 75 of 888 BBS routes in the region, 1966-1985; maximum route mean 19 birds, overall mean 0.26 ± 1.45 birds/route, total of route means 232 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber elm-ash-cottonwood, 1(1) sawtimber oak-hickory.

REPRODUCTION

Breeding season poorly known in the region, apparently extending from mid-April to early June. Nest at variable height in shrubs or trees, often in cedars or broadleaf evergreens. Clutch size 2-6, usually 4-5.

FOOD HABITS

Forage primarily in shrubs or small trees, also in herbaceous vegetation. Glean insects, seeds, berries in summer; in winter eat primarily seeds and berries.

GUILD

Bush or tree nesting bush or herb gleaning omnivore (summer) and granivore or frugivore (winter).

REFERENCES

Bent and Austin 1968a:290-321; DeGraaf and Rudis 1986:363; DeGraaf et al. 1980:494; Ehrlich et al. 1988:646; Imhof 1976:397; James and Neal 1986:365; Monroe et al. 1988:61; Oberholser 1974(II):877; Potter et al. 1980:367; Robbins et al. 1986:108; Robinson 1990:231; Root 1988:259; Verner and Boss 1980:274;.

Red Crossbill

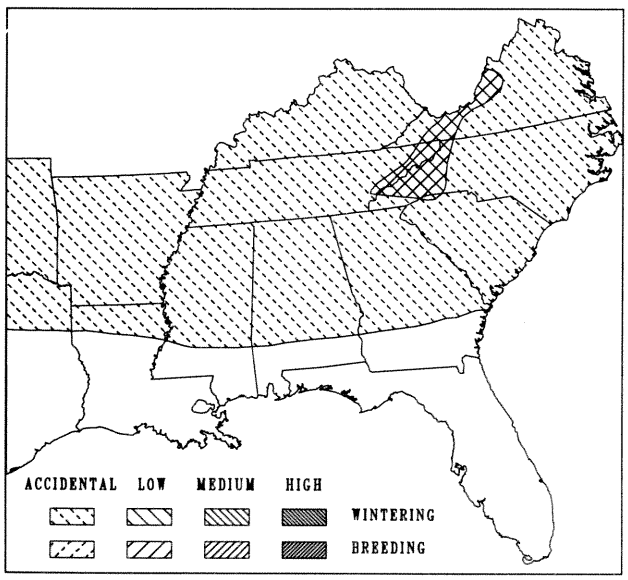
Loxia curvirostra **RECR**

PROTECTION STATUS

Monitored by Arkansas Natural Heritage Commission, Georgia Freshwater Wetlands and Heritage Inventory Program, Virginia Natural Heritage Program, West Virginia Natural Heritage Program. Forest Service sensitive on the George Washington National Forest.

ABUNDANCE STATUS

Breeding— R to U in the higher elevations of North Carolina and southwestern Virginia, but erratic from summer to summer; most individuals apparently do not breed, but there are several positive nesting records; VR away from the higher mountains. Wintering— highly erratic; major invasions into the region occur only several times a decade, and usually do not follow the alternating year pattern of Evening Grosbeaks and Pine Siskins. Often absent everywhere in certain winters. Fall arrival— late October to late November; spring departure— late April to late May.



PRIMARY HABITATS

Breeding— mainly in spruce-fir forests; occasionally in pine forests (principally in white pine). Wintering— coniferous woods; spruce-fir, hemlock, or pine; occasionally in hardwood trees.

KEY HABITAT REQUIREMENTS

Breeding— spruce-fir forests; Wintering— coniferous woods.

SAMPLE BREEDING DENSITIES

Recorded as Visitor in sapling/poletimber oak-hickory and sawtimber spruce-fir.

REPRODUCTION

Red Crossbills are erratic breeders in the region. A few nests have been found in North Carolina, Virginia, and Tennessee. Breeding season probably extends from early March to July. Nests are generally placed in conifers, 10-40 feet (3-12 m) up. Clutch size is 3-5.

FOOD HABITS

Forage mainly in the treetops of conifers, especially around cones, where they glean insects and use their unique crossed bills to pry out conifer seeds. Winter diet seeds, especially of conifers; in summer insects are also eaten.

GUILD

Tree nesting, tree foliage gleaning or probing omnivore-granivore.

REFERENCES

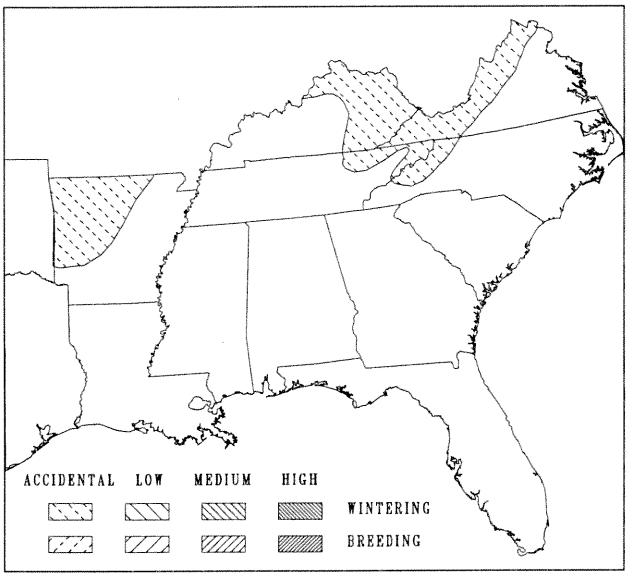
Bent and Austin 1968a:497-526; Burleigh 1958:631-635; DeGraaf and Rudis 1986:364; DeGraaf et al. 1980:504; Ehrlich et al. 1988:638; Forbush and May 1939:500; Imhof 1976:401; James and Neal 1986:365; Lowery 1974:567; Mengel 1965:474; Monroe et al. 1988:61; Oberholser 1974(II):889; Potter et al. 1980:372; Robbins et al. 1986:111; Robinson 1990:232; Root 1988:260, 294; Sprunt 1954:462; Sprunt and Chamberlain 1970:520; Stewart and Robbins 1958:346; Verner and Boss 1980:281.

White-winged Crossbill

Loxia leucoptera **WWCR**

ABUNDANCE STATUS

Wintering— highly erratic; absent from the region in at least half of the winters; in other winters, R to locally U in extreme northern Virginia, the mountains of that state, the Cumberland Plateau in Kentucky, as well as the Arkansas mountains; reach North Carolina only once per decade, on the average. Breed north of the region. Fall arrival— mid-November to early December; spring departure— late March to early May.



PRIMARY HABITATS

Favor spruce-fir forests, but also in pinewoods and other conifers; infrequent in hardwood trees.

KEY HABITAT REQUIREMENTS

Coniferous woods.

REPRODUCTION

Breed north of this region.

FOOD HABITS

Forage primarily in conifers where they pry seeds from cones; also glean other seeds.

GUILD

Tree foliage gleaning or probing granivore.

REFERENCES

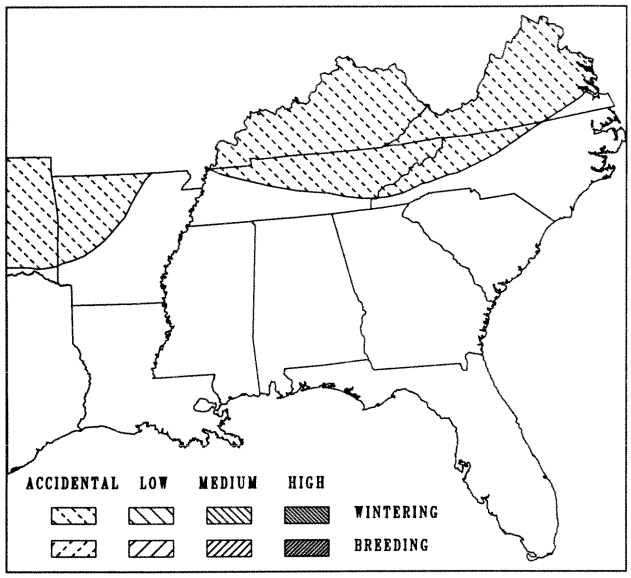
Bent and Austin 1968a:527; DeGraaf and Rudis 1986:365; DeGraaf et al. 1980:506; Ehrlich et al. 1988:638; Forbush and May 1939:501; James and Neal 1986:365; Mengel 1965:476; Monroe et al. 1988:61; Potter et al. 1980:374; Robbins et al. 1986:111; Robinson 1990:233; Root 1988:260, 294; Stewart and Robbins 1958:347.

Common Redpoll

Carduelis flammea **CORE**

ABUNDANCE STATUS

Winter— These are Very Rare and irregular "winter finches" that penetrate into the South only infrequently. They are more often seen in Kentucky and Tennessee, Virginia, and North Carolina (in the mountains of those states), than farther south or at lower elevations.



PRIMARY HABITATS

Winter— They inhabit open areas, old fields, early successional stages of upland types, and willow and alder thickets.

KEY HABITAT REQUIREMENTS

Winter— Their invasions are thought to be correlated with collapse of the winter food supplies in boreal Canada, with heavy snow cover, or with both.

SAMPLE WINTER DENSITIES

Recorded on a single census, 0.5 birds/40 ha in shrub/seedling mixed pine-hardwood vegetation.

REPRODUCTION

Do not breed in the region.

FOOD HABITS

Redpolls eat a great variety of small seeds, although they may show a preference for birch and alder catkins. Among their adaptations to a very northern existence is the ability to forage and roost in hollow pockets under snow cover.

GUILD

Gleaning granivore at variable heights

REFERENCES

Barbour et al. 1973:94; Bent and Austin 1968a:407, 421; Burleigh 1958:701; DeGraaf et al. 1980:498; DeGraaf and Rudis 1986:366; Ehrlich et al. 1988:640; Forbush and May 1939:495, 496; Imhof 1976:398; James and Neal 1986:366; Mengel 1965:472; Monroe et al. 1988:62; Oberholser 1974 (II):882; Potter et al. 1980:370; Robinson 1990:233; Root 1988:260, 295; Sprunt and Chamberlain 1970:561, 633; Stewart and Robbins 1958:343; Sutton 1967:592.

Pine Siskin

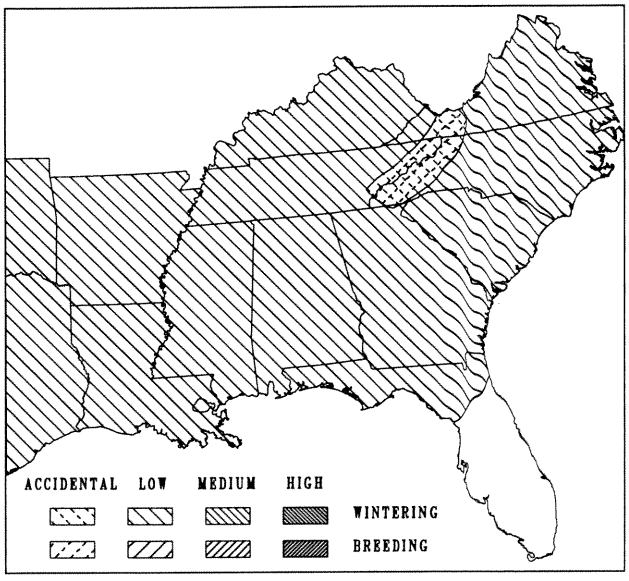
Carduelis pinus **PISI**

PROTECTION STATUS

Monitored by West Virginia Natural Heritage Program.

ABUNDANCE STATUS

Breeding— U and erratic at high elevations in North Carolina and southwestern Virginia, but actual breeding is probably VR; most birds appear to be non-breeders; juveniles have been reported but no nest has yet been found; mainly over 5000 feet (1500 m). Wintering— very erratic, with major influxes into the region tending to occur in alternate years; C to VC over most of the Southeast in some winters, but U to absent in others; always less numerous in the southern portion of the region than elsewhere. Fall arrival— mid-October to early November; spring departure— late April to mid-May.



PRIMARY HABITATS

Breeding— spruce-fir forests, especially where open, or along edges of this forest type. Wintering—in a wide variety of forests and thickets; found in hardwood forests (usually where moist), conifers, thickets (especially in Alnus), residential areas, and even in weedy fields.

KEY HABITAT REQUIREMENTS

Breeding— spruce-fir forests. Wintering— variety of woods or thickets; few essential requirements.

SAMPLE WINTER DENSITIES

1(1) sapling/poletimber longleaf pine-scrub oak, 1(1) grass/forb oak-hickory, 4.5(2) sawtimber mixed pine-hardwood, 19(1) shrub/seedling oak-hickory.

REPRODUCTION

Breeding season possibly early April to late May, based on data from outside the region. Nests are almost always built in conifers, usually at heights of 10-20 feet (3-6 m). Clutch size 3-5.

FOOD HABITS

Glean food from branches, cones, foliage, at various heights in shrubs and trees. Winter diet is primarily seeds and other plant material, to which insects are added in summer.

GUILD

Tree nesting, tree or bush foliage gleaning omnivore-granivore.

REFERENCES

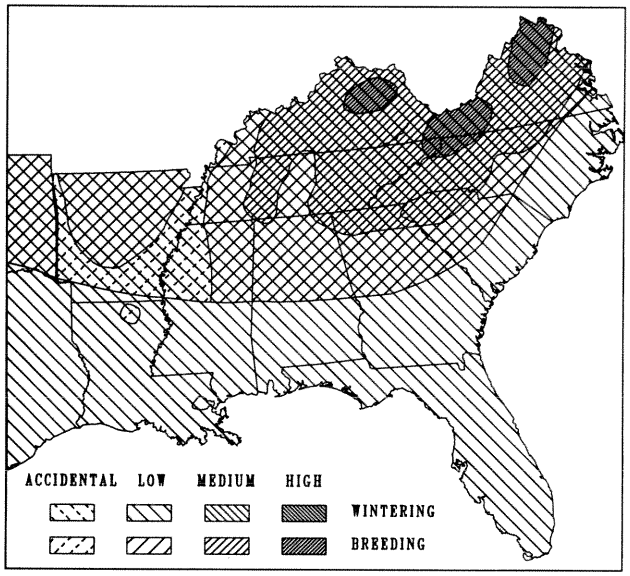
Bent and Austin 1968a:424; Burleigh 1958:624-628; DeGraaf and Rudis 1986:368; DeGraaf et al. 1980:500; Ehrlich et al. 1988:634; Forbush and May 1939:497; Imhof 1976:398; James and Neal 1986:366; Lowery 1974:565; Mengel 1965:472; Monroe et al. 1988:62; Oberholser 1974(II):883; Potter et al. 1980:370; Robbins et al. 1986:111; Robinson 1990:234; Root 1988:260, 295; Sprunt 1954:460; Sprunt and Chamberlain 1970:518; Stewart and Robbins 1958:344; Verner and Boss 1980:277.

American Goldfinch

Carduelis tristis **AMGO**

ABUNDANCE STATUS

Breeding— C over most of the range; FC in the Piedmont; U in the Coastal Plain and Mississippi Alluvial Plain. Wintering— C to VC, at times A, over most of the Southeast; less numerous at higher elevations.



PRIMARY HABITATS

Breeding— generally in moist shrubby places; overgrown fields, shrubs along margins of ponds and streams, marsh edges, and hedgerows. Wintering— very widespread; in weedy fields, thickets, hedgerows, and deciduous woods; generally scarce in pinewoods.

KEY HABITAT REQUIREMENTS

Breeding— shrubs or saplings, generally near water. Wintering— no essential requirements, but usually in weedy places, thickets, and open woods.

SAMPLE WINTER DENSITIES

0.3(5) shrub/seedling elm-ash-cottonwood, 7.5(4) grass/forb oak-hickory, 10(2) grass/forb, mixed pine-hardwood. Recorded on 263 of 888 BBS routes in the region, 1966-1985; maximum route mean 35 birds, overall mean 1.32 ± 3.40 birds/route, total of route means 1173 birds.

SAMPLE WINTER DENSITIES

0.5(1) sapling/poletimber bay swamp-pocosin, 0.5(1) shrub/seedling Virginia pine-pitch pine, 15(3) sapling/poletimber pine savanna, 33(1) shrub/seedling live oak maritime.

REPRODUCTION

Breeding season extends from mid-June to mid-September, peaking from late July to mid-August. This timing is apparently based upon the availability of thistle down, with which they line their nests. Nests are usually placed 3-15 feet (1-5 m) up in shrubs or saplings in thickets or old fields. Clutch size 4-6, most often 5.

FOOD HABITS

Glean primarily insects in summer and various seeds in winter, at all heights.

GUILD

Bush nesting, gleaning insectivore-granivore at variable heights.

REFERENCES

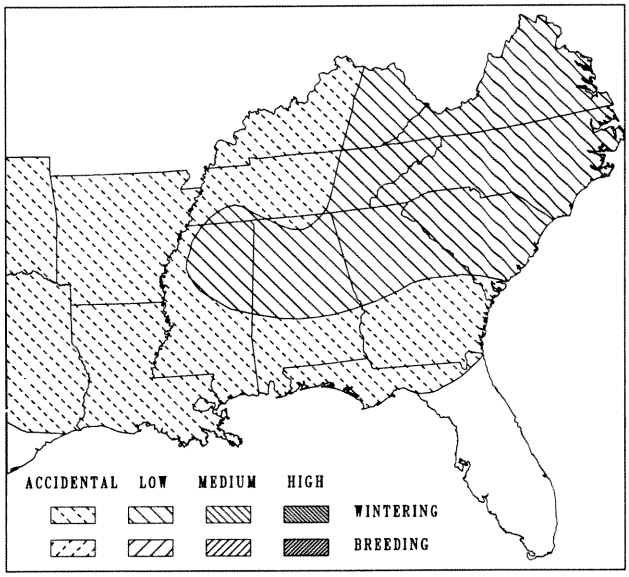
Bent and Austin 1968a:447-469; Burleigh 1958:628; DeGraaf and Rudis 1986:369; DeGraaf et al. 1980:502; Ehrlich et al. 1988:636; Forbush and May 1939:498; Imhof 1976:399; James and Neal 1986:367; Lowery 1974:565; Mengel 1965:473; Monroe et al. 1988:62; Oberholser 1974(II):884; Potter et al. 1980:371; Rappole et al. 1983:234; Robbins et al. 1986:108; Robinson 1990:234; Root 1988:262; Sprunt 1954:461; Sprunt and Chamberlain 1970:519; Stewart and Robbins 1958:345; Verner and Boss 1980:278.

Evening Grosbeak

Hesperiphona vespertina **EVGR**

ABUNDANCE STATUS

Wintering— highly variable from winter to winter; typically migrate into the region in substantial numbers only in alternate winters. In "off-years" generally U to absent everywhere; in good years, C to occasionally VC in the Southern Appalachians, the Piedmont, and across northern Alabama, Mississippi, and middle and eastern Kentucky and Tennessee; FC to at times C in the Coastal Plain; usually more numerous in the northern portion of the region than in the southern and coastal areas. Breed to the north of the region. Fall arrival— late October to late November; spring departure— late April to mid-May.



PRIMARY HABITATS

Generally in coniferous woods; mainly in pines, but also in spruce-fir; regularly seen in hardwoods feeding in the treetops. Commonly occur in residential areas, especially at feeders that provide sunflower seeds.

KEY HABITAT REQUIREMENTS

Woodlands of various types, where seeds or dry fruits are present; prefer conifers.

SAMPLE WINTER DENSITIES

1(1) sawtimber elm-ash-cottonwood, 1(1) sawtimber mixed pine-hardwood, 11(8) grass/forb elm-ash-cottonwood.

REPRODUCTION

Breed north of this region. A few summer records suggest that this status may change in the future.

FOOD HABITS

Glean tree seeds and buds generally in tree canopies, often at treetops; occasionally forage on the ground. Great strength of their mandibles enables them to eat even hard foods such as cherry, plum, occasionally peach seeds. Sunflower seeds are a favorite food at feeders.

GUILD

Tree foliage gleaning granivore or folivore.

REFERENCES

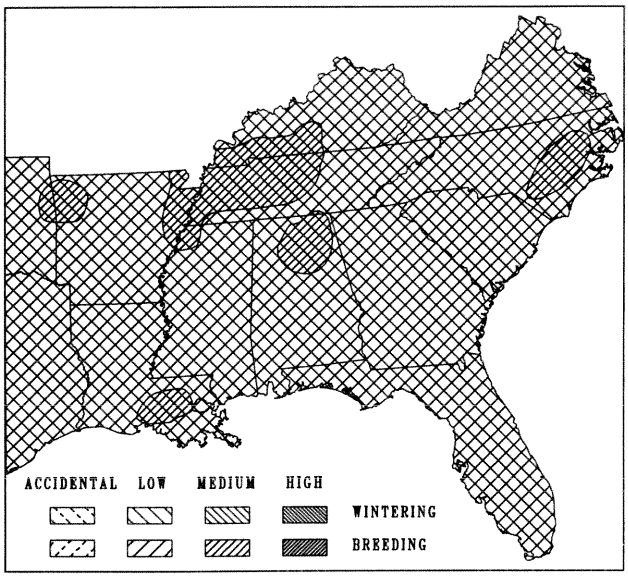
Bent and Austin 1968a:206-256; Burleigh 1958:621; DeGraaf and Rudis 1986:370; DeGraaf et al. 1980:490; Ehrlich et al. 1988:646; Forbush and May 1939:489; Imhof 1976:394; James and Neal 1986:368; Lowery 1974:563; Mengel 1965:470; Monroe et al. 1988:62; Oberholser 1974(II):871; Potter et al. 1980:364; Robbins et al. 1986:108; Robinson 1990:235; Root 1988:260, 295; Stewart and Robbins 1958:340; Verner and Boss 1980:271.

House Sparrow

Passer domesticus **HOSP**

ABUNDANCE STATUS

All seasons— VC to A essentially throughout ; somewhat less numerous at higher elevations, but occur in all mountain towns; R over 4000 feet (1200 m). Essentially non-migratory.



PRIMARY HABITATS

Seldom far from human settlements; widespread in cities, towns, open residential areas, and farms; scarce in wooded residential areas.

KEY HABITAT REQUIREMENTS

Areas of human habitation, principally in open places.

SAMPLE BREEDING DENSITIES

0.7(3) grass/forb elm-ash- cottonwood, 44(2) grass/forb mixed pine-hardwood. Recorded on 565 of 888 BBS routes in the region, 1966-1985; maximum route mean 709 birds, overall mean 25.1 ± 52.2 birds/route, total of route means 22,292 birds.

SAMPLE WINTER DENSITIES

1(1) sawtimber mixed pine-hardwood, 48(9) sapling/poletimber pine savanna, 70(2) sawtimber longleaf pine-slash pine.

REPRODUCTION

Breeding occurs from late March to mid-August, probably peaking in April and May. Nest sites varied, including woodpecker holes, bird boxes, on ledges or crannies in buildings, etc.; occasionally in trees. Very bulky and untidy nests. Clutch size 3-7, usually 4-6.

FOOD HABITS

Varied diet includes mainly vegetable matter, seed, grains, "tablescraps," as well as insects. Forage generally on the ground and low vegetation, usually by gleaning, occasionally other tactics employed.

GUILD

Cavity or ledge nesting, terrestrial gleaning omnivore.

REFERENCES

Bent 1958:1; Burleigh 1958:573; DeGraaf and Rudis 1986:371; DeGraaf et al. 1980:462; Ehrlich et al. 1988:632; Forbush and May 1939:456; Imhof 1976:369; James and Neal 1986:370; Kendeigh 1973; Lowery 1974;535; Mengel 1965:436; Monroe et al. 1988:62; Oberholser 1974(II):799; Potter et al. 1980:337; Robbins et al. 1986:98; Robinson 1990:236; Root 1988:263; Scott et al. 1977:90; Sprunt 1954:428; Sprunt and Chamberlain 1970:488; Stewart and Robbins 1958:317; Verner and Boss 1980:259.

