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

1992


The Nature Conservancy,
Chapel Hill, North Carolina

and
The U.S. Forest Service, Southern Region,
Atlanta, Georgia

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.

Additional copies are available for $20.00, postpaid from: The Nature Conservancy, P.O. Box 2267, Chapel Hill, NC 27515-2267.
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 It was fashioned from that work and a subsequent unpublished report I prepared for the Southern Region of the Forest Service in 1983.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.
ACKNOWLEDGMENTS

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 Droge 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.
# Table of Contents

## Chapter 1 Introduction .................................................. 1
- Legal - Historical Background ........................................... 1
- Purpose ............................................................................ 2
- Ecological Perspective ...................................................... 2
- Management Overview of Vegetation Types ......................... 3
- Expected Uses of This Work .............................................. 3
- Limitations ...................................................................... 4

## Chapter II Use of This Manual .......................................... 5
- Organization ..................................................................... 5
- Basic Use of This Work .................................................... 8
- Sources of Error ............................................................. 10

## Chapter III Relationship of Birds to Vegetation Types ............ 11
- Introduction ..................................................................... 11
- Vegetation Type Accounts .................................................. 13
- Everglades, Tropical Hardwoods, Mangroves ....................... 13
- Pine Savanna, Southern Scrub Oak, Sand Pine Southern Scrub Oak, Longleaf Pine-Scrub Oak, Sandhills Longleaf Pine .................. 23
- Southern Mixed Mesic Hardwoods, Bayswamp-Pocosin, Pond Pine-Pocosin, Long Leaf Pine-Slash Pine, Oak-Gum-Cypress ................. 34
- Oak-Hickory, White Pine-Hemlock, Cove Hardwoods, Maple-Beech-Birch, Spruce-Fir .................................................. 67

## Chapter IV Narrative Species Accounts ............................. 80

## Glossary ............................................................................ 354

## Literature Cited .................................................................. 359

## Appendices ........................................................................ 367
- A. Summaries of Published Bird Censuses ............................. A-1
- B. Species Occurrence by Vegetation Type, Habitat Suitability, and Season ......................................................... B-1
- C. Summary of Published Bird Density Information in the Southeast, from Breeding Bird Censuses and Winter Bird Population Studies, 1947-1979 ...................................................... C-1
- D. Species Associations (Guilds) by Nest Sites, by Foraging Substrates and Behavior, and by Diets ........................................ D-1
- E. Species Requiring Snags, Cavities, or Both ...................... E-1