GLOSSARY

AERIAL— Foraging in sustained flight.

AQUATIC— Foraging in a body of water.

ARBOREAL— Inhabiting trees, especially in relation to foraging.

BAYS and WET POCOSINS— Large, low, wet forested land recesses along the Outer Coastal Plain. Peaty soils and boggy conditions characterize these sites. RRE physiographic class 36.

BAY SWAMP-POCOSIN— Forests of boggy, poorly drained soils in which various species of broadleaf evergreen "bay" trees, singly or in combination, make up a plurality of the stocking. The primary species are blackgum (*Nyssa sylvatica* var. *biflora*), red bay (*Persea borbonia*), sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), fetterbush (*Lyonia lucida*), gallberry (*Ilex* sp.), and the semi-evergreen titi (*Cyrilla racemiflora*). RRE forest type 60 in physiographic classes 36 and 33, and possibly 32 and 34.

BIRD-HABITAT MATRIX— A table showing the preferential usage of habitats by bird species.

BBC— Breeding Bird Census, a program originally sponsored by the National Audubon Society, currently supported by the Cornell Laboratory of Ornithology and Association of Field Ornithologists. In this context, a spot census of the territories of breeding birds on a fixed plot. The results of these studies were formerly published in *Audubon Field Notes* and its successor *American Birds*; currently published in the *Journal Of Field Ornithology*. Full instructions for conducting a BBC are available form the Cornell Laboratory of Ornithology, 159 Sapsucker Woods Rd., Ithaca, NY 14850 607-254-2414.

BBS— Breeding Bird Survey, a program initiated in 1986 and carried on by the Migratory Bird Populations Station of the US Department of the Interior, Fish and Wildlife Service, Laurel, MD 20708 302-498-0205. A BBS route is a fixed roadside route, 24.5 miles long, surveyed by a single observer during the first 4 hours of daylight on a morning in June. The observer stops at the same points 0.5 mi apart each year and counts all birds seen or heard during a 3-min period at each stop. Results are summarized into reports and form a major data base.

BLUFFS— High, steep, broad-faced banks or cliffs along the margins of streams. These areas are normally quite fertile but the terrain is usually rugged. RRE physiographic class 23.

BROAD STREAM MARGINS— Broad, moist bottoms of land forming the margins of large streams. These bottoms are normally well-drained but might experience flooding during short periods of excessive rainfall. These sites are rich in alluvial deposits. RRE physiographic class 29.

BURROW— A nest cavity in soil, either in a bank or underground.

BUSH— A shrub or a sapling, generally less than 5 m tall.

CARNIVORE— An animal that feeds on meat, especially on animals larger than 5 cm in length.

CAVITY— A nest cavity inside a plant or a man-made structure, especially in a dead tree or stub.

CHARACTERISTIC SPECIES— A species that is characteristic of a given habitat is usually present in good numbers, and is generally present in most large stands of that habitat.

COVE HARDWOODS— Forests in which many species of hardwood constitute a plurality and which occur on moist, fertile, protected sites in deep hollows extending back into mountain ranges. Characteristic tree species are yellow-poplar (*Liriodendron tulipifera*), basswood (*Tilia heterophylla*), sugar maple (*Acer saccharum*), buckeye (*Aesculus octandra*), and white oak (*Quercus alba*). RRE forest types 50 or 80 in physiographic classes 24 or 27.

CYPRESS PONDS— Small depressions scattered throughout the flatwoods and pocosins of the Outer Coastal Plain. These areas are filled with water during wet seasons. RRE physiographic class 34.

CYPRESS STRANDS— Strands of forest land along the deep drainage features of the Outer Coastal Plain. There is a severe species limitation in these areas because of the presence of water. RRE physiographic class 32.

DBH— Diameter of a tree measured at breast height, 4.5 feet (1.35 m).

DEEP SWAMPS— Large, low, wet, flat forested areas which are flooded for long periods of time. Most of the large, poorly drained stream margins fall into this class. Soil and moisture conditions on these sites are generally quite favorable for forest growth of restricted species. RRE physiographic class 31.

DIVING— Foraging on underwater food items by tipping from the surface of the water or by diving from the surface. Also includes "dabbling."

ELM-ASH-COTTONWOOD— Bottomland forests in which elm (*Ulmus* sp.), ash (*Fraxinus* sp.), cottonwood (*Populus deltoides* or *P. heterophylla*), singly or in combination, compose a plurality of the stocking. RRE forest type 70.

ENDANGERED SPECIES— A species that is in danger of extinction throughout all or significant parts of its range. Federally endangered species are designated in the *Federal Register* by the appropriate Secretary.

EVERGLADES— Extensive treeless freshwater marshes of Florida south of Lake Okeechobee, and often covered by water. Saw-grass (*Cladium jamaicense*) and a variety of grasses dominate the vegetation. No RRE forest type. RRE ground land use class 68.

FLATWOODS AND DRY POCOSINS— Flat or fairly level areas, ordinarily with sandy soil, which are somewhat dry throughout much of the year. RRE physiographic class 21.

FOLIAGE— The leaves of a woody plant, including twigs but including large branches and trunks.

FOLIVORE— An animal that feeds on the vegetative parts of plants, such as leaves, roots, or buds; flowers also included.

FOREST TYPE— A classification of forest land based on the species that form a plurality of live-tree stocking.

FRUGIVORE— An animal that eats fruits, in particular, fleshy fruits such as berries.

GLEANING— Picking of a food item (usually non-moving or slow-moving) from a substrate. Includes "hovering."

GRANIVORE— A animal that feeds on dry fruits, especially seeds or nuts.

GROUND (NEST)— A nest on the ground or in herbaceous vegetation.

GUILD— A manner or mode of habitat utilization by animals, usually expressed in terms of foraging and/or nesting.

HABITAT PROFILE— A listing, in coded form, of habitats and habitat features (such as age of vegetation and topography) for each species in the breeding and/or wintering seasons.

HAWKING— Foraging in the air by making short flights from a perch; also called "sallying" or "flycatching."

HERB (HERBACEOUS VEGETATION)— Non-woody vascular plants, especially grasses, sedges, rushes, and composites.

HIGH MOUNTAIN TOPS AND SLOPES— Elevations in the Southern Appalachians above 5000 feet (1500 m). These sites are characterized by steep slopes, rock outcrops, natural balds, exposure to severe climatic conditions, and short growing seasons. RRE physiographic class 11.

INSECTIVORE— An animal that feeds on insects or other small animals, generally less than 5 cm in length. Larvae and eggs of these animals are included in the diets of insectivores.

LEDGE (NEST)— A nest on a rather horizontal surface above the ground, especially on a cliff or a man-made structure.

LIVE OAK MARITIME— Forests in which live oak (*Quercus virginiana*) composes at least 50 percent of the stocking. This type has no precise RRE forest type equivalent. Probably such stands would be classified as RRE forest 50 in RRE physiographic class 12.

LOBLOLLY PINE-SHORTLEAF PINE— Forests in which loblolly pine (*Pinus taeda*) or shortleaf pine (*P. echinata*), singly or in combination, constitute a plurality of the stocking. Hardwoods make up less than 25 percent of the stocking. RRE forest types 31 and 32.

LONGLEAF PINE-SCRUB OAK— Forests of sandy, upland topography in which longleaf pine and any of several scrub oaks (*Quercus* sp.) each composes at least 25 percent of the stocking. RRE forest type 21 in physiographic class 14.

LONGLEAF PINE-SLASH PINE— Forests of moist, flat topography in which a plurality of the stocking is longleaf pine (*Pinus palustris*) or slash pine (*P. elliottii*), singly or in combination. RRE forest types 21 and 22.

LOW MOUNTAIN TOPS AND DRY SLOPES— Ridge tops and steep slopes below 5000 feet (1500 m) in elevation. These sites are characterized by dryness, thin soil, rock outcrops, and normally have southern or western exposures. RRE physiographic class 13.

MANGROVES— Forests in which red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia nitida*), or white mangrove (*Laguncularia racemosa*), singly or in combination, make up a plurality of the stocking. RRE forest type 93.

MAPLE-BEECH-BIRCH— Forests in which sugar maple, beech (*Fagus grandifolia*), or yellow birch (*Betula lutea*), singly or in combination, compose a plurality of the stocking. RRE forest type 80.

MARL FLATS AND FORESTED PRAIRIES— Broad expanses of low site conditions marking the transition zones along the glades and marshes of the Southeast. RRE physiographic class 37.

MIXED PINE-HARDWOOD— Forests in which hardwoods (usually oaks) and pines each constitute at least 25 percent of the stocking. Occurs in several RRE forest types, as 31, 32, 50, and 60. Listed as oak-pine on page D-2 of RRE Field Instruction for Florida.

MOUNTAIN COVES— Moist, fertile, protected sites found in deep hollows extending back into the low mountain ranges. These sites receive very little direct exposure to sun and wind. RRE physiographic class 27.

MOUNTAIN FOOTHILLS— Low hills at or near the base of mountain ranges. These sites are characterized by dryness, thin soil, and more gentle terrain than that associated with the mountain ranges. RRE physiographic class 15.

MOUNTAIN SADDLES AND MOIST MOUNTAIN SLOPES— Broad gaps in mountain ranges below 5000 feet (1500 m) in elevation and moist slopes with northern or eastern exposure. These sites are characterized by adequate moisture, relatively deep soil, and rugged terrain. RRE physiographic class 24.

NARROW STREAM MARGINS— Low, moist, fertile areas along small streams. These sites are normally well drained but might experience flooding during short periods of excessive rainfall. RRE physiographic class 28.

NATURAL STREAM LEVEES— Embankments formed along the edges of larger streams by periodic flooding and receding waters. These sites are normally higher and drier than the general level of the stream margin. RRE physiographic class 25.

NECTARIVORE— An animal that feeds on nectar.

NFS— National Forest Systems, the forest management division of the U. S. Forest Service.

NONSTOCKED— Land less than 16.7 percent stocked with growing-stock trees.

OAK-GUM-CYPRESS— Bottomland or swamp forests in which tupelo (*Nyssa aquatica*), blackgum, sweetgum (*Liquidambar styraciflua*), oaks, or cypress (*Taxodium* sp.), singly or in combination, compose a plurality of the stocking. RRE forest type 60.

OAK-HICKORY— Forests in which a plurality of the stocking is upland oaks or hickories (*Carya* sp.), singly or in combination, and where pines make up less than 25 percent of the stocking. RRE forest types 50 and 52.

OMNIVORE— An animal that feeds on both animals and plants.

PHYSIOGRAPHIC CLASS— A measure of a forest plot based on topography, aspect, soil, moisture, and drainage.

PINE SAVANNA— "Forest" of scattered trees with no crown closure in which longleaf pine or slash pine, singly or in combination, constitute a plurality of the stocking. RRE forest types 21 and 22 in physiographic class 37, in which basal areas are low (ca. 10-20 square feet per acre, 2.5-5 square meters per hectare). Typically occurs in central Florida.

PIRACY— Foraging by attacking other animals, causing them to drop their prey, and taking the prey. The technique is also known as kleptoparasitism.

POLETIMBER TREES— Growing-stock trees of commercial species 5-9 inches (12-22 cm) DBH for coniferous trees and 5-11 inches (12-28 cm) DBH for hardwood trees.

POND PINE POCOSIN— Forests of boggy, poorly-drained soils in which pond pine (*Pinus serotina*) composes a majority of the stocking. RRE forest type 36.

POUNCING— Dropping onto a prey item (on the ground or in water) from a perch or from the air.

PROBING— Inserting the bill into a substrate, such as bark or mud, for a food item.

RESTRICTED SPECIES— A species that occurs primarily in just one to several habitats in the Southeast.

ROLLING UPLANDS— Well-drained terrain with level areas broken by gentle slopes and numerous small drains. (Excludes deep sands.) RRE physiographic class 22.

RRE— Renewable Resources Evaluation Project, an activity of the U. S. Forest Service Experiment Stations; formerly called Forest Survey.

SAF— Society of American Foresters.

SAND DUNES AND SAND RIDGES— Formed by wind along the beech and shores of large bodies of water. RRE physiographic class 12.

SAND HILLS— Rolling uplands of deep sand with level areas broken by gentle slopes and small drains. RRE physiographic class 14.

SANDHILLS LONGLEAF PINE— Forests of sandy, upland topography in which longleaf pine constitutes a majority of the stocking, and where less than 25 percent of the stocking is hardwoods. RRE forest type 21 in physiographic class 14.

SAND PINE-SOUTHERN SCRUB OAK— Forests of sandy, upland topography in which sand pine (*Pinus clausa*) and several species of scrub oaks (*Quercus* sp.) each compose at least 25 percent of the stocking. RRE forest type 34.

SAPLINGS— Live trees 1.0 to 5.0 inches (2.5-12 cm) DBH.

SAWTIMBER TREES— Live trees of commercial species at least 9.0 inches (22 cm) DBH for coniferous trees and 11.0 inches (28 cm) DBH for hardwood trees.

SCAVENGER— An animal that feeds on non-living organic matter, especially dead animals (carrion) or garbage.

SEEDLINGS— Live trees less than 1.0 inch (2.5 cm) in diameter that are expected to survive and develop.

SENSITIVE SPECIES— A species with special requirements or vulnerabilities, such that any small change or disturbance to its habitat may greatly affect the viability of its population. Forest Service sensitive species are designated by a Regional Forester.

SMALL DRAINS— Narrow, wet strands without a well defined stream. Although these areas serve as drains for the surrounding areas, they are usually poorly drained themselves. RRE physiographic class 33.

SNAG— A dead tree. We prefer this broad definition from forestry to one limiting "snag" to mean dead parts of otherwise live trees.

SOARING— Foraging by searching for terrestrial or aquatic prey from high in the air.

SOUTHERN MIXED MESIC HARDWOODS— Forests along stream banks or bluffs in southern Georgia and northern Florida where beech or southern magnolia (*Magnolia grandiflora*), singly or in combination, constitute a plurality of the stocking. This has no precise RRE forest type equivalent. Probably it would be classified as RRE forest type 50 in physiographic classes 22 or 23.

SOUTHERN SCRUB OAK— Forests of sandy, upland topography in which various species of scrub oaks (*Quercus* sp.) compose at least 75 percent of the stocking. RRE forest type 57.

SPRUCE-FIR— Forests in which a plurality of the stocking is red spruce (*Picea rubens*) or Fraser fir (*Abies fraseri*), singly or in combination. RRE forest type 10.

STALKING— Foraging on the ground or in shallow water, in a stealthy manner, for active prey items.

STAND SIZE— A measure of the average size of the dominant trees in a forest patch, in terms of their DBH.

STATUS— The relative abundance of a species in the region during the breeding and/or wintering seasons. Abundance codes— A = abundant, VC = very common, C = common, FC = fairly common, U = uncommon, R = rare, VR = very rare.

TERRESTRIAL— Pertaining to the ground, including bare ground, short grass, and mud.

THREATENED SPECIES— Any species that is likely to become endangered throughout all or a significant part of its range. Federally Threatened species are designated in the *Federal Register* by the appropriate Secretary.

TREE— A woody plant over 5 m in height.

TROPICAL HARDWOODS— Forests of central and southern Florida in which various species of mostly tropical broadleaf evergreen trees, singly or in combination, compose a plurality of the stocking. These forests are rarely if ever flooded. RRE forest type 95.

TRUNK— The main axis and large branches of a tree or bush.

VALLEY BOTTOMS— Well-drained stretches of level land nestled between mountain ranges or foothills. These areas are normally characterized by deep soil and one or more fast-flowing streams. RRE physiographic class 26.

VEGETATION TYPE— A classification of vegetation based on major plant associations, with topography and geography taken into consideration.

VIRGINIA PINE-PITCH PINE— Forests in which Virginia pine (*Pinus virginiana*) or pitch pine (*P. rigida*), singly or in combination, compose a plurality of the stocking. Hardwoods constitute less than 25 percent of the stocking. RRE forest types 33 and 38.

WPBS— Winter Bird Population Study, a program originally sponsored by the National Audubon Society, currently supported by the Cornell Laboratory of Ornithology and Association of Field Ornithologists. A WBPS in this context is a summary of repeated surveys of the number of winter birds on a fixed plot. Formerly, the results of these studies were published in *Audubon Field Notes* and its successor *American Birds*; currently published in the *Journal of Field Ornithology*. Full instructions for conducting a WBPS are available form the Cornell Laboratory of Ornithology, 159 Sapsucker Woods Rd, Ithaca, NY 145850 607-254-2414.

WHITE PINE-HEMLOCK— Forests in which a plurality of the stocking is hemlock (primarily *Tsuga canadensis* and rarely *T. caroliniana*) or white pine (*Pinus strobus*), singly or in combination. RRE forest type 04.

WILLOW HEADS AND STRANDS— Small areas in the early stages of succession to forest found around deep ponds and strands of permanent water. RRE physiographic class 35.

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APPENDICES

Each of the following 14 appendices either summarizes data in the matrices (Chapter III) and in narrative species accounts (Chapter IV), or presents data not conveniently handled in those locations.

Appendix A summarizes published census literature from the Southeast 1947-1979 by state, vegetation type, and successional stage. Areas in which more censusing needs to be done are immediately obvious from inspection of the tables in Appendix A.

Appendix B identifies all vegetation types and seasons of occurrence of the 269 species treated in this manual. Readers can go from the narrative account for a species to this appendix to find the habitat distribution in the South for the species.

Appendix C is a tabular summary of the quantitative census information published for the Southeast 1947-1979. Here alone are listed sample sizes, mean recorded densities, and standard errors for the censuses in which each species was found. This appendix also lists the low average density from a single habitat in the South, the high average density from a single habitat in the South, and sample sizes associated with those average densities. The reader can get a brief overview of the frequencies and abundances of the species on published censuses in the South from this appendix.

Appendix D summarizes the information listed in the guild section of the species's narrative accounts, as well as some of that listed in the substrate utilization columns in the matrices. Here are the lists of species likely to be affected when management practices enhance or remove certain habitat elements.

Appendices E-J are summaries of information in selected columns of the specific requirements section of the matrices. Appendix E identifies snag and cavity dependent species. Appendix F identifies species dependent on large sawtimber trees. Appendix G identifies species dependent on forest interior conditions or areas of extensive forest. Appendix H identifies species requiring slash piles or windrows. Appendix I identifies species requiring rock outcrops, caves, crevices, or earthen banks. Appendix J identifies species requiring aquatic habitats.

Appendices K and L cross-reference the vegetation types in this work with the standard types of the Society of American Foresters (SAF; Eyre 1980; Appendix K) and of the U. S. Forest Service Southern Region (USFS; U. S. Department of Agriculture 1979; Appendix L).

Species listed in **Appendix M** are those treated in this work for which the most recent A.O.U. Checklist (1983) lists separate breeding and winter ranges, and for which at least part of the winter range is to the south of the Tropic of Cancer. Where the Checklist deals separately with different populations, the ranges pertinent to the population that occurs in the South were the ones used to make the determination. In a few cases, marked with "?" it was not clear whether the winter range reached the Tropic of Cancer or whether the population in the South actually included individuals that migrated to the Tropics. In a number of other cases as well, the status of the species as a whole may not mean that individuals that occur in the South actually migrate to the Tropics.

Species marked with "*" are those considered Neotropical Migrants by the Southeastern Working Group of the Neotropical Migratory Bird Conservation Program. Species marked with () are those on the second draft list of Neotropical Migratory Birds prepared by the Research Working Group of the Neotropical Migratory Bird Conservation Program, as follows: (A) winter generally south of the United States, (B) winter usually in the United States, sometimes south of the United States, and (C) are primarily tropical species, that reach the United States primarily as peripheral breeding species.

Appendix N lists the official 4-letter codes used by the USFWS Bird Banding Laboratory. In a few cases, asterisks indicate non-standard codes, primarily for species such as resident game birds for which no official code was designated.

Appendix A.

Summaries of Published Bird Censuses.

Table A-1. Summary of published Breeding Bird Censuses made in the Southeast in 1947 - 1979.

Vegetation type and successional stage	State[a]					Total
	Florida	Georgia	S. C.	N. C.	Virginia	
Everglades						
Grass/forb	1(1)	-	-	-	-	1(1)
Southern scrub oak						
Shrub/seedling	2(2)	-	-	-	-	2(2)
Sand pine-sthrn. scrub oak						
Sapl./poletimber	1(1)	-	-	-	-	1(1)
Longleaf pine-scrub oak						
Sapl./poletimber	2(6)	-	-	-	-	2(6)
Bay swamp-pocosin						
Grass/forb	-	-	3(3)	-	-	3(3)
Longleaf pine-slash pine						
Sapl./poletimber	-	2(2)	-	-	-	2(2)
Sawtimber	1(1)	4(7)	-	-	-	5(8)
Oak-gum-cypress						
Sapl./poletimber	1(2)	1(1)	2(2)	-	-	4(5)
Sawtimber	-	-	1(1)	1(1)	-	2(2)
Live oak maritime						
Sapl./poletimber	2(3)	-	-	-	-	2(3)
Sawtimber	-	-	1(1)	1(1)	-	2(2)
Elm-ash-cottonwood						
Grass/forb or Shrub/seedling	-	-	-	4(19)	-	4(19)
Sapl./poletimber	-	-	-	1(18)	-	1(18)
Sawtimber	-	-	-	-	2(3)	2(3)
Loblolly pine-shortleaf pine						
Grass/forb	-	1(1)	-	-	-	1(1)
Shrub/seedling	-	-	-	1(1)	-	1(1)
Sapl./poletimber	-	2(2)	-	1(1)	-	3(3)
Sawtimber	-	-	-	3(3)	-	3(3)

Vegetation type and successional stage	State[a]					Total
	Florida	Georgia	S. C.	N. C.	Virginia	
Mixed pine-hardwood						
Grass/forb	-	-	-	1(2)	-	1(2)
Shrub/seedling	-	-	-	3(5)	1(2)	4(7)
Sapl./poletimber	-	-	-	2(5)	-	2(5)
Sawtimber	-	1(11)	-	1(23)	1(2)	3(36)
Oak-hickory						
Grass/forb	-	-	-	1(4)	-	1(4)
Shrub/seedling	-	1(2)	-	-	-	1(2)
Sapl./poletimber	-	-	-	3(9)	3(3)	6(12)
Sawtimber	-	2(2)	-	4(12)	7(22)	13(36)
White pine-hemlock						
Sawtimber	-	-	-	1(2)	1(1)	2(3)
Cove hardwoods						
Sawtimber	-	1(10)	-	1(1)	-	2(11)
Spruce-fir						
Sawtimber	-	-	-	2(2)	-	2(2)
Totals	**10(16)**	**15(38)**	**7(7)**	**32(112)**	**16(34)**	**78(207)**

[a] Entries are listed as "Plots (Years censused)."

Table A-2. Summary of published Winter Bird Population Studies made in the Southeast in 1947 - 1979.

Vegetation type and successional stage	State[a]					Total
	Florida	Georgia	S. C.	N. C.	Virginia	
Everglades						
Grass/forb	1(1)	-	-	-	-	1(1)
Pine savanna						
Sapl./poletimber	1(9)	-	-	-	-	1(9)
Southern scrub oak						
Shrub/seedling	2(2)	-	-	-	-	2(2)
Sand pine-southern scrub oak						
Sapl./poletimber	1(1)	-	-	-	-	1(1)
Longleaf pine-scrub oak						
Sapl./poletimber	1(1)	-	-	-	-	1(1)
Sawtimber	-	-	-	1(2)	-	1(2)
Bay swamp-pocosin						
Sapl./poletimber	-	1(1)	-	-	-	1(1)
Longleaf pine-slash pine						
Grass/forb	1(2)	-	-	-	-	1(2)
Sapl./poletimber	-	1(1)	-	-	-	1(1)
Sawtimber	1(4)	-	-	-	-	1(4)
Oak-gum-cypress						
Sapl./poletimber	1(1)	-	-	-	-	1(1)
Live oak maritime						
Shrub/seedling	1(1)	-	-	-	-	1(1)
Sapl./poletimber	2(2)	-	-	-	-	2(2)
Sawtimber	-	-	1(3)	-	-	1(3)
Elm-ash-cottonwood						
Grass/forb or Shrub/seedling	-	-	-	4(29)	-	4(29)
Sawtimber	-	-	-	-	1(3)	1(3)
Loblolly pine-shortleaf pine						
Grass/forb	-	1(1)	1(1)	-	-	2(2)
Shrub/seedling	-	-	-	1(1)	-	1(1)
Sapl./poletimber	-	-	-	-	-	1(1)

Vegetation type and successional stage	State[a]					Total
	Florida	Georgia	S. C.	N. C.	Virginia	
Virginia pine-pitch pine						
Shrub/seedling	-	-	-	-	1(1)	1(1)
Sapl./poletimber	-	-	-	-	1(7)	1(7)
Mixed pine-hardwood						
Sawtimber	-	1(10)	-	1(23)	-	2(33)
Oak-hickory						
Grass/forb	-	-	-	1(5)	4(8)	5(13)
Shrub/seedling	-	-	-	-	1(4)	1(4)
Sapl./poletimber	-	-	-	-	1(1)	1(1)
Sawtimber	-	-	-	3(5)	3(15)	6(20)
Totals	**12(24)**	**4(13)**	**2(4)**	**12(66)**	**12(39)**	**42(146)**

[a] Entries are listed as "Plots (Years censused)."

Appendix B.

Species Occurrence by Vegetation Type, Habitat Quality, and Season.

Common Name	B/W[a]	Highest Habitat Quality By Vegetation Type For Any Successional Stage[b]																					
		EVGL	TROP	MANG	PSAV	SOSO	SPSO	LLSO	SHLL	SMMH	BSPO	PPPO	LLSL	OGCY	LOMA	EACO	LPSH	VPPT	MPHW	OKHK	WPHM	COVE	MABB	SPFR
Pied-billed Grebe	B	M																					
	W	M																					
Brown Pelican	B		M	O											M								
	W																						
Double-crested Cormorant	B		M	S										O		M							
	W																						
Olivaceous Cormorant	B			M							S			S	S								
	W																						
Anhinga	B		M	S										O		M							
	W	M												O		M							
Magnificent Frigatebird	B			O																			
	W																						
American Bittern	B	M			M																		
	W	O			S																		
Least Bittern	B	S			M																		
	W	S			M																		
Great Blue Heron	B		S	O										O	S	S							
	W	O			M									M		M							
Great Egret	B		S	O						M				O	O	S							
	W	O			M						M	M											
Snowy Egret	B		S	O										O	O	M							
	W	O			M						M	M											
Little Blue Heron	B		S	S						M				O	O	S							
	W	O			M						M	M											
Tricolored Heron	B		S	O										S	O	M							
	W	O			M						M	M											
Reddish Egret	B		S	O																			
	W	M																					
Cattle Egret	B		S	O						M				O	O	S							
	W	M			S																		
Green-backed Heron	B		S	O						M				O	S	O							
	W	O																					
Black-crowned Night Heron	B		S	O						M				S	O	M							
	W	O			M						M	M											
Yellow-crowned Night Heron	B		M	S						M				O	S	S							
	W	S									M	M											
White Ibis	B		S	O						M				O	O	S							
	W	O			M						M	M											
Glossy Ibis	B		S	O										S	O	M							
	W	O			M						M	M											

(a) B - Breeding
W - Wintering

(b) Cover Type

EVGL - Everglades
TROP - Tropical Hardwoods
MANG - Mangroves
PSAV - Pine savanna
SOSO - Southern scrub oak
SPSO - Sand pine-southern scrub oak
LLSO - Longleaf pine-scrub oak
SHLL - Sandhills longleaf pine
SMMH - Southern mixed mesic hardwoods
BSPO - Bay swamp-pocosin
PPPO - Pond pine pocosin
LLSL - Longleaf pine-slash pine
OGCY - Oak-gum-cypress
LOMA - Live oak-maritime
EACO - Elm-ash-cottonwood
LPSH - Loblolly pine-shortleaf pine
VPPT - Virginia pine-pitch pine
MPHW - Mixed pine-hardwood
OKHK - Oak-hickory
WPHM - White pine-hemlock
COVE - Cove hardwoods
MABB - Maple-beech-birch
SPFR - Spruce-fir

M - Marginal
S - Suitable
O - Optimal

Common Name	B/W[a]	Highest Habitat Quality By Vegetation Type For Any Successional Stageb																					
		EVGL	TROP	MANG	PSAV	SOSO	SPSO	LLSO	SHLL	SMMH	BSPO	PPPO	LLSL	OGCY	LOMA	EACO	LPSH	VPPT	MPHW	OKHK	WPHM	COVE	MABB	SPFR
White-faced Ibis	B			M										S	S								
	W										M			M	M								
Roseate Spoonbill	B		S	O																			
	W	M																					
Wood Stork	B		S	S										O	M								
	W	O			M						M												
Wood Duck	B													O		S							
	W													O		S							
Mallard	B																						
	W	M									M			S		S							
Hooded Merganser	B													O		M							
	W													M		M							
Black Vulture	B		S		O	O	S	S	M	S		M	M	O	M	S	S		O	S				
	W		S		O	O	S	S	M	M	M	M	M	O	M	S	M		S	M				
Turkey Vulture	B		O		O	O	S	S	M	S		M	S	O	M	S	S	M	O	O		M	M	
	W		O		O	O	S	S	M	M	M	M	S	O	M	M	M	M	S	M		M	M	
Osprey	B	S	S	S	S							M	M	O	M	M	M							
	W	S	S	S	S									O	M	M								
American Swallow-tailed Kite	B		M		S					M			M	O		S			M				
	W																						
Black-shouldered Kite	B				O	S	M						M										
	W				O	S	M						M										
Snail Kite	B	O			S																		
	W	O			S																		
Mississippi Kite	B									S				S		O	M		M				
	W																						
Bald Eagle	B	M	M	M	S								M	O		M	S		M				
	W	M	S	M	S									S		M	M		M				
Northern Harrier	B																						
	W	O	M		M	M	M	M	M	M	M	M	M	S	S	S	M	M	S	S			
Sharp-shinned Hawk	B																	M	O	O	M	S	S
	W		S	M		S	M	M	M	S		S	M	M	O	S	S	M	O	M	M	M		
Cooper's Hawk	B					M				M				M		M	M	M	O	O	M	S	S
	W		S	M		S	M	M	M	S		S	M	M	M	S	S	M	O	M	M	M		
Northern Goshawk	B																						
	W															M		M	S	M	S	M	M	S
Red-shouldered Hawk	B		S	M	M					S			M	O	M	O								
	W	M	S	M	S					S	S	M	M	O	M	O								
Broad-winged Hawk	B									S									S	O		S	M	
	W		O	M																M				
Short-tailed Hawk	B		S	O	M					M				O		M								
	W		O	O										S		M								

(a) B - Breeding
W - Wintering

(b) Cover Type

EVGL - Everglades
TROP - Tropical Hardwoods
MANG - Mangroves
PSAV - Pine savanna
SOSO - Southern scrub oak
SPSO - Sand pine-southern scrub oak
LLSO - Longleaf pine-scrub oak
SHLL - Sandhills longleaf pine
SMMH - Southern mixed mesic hardwoods
BSPO - Bay swamp-pocosin
PPPO - Pond pine pocosin
LLSL - Longleaf pine-slash pine
OGCY - Oak-gum-cypress
LOMA - Live oak-maritime
EACO - Elm-ash-cottonwood
LPSH - Loblolly pine-shortleaf pine
VPPT - Virginia pine-pitch pine
MPHW - Mixed pine-hardwood
OKHK - Oak-hickory
WPHM - White pine-hemlock
COVE - Cove hardwoods
MABB - Maple-beech-birch
SPFR - Spruce-fir

M - Marginal
S - Suitable
O - Optimal

Common Name	B/W[a]	Highest Habitat Quality By Vegetation Type For Any Successional Stage[b]																					
		EVGL	TROP	MANG	PSAV	SOSO	SPSO	LLSO	SHLL	SMMH	BSPO	PPPO	LLSL	OGCY	LOMA	EACO	LPSH	VPPT	MPHW	OKHK	WPHM	COVE	MABB	SPFR
Swainson's Hawk	B																							
	W		M																					
Red-tailed Hawk	B		M		M					S					M	M	M		O	O		M	M	
	W		M		M	M	M	M	M	S	M	M	M	M	M	M	S	M	O	O	M	M	M	
Ferruginous Hawk	B																							
	W														M	M	M		M	M				
Rough-legged Hawk	B																							
	W													M	M		M		S	O				
Golden Eagle	B																						M	M
	W																		M	M			S	O
Crested Caracara	B				O	M																		
	W				O	M																		
American Kestrel	B				S	M	M						M				S	M	S	S				
	W	M	O		O	S	S	S	S	M	M	M	M		O		O	M	O	O				
Merlin	B																							
	W	M	S	M	M										S									
Peregrine Falcon	B																						M	M
	W	M	S	M	M										S									
Black Francolin	B				M								M	M			M		M	M				
	W				M								M	M			M		M	M				
Ring-necked Pheasant	B														M		M	M	S	S				
	W														M		M	M	S	S				
Ruffed Grouse	B																	M	S	S	M	S	O	S
	W																	S	S	M	O	O	O	S
Wild Turkey	B		M		M		M	M	S	S			S	S	S		S		S	S		S	S	
	W		M		M		M	S	S	O			S	S	S		S		S	S	M	S	M	
Northern Bobwhite	B		M		O	S	S	S	S	M		M	S		M		O	S	O	O		M		
	W		M		O	S	S	S	S	M		M	S		M		S	S	O	O		M		
Yellow Rail	B																							
	W	S												M		M								
Black Rail	B																							
	W	M												M		M								
Clapper Rail	B														M									
	W														M									
King Rail	B	O			M									M		M								
	W	O			M									M		M								
Virginia Rail	B																							
	W	M												M		M								
Sora	B																							
	W	O												M		M								
Purple Gallinule	B	M												M										
	W	M												M										

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M - Marginal
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Common Name	B/W[a]	Highest Habitat Quality By Vegetation Type For Any Successional Stage[b]																					
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Common Moorhen	B	M												M									
	W	M												M									
American Coot	B																						
	W	M																					
Limpkin	B	S			M						S			O									
	W	S			M						S			O									
Sandhill Crane	B	M	M		O								M										
	W	M	M		S								M										
Killdeer	B				M									M		M	M						
	W				M									M		M	M						
Upland Sandpiper	B																M	M	O	O			
	W																						
Common Snipe	B																						
	W	S												S		S							
American Woodcock	B									M				S		O			S	S		M	M	M
	W		M							S		M	M	O	S	O	M		S	S				
Rock Dove	B				M	M	M	M	M	M			M		M	M	M	M	M	M				
	W				M	M	M	M	M	M			M		M	M	M	M	M	M				
White-crowned Pigeon	B		O	O		M																		
	W		O	O		M																		
White-winged Dove	B														M									
	W				M										M									
Mourning Dove	B		S		S	O	S	S	S	S		M	S	M	S	S	S	M	O	O		M	M	
	W		S		S	S	S	S	S	S	M	M	S	M	S	S	O	M	S	S		M	M	
Common Ground-Dove	B		S		M	O	O	S	M						O		O		M					
	W		S		M	O	O	S	M						O		S		M					
Black-billed Cuckoo	B															M			M	S		S	O	
	W																							
Yellow-billed Cuckoo	B		O	S		M				S				O	S	O			M	S		M		
	W																							
Mangrove Cuckoo	B		O	O																				
	W		O	O																				
Greater Roadrunner	B				S	S		S					M			S	S		S	S				
	W				S	S		S					M			S	S		S	S				
Smooth-billed Ani	B		M	S		M																		
	W		M	S		M																		
Groove-billed Ani	B																							
	W				M								M	M	M	M	M		M	M				
Common Barn-Owl	B	M	M		S	S	M	M	M	M	S	S	S		S		O	M	O	O				
	W	S	O		S	S	M	M	M	M	S	S	S		O		O	M	O	O				
Eastern Screech-Owl	B		S		S	M	M	S	S	O		M	S	S	S	S	O	M	O	O	M	S	S	
	W		S		S	M	M	S	S	O		M	S	S	S	S	O	M	O	O	M	S	S	

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Great Horned Owl	B		M		S			M	S	S		M	S	M	S	M	O	M	O	S	S	M		
	W		M		S			M	S	S		M	S	M	S	M	O	M	O	S	S	M		
Snowy Owl	B																							
	W														M	M	M	M	M	M				
Burrowing Owl	B				O	S	M	M																
	W				O	S	M	M																
Barred Owl	B		S							O				O		O				M	M	M	M	M
	W		S							O				O		O				M	M	M	M	M
Long-eared Owl	B																	M	S		O			M
	W																O	S	M		O			
Short-eared Owl	B																							
	W	M			M						M	M	M	M	S	M	M		M	M				
Northern Saw-whet Owl	B																							O
	W																O	S	M		M			M
Common Nighthawk	B																							
	W		M		M	O	O	S	S				M		M									
Chuck-will's-widow	B		M			M	S	S	M	S		M	M		S		O		O	M				
	W		O			S	S	M							M		M		S					
Whip-poor-will	B											M				M	S	S	O	S		M		
	W		S			M	M	M		M				M	O	M	S		O					
Chimney Swift	B									M				M		M				M	M	M	M	M
	W																							
Buff-bellied Hummingbird	B																							
	W														M					M				
Ruby-throated Hummingbird	B					M	M	M		S	S	M	M	S	S	O			M	S		S	M	
	W		O	M		S	M				M			M										
Black-chinned Hummingbird	B																							
	W														M					M				
Rufous Hummingbird	B																							
	W										S			S	S					M				
Belted Kingfisher	B	M	M	M						M				S	M	S				M	M			
	W	M	M	M						M				S	M	S				M	M			
Red-headed Woodpecker	B				S	M	M	S	O		M	S	O	S	M	M	M		M	S				
	W				S	M	M	M	S	M	S		S	O	M	O	M		M	S				
Red-bellied Woodpecker	B		S	S	M	M	M	S	S	O	O	M	S	O	S	O	M		S	O				
	W		S	S	M	M	M	S	S	O	O	M	S	O	S	O	M		S	O				
Yellow-bellied Sapsucker	B																			M		M	O	
	W		M	M	M	S	M	M	M	O	M	M	M	S	M	S	S	M	O	O	M	M	M	
Downy Woodpecker	B		M		M	M	M	M	M	O	S	M	M	O	S	O	S	M	O	O	M	S	M	
	W		M		M	M	M	M	M	O	S	M	M	O	S	O	S	M	O	O	M	S	M	
Hairy Woodpecker	B		M			M	M	M	M	O	S	M	S	O	M	O	M	M	S	O	S	S	O	S
	W		M			M	M	M	M	O	S	M	S	O	M	O	M	M	S	O	S	S	O	S

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Red-cockaded Woodpecker	B				S		M	S	O			M	O				S	M	M					
	W				S		M	S	O			M	O				O	M	M					
Northern (Yellow-shafted) Flicker	B		M		S	M	M	M	M	S	M	M	S	M	M	M	M	M	S	S	M	S		
	W		S		S	M	M	M	M	S	S	S	S	S	S	S	S	M	S	S	M	M		
Pileated Woodpecker	B		S	M						O	S	M	M	O	M	O	M		S	O	M	O	S	M
	W		S	M						O	S	M	M	O	M	O	M	M	S	O	M	O	S	M
Olive-sided Flycatcher	B																				M			S
	W																							
Eastern Wood-Pewee	B				M	M	M	S	O	O	S	M	O	M	M	S	O	M	O	O		S	M	
	W																							
Acadian Flycatcher	B									O	S			O		O			M	S	S	O		
	W																							
Alder Flycatcher	B																						M	S
	W																							
Willow Flycatcher	B															S				M				
	W																							
Yellow-bellied Flycatcher	B																							M
	W																							
Least Flycatcher	B															M		M		S	M	M	S	
	W		O			M	M																	
Eastern Phoebe	B													M		S				M	M	M	M	
	W		S	M	S	M	M	M	M	O	S	M	M	O	O	O	S	M	S	S	M	M		
Vermilion Flycatcher	B																							
	W				S						S			S	S	S								
Ash-throated Flycatcher	B																							
	W		M	M											M									
Great Crested Flycatcher	B		S	M	M	M	M	S	S	O	S	S	S	O	O	S	S	M	O	O		S		
	W		O	M		M					S		M	M	M									
Brown-crested Flycatcher	B																							
	W		M												M									
Western Kingbird	B																							
	W		S																					
Eastern Kingbird	B				M								M		M		M		M	M				
	W																							
Gray Kingbird	B		O	O											S									
	W																							
Scissor-tailed Flycatcher	B				S	S		S								S	S		S	S				
	W		S		S								S		S									
Horned Lark	B													M		M	M	M	M	M	M	M	M	
	W													M		M	M	M	M	M	M	M	M	
Purple Martin	B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
	W																							

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Tree Swallow	B													M		M								
	W	O	O	O	M						S	M		M	S									
Northern Rough-winged Swallow	B																							
	W	S	M	M																				
Bank Swallow	B																		M	M				
	W																							
Cliff Swallow	B															M	M	M	M	M				
	W																							
Barn Swallow	B							M	M		M	M	M	M	M	M	M	M	M	M	M	M	M	
	W																							
Blue Jay	B		S			S	S	S	S	O	S	S	S	M	S	M	S	M	O	O		S	M	
	W		S			S	S	S	S	O	S	S	S	M	S	M	S	M	O	O		S	M	
Scrub Jay	B					O	S	S							S									
	W					O	S	S							S									
American Crow	B		S			M	M	M	M	S	M	M	M	M	M	M	O	S	O	S	M	M	S	
	W		S			S	S	S	S	S	S	S	S	S	S	M	O	S	O	S	S	S	S	
Fish Crow	B	S	M	O		S	M			M	S	S	M	M	O	M	O		S					
	W	S	M	O		S	M			M	S	S	M	S	O	M	S		S					
Common Raven	B																	M	M	M	M	M	M	S
	W																	M	M	M	M	M	S	O
Black-capped Chickadee	B																		M	M	M	M	O	O
	W																	M	M	S	S	S	O	S
Carolina Chickadee	B						M	S	S	S	S	O	S	S	S	S	O	S	O	S	S	S	S	
	W						M	S	S	S	S	O	S	S	S	S	O	S	O	S	S	S	S	
Tufted Titmouse	B		M				M	M	M	O	S	M	M	O	M	S	M		O	O		O	S	
	W		M				M	M	M	O	S	M	M	O	M	S	S	M	O	O		O	S	
Red-breasted Nuthatch	B																	M			S			O
	W							M	S			M	S					O	O		S			S
White-breasted Nuthatch	B									S	M		M	S		S	M		M	O	M	O	O	
	W									S	M		M	S		S	M		M	O	M	O	O	
Brown-headed Nuthatch	B				S		S	O	O			S	O				O	M	M					
	W				S		S	O	O			S	O				O	M	M					
Brown Creeper	B															M					S		M	O
	W				M	M	M	S	S	M	M	M	S	S	M	S	O	S	O	S	S	S	M	M
Carolina Wren	B		O	M		O	S	S	M	O	O	O	M	O	O	O	S	M	O	O	M	S	M	
	W		O	M		O	S	S	M	O	O	O	M	O	O	O	S	M	O	O	M	S	M	
Bewick's Wren	B																M		M	M			M	
	W					M													M	M				
House Wren	B																			M				
	W		O	M	S	O	S	S	M	M	S	O	S	M	M	M	M		M	M				
Winter Wren	B																				S	M	M	O
	W									S	O	S		O	M	O	S	M	S	S	S	S	M	S

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Sedge Wren	B																						
	W	S			M						M	M	M	M		M							
Marsh Wren	B													M		M							
	W	M			M									M		M							
Golden-crowned Kinglet	B																				S		
	W							M	S	M		M	S	S	M	S	O	O	O	M	S			O
Ruby-crowned Kinglet	B																						
	W		S	S	M	S	S	S	S	S	S	S	S	O	O	S	O	S	O	S	M	M		S
Blue-gray Gnatcatcher	B		M			M				O	O		M	O	S	O			S	S		M		
	W		O	M		S	S	M		S	O	M		M	O	M	S		O					
Eastern Bluebird	B				O	S	S	S	S				S				M		M	M				
	W				O	S	S	S	S				S				S		M	M				
Veery	B																			M	S	S	O	S
	W																							
Swainson's Thrush	B																							O
	W																							
Hermit Thrush	B																							O
	W		S			M	M	M		O	O	S	M	S	S	O	S	M	O	S	M	M		
Wood Thrush	B									O	M			O	M	O	S		S	O	S	S	M	
	W																							
American Robin	B																M	M	M	M	M		S	O
	W		S	M		M				S	O	S		O	S	O			M	M				
Gray Catbird	B									S	S	M		S	M	O			M	M		S	O	S
	W		O	S		S	M	M		S	O	O		S	S	O			M					
Northern Mockingbird	B		M		M	M	M	M		M					M				M	M				
	W		M		M	M	M	M		M					M		M	M	M	M				
Brown Thrasher	B				M	O	S	S		O	M	M	M	S	S	S	S	S	O	O		M	M	M
	W				S	O	O	S		O	M	M	M	S	S	S	S	M	O	O				
Water Pipit	B																							
	W													S		S								
Sprague's Pipit	B																							
	W												M			M	M		M	M				
Cedar Waxwing	B															M				M		M	M	S
	W		M	M		M				S	O			M	S	S			M	S				
Loggerhead Shrike	B				S												M							
	W				S												M							
European Starling	B																		M	M				
	W		M							M	S	M		S	M	S	M		M	M				
White-eyed Vireo	B	S	O	S		S	M	M		S	O	S		S	M	O				M				
	W	S	O	O		O	M	M		M	O	M		S	M	S								
Bell's Vireo	B					S								M		S			S	S				
	W																							

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Solitary Vireo	B							M									S	M	S	M	O	O	O	O
	W		S	M		S	S	S	M	S	O	M	S	M	O	M	O		O					
Yellow-throated Vireo	B							M		S	M			S		O			M	S		M		
	W		O																					
Warbling Vireo	B															S				M				
	W																							
Red-eyed Vireo	B							M		O	S			O	M	S	M		S	O		O	M	
	W																							
Black-whiskered Vireo	B		O	O																				
	W																							
Bachman's Warbler	B										S	M		O		S								
	W																							
Blue-winged Warbler	B															M			M	O		M		
	W																							
Golden-winged Warbler	B																M		M	S		S	O	
	W																							
Orange-crowned Warbler	B																							
	W		O	M		S	M	M		M	O	M		S	S	S	M		M					
Nashville Warbler	B																							
	W																							O
Northern Parula	B									S	S			O	O	O			S	M	O	S	S	
	W		O	M		M								O	M									
Yellow Warbler	B		M	O												S						M	M	
	W		S	O		M																		
Chestnut-sided Warbler	B																		S	O	M	S	O	S
	W																							
Magnolia Warbler	B																				M			O
	W		O	M																				
Cape May Warbler	B																							
	W		O	M																				
Black-throated Blue Warbler	B																			M	S	O	O	S
	W		O	M																				
Yellow-rumped (Myrtle) Warbler	B																							
	W		M	O	M	S	S	S	M	S	O	S	M	O	O	O	S	M	O	M	M	M		
Black-throated Gray Warbler	B																							
	W										M			M	M					M				
Black-throated Green Warbler	B			M							M	S		O	M	S	M	M	S	M	O	S	S	O
	W		O																					
Blackburnian Warbler	B																			M	O	M	S	O
	W																							
Yellow-throated Warbler	B									S	S	M	M	O	S	O	S	M	S	M	M			
	W		S	M		M	M	S	M	M	S	M	O	M	O		S		S						

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Pine Warbler	B				S		S	O	O			M	O				O	M	S					
	W				S		S	O	O			M	O				O	M	S					
Prairie Warbler	B			S				S	M	S	O	S	M	M	O	M	S		O	O		M		
	W		O	S	S	O	S	M	M		S	M	M	M	S	M	M		M					
Palm Warbler	B																							
	W	M	O	S	S	O	O	S	M	M	S	M	M		S		O	M	S	M				
Cerulean Warbler	B													S		S				S		O	M	
	W																							
Black-and-white Warbler	B									M	M			M		M			M	O		O	S	
	W		O	M		M	M	M		S	O	M		O	O	S			S					
American Redstart	B									S				S		O				S		S		
	W		O	O										M		M								
Prothonotary Warbler	B									M	S	M		O		S								
	W																							
Worm-eating Warbler	B									M	M			S		M			M	S	M	O		
	W		O																					
Swainson's Warbler	B									S	O	M		O		S					S	O		
	W																							
Ovenbird	B										M			M		M	M		O	O		O	S	
	W		O			S				S	O	M		O	S	M	M		S	M				
Northern Waterthrush	B																				M			M
	W		S	O							M			S		M								
Louisiana Waterthrush	B									S				M		S			M	S	M	S		
	W																							
Kentucky Warbler	B									M	M			O		O			M	S		M		
	W																							
Mourning Warbler	B																					M	S	S
	W																							
Common Yellowthroat	B	O	S	S	M	M	M	M		M	O	S	S	O	S	O	S		S	S		M	M	M
	W	O	O	S	S	S	M	M		M	O	S	M	M	S	O	M		M	M				
Hooded Warbler	B									S	S			O	M	O	S		S	O		O	S	
	W																							
Wilson's Warbler	B																							
	W										S			S	S	S	M		M	M				
Canada Warbler	B																				O	S	S	O
	W																							
Yellow-breasted Chat	B							M				O	M	S	M	S	S		S	O		M	M	
	W		O	S		O	S	M			M				S	M			M	M				
Summer Tanager	B		M		M	M	M	O	S	O	M		S	M	S	M	S		O	O		M		
	W																							
Scarlet Tanager	B															M			S	O		O	S	
	W																							

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Western Tanager	B																							
	W														M				M	M				
Northern Cardinal	B		O	M	M	S	M	S	M	O	S	M	M	S	O	S	S	M	O	S		M	M	
	W		O	M	M	S	M	S	M	S	S	M	M	S	O	S	S	M	O	M		M	M	
Rose-breasted Grosbeak	B																			S	M	S	O	M
	W																							
Black-headed Grosbeak	B																							
	W														M					M				
Blue Grosbeak	B					S	M			S	S			M		S	S		S	O				
	W																							
Indigo Bunting	B					M		M		S	M		S	S	M	M	S		S	S		M	M	
	W		O	M		O	M				M			M	M	M								
Painted Bunting	B			M		S				M	M			M	O	M								
	W		O	M		O	M				M			M	S	M								
Dickcissel	B													M		M	M	M	M	O				
	W		M			M									M					S				
Green-tailed Towhee	B																							
	W				M	M		M					M		M		M		M	M				
Rufous-sided Towhee	B		S	M	M	O	O	O	S	O	S	S	O	M	O	S	S	M	O	O		S	M	M
	W		S	M	M	O	O	O	O	O	S	S	O	M	O	S	S	S	O	O		M		
Bachman's Sparrow	B				O		M	S	S				O				O	M	S	M				
	W				O	M	M	M	M				O		M		M		M	M				
Rufous-crowned Sparrow	B					S														M				
	W					S														M				
American Tree Sparrow	B																							
	W																M	M	O	O			M	
Chipping Sparrow	B							M	M				M				S		M	M				
	W		M		S	S	S	S	S	M			M		M		S		M	M				
Clay-colored Sparrow	B																							
	W					M		M							M	M	M		M	M				
Field Sparrow	B							M	M				S		M	M	O	S	S	O		M	M	
	W		M		M	S	S	S	S	S			S		S	M	O	S	O	O		M		
Vesper Sparrow	B																	M	M	M			S	M
	W				M	M	M	S	S	M					M		S		S	S				
Lark Sparrow	B				M	O										M	S	S	S	S				
	W		M		M	S		S	S				M		S	M	S		S	S				
Lark Bunting	B																							
	W				M	M											M		M	M				
Savannah Sparrow	B																		S	O				
	W	M	S		S	M	M	M	M	M	M	M	M	S	S	S	S	M	S	S				
Grasshopper Sparrow	B				S												O	M	O	O				
	W	M	S		O	M	M	M	M	M	M	M	S	M	M	M	O		O	O				

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Henslow's Sparrow	B																M	M	M	S				
	W				O					M	M	M	O				M		M	M				
Le Conte's Sparrow	B																							
	W				M			M	M		M	M	O	M		M	O		O	S				
Sharp-tailed Sparrow	B														M									
	W	M													M									
Seaside Sparrow	B	M													M									
	W	M													M									
Fox Sparrow	B																							
	W							M	M	S	O	S	M	M	S	S	O	M	O	M	M			
Song Sparrow	B														M	S			M	M		M	S	S
	W	M		M	M					S	S	S	M	M	M	S	S	M	S	S				
Lincoln's Sparrow	B																							
	W		M		M					M	M	M	M	M		S								
Swamp Sparrow	B																							
	W	S		M	M						M	M	M	S		S			M					
White-throated Sparrow	B																							
	W					M	M	M	M	S	O	M	M	O	S	O	M	M	S	S		S	M	
White-crowned Sparrow	B																							
	W				M	M											M	M	S	S				
Harris' Sparrow	B																							
	W					M										S	S		S	S				
Dark-eyed Junco	B																			M	S	S	O	O
	W							S	S	M	M	M	S		M		O	S	O	M	S	M	M	S
Lapland Longspur	B																							
	W														M									
Smith's Longspur	B																							
	W					M										M	M		M	M				
Chestnut-collared Longspur	B																							
	W					M											M		M	M				
Snow Bunting	B																							
	W														M									M
Bobolink	B																							
	W																M		M	S				
Red-winged Blackbird	B	O	S	O	S	M	M	M	M	M	O	S	M	O	S	O	S	M	S	S				
	W	O	O	O	M	M	M	M	M	M	O	S	M	O	M	O	M	M	M	M				
Eastern Meadowlark	B	S	M		O	M	M	M		M			M	M	M	M	O	S	O	O				
	W	S	M		O	M	M	M		M			M	M	M	M	O	S	O	O				
Western Meadowlark	B															M				M				
	W				M	M		M					M		M	M	M		M	M				
Yellow-headed Blackbird	B																							
	W				M										M	M	M		M	M				

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Rusty Blackbird	B																							
	W									M	O	M		O		S			M	M				
Brewer's Blackbird	B																							
	W																M		M	M				
Great-tailed Grackle	B				M									S	S	S	M		M	S				
	W				M									S	S	S	M		M	S				
Boat-tailed Grackle	B	O									M			M	O	M								
	W	O									M			M	O	M								
Common Grackle	B				S		M	M	M			M	M	S	S		S	M	S		M			
	W			M		M				S	S	S		S	M	S	M		M	M				
Bronzed Cowbird	B				M									M	M	M	M		M	M				
	W				M											M	M		M	M				
Brown-headed Cowbird	B					M	M	M	M	M	M	M	M	M	M	S	S	M	S	O		M	M	
	W		M			M				M	S	M		M	M	S	M		M	M				
Orchard Oriole	B					M	M	M							M	M				M				
	W																							
Spot-breasted Oriole	B				M								M											
	W				M								M											
Northern (Baltimore) Oriole	B															M				M				
	W		S																	M				
Purple Finch	B																							O
	W							M	M	M	S	M	M	S	M	O	S	S	O	S	M	M	M	M
House Finch	B																							
	W																M		M	S				
Red Crossbill	B																M	M			S			O
	W							M	M				M				S	S	M		S			O
White-winged Crossbill	B																							
	W																	M			M			O
Common Redpoll	B																							
	W															S	M	M	S	S	M	S	S	M
Pine Siskin	B																							O
	W							M	M	M	M	M	M	S	M	O	O	M	S	M	S	M	M	O
American Goldfinch	B															O	M		M	S		M	M	
	W		S	M	M	M	M	M	M	S	M	M	M	M	M	O	O	S	O	O		M	M	
Evening Grosbeak	B																							
	W							M	M		M	M	M			M	O	S	O	M	S	M	M	O
House Sparrow	B				M	M	M	M	M	M			M		M	M	M	M	M	M				
	W				M	M	M	M	M	M			M		M	M	M	M	M	M				

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Appendix C.

Summary of Published Bird Density Information in the Southeast, from Breeding Bird Censuses and Winter Bird Population Studies, 1947- 1979.

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
Pied-billed Grebe	Winter	3	1.7	0.7	1(1)	3(1)
American Anhinga	Breeding	5	0.3	0.2	1(1)	-
	Winter	3	2.3	0.7	1(1)	3(1)
American Bittern	Breeding	1	Visitor in one habitat			
	Winter	1	5.0	0	5(1)	-
Least Bittern	Breeding	2	4.5	2.5	4.5(2)	-
Great Blue Heron	Breeding	9	Visitor in nine habitats			
	Winter	11	1.0	0.1	0.5(1)	2(1)
Great Egret	Breeding	5	Visitor in four habitats			
	Winter	8	1.3	0.3	0.5(1)	3(1)
Snowy Egret	Breeding	2	Visitor in two habitats			
	Winter	2	1.0	0	1(2)	-
Little Blue Heron	Breeding	3	Visitor in two habitats			
	Winter	3	1.0	0	1(2)	-
Tricolored Heron	Breeding	1	2.0	0	1(2)	-
	Winter	2	0.8	0.25	0.5(1)	1(1)
Cattle Egret	Winter	12	2.1	0.6	0.5(2)	2.5(2)
Green-backed Heron	Breeding	26	8.4	1.6	0.6(2)	13(1)
	Winter	6	2.7	0.8	1(1)	5(1)
Black-cr. Night Heron	Breeding	2	Visitor in one habitat			
	Winter	4	9.0	5.8	1(1)	26(1)
Yellow-cr. Night Heron	Breeding	2	Visitor in two habitats			
White Ibis	Breeding	2	Visitor in two habitats			
	Winter	3	6.3	3.9	1(1)	14(1)
Wood Stork	Winter	1	1.0	0	1(1)	-
Wood Duck	Breeding	22	4.1	1.4	1.6(2)	13(3)
	Winter	5	2.1	0.8	0.5(1)	4(1)
Mallard	Winter	5	4.4	2.3	4(1)	4.5(4)
Black Duck	Winter	4	1.8	0.75	1(1)	2(3)
Mottled Duck	Breeding	1	Visitor in one habitat			
	Winter	2	1.2	0.75	0.5(1)	2(1)
Gadwall	Winter	2	1.0	0	1(1)	-

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
*Blue-winged Teal	Breeding	1	30.0	0	-	30(1)
American Wigeon	Winter	1	1.0	0	1(1)	-
Hooded Merganser	Winter	1	1.0	0	1(1)	-
Black Vulture	Breeding	5	Visitor in four habitats			
	Winter	17	1.7	0.33	0.5(1)	4(2)
Turkey Vulture	Breeding	24	Visitor in twelve habitats			
	Winter	48	1.4	0.22	0.5(3)	6(1)
Osprey	Breeding	1	Visitor in one habitat			
	Winter	2	0.5	0	0.5(1)	-
Bald Eagle	Breeding	1	Visitor in one habitat			
Northern Harrier	Winter	12	1.2	0.4	0.5(2)	2.5(2)
Sharp-shinned Hawk	Breeding	2	0.3	0.2	0.5(1)	-
	Winter	14	1.6	0.4	0.5(2)	3.5(4)
Cooper's Hawk	Breeding	9	0.4	0.3	Visit(4)	1(3)
	Winter	8	0.6	0.1	0.5(1)	1(2)
Red-shouldered Hawk	Breeding	22	0.7	0.23	0.5(3)	3.5(2)
	Winter	31	1.4	0.24	0.5(4)	5(1)
Broad-winged Hawk	Breeding	31	0.9	0.2	1(6)	3(1)
Swainson's Hawk	Winter	1	1.0	0	1(1)	-
Red-tailed Hawk	Breeding	30	0.2	0.1	Visit(7)	1(1)
	Winter	33	0.8	0.1	0.5(6)	3(1)
American Kestrel	Breeding	13	0.8	0.4	0.6(2)	1.7(3)
	Winter	36	2.4	.4	0.5(9)	6.2(4)
Merlin	Winter	5	0.6	0.1	0.5(4)	1(1)
Ruffed Grouse	Breeding	13	2.1	1.3	0.5(5)	8(3)
	Winter	4	3.0	2.3	1(1)	3.7(3)
Wild Turkey	Breeding	8	0.7	0.23	0.8(2)	2(1)
	Winter	2	0.8	0.25	0.8(2)	-
Northern Bobwhite	Breeding	109	6.7	1.0	1(4)	12(5)
	Winter	38	6.0	1.1	1(1)	15(2)
King Rail	Breeding	1	1.0	0	1(1)	-
	Winter	1	4.0	0	4(1)	-
Virginia Rail	Breeding	1	15.0	0	15(1 small plot)	

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
Sora	Winter	1	1.0	0	1(1)	-
Purple Gallinule	Breeding	4	0.3	0.22	1(1)	-
	Winter	1	4.0	0	4(1)	-
Common Moorhen	Breeding	1	12.0	0	12(1 small plot)	
	Winter	3	1.2	0.44	0.5(1)	2(1)
American Coot	Winter	4	3.1	1.0	0.5(1)	5(1)
Limpkin	Breeding	3	0.2	0.13	0.5(1)	-
	Winter	2	2.0	1.0	1(1)	3(1)
Sandhill Crane	Breeding	1	Visitor in one habitat			
	Winter	3	0.8	0.17	0.5(1)	1(2)
Killdeer	Breeding	6	0.7	0.2	1(4)	-
	Winter	21	14.9	8.1	2.5(13)	66(4)
Greater Yellowlegs	Winter	1	1.0	0	1(1)	-
Lesser Yellowlegs	Winter	1	0.5	0	0.5(1)	-
Common Snipe	Winter	9	2.7	1.0	0.5(1)	7.5(2)
American Woodcock	Breeding	15	8.8	1.8	0.6(2)	7.5(8)
	Winter	4	1.0	0	1(3)	-
Black-headed Gull	Winter	1	1.0	0	1(1)	-
Ring-billed Gull	Breeding	1	Visitor in one habitat			
	Winter	11	36.2	19.2	0.5(3)	127(3)
Herring Gull	Winter	2	Visitor in two habitats			
Rock Dove	Winter	13	28.5	8.6	1(1)	85(2)
White-winged Dove	Winter	1	1.0	0	1(1)	-
Mourning Dove	Breeding	112	7.3	1.0	0.7(13)	11(3)
	Winter	93	24.6	3.8	1(1)	70(9)
Common Ground-Dove	Breeding	6	2.7	1.5	1(2)	6(2)
	Winter	10	4.0	1.4	1(2)	6(4)
Black-billed Cuckoo	Breeding	4	Visitor in two habitats			
Yellow-billed Cuckoo	Breeding	101	6.1	0.6	0.4(3)	8.5(6)
Smooth-billed Ani	Winter	3	16.0	4.0	16(3)	-
Common Barn-Owl	Breeding	2	1.0	0	1(2)	-
	Winter	1	1.0	0	1(1)	-

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
Eastern Screech-Owl	Breeding	60	2.3	0.4	Visit(4)	2.8(5)
	Winter	16	2.1	0.27	0.5(1)	2.5(1)
Great Horned Owl	Breeding	26	0.4	0.1	0.3(18)	1(1)
	Winter	13	1.0	1(13 plots, 5 habitats)		
Barred Owl	Breeding	50	1.3	0.17	Visit(3)	1.7(28)
	Winter	28	1.9	0.2	1(1)	2.4(17)
Short-eared Owl	Winter	1	4.0	0	4(1)	-
Northern Saw-whet Owl	Breeding	1	Visitor in one habitat			
Common Nighthawk	Breeding	14	1.2	0.6	Visit(5)	3.5(4)
Chuck-will's-widow	Breeding	28	2.7	0.63	0.3(2)	7(1)
	Winter	2	0.5	0	0.5(1)	-
Whip-poor-will	Breeding	32	2.2	0.25	1.9(6)	3.7(3)
	Winter	6	1.1	0.2	0.5(1)	2(1)
Chimney Swift	Breeding	51	0.8	0.4	Visit(16)	14(2)
Ruby-thr. Hummingbird	Breeding	64	3.8	0.53	Visit(7)	5.4(5)
	Winter	6	3.0	0.8	0.5(1)	4.2(4)
Belted Kingfisher	Breeding	15	0.2	0.06	Visit(6)	0.6(2)
	Winter	15	1.6	0.4	0.5(1)	5(1)
Red-headed Woodpecker	Breeding	16	2.3	0.43	1(1)	4(2)
	Winter	4	1.8	1.1	0.5(2)	5(1)
Red-bellied Woodpecker	Breeding	116	6.9	0.5	1(2)	12(4)
	Winter	84	5.6	0.55	0.5(5)	26(1)
Yellow-bellied Sapsucker	Breeding	1	Visitor in one habitat			
	Winter	59	3.2	0.43	0.5(1)	16(1)
Downy Woodpecker	Breeding	134	4.2	0.36	0.3(4)	8.7(3)
	Winter	92	2.8	0.21	0.6(8)	8(1)
Hairy Woodpecker	Breeding	73	3.2	0.36	0.7(3)	10(2)
	Winter	43	2.2	0.24	1(1)	5(3)
Red-cockaded Woodpecker	Breeding	4	1.0	0.39	0.6(2)	1.5(2)
	Winter	1	2.0	0	2(1)	-
Northern Flicker	Breeding	127	4.2	0.44	0.5(5)	6(4)
	Winter	68	3.5	0.7	0.5(14)	10(3)
Pileated Woodpecker	Breeding	89	2.1	0.26	0.5(1)	7.2(10)
	Winter	49	2.4	0.24	0.6(2)	5.5(2)

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
Eastern Wood-Pewee	Breeding	98	7.4	0.52	1.4(3)	11(3)
Acadian Flycatcher	Breeding	102	14.5	1.45	1(1)	43(10)
*Willow Flycatcher	Breeding	22	31.9	3.8	0.7(3)	39(18)
*Least Flycatcher	Breeding	3	10.0	5.0	Visit(1)	15(2)
	Winter	3	1.0	0	1(3)	-
Eastern Phoebe	Breeding	25	4.8	1.1	0.6(2)	9(2)
	Winter	36	2.3	0.6	1(1)	14(2)
Great Crested Flycatcher	Breeding	135	5.6	0.56	2(3)	25(4)
	Winter	4	2.4	1.5	0.5(1)	7.3(6)
Eastern Kingbird	Breeding	25	3.8	1.1	Visit(3)	10(3)
Gray Kingbird	Breeding	1	Visitor in one habitat			
Horned Lark	Breeding	6	1.8	0.17	1.8(6)	-
	Winter	20	36.2	13.7	3.7(10)	96(7)
Purple Martin	Breeding	10	Visitor in nine habitats			
	Winter	1	1.0	0	1(1)	-
Tree Swallow	Winter	11	11.4	2.3	1(1)	17(4)
North. Rough-winged Swallow	Breeding	26	0.1	0.03	Visit(6)	0.2(9)
Barn Swallow	Breeding	33	0.7	0.43	Visit(7)	10(2)
Blue Jay	Breeding	138	6.8	0.47	1(1)	16(1)
	Winter	86	9.6	1.5	0.5(4)	62(1)
Scrub Jay	Breeding	3	6.7	1.7	5(1)	7.5(2)
	Winter	3	25.0	2.9	20(1)	28(2)
American Crow	Breeding	94	1.7	0.36	0.3(8)	8(1)
	Winter	97	26.4	4.5	1(1)	66(29)
Fish Crow	Breeding	34	0.6	0.4	0.4(3)	13(1)
	Winter	27	10.9	4.3	0.4(3)	68(3)
Common Raven	Breeding	7	Visitor in four habitats			
	Winter	1	0.5	0	0.5(1)	-
Black-capped Chickadee	Breeding	5	2.8	1.5	Visit(2)	7(1)
	Winter	2	4.0	1.0	3(1)	5(1)
Carolina Chickadee	Breeding	137	9.2	0.6	1(2)	16(10)
	Winter	83	11.8	1.2	1(1)	24(1)

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
Eastern Tufted Titmouse	Breeding	143	12.1	0.7	1(1)	23(5)
	Winter	87	10.2	1.0	0.5(1)	20(1)
Red-breasted Nuthatch	Breeding	5	14.4	2.3	10(1)	17(2)
	Winter	21	3.2	1.0	0.5(1)	3.8(13)
White-breasted Nuthatch	Breeding	79	4.7	0.5	1(1)	6.5(25)
	Winter	53	3.3	0.28	1(1)	4.4(17)
Brown-headed Nuthatch	Breeding	18	4.5	1.5	1(1)	12(2)
	Winter	9	2.7	0.7	1(1)	5.5(2)
Brown Creeper	Breeding	10	5.4	1.4	Visit(1)	8(2)
	Winter	53	2.5	0.27	1(1)	7(1)
Carolina Wren	Breeding	155	16.8	1.2	1(1)	43(3)
	Winter	93	6.0	0.84	1(1)	48(1)
Bewick's Wren	Winter	1	0.5	0	0.5(1)	-
House Wren	Breeding	14	7.9	2.1	1(1)	16(2)
	Winter	14	5.0	1.8	0.5(1)	5.5(2)
Winter Wren	Breeding	3	22.7	11.3	Visit(1)	34(2)
	Winter	36	2.8	0.46	1(6)	5.3(3)
Marsh Wren	Winter	1	5.0	0	5(1)	-
Golden-crowned Kinglet	Breeding	2	50.0	0	-	50(2)
	Winter	61	5.9	1.2	0.5(1)	28(1)
Ruby-crowned Kinglet	Winter	52	11.1	2.2	0.5(1)	70(1)
Blue-gray Gnatcatcher	Breeding	96	10.0	1.3	0.7(3)	37(3)
	Winter	18	20.7	6.8	1(4)	98(1)
Eastern Bluebird	Breeding	28	3.2	0.5	0.6(2)	6(2)
	Winter	43	3.8	0.82	0.8(10)	13(1)
Veery	Breeding	9	12.9	3.7	Visit(2)	20(1)
Hermit Thrush	Winter	59	2.9	0.32	0.5(1)	8.5(2)
Wood Thrush	Breeding	114	14.2	1.0	1.0(2)	41(3)
American Robin	Breeding	101	14.2	2.8	0.5(16)	12(2)
	Winter	94	18.7	4.6	0.5(1)	190(2)
*Gray Catbird	Breeding	89	17.0	2.9	1(1)	67(18)
	Winter	11	20.4	5.9	1(2)	53(1)

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
Northern Mockingbird	Breeding	62	5.0	0.9	0.6(11)	22(1)
	Winter	56	5.8	1.0	0.5(2)	18(2)
*Brown Thrasher	Breeding	97	6.0	0.8	0.6(2)	22(13)
	Winter	26	5.3	1.2	0.5(1)	18(3)
Water Pipit	Winter	5	19.0	18.2	0.8(2)	92(1)
*Cedar Waxwing	Breeding	9	2.5	1.6	1(2)	15(1)
	Winter	22	33.3	18.1	3(2)	147(3)
Loggerhead Shrike	Breeding	8	0.7	0.6	Visit(5)	5(1)
	Winter	25	2.3	0.5	0.5(10)	6.2(4)
European Starling	Breeding	39	5.8	1.3	0.7(12)	28(2)
	Winter	61	85.6	16.4	2(2)	148(28)
White-eyed Vireo	Breeding	65	10.7	1.4	2(1)	28(5)
	Winter	17	4.8	1.2	1(4)	17(1)
Bell's Vireo	Breeding	1	1.0	0	1(1)	-
Solitary Vireo	Breeding	24	8.6	2.3	3.0(1)	28(2)
	Winter	12	1.6	0.67	0.5(1)	9(1)
Yellow-throated Vireo	Breeding	83	5.1	0.51	0.3(2)	9.8(4)
Red-eyed Vireo	Breeding	142	22.7	1.7	1(1)	60(11)
Black-whiskered Vireo	Breeding	1		Visitor in one habitat		
Blue-winged Warbler	Breeding	1		Visitor in one habitat		
Golden-winged Warbler	Breeding	2	14.5	5.5	-	14(2)
Orange-crowned Warbler	Winter	12	1.4	0.37	1(3)	5(1)
Northern Parula Warbler	Breeding	71	13.7	2.5	3.4(5)	44(2)
	Winter	2	11.0	1.0	-	12(1)
*Yellow Warbler	Breeding	26	40.4	6.2	1(1)	57(18)
Chestnut-sided Warbler	Breeding	13	11.9	3.4	6(1)	36(2)
Black-thr. Blue Warbler	Breeding	14	35.5	9.3	3(1)	56(2)
Yellow-rumped Warbler	Winter	59	29.4	9.2	1(3)	413(1)
Black-thr. Green Warbler	Breeding	14	25.7	5.2	7(2)	44(2)
Blackburnian Warbler	Breeding	12	17.2	4.8	6(2)	44(2)
Yellow-throated Warbler	Breeding	41	5.1	0.91	1.7(3)	25(1)
	Winter	13	4.4	1.6	0.5(1)	20(1)

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
Pine Warbler	Breeding	59	8.9	1.2	1(1)	30(3)
	Winter	21	12.3	2.4	1(2)	35(1)
Prairie Warbler	Breeding	28	14.6	3.2	1(2)	43(5)
	Winter	5	1.8	0.84	0.5(1)	5(1)
Palm Warbler	Winter	28	5.8	1.4	0.5(1)	33(1)
Cerulean Warbler	Breeding	6	9.8	1.4	-	10(6)
Black-and-white Warbler	Breeding	58	10.4	1.3	1(3)	19(11)
	Winter	17	3.6	0.94	1(2)	10(2)
American Redstart	Breeding	32	8.7	2.8	2.7(5)	87(1)
	Winter	2	2.5	1.5	1(1)	4(1)
Prothonotary Warbler	Breeding	14	14.9	3.9	6(2)	28(4)
Swainson's Warbler	Breeding	14	8.5	2.1	3(2)	17(2)
Worm-eating Warbler	Breeding	26	13.8	2.8	2.9(4)	30(10)
Ovenbird	Breeding	88	12.8	1.4	1.5(2)	24(3)
	Winter	5	4.0	1.3	2.5(2)	6(2)
Northern Waterthrush	Winter	1	0.5	0	0.5(1)	-
Louisiana Waterthrush	Breeding	45	5.6	0.82	3(1)	15(4)
Kentucky Warbler	Breeding	41	4.8	0.56	1(1)	8.5(2)
*Common Yellowthroat	Breeding	73	14.6	2.0	0.6(2)	41(18)
	Winter	19	12.1	3.1	0.5(1)	49(1)
Hooded Warbler	Breeding	77	16.0	1.8	2(2)	47(10)
Canada Warbler	Breeding	9	28.9	7.8	5(1)	60(2)
*Yellow-breasted Chat	Breeding	56	17.0	2.3	1(3)	32(17)
Summer Tanager	Breeding	87	6.1	0.6	0.6(2)	22(5)
Scarlet Tanager	Breeding	80	8.2	0.64	1(1)	19(3)
Northern Cardinal	Breeding	179	23.4	1.6	0.5(1)	41(2)
	Winter	108	9.3	1.4	0.5(1)	54(2)
Rose-breasted Grosbeak	Breeding	10	9.2	4.0	2.7(3)	43(1)
	Winter	1	1.0	0	1(1)	-
Blue Grosbeak	Breeding	29	4.4	1.0	0.3(5)	5.4(5)
Indigo Bunting	Breeding	87	12.4	1.4	0.7(9)	32(2)
	Winter	5	8.6	2.7	1(1)	10(4)

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
Painted Bunting	Breeding	12	3.3	1.1	Visit(2)	9(2)
	Winter	5	18.3	5.5	0.5(1)	23(4)
Rufous-sided Towhee	Breeding	121	15.9	1.4	2(2)	65(2)
	Winter	62	14.8	2.8	0.5(1)	85(1)
Bachman's Sparrow	Breeding	10	5.2	1.5	2(2)	10(2)
	Winter	1	1.0	0	1(1)	-
American Tree Sparrow	Winter	7	11.8	6.1	0.5(1)	45(1)
Chipping Sparrow	Breeding	25	6.8	1.8	1(2)	26(2)
	Winter	4	7.2	5.9	1(1)	25(1)
Field Sparrow	Breeding	58	17.4	2.4	1.1(13)	51(7)
	Winter	50	7.1	1.0	3.2(11)	19(6)
Vesper Sparrow	Breeding	4	0.6	0.48	Visit(2)	1(2)
	Winter	3	15.7	14.2	1(1)	23(2)
Savannah Sparrow	Winter	13	8.9	4.1	1.2(6)	47(1)
Grasshopper Sparrow	Breeding	17	6.6	1.5	2(2)	16(4)
Henslow's Sparrow	Breeding	2	0.6	0.45	1(1)	-
Fox Sparrow	Winter	33	7.7	2.0	1(1)	18(9)
*Song Sparrow	Breeding	62	12.3	2.1	1.1(5)	35(18)
	Winter	67	8.4	1.8	1(1)	28(8)
Swamp Sparrow	Winter	10	6.8	4.6	0.5(1)	47(1)
White-throated Sparrow	Winter	78	16.3	3.1	1(1)	100(3)
White-crowned Sparrow	Winter	9	0.7	0.18	Visit(1)	0.8(8)
Dark-eyed Junco	Breeding	10	27.0	8.9	6(1)	71(2)
	Winter	65	7.7	1.6	1(1)	83(1)
Bobolink	Breeding	3	1.0	0	1(3)	-
Red-winged Blackbird	Breeding	58	13.0	2.3	0.5(15)	53(3)
	Winter	35	17.1	5.0	1(2)	29(1)
Eastern Meadowlark	Breeding	36	5.7	0.76	0.6(2)	20(2)
	Winter	44	16.0	3.1	2.5(2)	29(11)
Rusty Blackbird	Winter	11	2.7	0.92	1(1)	3.1(9)
Boat-tailed Grackle	Breeding	3	1.7	1.6	Visit(2)	5(1)
	Winter	14	10.9	4.6	1(1)	44(2)

Species	Season	Total sample[a]			Density range[b]	
		N	Mean	S. E.	Low	High
		Breeding: pairs/40 ha; Winter: birds/40ha				
*Common Grackle	Breeding	107	15.5	3.2	0.2(15)	41(16)
	Winter	23	10.2	4.8	0.8(2)	87(1)
Brown-headed Cowbird	Breeding	73	5.1	0.72	0.4(3)	19(1)
	Winter	6	8.0	3.6	2(1)	9.5(2)
*Orchard Oriole	Breeding	16	6.2	1.5	1(2)	15(4)
Spotted Oriole	Winter	7	2.0	0.65	1.8(5)	2.5(2)
Northern Oriole	Breeding	9	1.0	0.57	Visit(3)	4(2)
	Winter	1	1.0	0	1(1)	-
Purple Finch	Winter	54	7.6	1.3	0.6(2)	15(3)
House Finch	Winter	2	1.0	0	1(1)	-
Red Crossbill	Breeding	2	Visitor in two habitats			
Common Redpoll	Winter	1	0.5	0	0.5(1)	-
Pine Siskin	Winter	8	3.4	1.3	1(1)	10(1)
American Goldfinch	Breeding	71	5.2	0.84	0.3(5)	10(2)
	Winter	74	4.9	0.84	0.5(1)	33(1)
Evening Grosbeak	Winter	15	6.2	5.3	1(1)	11(8)
House Sparrow	Breeding	11	12.3	5.1	0.7(3)	44(2)
	Winter	30	23.2	5.0	1(1)	70(2)

[a] Total Sample includes all censuses made in forested habitats in Florida, Georgia, North Carolina, South Carolina, and Virginia 1947-1979 that were published in Audubon Field Notes or in American Birds.

[b] Entries are listed as "Average density (No. of censuses)". Each entry indicates the mean and sample size of censuses recorded from a single habitat (a vegetation type-successional stage combination) for a single bird species in a single season.

* Species with asterisks:
High density figure exaggerated because it was recorded on a small 2.5 ha (6.3 acre) plot of poletimber Elm-ash-cottonwood surrounded by agricultural fields near North Wilkesboro, N. C.

Appendix D.

Species Associations (Guilds) by Nest Sites, by Foraging Substrates and Behavior, and by Diets.

D-1. Species Associations by Nest Sites.

Nest site category	Category no.
Behind loose bark	D-1.1.
Burrows	D-1.2.
Bushes (or shrubs)	D-1.3.
Cavities	D-1.4.
Ground or ground covering vegetation	D-1.5.
Ledges	D-1.6.
Trees	D-1.7.
Vertical surfaces	D-1.8.

D-1.1. Nests placed behind loose bark.

Brown Creeper

D-1.2. Nests placed in burrows.

Burrowing Owl
Belted Kingfisher
Northern Rough-winged Swallow
Bank Swallow

D-1.3. Nests placed in bushes.

Brown Pelican
Olivaceous Cormorant
Anhinga
Magnificent Frigatebird
Snowy Egret
Little Blue Heron
Tricolored Heron
Reddish Egret
Cattle Egret
Green-backed Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
White Ibis
Glossy Ibis
White-faced Ibis
Roseate Spoonbill
Snail Kite
Crested Caracara
Limpkin
White-crowned Pigeon
White-winged Dove
Mourning Dove
Common Ground-Dove
Black-billed Cuckoo
Mangrove Cuckoo
Greater Roadrunner
Smooth-billed Ani
Groove-billed Ani
Ruby-throated Hummingbird
Alder Flycatcher
Willow Flycatcher
Gray Kingbird
Scissor-tailed Flycatcher
Scrub Jay
Fish Crow
Swainson's Thrush
Wood Thrush
American Robin
Gray Catbird
Northern Mockingbird
Brown Thrasher
Loggerhead Shrike
White-eyed Vireo
Bell's Vireo
Solitary Vireo
Black-whiskered Vireo
Bachman's Warbler
Yellow Warbler

Chestnut-sided Warbler
Magnolia Warbler
Black-throated Blue Warbler
Prairie Warbler
Swainson's Warbler
Common Yellowthroat
Hooded Warbler
Yellow-breasted Chat
Northern Cardinal
Rose-breasted Grosbeak
Blue Grosbeak
Indigo Bunting
Painted Bunting
Rufous-sided Towhee
Chipping Sparrow
Field Sparrow
Lark Sparrow
Song Sparrow
Swamp Sparrow
Red-winged Blackbird
Great-tailed Grackle
Boat-tailed Grackle
Common Grackle
Bronzed Cowbird
Brown-headed Cowbird
House Finch

D-1.4. Nests placed in cavities.

Wood Duck
Hooded Merganser
Black Vulture
Turkey Vulture
American Kestrel
Common Barn-Owl
Eastern Screech-Owl
Barred Owl
Northern Saw-whet Owl
Red-headed Woodpecker
Red-bellied Woodpecker
Yellow-bellied Sapsucker
Downy Woodpecker
Hairy Woodpecker
Red-cockaded Woodpecker
Northern (Yellow-shafted) Flicker
Pileated Woodpecker
Great Crested Flycatcher
Purple Martin
Tree Swallow
Black-capped Chickadee
Carolina Chickadee
Tufted Titmouse
Red-breasted Nuthatch
White-breasted Nuthatch
Brown-headed Nuthatch
Brown Creeper
Carolina Wren
Bewick's Wren
House Wren
Eastern Bluebird
European Starling
Prothonotary Warbler
House Sparrow

D-1.5. Nests placed on ground or in ground covering vegetation.

Pied-billed Grebe
Brown Pelican
Olivaceous Cormorant
American Bittern
Least Bittern
Mallard
Black Vulture
Turkey Vulture
Snail Kite
Northern Harrier
Black Francolin
Ring-necked Pheasant
Ruffed Grouse
Wild Turkey
Northern Bobwhite
Black Rail
Clapper Rail
King Rail
Virginia Rail
Sora
Purple Gallinule
Common Moorhen
American Coot
Limpkin
Sandhill Crane
Killdeer
Upland Sandpiper
American Woodcock
White-winged Dove
Common Ground-Dove
Greater Roadrunner
Short-eared Owl
Common Nighthawk
Chuck-will's-widow

Whip-poor-will
Yellow-bellied Flycatcher
Horned Lark
Carolina Wren
Winter Wren
Sedge Wren
March Wren
Veery
Hermit Thrush
Blue-winged Warbler
Golden-winged Warbler
Nashville Warbler
Black-and-white Warbler
Worm-eating Warbler
Ovenbird
Northern Waterthrush
Louisiana Waterthrush
Kentucky Warbler
Mourning Warbler
Common Yellowthroat
Canada Warbler
Dickcissel
Rufous-sided Towhee
Bachman's Sparrow
Rufous-crowned Sparrow
Field Sparrow
Vesper Sparrow
Lark Sparrow
Savannah Sparrow
Grasshopper Sparrow
Henslow's Sparrow
Sharp-tailed Sparrow
Seaside Sparrow
Song Sparrow
Swamp Sparrow
Dark-eyed Junco
Bobolink
Red-winged Blackbird
Eastern Meadowlark
Western Meadowlark
Great-tailed Grackle

D-1.6. Nests placed on ledges.

Black Vulture
Turkey Vulture
Osprey
Golden Eagle
Peregrine Falcon
Rock Dove
Common Barn-Owl
Common Nighthawk
Eastern Phoebe
Barn Swallow
Common Raven
Carolina Wren
Bewick's Wren
European Starling
House Sparrow

D-1.7. Nests placed in trees.

Double-crested Cormorant
Olivaceous Cormorant
Anhinga
Great Blue Heron
Great Egret
Snowy Egret
Little Blue Heron
Tricolored Heron
Reddish Egret
Cattle Egret
Green-backed Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
White Ibis
Glossy Ibis
White-faced Ibis
Roseate Spoonbill
Wood Stork
Osprey
American Swallow-tailed Kite
Black-shouldered Kite
Mississippi Kite
Bald Eagle
Sharp-shinned Hawk
Cooper's Hawk
Red-shouldered Hawk
Broad-winged Hawk
Short-tailed Hawk
Red-tailed Hawk
White-crowned Pigeon
Mourning Dove
Black-billed Cuckoo
Yellow-billed Cuckoo
Mangrove Cuckoo
Smooth-billed Ani
Groove-billed Ani

Great Horned Owl
Long-eared Owl
Ruby-throated Hummingbird
Olive-sided Flycatcher
Eastern Wood-Pewee
Acadian Flycatcher
Least Flycatcher
Eastern Kingbird
Gray Kingbird
Scissor-tailed Flycatcher
Blue Jay
American Crow
Fish Crow
Golden-crowned Kinglet
Blue-gray Gnatcatcher
Cedar Waxwing
Loggerhead Shrike
Solitary Vireo
Yellow-throated Vireo
Warbling Vireo
Red-eyed Vireo
Black-whiskered Vireo
Northern Parula
Magnolia Warbler
Black-throated Green Warbler
Blackburnian Warbler
Yellow-throated Warbler
Pine Warbler
Cerulean Warbler
American Redstart
Summer Tanager
Scarlet Tanager
Rose-breasted Grosbeak
Chipping Sparrow
Great-tailed Grackle
Boat-tailed Grackle
Common Grackle
Bronzed Cowbird
Brown-headed Cowbird
Orchard Oriole
Spot-breasted Oriole
Northern (Baltimore) Oriole
Purple Finch
House Finch
Red Crossbill

D-2. Species Associations by Foraging Substrate and Behavior.

Categories are listed alphabetically. In this introductory dictionary to the lists, categories are cross-referenced both by technique and by substrate. Numbers in the cross-references indicate where in the appendix a particular category can be found.

Foraging substrate and behavioral category	Category no.
aerial piracy over marine habitats	D-2.1.
airborne prey, capturing during sustained flight.	D-2.2.
bushes, gleaning in.	D-2.9.
bushes, hawking from.	D-2.16.
bushes, probing in.	D-2.24.
canopies of trees, gleaning in.	D-2.12.
canopies of trees, probing in various substrates in.	D-2.25.
capturing airborne prey during sustained flight.	D-2.2.
crepuscular.	D-2.3.
diurnal.	D-2.4.
diving from the surface of water.	D-2.5.
filter-feeding in water.	D-2.6.
foliage of trees, gleaning from the.	D-2.10.
gleaning at various heights.	D-2.7.
gleaning from the water surface.	D-2.8.
gleaning in bushes.	D-2.9.
gleaning in foliage of trees.	D-2.10.
gleaning in herbaceous vegetation.	D-2.11.
gleaning in tree canopies.	D-2.12.
gleaning on the ground.	D-2.13.
gleaning on trunks of trees.	D-2.14.
ground, gleaning on the.	D-2.13.
ground, pouncing onto the.	D-2.21.
ground, probing into the.	D-2.28.
ground, stalking on the.	D-2.36.
habitats, SEE marine habitats, terrestrial habitats	
hawking at various heights.	D-2.15.
hawking from bushes.	D-2.16.
hawking from trees.	D-2.17.
herbaceous vegetation, gleaning in.	D-2.11.
herbaceous vegetation, pouncing into.	D-2.20.
herbaceous vegetation, probing into.	D-2.27.
herbaceous vegetation, soaring over.	D-2.30.
herbaceous vegetation, stalking in.	D-2.34.
hovering.	D-2.18.
marine habitats, aerial piracy over.	D-2.1.
nocturnal.	D-2.19.
piracy, aerial, over marine habitats.	D-2.1.
plunging or pouncing into water.	D-2.23.
pouncing into herbaceous vegetation.	D-2.20.
pouncing onto the ground.	D-2.21.
pouncing onto various substrates.	D-2.22.
pouncing or plunging into water.	D-2.23.
probing in bushes.	D-2.24.
probing in various substrates in tree canopies.	D-2.25.
probing in water.	D-2.26.
probing into herbaceous vegetation.	D-2.27.

probing into the ground. D-2.28.
probing into trunks of trees. D-2.29.
soaring over herbaceous vegetation. D-2.30.
soaring over terrestrial habitats. D-2.31.
soaring over various substrates. D-2.32.
soaring over water. D-2.33.
stalking in herbaceous vegetation. D-2.34.
stalking in water. D-2.35.
stalking on the ground. D-2.36.
substrates, SEE various substrates
sustained flight, capturing airborne prey during. D-2.2.
terrestrial habitats, soaring over. D-2.31.
trees, gleaning from the foliage of. D-2.10.
trees, gleaning in canopies of. D-2.12.
trees, gleaning on trunks of. D-2.14.
trees, hawking from. D-2.17.
trees, probing into trunks of. D-2.29.
trees, probing in various substrates in canopies. D-2.25.
trunks of trees, gleaning on. D-2.14.
trunks of trees, probing into. D-2.29.
various heights, gleaning at. D-2.7.
various heights, hawking at. D-2.15.
various substrates in tree canopies, probing in. D-2.25.
various substrates, pouncing onto. D-2.22.
various substrates, soaring over. D-2.32.
water, diving from the surface of. D-2.5.
water, filter-feeding in. D-2.6.
water, probing in. D-2.26.
water, soaring over. D-2.33.
water, stalking in. D-2.35.
water surface, diving from. D-2.5.
water surface, gleaning from the. D-2.8.

D-2.1. Foraging by aerial piracy over marine habitats.

Magnificent Frigatebird

D-2.2. Foraging by capturing airborne prey during sustained flight.

American Swallow-tailed Kite
Mississippi Kite
Sharp-shinned Hawk
Cooper's Hawk
Whip-poor-will
Chimney Swift
Purple Martin
Tree Swallow
Northern Goshawk
Merlin
Peregrine Falcon
Common Nighthawk
Chuck-will's-widow
Northern Rough-winged Swallow
Bank Swallow
Cliff Swallow
Barn Swallow

D-2.3. Crepuscular.

American Woodcock
Common Nighthawk

D-2.4. Diurnal.

All species save those listed as "Crepuscular" or "Nocturnal," with the exception of Snowy Owl, which is active both by day and by night.

D-2.5. Foraging by diving from the surface of water.

Pied-billed Grebe
Double-crested Cormorant
Olivaceous Cormorant
American Anhinga
Wood Duck
Hooded Merganser
American Coot

D-2.6. Foraging by filter-feeding in water.

Roseate Spoonbill

D-2.7. Foraging by gleaning at various heights.

Black-chinned Hummingbird
Yellow-rumped Warbler
Western Tanager
American Goldfinch
Common Redpoll

D-2.8. Foraging by gleaning from the water surface.

American Bittern
Least Bittern
Glossy Ibis
White-faced Ibis
Roseate Spoonbill
Wood Stork
Wood Duck
Mallard
Clapper Rail
King Rail
Virginia Rail
Sora
Purple Gallinule
Common Moorhen
American Coot
Limpkin
Sandhill Crane
Northern Waterthrush
Louisiana Waterthrush
Great-tailed Grackle
Boat-tailed Grackle

D-2.9. Foraging by gleaning in bushes.

Ruffed Grouse
Groove-billed Ani
Buff-bellied Hummingbird
Rufous Hummingbird
Vermilion Flycatcher
Yellow-bellied Flycatcher
Ash-throated Flycatcher
Carolina Wren
Bewick's Wren
House Wren
Ruby-crowned Kinglet
Hermit Thrush
American Robin
Gray Catbird
Northern Mockingbird
Brown Thrasher
Cedar Waxwing
White-eyed Vireo
Bell's Vireo
Bachman's Warbler
Blue-winged Warbler
Golden-winged Warbler
Orange-crowned Warbler
Nashville Warbler
Yellow Warbler
Chestnut-sided Warbler
Magnolia Warbler
Cape May Warbler
Black-throated Blue Warbler
Black-throated Gray Warbler
Prairie Warbler
Palm Warbler
Prothonotary Warbler
Worm-eating Warbler
Mourning Warbler
Common Yellowthroat

Hooded Warbler
Wilson's Warbler
Canada Warbler
Yellow-breasted Chat
Northern Cardinal
Blue Grosbeak
Indigo Bunting
Painted Bunting
Green-tailed Towhee
Rufous-sided Towhee
Clay-colored Sparrow
White-throated Sparrow
Harris' Sparrow
House Finch
Pine Siskin

D-2.10. Foraging by gleaning in foliage of trees.

White-crowned Pigeon
Black-billed Cuckoo
Yellow-billed Cuckoo
Mangrove Cuckoo
Golden-crowned Kinglet
Ruby-crowned Kinglet
Blue-gray Gnatcatcher
Cedar Waxwing
Solitary Vireo
Yellow-throated Vireo
Warbling Vireo
Red-eyed Vireo
Black-whiskered Vireo
Bachman's Warbler
Northern Parula
Magnolia Warbler
Cape May Warbler
Black-throated Blue Warbler
Yellow-rumped (Myrtle) Warbler
Black-throated Gray Warbler
Black-throated Green Warbler
Blackburnian Warbler
Yellow-throated Warbler
Pine Warbler
Cerulean Warbler
American Redstart
Wilson's Warbler
Summer Tanager
Scarlet Tanager
Rose-breasted Grosbeak
Black-headed Grosbeak
Orchard Oriole
Spot-breasted Oriole
Northern (Baltimore) Oriole
Purple Finch
Red Crossbill
White-winged Crossbill
Pine Siskin
Evening Grosbeak

D-2.11. Foraging by gleaning in herbaceous vegetation.

American Bittern
Least Bittern
Black Francolin
Ring-necked Pheasant
Northern Bobwhite
Yellow Rail
Black Rail
Clapper Rail
King Rail
Virginia Rail
Sora
Purple Gallinule
Common Moorhen
Upland Sandpiper
Greater Roadrunner
Groove-billed Ani
Buff-bellied Hummingbird
Rufous Hummingbird
Vermilion Flycatcher
Bewick's Wren
Sedge Wren
Marsh Wren
Sprague's Pipit
Bell's Vireo
Orange-crowned Warbler
Palm Warbler
Mourning Warbler
Common Yellowthroat
Blue Grosbeak
Indigo Bunting
Painted Bunting
Dickcissel
Green-tailed Towhee
Bachman's Sparrow
American Tree Sparrow
Clay-colored Sparrow
Field Sparrow
Vesper Sparrow
Lark Sparrow
Lark Bunting
Savannah Sparrow
Grasshopper Sparrow

Henslow's Sparrow
Le Conte's Sparrow
Sharp-tailed Sparrow
Seaside Sparrow
Song Sparrow
Lincoln's Sparrow
Swamp Sparrow
White-crowned Sparrow
Smith's Longspur
Bobolink
Chestnut-collared Longspur
Red-winged Blackbird
Eastern Meadowlark
Western Meadowlark
Yellow-headed Blackbird
Bronzed Cowbird
House Finch
Great-tailed Grackle

D-2.12. Foraging by gleaning in tree canopies.

Ash-throated Flycatcher
Blue Jay
Black-capped Chickadee
Carolina Chickadee
Tufted Titmouse
Red-breasted Nuthatch
Brown-headed Nuthatch
American Robin
Swainson's Thrush
Hooded Warbler
Harris' Sparrow

D-2.13. Foraging by gleaning on the ground.

Cattle Egret
Mallard
Black Francolin
Ring-necked Pheasant
Ruffed Grouse
Wild Turkey
Northern Bobwhite
Sandhill Crane
Killdeer
Rock Dove
White-winged Dove
Mourning Dove
Common Ground-Dove
Greater Roadrunner
Smooth-billed Ani
Groove-billed Ani
Horned Lark
American Crow
Fish Crow
Common Raven
Carolina Wren
Winter Wren
Veery
Swainson's Thrush
Hermit Thrush
Wood Thrush
American Robin
Northern Mockingbird
Brown Thrasher
Water Pipit
Sprague's Pipit
European Starling
Pine Warbler (W)
Palm Warbler
Worm-eating Warbler
Swainson's Warbler
Ovenbird
Northern Waterthrush
Louisiana Waterthrush
Kentucky Warbler
Northern Cardinal
Green-tailed Towhee
Rufous-sided Towhee
Rufous-crowned Sparrow
Chipping Sparrow
Clay-colored Sparrow
Vesper Sparrow
Lark Sparrow
Lark Bunting
Savannah Sparrow
Sharp-tailed Sparrow
Seaside Sparrow
Fox Sparrow
Song Sparrow
White-throated Sparrow
White-crowned Sparrow
Harris' Sparrow
Dark-eyed Junco
Lapland Longspur
Smith's Longspur
Chestnut-collared Longspur
Snow Bunting
Red-winged Blackbird
Eastern Meadowlark
Western Meadowlark
Yellow-headed Blackbird

Rusty Blackbird
Brewer's Blackbird
Great-tailed Grackle
Boat-tailed Grackle
Common Grackle
Bronzed Cowbird
Brown-headed Cowbird

D-2.14. Foraging by gleaning on trunks of trees.

Red-breasted Nuthatch
White-breasted Nuthatch
Brown-headed Nuthatch
Yellow-throated Warbler
Brown Creeper
Black-and-white Warbler

D-2.15. Foraging by hawking at various heights.

Sharp-shinned Hawk
Cooper's Hawk
Northern Goshawk
Eastern Phoebe
Vermilion Flycatcher
Ash-throated Flycatcher
Brown-crested Flycatcher
Western Kingbird
Eastern Kingbird
Gray Kingbird
Scissor-tailed Flycatcher

D-2.16. Foraging by hawking from bushes.

Alder Flycatcher
Willow Flycatcher
Hooded Warbler
Wilson's Warbler
Canada Warbler

D-2.17. Foraging by hawking from trees

Olive-sided Flycatcher
Eastern Wood-Pewee
Acadian Flycatcher
Least Flycatcher
Great Crested Flycatcher
American Redstart
Hooded Warbler
Wilson's Warbler

D-2.18. Foraging by hovering.

Buff-bellied Hummingbird
Ruby-throated Hummingbird
Black-chinned Hummingbird
Rufous Hummingbird

D-2.19. Nocturnal.

Black-crowned Night Heron
American Woodcock
Common Barn-Owl
Eastern Screech-Owl
Great Horned Owl
Snowy Owl
Burrowing Owl
Barred Owl
Long-eared Owl
Short-eared Owl
Northern Saw-whet Owl
Common Nighthawk
Chuck-will's-widow
Whip-poor-will

D-2.20. Foraging by pouncing into herbaceous vegetation.

Snail Kite
Northern Harrier
Red-tailed Hawk
Ferruginous Hawk
Rough-legged Hawk
Common Barn-Owl
Short-eared Owl

D-2.21. Foraging by pouncing onto the ground.

Northern Harrier
Swainson's Hawk
Red-tailed Hawk
Ferruginous Hawk
Rough-legged Hawk
Crested Caracara
American Kestrel
Eastern Screech-Owl
Great Horned Owl
Snowy Owl
Long-eared Owl
Northern Saw-whet Owl
Vermilion Flycatcher
Eastern Bluebird
Loggerhead Shrike

D-2.22. Foraging by pouncing onto various substrates.

American Swallow-tailed Kite
Black-shouldered Kite
Northern Goshawk
Red-shouldered Hawk
Broad-winged Hawk
Short-tailed Hawk
Merlin
Peregrine Falcon
Barred Owl
Eastern Phoebe
Western Kingbird

D-2.23. Foraging by pouncing or plunging into water.

Brown Pelican
Magnificent Frigatebird
Osprey
Snail Kite
Bald Eagle
Belted Kingfisher

D-2.24. Foraging by probing in bushes.

Black-chinned Hummingbird
Rufous Hummingbird
Downy Woodpecker

D-2.25. Foraging by probing in various substrates in tree canopies.

Ruby-throated Hummingbird
Black-chinned Hummingbird
Downy Woodpecker
Red-breasted Nuthatch
Brown-headed Nuthatch
Red Crossbill
White-winged Crossbill

D-2.26. Foraging by probing in water.

Olivaceous Cormorant
Glossy Ibis
White-faced Ibis
White Ibis
Wood Stork
Clapper Rail
King Rail
Virginia Rail
Common Snipe

D-2.27. Foraging by probing into herbaceous vegetation.

Buff-bellied Hummingbird
Ruby-throated Hummingbird
Black-chinned Hummingbird
Rufous Hummingbird
European Starling
Eastern Meadowlark
Western Meadowlark

D-2.28. Foraging by probing into the ground.

Glossy Ibis
White Ibis
Clapper Rail
King Rail
Virginia Rail
American Woodcock
Common Snipe
Northern Flicker
European Starling
Eastern Meadowlark
Western Meadowlark

D-2.29. Foraging by probing into trunks of trees.

Red-headed Woodpecker
Red-bellied Woodpecker
Yellow-bellied Sapsucker
Downy Woodpecker
Hairy Woodpecker
Red-cockaded Woodpecker
Northern Flicker
Pileated Woodpecker
Red-breasted Nuthatch
White-breasted Nuthatch
Brown-headed Nuthatch

D-2.30. Foraging by soaring over herbaceous vegetation.

Red-tailed Hawk
Ferruginous Hawk

D-2.31. Foraging by soaring over terrestrial habitats.

Black Vulture
Turkey Vulture
Red-tailed Hawk
Golden Eagle

D-2.32. Foraging by soaring over various substrates.

Red-shouldered Hawk
Short-tailed Hawk

D-2.33. Foraging by soaring over water.

Magnificent Frigatebird
Osprey
Bald Eagle

D-2.34. Foraging by stalking in herbaceous vegetation.

American Bittern
Least Bittern
Greater Roadrunner

D-2.35. Foraging by stalking in water.

American Bittern
Great Blue Heron
Great Egret
Snowy Egret
Little Blue Heron
Tricolored Heron
Reddish Egret
Green-backed Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
Wood Stork

D-2.36. Foraging by stalking on the ground.

Crested Caracara
Greater Roadrunner
Burrowing Owl

D-3. Species Associations by Diet.

Diet category[a]	Category no.
Carnivores	D-3.1.
Folivores	D-3.2.
Frugivores	D-3.3.
Granivores	D-3.4.
Insectivores	D-3.5.
Nectarivores	D-3.6.
Omnivores	D-3.7.
Scavengers	D-3.8.

[a] Birds whose diets change depending upon seasonal availability of food items are marked (S) - summer diet, and (W) - winter diet.

D-3.1. Carnivores.

Pied-billed Grebe
Brown Pelican
Double-crested Cormorant
Olivaceous Cormorant
Anhinga
Magnificent Frigatebird
American Bittern
Least Bittern
Great Blue Heron
Great Egret
Snowy Egret
Little Blue Heron
Tricolored Heron
Reddish Egret
Green-backed Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
White Ibis
Glossy Ibis
White-faced Ibis
Roseate Spoonbill
Wood Stork
Hooded Merganser
Osprey
American Swallow-tailed Kite
Black-shouldered Kite
Snail Kite
Bald Eagle
Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Northern Goshawk
Red-shouldered Hawk
Broad-winged Hawk
Short-tailed Hawk
Swainson's Hawk
Red-tailed Hawk
Ferruginous Hawk
Rough-legged Hawk
Golden Eagle
Crested Caracara
American Kestrel (W)
Merlin
Peregrine Falcon
Clapper Rail
King Rail (S)
Virginia Rail
Limpkin
Greater Roadrunner
Common Barn-Owl
Eastern Screech-Owl
Great Horned Owl
Snowy Owl
Burrowing Owl
Barred Owl
Long-eared Owl
Short-eared Owl
Northern Saw-whet Owl
Belted Kingfisher
Loggerhead Shrike

D-3.2. Folivores.

Ruffed Grouse
Common Moorhen
Harris' Sparrow
Purple Finch (W)

Evening Grosbeak

D-3.3 Frugivores.

Ruffed Grouse
White-crowned Pigeon
Gray Catbird (W)
Cedar Waxwing (W)
Fox Sparrow
Spotted Oriole
House Finch (W)

D-3.4. Granivores.

Ruffed Grouse
Northern Bobwhite (W)
Purple Gallinule (W)
Common Moorhen
Rock Dove
White-winged Dove
Mourning Dove
Common Ground-Dove
Horned Lark (W)
Northern Cardinal (W)
Indigo Bunting (W)
Dickcissel (W)
Bachman's Sparrow (W)
Rufous-crowned Sparrow (W)
American Tree Sparrow
Chipping Sparrow (W)
Field Sparrow (W)
Vesper Sparrow (W)
Lark Sparrow(W)
Lark Bunting
Savannah Sparrow (W)
Henslow's Sparrow (W)
Le Conte's Sparrow
Fox Sparrow
Lincoln's Sparrow
White-throated Sparrow
White-crowned Sparrow
Harris' Sparrow
Dark-eyed Junco(W)
Lapland Longspur
Chestnut-collared Longspur
Snow Bunting
Common Grackle (W)
Purple Finch (W)
House Finch (W)
Red Crossbill (W)
White-winged Crossbill
Common Redpoll (W)
Pine Siskin (W)
American Goldfinch (W)
Evening Grosbeak

D-3.5. Insectivores.

Pied-billed Grebe
Olivaceous Cormorant
Cattle Egret
Glossy Ibis
White-faced Ibis
Roseate Spoonbill
American Swallow-tailed Kite
Mississippi Kite
Swainson's Hawk
American Kestrel (S)
Virginia Rail
Killdeer
Upland Sandpiper
Common Snipe
American Woodcock
Black-billed Cuckoo
Yellow-billed Cuckoo
Mangrove Cuckoo
Greater Roadrunner
Smooth-billed Ani
Groove-billed Ani
Burrowing Owl
Common Nighthawk
Chuck-will's-widow
Whip-poor-will
Chimney Swift
Buff-bellied Hummingbird
Ruby-throated Hummingbird
Black-chinned Hummingbird
Rufous Hummingbird
Belted Kingfisher
Red-headed Woodpecker (S)
Red-bellied Woodpecker (S)
Downy Woodpecker
Hairy Woodpecker
Red-cockaded Woodpecker
Northern (Yellow-shafted) Flicker
Pileated Woodpecker
Olive-sided Flycatcher
Eastern Wood-Pewee
Acadian Flycatcher
Alder Flycatcher

Willow Flycatcher
Yellow-bellied Flycatcher
Least Flycatcher
Eastern Phoebe
Vermilion Flycatcher
Ash-throated Flycatcher
Great Crested Flycatcher
Brown-crested Flycatcher
Western Kingbird
Eastern Kingbird
Gray Kingbird
Scissor-tailed Flycatcher
Horned Lark (S)
Purple Martin
Tree Swallow (S)
Northern Rough-winged Swallow
Bank Swallow
Cliff Swallow
Barn Swallow
Black-capped Chickadee (S)
Carolina Chickadee (S)
Tufted Titmouse (S)
Red-breasted Nuthatch (S)
White-breasted Nuthatch
Brown-headed Nuthatch (S)
Brown Creeper
Carolina Wren
Bewick's Wren
House Wren
Winter Wren
Sedge Wren
Marsh Wren
Golden-crowned Kinglet
Ruby-crowned Kinglet
Blue-gray Gnatcatcher
Eastern Bluebird (S)
Veery
Swainson's Thrush
Hermit Thrush (S)
Wood Thrush
American Robin (S)
Gray Catbird (S)
Northern Mockingbird (S)
Brown Thrasher (S)
Water Pipit
Cedar Waxwing (S)
Loggerhead Shrike
White-eyed Vireo
Bell's Vireo
Solitary Vireo
Yellow-throated Vireo
Warbling Vireo
Red-eyed Vireo
Black-whiskered Vireo
Bachman's Warbler
Blue-winged Warbler
Golden-winged Warbler
Nashville Warbler
Northern Parula
Yellow Warbler
Chestnut-sided Warbler
Magnolia Warbler
Black-throated Blue Warbler
Black-throated Gray Warbler
Black-throated Green Warbler
Blackburnian Warbler
Yellow-throated Warbler
Pine Warbler (S)
Prairie Warbler
Palm Warbler
Cerulean Warbler
Black-and-white Warbler
American Redstart
Prothonotary Warbler
Worm-eating Warbler
Swainson's Warbler
Ovenbird
Northern Waterthrush
Louisiana Waterthrush
Kentucky Warbler
Mourning Warbler
Common Yellowthroat
Hooded Warbler
Wilson's Warbler
Canada Warbler
Yellow-breasted Chat (S)
Summer Tanager
Scarlet Tanager
Bachman's Sparrow (S)
Rufous-crowned Sparrow (S)
Chipping Sparrow (S)
Vesper Sparrow (S)
Grasshopper Sparrow (S)
Henslow's Sparrow (S)
Sharp-tailed Sparrow (S)
Seaside Sparrow (S)
Song Sparrow (S)
Swamp Sparrow (S)
Bobolink
Red-winged Blackbird (S)
Eastern Meadowlark (S)
Western Meadowlark (S)
Common Grackle (S)
Orchard Oriole
Northern (Baltimore) Oriole (S)

D-3.6. Nectarivores.

Buff-bellied Hummingbird
Ruby-throated Hummingbird
Black-chinned Hummingbird
Rufous Hummingbird
Spotted Oriole

D-3.7. Omnivores.

Wood Duck
Mallard
Black Francolin
Ring-necked Pheasant
Wild Turkey
Northern Bobwhite (S)
Yellow Rail
Black Rail
King Rail (W)
Sora
Purple Gallinule (S)
American Coot
White-winged Dove
Red-headed Woodpecker (W)
Red-bellied Woodpecker (W)
Yellow-bellied Sapsucker
Northern (Yellow-shafted) Flicker
Ash-throated Flycatcher
Tree Swallow (W)
Blue Jay
Scrub Jay
American Crow
Fish Crow
Common Raven
Black-capped Chickadee (W)
Carolina Chickadee (W)
Tufted Titmouse (W)
Red-breasted Nuthatch (W)
Brown-headed Nuthatch (W)
Eastern Bluebird (W)
Hermit Thrush (S)
American Robin (S)
Northern Mockingbird (S)
Brown Thrasher (S)
Sprague's Pipit
European Starling
Orange-crowned Warbler
Cape May Warbler
Yellow-rumped (Myrtle) Warbler
Yellow-breasted Chat (W)
Western Tanager
Northern Cardinal (S)
Rose-breasted Grosbeak
Black-headed Grosbeak
Blue Grosbeak
Indigo Bunting (S)
Painted Bunting
Dickcissel (S)
Green-tailed Towhee
Rufous-sided Towhee
Clay-colored Sparrow
Field Sparrow (S)
Lark Sparrow (S)
Savannah Sparrow (S)
Grasshopper Sparrow (W)
Sharp-tailed Sparrow (W)
Seaside Sparrow (W)
Song Sparrow (W)
Swamp Sparrow (W)
Harris' Sparrow
Dark-eyed Junco (S)
Smith's Longspur
Red-winged Blackbird (W)
Eastern Meadowlark (W)
Western Meadowlark (W)
Yellow-headed Blackbird
Rusty Blackbird
Brewer's Blackbird
Great-tailed Grackle
Boat-tailed Grackle
Bronzed Cowbird
Brown-headed Cowbird
Northern (Baltimore) Oriole (W)
Purple Finch (S)
House Finch (S)
Red Crossbill (S)
Pine Siskin (S)
House Sparrow
Pine Warbler (W)

D-3.8. Scavengers.

Black Vulture
Turkey Vulture
Bald Eagle
Ferruginous Hawk
Crested Caracara

Appendix E.

Species Requiring Snags, Cavities, or Both

Species	Cavity use		Snag use[a]		Use[a] of living cavity trees
	Excavator	Secondary	Uses	Minimum d.b.h. inches(cm)	
Wood Duck		*	N	18(46)	N
Hooded Merganser		*	N	18(46)	N
[b]Black Vulture		*	N	?	N
[b]Turkey Vulture		*	N	?	N
Osprey			N,P	20(51)	
Bald Eagle			N,P	20(51)	
American Kestrel			F	6(15)	
		*	N	14(35)	N,P
Common Barn-Owl		*	N,P	18(46)	N,P
Eastern Screech-Owl		*	N,P	14(35)	N,P
Barred Owl		*	N,P	20(51)	N,P
Northern Saw-whet Owl		*	N,P	10(25)	N,P
Chimney Swift		*	N,P	14(35)	N,P
[b]Belted Kingfisher			F	6(15)	
Red-headed Woodpecker	*	*	N,P	14(35)	N,P
Red-bellied Woodpecker	*	*	N,P	14(35)	N,P
Yellow-bellied Sapsucker	*		N	10(25)	F
Downy Woodpecker	*		All	6(15)	All
Hairy Woodpecker	*		All	10(25)	All
Red-cockaded Woodpecker	*				All
Northern Flicker	*	*	N,P	14(35)	N,P
Pileated Woodpecker	*		All	20(51)	N,P
[b]Olive-sided Flycatcher			F	10(25)	
[b]Eastern Wood-Pewee			F	6(15)	
[b]Acadian Flycatcher			F	6(15)	
Great Crested Flycatcher		*	N,P	10(25)	N,P
[b]Western Kingbird			F	6(15)	
[b]Eastern Kingbird			F	6(15)	
[b]Gray Kingbird			F	6(15)	
Purple Martin		*	N	10(25)	N
Tree Swallow		*	N	6(15)	
Black-capped Chickadee	*	*	N,P	6(15)	N,P

Species	Cavity use		Snag use[a]		Use[a] of living cavity trees
	Excavator	Secondary	Uses	Minimum d.b.h. inches(cm)	
Carolina Chickadee	*	*	N,P	6(15)	N,P
Tufted Titmouse	*	*	N,P	6(15)	N,P
Red-breasted Nuthatch	*	*	N	6(15)	
White-breasted Nuthatch	*	*			N
Brown-headed Nuthatch	*	*	N	6(15)	N
Brown Creeper		*	N	10(25)	N
Carolina Wren		*	N	6(15)	N
Bewick's Wren		*	N	6(15)	N
House Wren		*			
Eastern Bluebird		*	N,P	6(15)	N,P
[b]Loggerhead Shrike			F	6(15)	
European Starling		*	N	10(25)	N
Prothonotary Warbler		*	N	6(15)	N
[b]Brown-headed Cowbird			P	6(15)	

[a]Symbols are: N - breeding activities and nest site; P - resting roosting or singing perches; F - foraging sites; *I - all activities.

[b]Explanatory notes:

Black Vulture	Frequently nest in hollow logs and cavities at base of hollow trees
Turkey Vulture	Frequently nest in hollow logs and cavities at base of hollow trees
Belted Kingfisher	Require perches with unobstructed view of water for foraging
Olive-sided Flycatcher	Require exposed perches above canopy for foraging and territory defense
Eastern Wood-Pewee	Require exposed perches for foraging
Acadian Flycatcher	Require exposed perches in midstory for foraging
Western Kingbird	Require exposed perches for foraging
Eastern Kingbird	Require exposed perches for foraging and territory defense
Gray Kingbird	Require exposed perches for foraging and territory defense
Loggerhead Shrike	Require exposed perches for foraging
Brown-headed Cowbird	Females use exposed perches as observation posts to locate hosts building nests

Appendix F.

Species Requiring Large Sawtimber Trees, at least 20" (50 cm) d.b.h.

Species	Use
Osprey	Nesting and perching
American Swallow-tailed Kite	Nesting and perching
Bald Eagle	Nesting and perching
Barred Owl	Nesting and perching
Red-cockaded Woodpecker	Nesting and perching
Pileated Woodpecker	All activities
White-breasted Nuthatch	All activities
Blackburnian Warbler	All activities
Yellow-throated Warbler	All activities
Cerulean Warbler	All activities

Appendix G.

Species Requiring Forest Interior Conditions or Areas of Extensive Forest.

Species	Utilization of forest[a]			
	Big Trees	Forest Interior	Extensive Forest	Minimum Tract Size(ha)
American Swallow-tailed Kite	X		X	
Mississippi Kite			X	
Sharp-shinned Hawk	X	X		
Cooper's Hawk	X	X		
Red-shouldered Hawk				550
Broad-winged Hawk			X	
Ruffed Grouse			X	
Wild Turkey			X	
Black-billed Cuckoo			X	
Yellow-billed Cuckoo			X	
Great Horned Owl				None
Barred Owl	X			None
Whip-poor-will			X	
Ruby-throated Hummingbird			X	
Red-bellied Woodpecker				1
Hairy Woodpecker				18
Pileated Woodpecker	X	X		405
Olive-sided Flycatcher			X?	
Acadian Flycatcher		X		37
Great Crested Flycatcher				1
Blue Jay			X	
Tufted Titmouse				2
White-breasted Nuthatch	X			8
Brown Creeper			X	
Winter Wren		X		
Golden-crowned Kinglet		X		
Blue-gray Gnatcatcher				37
Veery		X		50
Swainson's Thrush		X		
Hermit Thrush		X		
Wood Thrush		X		3

Species	Utilization of forest[a]			
	Big Trees	Forest Interior	Extensive Forest	Minimum Tract Size(ha)
Solitary Vireo			X	
Yellow-throated Vireo			X	
Red-eyed Vireo				7
Bachman's			X?	
Northern Parula		X		1300
Chestnut-sided Warbler			X	
Magnolia Warbler			X?	
Black-throated Blue Warbler		X		2500
Black-throated Green Warbler		X	X	
Blackburnian Warbler	X	X	X	
Yellow-throated Warbler	X	X	X	
Pine Warbler			X	
Cerulean Warbler	X	X		1750
Black-and-white Warbler		X		550
American Redstart			X	
Prothonotary Warbler		X	X	
Worm-eating Warbler		X		370
Swainson's Warbler		X	X	
Ovenbird		X		15
Northern Waterthrush				500
Louisiana Waterthrush		X		875
Kentucky Warbler		X		45
Hooded Warbler		X	X	
Canada Warbler				1000
Summer Tanager				100
Scarlet Tanager		X		30
Rose-breasted Grosbeak				3

[a] Information in this table reflects the important work of Robbins (1979; cf. Whitcomb 1977) or Robbins et al. (1989) modified by the author's judgment.

Appendix H.

Species Using Slash Piles, Windrows, and Downed Logs.

Species	Use
Green-backed Heron	Use slash at water's edge for foraging perches
Black Vulture	Frequently nest in downed logs and cavities at base of hollow trees
Turkey Vulture	Frequently nest in downed logs and cavities at base of hollow trees
Belted Kingfisher	Require perches with unobstructed view of water for foraging
Pileated Woodpecker	Forage on downed logs
Carolina Wren	All activities
Bewick's Wren	All activities
House Wren	All activities
Winter Wren	All activities

Appendix I.

Species Using Rock Outcrops, Caves, Crevices, and Earthen Banks.

Species	Use
Golden Eagle	Nest and roost on cliffs and rock outcrops
Peregrine Falcon	Nest and roost on cliffs and rock outcrops
Rock Dove	Nest and roost on rock outcrops, especially on buildings
Common Barn-Owl	Nest and roost in caves and crevices
Burrowing Owl	Nest in burrows dug in sand by other animals
Common Nighthawk	Nest on gravel surfaces, such as roofs of buildings
Belted Kingfisher	Excavate nesting burrows in earthen banks near water
Eastern Phoebe	Nest on rock outcrops, buildings, bridges, and other sites
Northern Rough-winged Swallow	Excavate nesting burrows in earthen banks, or use existing cavities there
Bank Swallow	Excavate nesting burrows in earthen banks
Cliff Swallow	Build nests on vertical surfaces
Barn Swallow	Build nests on buildings, bridges, or other sites
Common Raven	Nest and roost on cliffs and rock outcrops
Carolina Wren	Nest in a variety of crevices
Bewick's Wren	Nest in a variety of crevices
European Starling	Nest in a variety of crevices
Louisiana Waterthrush	Frequently breed along rocky streams

Appendix J.

Species Utilizing Aquatic Habitats for Foraging or Nesting[a].

Species	Season	Water type[b]	
		Standing	Flowing
Pied-billed Grebe	Breeding	Fresh	-
	Winter	Fresh,Brackish	-
Brown Pelican	All	Salt	-
Double-crested Cormorant	All	All	Fresh
Olivaceous Cormorant	All	All	Fresh
American Anhinga	All	Fresh,Brackish	-
Magnificent Frigatebird	All	Salt	-
American Bittern	All	All	-
Least Bittern	All	Fresh,Brackish	-
Great Blue Heron	All	All	Fresh
Great Egret	All	All	Fresh
Snowy Egret	All	All	Fresh
Little Blue Heron	All	All	Fresh
Tricolored Heron	All	All	-
Reddish Egret	All	Salt,Brackish	-
Cattle Egret	All	Fresh	-
Green-backed Heron	All	All	Fresh
Black-crowned Night Heron	All	All	Fresh
Yellow-crowned Night Heron	All	All	Fresh
White Ibis	All	All	-
Glossy Ibis	All	All	-
White-faced Ibis	All	Fresh,Brackish	Fresh
Wood Stork	All	All	-
Roseate Spoonbill	All	Salt,Brackish	-
Wood Duck	All	Fresh	Fresh
Mallard	All	Fresh,Brackish	Fresh
Hooded Merganser	Breeding	Fresh	-
	Winter	Fresh,Brackish	-
Osprey	All	All	Fresh
American Swallow-tailed Kite	Breeding	Fresh	Fresh
Snail Kite	All	Fresh	-

Species	Season	Water type[b]	
		Standing	Flowing
Mississippi Kite	Breeding	Fresh	Fresh
Bald Eagle	All	All	Fresh
Red-shouldered Hawk	All	Fresh	Fresh
Yellow Rail	Winter	All	-
Black Rail	All	All	-
Clapper Rail	All	Salt,Brackish	-
King Rail	All	Fresh,Brackish	-
Virginia Rail	All	Fresh,Brackish	-
Sora	All	Fresh	-
Purple Gallinule	All	Fresh	-
Common Moorhen	All	Fresh	-
American Coot	All	Fresh,Brackish	-
Limpkin	All	Fresh	Fresh
Sandhill Crane	All	Fresh	-
Common Snipe	All	Fresh,Brackish	Fresh
American Woodcock	All	Fresh	-
Barred Owl	All	Fresh	Fresh
Belted Kingfisher	All	All	Fresh
Acadian Flycatcher	Breeding	Fresh	Fresh
Willow Flycatcher	Breeding	Fresh	Fresh
Vermilion Flycatcher	Winter	Fresh	-
Tree Swallow	All	Fresh,Brackish	Fresh
Northern Rough-winged Swallow	All	Fresh,Brackish	Fresh
Bank Swallow	Breeding	Fresh,Brackish	Fresh
Fish Crow	All	All	Fresh
Sedge Wren	Breeding	Salt,Brackish	-
Marsh Wren	All	All	-
Prothonotary Warbler	Breeding	Fresh	Fresh
Northern Waterthrush	Breeding	Fresh	-
	Winter	Fresh	Fresh
Louisiana Waterthrush	Breeding	-	Fresh

Species	Season	Water type[b]	
		Standing	Flowing
Henslow's Sparrow	Breeding	Fresh,Brackish	-
Sharp-tailed Sparrow	All	Salt,Brackish	-
Seaside Sparrow	All	Salt,Brackish	-
Lincoln's Sparrow	Winter	Fresh	-
Swamp Sparrow	Breeding	Fresh	-
	Winter	Fresh,Brackish	-
Boat-tailed Grackle	All	All	-

[a] All - Any salinity
Brackish - Brackish water
Fresh - Fresh water
Salt - Salt water

[b] For simplicity, the designation standing water includes all marshes whether they occur in headwater situations or in association with inland or tidewater rivers. Flowing water is defined to be only the unvegetated parts of freshwater rivers and creeks.

Appendix K.

SAF Forest Types Equivalent to Vegetation Types in this Work.

SAF No.	SAF forest type[a]	Vegetation type
17	Pin cherry	Maple-beech-birch
20	White pine-northern red oak-red maple	White pine-hemlock
21	Eastern white pine	White pine-hemlock
22	White pine-hemlock	White pine-hemlock
23	Eastern hemlock	White pine-hemlock
24	Hemlock-yellow birch	White pine-hemlock (in part), Maple-beech-birch (in part)
25	Sugar maple-beech-yellow birch	Maple-beech-birch
26	Sugar maple-basswood	Maple-beech-birch (in part), Cove hardwoods (in part)
27	Sugar maple	Maple-beech-birch
28	Black cherry-maple	Maple-beech-birch (in part), Cove hardwoods (in part)
30	Red spruce-yellow birch	Spruce-fir (in part), Maple-beech-birch (in part)
31	Red spruce-sugar maple-beech	Spruce-fir (in part), Maple-beech-birch (in part)
32	Red spruce	Spruce-fir
34	Red spruce-Fraser fir	Spruce-fir
39	Black ash-American elm-red maple	Elm-ash-cottonwood
40	Post oak-blackjack oak	Oak-hickory
43	Bear oak	Oak-hickory
44	Chestnut oak	Oak-hickory
45	Pitch pine	Virginia pine-pitch pine
46	Eastern redcedar	Loblolly pine-shortleaf pine
50	Black locust	Oak-hickory
51	White pine-chestnut oak	White pine-hemlock (in part), Oak-hickory (in part)
52	White oak-black oak-northern red oak	Oak-hickory
53	White oak	Oak-hickory
55	Northern red oak	Oak-hickory (upland sites), Cove hardwoods (in coves)
57	Yellow-poplar	Cove hardwoods (in the Mountains), Elm-ash-cottonwood (elsewhere)
58	Yellow-poplar-eastern hemlock	Cove hardwoods
59	Yellow-poplar-white oak-northern red oak	Cove hardwoods
60	Beech-sugar maple	Maple-beech-birch (in the Mountains), Cove hardwoods (in coves), Oak-hickory (elsewhere)
61	River birch-sycamore	Elm-ash-cottonwood
62	Silver maple-American elm	Elm-ash-cottonwood
63	Cottonwood	Elm-ash-cottonwood
64	Sassafras-persimmon	Oak-hickory
65	Pin oak-sweetgum	Oak-gum-cypress (in part), Elm-ash-cottonwood (in part)
69	Sand pine	Sand pine-southern scrub oak
70	Longleaf pine	Sandhills longleaf pine (in part), Longleaf pine-slash pine (in part)

SAF No.	SAF forest type[a]	Vegetation type
71	Longleaf pine-scrub oak	Longleaf pine-scrub oak
72	Southern scrub oak	Southern scrub oak
73	Southern redcedar	Live oak maritime
74	Cabbage palmetto	Live oak maritime (on the Coast), Bay swamp-pocosin (elsewhere)
75	Shortleaf pine	Loblolly pine-shortleaf pine
76	Shortleaf pine-oak	Mixed pine-hardwood
78	Virginia pine-oak	Mixed pine-hardwood
79	Virginia pine	Virginia pine-pitch pine
80	Loblolly pine-shortleaf pine	Loblolly pine-shortleaf pine
81	Loblolly pine	Loblolly pine-shortleaf pine
82	Loblolly pine-hardwood	Mixed pine-hardwood (on uplands), Loblolly pine-shortleaf pine (on bottomlands, in part), Oak-gum-cypress (on bottomlands, in part)
83	Longleaf pine-slash pine	Longleaf pine-slash pine
84	Slash pine	Longleaf pine-slash pine
85	Slash pine-hardwood	Longleaf pine-slash pine (in part), Bay swamp-pocosin (in part)
87	Sweetgum-yellow-poplar	Elm-ash-cottonwood
88	Willow oak-water oak-diamondleaf oak	Oak-gum-cypress
91	Swamp chestnut oak-cherrybark oak	Oak-gum-cypress
92	Sweetgum-willow oak	Oak-gum-cypress
93	Sugarberry-American elm-green ash	Elm-ash-cottonwood
94	Sycamore-sweetgum-American elm	Elm-ash-cottonwood
95	Black willow	Elm-ash-cottonwood
96	Overcup oak-water hickory	Oak-gum-cypress
97	Atlantic white-cedar	Pond pine pocosin
98	Pond pine	Pond pine pocosin
100	Pondcypress	Oak-gum-cypress
101	Baldcypress	Oak-gum-cypress
102	Baldcypress-tupelo	Oak-gum-cypress
103	Water tupelo-swamp tupelo	Oak-gum-cypress
104	Sweetbay-swamp tupelo-redbay	Bay swamp-pocosin
105	Tropical hardwoods	Tropical hardwoods
106	Mangrove	Mangroves
108	Red maple	Bay swamp-pocosin (in the Coastal Plain), Cove hardwoods (in Mountains), Elm-ash-cottonwood (elsewhere)
110	Black oak	Oak-hickory
111	South Florida slash pine	Longleaf pine-slash pine

[a] SAF forest types from Eyre (1980).

Appendix L.

USFS Forest Types Equivalent to Vegetation Types in this Work.

USFS No.	USFS forest type[a]	Vegetation type
03	White pine	White pine-hemlock
04	White pine-hemlock	White pine-hemlock
05	Hemlock	White pine-hemlock
06	Fraser fir	Spruce-fir
07	Red spruce-Fraser fir	Spruce-fir
08	Hemlock-hardwood	White pine-hemlock (in part), Cove hardwoods (in part)
09	White pine-cove hardwoods	White pine-hemlock (in part), Cove hardwoods (in part)
10	White pine-upland hardwoods	White pine-hemlock (in part), Oak-hickory (in part)
11	Eastern red cedar-hardwood	Mixed pine-hardwood
12	Shortleaf pine-oak	Mixed pine-hardwood
13	Loblolly pine-hardwood	Mixed pine-hardwood (on uplands), Oak-gum-cypress (on bottomlands, in part), Loblolly pine-shortleaf pine (on bottomlands, in part)
14	Slash pine-hardwood	Longleaf pine-slash pine (in part), Bay swamp-pocosin (in part)
15	Pitch pine-oak	Mixed pine-hardwood
16	Virginia pine-oak	Mixed pine-hardwood
17	Red spruce-northern hardwoods	Spruce-fir (in part), Maple-beech-birch (in part)
18	Pond pine-hardwood	Pond pine pocosin (in part), Bay swamp-pocosin (in part)
19	Sand pine-hardwood	Sand pine-southern scrub oak
20	Table Mountain pine-hardwood	Mixed pine-hardwood
21	Longleaf pine	Longleaf pine-scrub oak, Sandhills longleaf pine, or Longleaf pine-slash pine, depending upon site and associated understory species
22	Slash pine	Longleaf pine-slash pine
23	Pond cypress	Oak-gum-cypress
24	Bald cypress	Oak-gum-cypress
31	Loblolly pine	Loblolly pine-shortleaf pine
32	Shortleaf pine	Loblolly pine-shortleaf pine
33	Virginia pine	Virginia pine-pitch pine
34	Sand pine	Sand pine-southern scrub oak
35	Eastern red cedar	Loblolly pine-shortleaf pine
36	Pond pine	Pond pine pocosin
37	Spruce pine	Loblolly pine-shortleaf pine
38	Pitch pine	Virginia pine-pitch pine
39	Table Mountain pine	Virginia pine-pitch pine
40	Hardwood-pond pine	Pond pine pocosin (in part), Bay swamp-pocosin (in part)
41	Cove hardwoods-white pine-hemlock	Cove hardwoods (in part), White pine-hemlock (in part)
42	Upland hardwoods-white pine	White pine-hemlock (in part), Oak-hickory (in part)

USFS No.	USFS forest type[a]	Vegetation type
43	Oak-eastern red cedar	Mixed pine-hardwood
44	Southern red oak-yellow pine	Mixed pine-hardwood
45	Chestnut oak-scarlet oak-yellow pine	Mixed pine-hardwood
46	Bottomland hardwood-yellow pine	Oak-gum-cypress (in part), Mixed pine-hardwood (in part)
47	White oak-black oak-yellow pine	Mixed pine-hardwood
48	Northern red oak-hickory-yellow pine	Mixed pine-hardwood
49	Bear oak-southern scrub oaks-yellow pine	Sand pine-southern scrub, oak, Longleaf pine-scrub oak, Southern scrub oak, or Mixed pine-hardwood depending upon location and which "yellow pine" involved
50	Yellow-poplar	Cove hardwoods (in the Mountains), Elm-ash-cottonwood (elsewhere)
51	Post oak-black oak	Oak-hickory
52	Chestnut oak	Oak-hickory
53	White oak-red oak-hickory	Oak-hickory
54	White oak	Oak-hickory
55	Northern red oak	Oak-hickory
56	Yellow-poplar-white oak-northern red oak	Cove hardwoods
57	Scrub oak	Southern scrub oak
58	Sweetgum-yellow-poplar	Elm-ash-cottonwood
59	Scarlet oak	Oak-hickory
61	Swamp chestnut oak-cherrybark oak	Oak-gum-cypress
62	Sweetgum-Nuttall oak-willow	Oak-gum-cypress
63	Sugarberry-American elm-green ash	Elm-ash-cottonwood
64	Laurel oak-willow oak	Oak-gum-cypress
65	Overcup oak-water hickory	Oak-gum-cypress
66	Atlantic white cedar	Pond pine pocosin
67	Bald cypress-water tupelo	Oak-gum-cypress
68	Sweetbay-swamp tupelo-red maple	Bay swamp-pocosin (in part), Oak-gum-cypress (in part)
69	Beech-magnolia	Southern mixed mesic hardwoods
71	Black ash-American elm-red maple	Elm-ash-cottonwood
72	River birch-sycamore	Elm-ash-cottonwood
73	Cottonwood	Elm-ash-cottonwood
74	Willow	Elm-ash-cottonwood
75	Sycamore-pecan-American elm	Elm-ash-cottonwood
76	Silver maple-American elm	Elm-ash-cottonwood
81	Sugar maple-beech-yellow birch	Maple-beech-birch
82	Black walnut	Elm-ash-cottonwood
98	Undrained flatwoods	Pine savanna

[a] USFS forest types from the *Compartment Prescription Handbook* (USDA 1979).

Appendix M.

Neotropical Migratory Birds Treated in this Work[a.]

Pied-billed Grebe
Double-crested Cormorant
Olivaceous Cormorant
Anhinga
American Bittern
Least Bittern
Great Blue Heron
Great Egret
Snowy Egret
Little Blue Heron
Reddish Egret
Cattle Egret
Green-backed Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
Tricolored Heron
Glossy Ibis
White-faced Ibis
Wood Duck
Mallard
Hooded Merganser
Turkey Vulture (B)
* Osprey
* American Swallow-tailed Kite (A)
* Mississippi Kite (A)
Northern Harrier (B)
Sharp-shinned Hawk (B)
Cooper's Hawk (B)
Northern Goshawk (B)
Red-shouldered Hawk (B)
* Broad-winged Hawk (A)
* Short-tailed Hawk
* Swainson's Hawk (A)
Red-tailed Hawk (B)
Ferruginous Hawk (B)
American Kestrel (B)
Merlin (A)
* Peregrine Falcon (A)
* White-crowned Pigeon (C)
* White-winged Dove (C)
Mourning Dove (B)
* Black-billed Cuckoo (A)
* Yellow-billed Cuckoo (A)
* Mangrove Cuckoo (C)
* Burrowing Owl (A)
Long-eared Owl (B)
Short-eared Owl (B)
* Common Nighthawk (A)
* Chuck-will's-widow (A)
* Whip-poor-will (A)
* Chimney Swift (A)
* Buff-bellied Hummingbird (C)
* Ruby-throated Hummingbird (A)
* Black-chinned Hummingbird (A)
* Rufous Hummingbird (A)
Belted Kingfisher (B)
Yellow-bellied Sapsucker (B)
Northern Flicker (B)
* Olive-sided Flycatcher (A)
* Eastern Wood-Pewee (A)
* Yellow-bellied Flycatcher (A)
* Acadian Flycatcher (A)
* Alder Flycatcher (A)
* Willow Flycatcher (A)
* Least Flycatcher (A)
Eastern Phoebe (B)
* Vermilion Flycatcher (C)
* Ash-throated Flycatcher (A)
* Great Crested Flycatcher (A)
* Brown-crested Flycatcher (C)
* Western Kingbird (A)
* Eastern Kingbird (A)
* Gray Kingbird (C)
* Scissor-tailed Flycatcher (A)
Horned Lark (B)
* Purple Martin (A)

Black Rail
King Rail
Virginia Rail
Sora
Purple Gallinule
Common Moorhen
American Coot
Sandhill Crane
Killdeer
Upland Sandpiper (A)
Common Snipe
Eastern Bluebird (B)
* Veery (A)
* Swainson's Thrush (A)
Hermit Thrush (A, B)
* Wood Thrush (A)
American Robin (B)
Northern Mockingbird (B)
* Gray Catbird (A)
American Water Pipit (B)
* Sprague's Pipit (B)
Cedar Waxwing (B)
Loggerhead Shrike (B)
* White-eyed Vireo (A)
* Bell's Vireo (A)
* Solitary Vireo (A)
* Yellow-throated Vireo (A)
* Warbling Vireo (A)
* Red-eyed Vireo (A)
* Black-whiskered Vireo (C)
* Bachman's Warbler (A)
* Blue-winged Warbler (A)
* Golden-winged Warbler (A)
* Orange-crowned Warbler (A)
* Nashville Warbler (A)
* Northern Parula (A)
* Yellow Warbler (A)
* Chestnut-sided Warbler (A)
* Magnolia Warbler (A)
* Cape May Warbler (A)
* Black-throated Blue Warbler (A)
Yellow-rumped (Myrtle) Warbler (B)
* Tree Swallow (A, B)
* Northern Rough-winged Swallow (A)
* Bank Swallow (A)
* Cliff Swallow (A)
* Barn Swallow (A)
Brown Creeper (B)
* House Wren (A, B)
Sedge Wren (B)
Marsh Wren (B)
Ruby-crowned Kinglet (A, B)
* Blue-gray Gnatcatcher (A)
* Kentucky Warbler (A)
* Mourning Warbler (A)
* Common Yellowthroat (A)
* Hooded Warbler (A)
* Wilson's Warbler (A)
* Canada Warbler (A)
* Yellow-breasted Chat (A)
* Summer Tanager (A)
* Scarlet Tanager (A)
* Western Tanager (A)
* Rose-breasted Grosbeak (A)
* Black-headed Grosbeak (A)
* Blue Grosbeak (A)
* Indigo Bunting (A)
* Painted Bunting (A)
* Dickcissel (A)
* Green-tailed Towhee (A)
Rufous-sided Towhee (B)
Rufous-crowned Sparrow
* Chipping Sparrow (A)
* Clay-colored Sparrow (A)
Vesper Sparrow (B)
* Lark Sparrow (A)
* Lark Bunting (A)
Savannah Sparrow (A, B)
* Grasshopper Sparrow (A)
Fox Sparrow (B)
Song Sparrow (B)
Lincoln's Sparrow (A)
Swamp Sparrow (B)
White-throated Sparrow (B)

* Black-throated Gray Warbler (A)
* Black-throated Green Warbler (A)
* Blackburnian Warbler (A)
* Yellow-throated Warbler (A)
* Prairie Warbler (A)
* Palm Warbler (A)
* Cerulean Warbler (A)
* Black-and-White Warbler (A)
* American Redstart (A)
* Prothonotary Warbler (A)
* Worm-eating Warbler (A)
* Swainson's Warbler (A)
* Ovenbird (A)
* Northern Waterthrush (A)
* Louisiana Waterthrush (A)

White-crowned Sparrow (B)
Dark-eyed Junco (B)
Chestnut-collared Longspur (B)
* Bobolink (A)
Red-winged Blackbird (B)
Eastern Meadowlark (B)
Western Meadowlark (B)
* Yellow-headed Blackbird (A)
Brewer's Blackbird (A, B)
* Bronzed Cowbird (C)
Brown-headed Cowbird (B)
* Orchard Oriole (A)
* Northern Oriole (A)
Pine Siskin (B)
American Goldfinch (B)

[a]This appendix lists species treated in this work for which the most recent A.O.U. Checklist (1983) lists separate breeding and winter ranges, and for which at least part of the winter range is to the south of the Tropic of Cancer. Where the Checklist deals separately with different populations, the ranges pertinent to the population that occurs in the South were the ones used to make the determination. In a few cases, marked with "?" it was not clear whether the winter range reached the Tropic of Cancer or whether the population in the South actually included individuals that migrated to the Tropics. In a number of other cases as well, the status of the species as a whole may not mean that individuals that occur in the South actually migrate to the Tropics. Additional clarification of these statuses is possible through use of the marks explained below.

Species marked with "*" are those considered Neotropical Migrants by the Southeastern Working Group of the Neotropical Migratory Bird Conservation Program. Species marked with ( ) are those on the second draft list of Neotropical Migratory Birds prepared by the Research Working Group of the Neotropical Migratory Bird Conservation Program, as follows: (A) winter generally south of the United States, (B) winter usually in the United States, sometimes south of the United States, and (C) are primarily tropical species, that reach the United States primarily as peripheral breeding species.

Appendix N

Species Codes

Common Name	Species Code
Pied-billed Grebe	PBGR
Brown Pelican	BRPE
Double-crested Cormorant	DCCO
Olivaceous Cormorant	OLCO
Anhinga	ANHI
Magnificent Frigatebird	MAFR
American Bittern	AMBI
Least Bittern	LEBI
Great Blue Heron	GTBH
Great Egret	GREG
Snowy Egret	SNEG
Little Blue Heron	LBHE
Tricolored Heron	TRHE
Reddish Egret	REEG
Cattle Egret	CAEG
Green-backed Heron	GNBH
Black-crowned Night Heron	BCNH
Yellow-crowned Night Heron	YCNH
White Ibis	WHIB
Glossy Ibis	GLIB
White-faced Ibis	WFIB
Roseate Spoonbill	ROSP
Wood Stork	WOST
Wood Duck	WODU
Mallard	MALL
Hooded Merganser	HOME
Black Vulture	BLVU
Turkey Vulture	TUVU
Osprey	OSPR
American Swallow-tailed Kite	ASTK
Black-shouldered Kite	BSKI
Snail Kite	SNKI
Mississippi Kite	MIKI
Bald Eagle	BAEA
Northern Harrier	NOHA
Sharp-shinned Hawk	SSHA
Cooper's Hawk	COHA
Northern Goshawk	NOGO
Red-shouldered Hawk	RSHA
Broad-winged Hawk	BWHA
Short-tailed Hawk	STHA
Swainson's Hawk	SWHA
Red-tailed Hawk	RTHA
Ferruginous Hawk	FEHA
Rough-legged Hawk	RLHA
Golden Eagle	GOEA
Crested Caracara	CRCA
American Kestrel	AMKE
Merlin	MERL

Common Name	Species Code
Peregrine Falcon	PEFA
Black Francolin	BLFR*
Ring-necked Pheasant	RNPH*
Ruffed Grouse	RUGR*
Wild Turkey	WITU*
Northern Bobwhite	NOBO*
Yellow Rail	YERA
Black Rail	BLRA
Clapper Rail	CLRA
King Rail	KIRA
Virginia Rail	VIRA
Sora	SORA
Purple Gallinule	PUGA
Common Moorhen	COMO
American Coot	AMCO
Limpkin	LIMP
Sandhill Crane	SACR
Killdeer	KILL
Upland Sandpiper	UPSA
Common Snipe	COSN
American Woodcock	AMWO
Rock Dove	RODO*
White-crowned Pigeon	WCPI
White-winged Dove	WWDO
Mourning Dove	MODO
Common Ground-Dove	CGDO
Black-billed Cuckoo	BBCU
Yellow-billed Cuckoo	YBCU
Mangrove Cuckoo	MACU
Greater Roadrunner	GRRO
Smooth-billed Ani	SBAN
Groove-billed Ani	GBAN
Common Barn-Owl	COBO
Eastern Screech-Owl	EASO
Great Horned Owl	GHOW
Snowy Owl	SNOW
Burrowing Owl	BUOW
Barred Owl	BAOW
Long-eared Owl	LEOW
Short-eared Owl	SEOW
Northern Saw-whet Owl	NSWO
Common Nighthawk	CONI
Chuck-will's-widow	CWWI
Whip-poor-will	WPWI
Chimney Swift	CHSW
Buff-bellied Hummingbird	BUFH
Ruby-throated Hummingbird	RTHU
Black-chinned Hummingbird	BCHU
Rufous Hummingbird	RUHU

Common Name	Species Code
Belted Kingfisher	BEKI
Red-headed Woodpecker	RHWO
Red-bellied Woodpecker	RBWO
Yellow-bellied Sapsucker	YBSA
Downy Woodpecker	DOWO
Hairy Woodpecker	HAWO
Red-cockaded Woodpecker	RCWO
Northern (Yellow-shafted) Flicker	YSFL*
Pileated Woodpecker	PIWO
Olive-sided Flycatcher	OSFL
Eastern Wood-Pewee	EAWP
Acadian Flycatcher	ACFL
Alder Flycatcher	ALFL
Yellow-bellied Flycatcher	YBFL
Willow Flycatcher	WIFL
Least Flycatcher	LEFL
Eastern Phoebe	EAPH
Vermilion Flycatcher	VEFL
Ash-throated Flycatcher	ATFL
Great Crested Flycatcher	GCFL
Brown-crested Flycatcher	BCFL
Western Kingbird	WEKI
Eastern Kingbird	EAKI
Gray Kingbird	GRAK
Scissor-tailed Flycatcher	STFL
Horned Lark	HOLA
Purple Martin	PUMA
Tree Swallow	TRES
Northern Rough-winged Swallow	NRWS
Bank Swallow	BANS
Cliff Swallow	CLSW
Barn Swallow	BARS
Blue Jay	BLJA
Scrub Jay	SCJA
American Crow	AMCR
Fish Crow	FICR
Common Raven	CORA
Black-capped Chickadee	BCCH
Carolina Chickadee	CACH
Tufted Titmouse	ETTI*
Red-breasted Nuthatch	RBNU
White-breasted Nuthatch	WBNU
Brown-headed Nuthatch	BHNU
Brown Creeper	BRCR
Carolina Wren	CARW
Bewick's Wren	BEWR
House Wren	HOWR
Winter Wren	WIWR
Sedge Wren	SEWR

Common Name	Species Code
Marsh Wren	MAWR
Golden-crowned Kinglet	GCKI
Ruby-crowned Kinglet	RCKI
Blue-gray Gnatcatcher	BGGN
Eastern Bluebird	EABL
Veery	VEER
Swainson's Thrush	SWTH
Hermit Thrush	HETH
Wood Thrush	WOTH
American Robin	AMRO
Gray Catbird	GRCA
Northern Mockingbird	NOMO
Brown Thrasher	BRTH
Water Pipit	WAPI
Sprague's Pipit	SPPI
Cedar Waxwing	CEDW
Loggerhead Shrike	LOSH
European Starling	EUST
White-eyed Vireo	WEVI
Bell's Vireo	BEVI
Solitary Vireo	SOVI
Yellow-throated Vireo	YTVI
Warbling Vireo	WAVI
Red-eyed Vireo	REVI
Black-whiskered Vireo	BWVI
Bachman's Warbler	BAWA
Blue-winged Warbler	BWWA
Golden-winged Warbler	GWWA
Orange-crowned Warbler	OCWA
Nashville Warbler	NAWA
Northern Parula	NOPA
Yellow Warbler	YWAR
Chestnut-sided Warbler	CSWA
Magnolia Warbler	MAWA
Cape May Warbler	CMWA
Black-throated Blue Warbler	BTBW
Yellow-rumped (Myrtle) Warbler	MYWA
Black-throated Gray Warbler	BTYW
Black-throated Green Warbler	BTNW
Blackburnian Warbler	BLBW
Yellow-throated Warbler	YTWA
Pine Warbler	PIWA
Prairie Warbler	PRAW
Palm Warbler	PAWA*
Cerulean Warbler	CERW
Black-and-white Warbler	BAWW
American Redstart	AMRE
Prothonotary Warbler	PROW
Worm-eating Warbler	WEWA

Common Name	Species Code
Swainson's Warbler	SWWA
Ovenbird	OVEN
Northern Waterthrush	NOWA
Louisiana Waterthrush	LOWA
Kentucky Warbler	KEWA
Mourning Warbler	MOWA
Common Yellowthroat	COYE
Hooded Warbler	HOWA
Wilson's Warbler	WIWA
Canada Warbler	CAWA
Yellow-breasted Chat	YBCH
Summer Tanager	SUTA
Scarlet Tanager	SCTA
Western Tanager	WETA
Northern Cardinal	NOCA
Rose-breasted Grosbeak	RBGR
Black-headed Grosbeak	BHGR
Blue Grosbeak	BLGR
Indigo Bunting	INBU
Painted Bunting	PABU
Dickcissel	DICK
Green-tailed Towhee	GTTO
Rufous-sided Towhee	RSTO
Bachman's Sparrow	BACS
Rufous-crowned Sparrow	RCSP
American Tree Sparrow	ATSP
Chipping Sparrow	CHSP
Clay-colored Sparrow	CCSP
Field Sparrow	FISP
Vesper Sparrow	VESP
Lark Sparrow	LASP
Lark Bunting	LARB
Savannah Sparrow	SAVS
Grasshopper Sparrow	GRSP
Henslow's Sparrow	HESP
Le Conte's Sparrow	LCSP
Sharp-tailed Sparrow	STSP

Common Name	Species Code
Seaside Sparrow	SESP
Fox Sparrow	FOSP
Song Sparrow	SOSP
Lincoln's Sparrow	LISP
Swamp Sparrow	SWSP
White-throated Sparrow	WTSP
White-crowned Sparrow	WCSP
Harris' Sparrow	HASP
Dark-eyed Junco	SCJU*
Lapland Longspur	LALO
Smith's Longspur	SMLO
Chestnut-collared Longspur	CCLO
Snow Bunting	SNBU
Bobolink	BOBO
Red-winged Blackbird	RWBL
Eastern Meadowlark	EAME
Western Meadowlark	WEME
Yellow-headed Blackbird	YHBL
Rusty Blackbird	RUBL
Brewer's Blackbird	BRBL
Great-tailed Grackle	GTGR
Boat-tailed Grackle	BTGR
Common Grackle	COGR
Bronzed Cowbird	BROC
Brown-headed Cowbird	BHCO
Orchard Oriole	OROR
Spot-breasted Oriole	SPOO
Northern (Baltimore) Oriole	BAOR*
Purple Finch	PUFI
House Finch	HOFI
Red Crossbill	RECR
White-winged Crossbill	WWCR
Common Redpoll	CORE
Pine Siskin	PISI
American Goldfinch	AMGO
Evening Grosbeak	EVGR
House Sparrow	HOSP

* Non-standard code, see Chapter IV for explanation.

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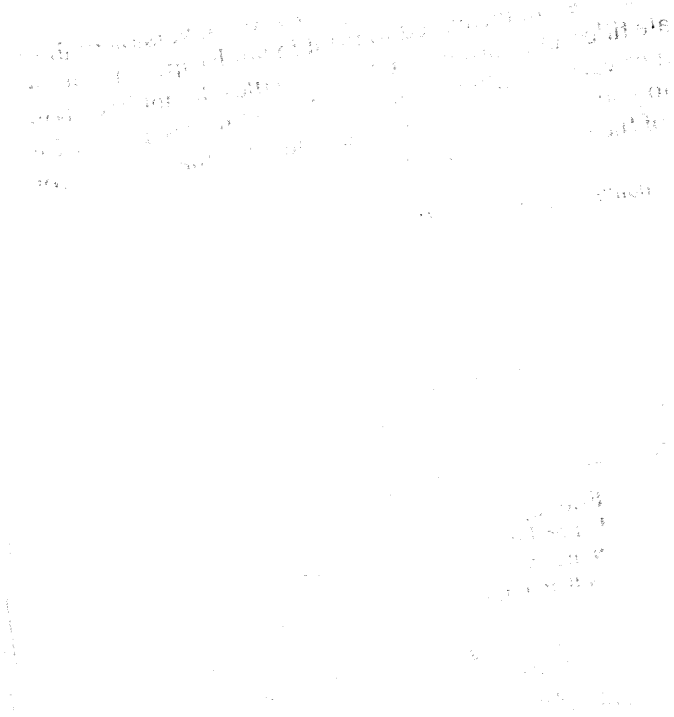
Acadian Flycatcher	ACFL	193
Alder Flycatcher	ALFL	194
American Coot	AMCO	146
American Swallow-tailed Kite	ASTK	112
American Tree Sparrow	ATSP	305
American Crow	AMCR	216
American Woodcock	AMWO	152
American Redstart	AMRE	277
American Kestrel	AMKE	130
American Robin	AMRO	240
American Goldfinch	AMGO	351
American Bittern	AMBI	89
Anhinga	ANHI	87
Ash-throated Flycatcher	ATFL	200
Bachman's Sparrow	BACS	303
Bachman's Warbler	BAWA	256
Bald Eagle	BAEA	116
Bank Swallow	BANS	211
Barn Swallow	BARS	213
Barred Owl	BAOW	169
Bell's Vireo	BEVI	250
Belted Kingfisher	BEKI	181
Bewick's Wren	BEWR	227
Black-throated Blue Warbler	BTBW	266
Black Francolin	BLFR*	133
Black-capped Chickadee	BCCH	219
Black-throated Gray Warbler	BTYW	268
Black-throated Green Warbler	BTNW	269
Black Rail	BLRA	139
Black-and-white Warbler	BAWW	276
Black-chinned Hummingbird	BCHU	179
Black-crowned Night Heron	BCNH	99
Black-headed Grosbeak	BHGR	296
Black-whiskered Vireo	BWVI	255
Black-shouldered Kite	BSKI	113
Black-billed Cuckoo	BBCU	158
Black Vulture	BLVU	109
Blackburnian Warbler	BLBW	270
Blue Jay	BLJA	214
Blue Grosbeak	BLGR	297
Blue-gray Gnatcatcher	BGGN	234
Blue-winged Warbler	BWWA	257
Boat-tailed Grackle	BTGR	338
Bobolink	BOBO	330
Brewer's Blackbird	BRBL	336
Broad-winged Hawk	BWHA	122
Bronzed Cowbird	BROC	340
Brown Thrasher	BRTH	243
Brown-headed Nuthatch	BHNU	224
Brown-crested Flycatcher	BCFL	202
Brown-headed Cowbird	BHCO	341
Brown Pelican	BRPE	84
Brown Creeper	BRCR	225
Buff-bellied Hummingbird	BUFH	177
Burrowing Owl	BUOW	168

Common Name	SP Code	Page
Canada Warbler	CAWA	289
Cape May Warbler	CMWA	265
Carolina Wren	CARW	226
Carolina Chickadee	CACH	220
Cattle Egret	CAEG	97
Cedar Waxwing	CEDW	246
Cerulean Warbler	CERW	275
Chestnut-collared Longspur	CCLO	328
Chestnut-sided Warbler	CSWA	263
Chimney Swift	CHSW	176
Chipping Sparrow	CHSP	306
Chuck-will's-widow	CWWI	174
Clapper Rail	CLRA	140
Clay-colored Sparrow	CCSP	307
Cliff Swallow	CLSW	212
Common Ground-Dove	CGDO	157
Common Barn-Owl	COBO	164
Common Redpoll	CORE	349
Common Yellowthroat	COYE	286
Common Moorhen	COMO	145
Common Raven	CORA	218
Common Snipe	COSN	151
Common Grackle	COGR	339
Common Nighthawk	CONI	173
Cooper's Hawk	COHA	119
Crested Caracara	CRCA	129
Dark-eyed Junco	SCJU*	325
Dickcissel	DICK	300
Double-crested Cormorant	DCCO	85
Downy Woodpecker	DOWO	185
Eastern Wood-Pewee	EAWP	192
Eastern Phoebe	EAPH	198
Eastern Bluebird	EABL	235
Eastern Kingbird	EAKI	204
Eastern Meadowlark	EAME	332
Eastern Screech-Owl	EASO	165
European Starling	EUST	248
Evening Grosbeak	EVGR	352
Ferruginous Hawk	FEHA	126
Field Sparrow	FISP	308
Fish Crow	FICR	217
Fox Sparrow	FOSP	318
Glossy Ibis	GLIB	102
Golden-crowned Kinglet	GCKI	232
Golden Eagle	GOEA	128
Golden-winged Warbler	GWWA	258
Grasshopper Sparrow	GRSP	313
Gray Kingbird	GRAK	205
Gray Catbird	GRCA	241
Great Blue Heron	GTBH	91
Great-tailed Grackle	GTGR	337
Great Horned Owl	GHOW	166
Great Egret	GREG	92
Great Crested Flycatcher	GCFL	201
Greater Roadrunner	GRRO	161

Common Name	SP Code	Page
Green-backed Heron	GNBH	98
Green-tailed Towhee	GTTO	301
Groove-billed Ani	GBAN	163
Hairy Woodpecker	HAWO	186
Harris' Sparrow	HASP	324
Henslow's Sparrow	HESP	314
Hermit Thrush	HETH	238
Hooded Warbler	HOWA	287
Hooded Merganser	HOME	108
Horned Lark	HOLA	207
House Finch	HOFI	346
House Wren	HOWR	228
House Sparrow	HOSP	353
Indigo Bunting	INBU	298
Ivory-billed Woodpecker	IBOW	188
Kentucky Warbler	KEWA	284
Killdeer	KILL	149
King Rail	KIRA	141
Lapland Longspur	LALO	326
Lark Bunting	LARB	311
Lark Sparrow	LASP	310
Le Conte's Sparrow	LCSP	315
Least Flycatcher	LEFL	197
Least Bittern	LEBI	90
Limpkin	LIMP	147
Lincoln's Sparrow	LISP	320
Little Blue Heron	LBHE	94
Loggerhead Shrike	LOSH	247
Long-eared Owl	LEOW	170
Louisiana Waterthrush	LOWA	283
Magnificent Frigatebird	MAFR	88
Magnolia Warbler	MAWA	264
Mallard	MALL	107
Mangrove Cuckoo	MACU	160
Marsh Wren	MAWR	231
Merlin	MERL	131
Mississippi Kite	MIKI	115
Mourning Warbler	MOWA	285
Mourning Dove	MODO	156
Nashville Warbler	NAWA	260
Northern Mockingbird	NOMO	242
Northern Harrier	NOHA	117
Northern Goshawk	NOGO	120
Northern (Yellow-shafted) Flicker	YSFL*	189
Northern Rough-winged Swallow	NRWS	210
Northern Bobwhite	NOBO*	137
Northern Cardinal	NOCA	294
Northern Waterthrush	NOWA	282
Northern (Baltimore) Oriole	BAOR*	344
Northern Parula	NOPA	261
Northern Saw-whet Owl	NSWO	172
Olivaceous Cormorant	OLCO	86
Olive-sided Flycatcher	OSFL	191
Orange-crowned Warbler	OCWA	259
Orchard Oriole	OROR	342
Osprey	OSPR	111
Ovenbird	OVEN	281
Painted Bunting	PABU	299
Palm Warbler	PAWA*	274
Peregrine Falcon	PEFA	132
Pied-billed Grebe	PBGR	83
Pileated Woodpecker	PIWO	190
Pine Siskin	PISI	350
Pine Warbler	PIWA	272
Prairie Warbler	PRAW	273
Prothonotary Warbler	PROW	278
Purple Finch	PUFI	345
Purple Gallinule	PUGA	144
Purple Martin	PUMA	208
Red-shouldered Hawk	RSHA	121
Red-cockaded Woodpecker	RCWO	187
Red Crossbill	RECR	347
Red-breasted Nuthatch	RBNU	222
Red-bellied Woodpecker	RBWO	183
Red-winged Blackbird	RWBL	331
Red-eyed Vireo	REVI	254
Red-tailed Hawk	RTHA	125
Red-headed Woodpecker	RHWO	182
Reddish Egret	REEG	96
Ring-necked Pheasant	RNPH*	134
Rock Dove	RODO*	153
Rose-breasted Grosbeak	RBGR	295
Roseate Spoonbill	ROSP	104
Rough-legged Hawk	RLHA	127
Ruby-throated Hummingbird	RTHU	178
Ruby-crowned Kinglet	RCKI	233
Ruffed Grouse	RUGR*	135
Rufous Hummingbird	RUHU	180
Rufous-sided Towhee	RSTO	302
Rufous-crowned Sparrow	RCSP	304
Rusty Blackbird	RUBL	335
Sandhill Crane	SACR	148
Savannah Sparrow	SAVS	312
Scarlet Tanager	SCTA	292
Scissor-tailed Flycatcher	STFL	206
Scrub Jay	SCJA	215
Seaside Sparrow	SESP	317
Sedge Wren	SEWR	230
Sharp-shinned Hawk	SSHA	118
Sharp-tailed Sparrow	STSP	316
Short-tailed Hawk	STHA	123
Short-eared Owl	SEOW	171
Smith's Longspur	SMLO	327
Smooth-billed Ani	SBAN	162
Snail Kite	SNKI	114
Snow Bunting	SNBU	329
Snowy Owl	SNOW	167
Snowy Egret	SNEG	93
Solitary Vireo	SOVI	251
Song Sparrow	SOSP	319

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Sora	SORA	143
Spot-breasted Oriole	SPOO	343
Sprague's Pipit	SPPI	245
Summer Tanager	SUTA	291
Swainson's Warbler	SWWA	280
Swainson's Hawk	SWHA	124
Swainson's Thrush	SWTH	237
Swamp Sparrow	SWSP	321
Tree Swallow	TRES	209
Tricolored Heron	TRHE	95
Tufted Titmouse	ETTI*	221
Turkey Vulture	TUVU	110
Upland Sandpiper	UPSA	150
Veery	VEER	236
Vermilion Flycatcher	VEFL	199
Vesper Sparrow	VESP	309
Virginia Rail	VIRA	142
Warbling Vireo	WAVI	253
Water Pipit	WAPI	244
Western Meadowlark	WEME	333
Western Kingbird	WEKI	203
Western Tanager	WETA	293
Whip-poor-will	WPWI	175
White-winged Dove	WWDO	155
White-crowned Pigeon	WCPI	154
White-breasted Nuthatch	WBNU	223
White-faced Ibis	WFIB	103
White Ibis	WHIB	101
White-crowned Sparrow	WCSP	323
White-throated Sparrow	WTSP	322
White-winged Crossbill	WWCR	348
White-eyed Vireo	WEVI	249
Wild Turkey	WITU*	136
Willow Flycatcher	WIFL	195
Wilson's Warbler	WIWA	288
Winter Wren	WIWR	229
Wood Duck	WODU	106
Wood Stork	WOST	105
Wood Thrush	WOTH	239
Worm-eating Warbler	WEWA	279
Yellow-billed Cuckoo	YBCU	159
Yellow-bellied Flycatcher	YBFL	196
Yellow-breasted Chat	YBCH	290
Yellow Rail	YERA	138
Yellow-rumped (Myrtle) Warbler	MYWA	267
Yellow Warbler	YWAR	262
Yellow-bellied Sapsucker	YBSA	184
Yellow-throated Warbler	YTWA	271
Yellow-crowned Night Heron	YCNH	100
Yellow-headed Blackbird	YHBL	334
Yellow-throated Vireo	YTVI	252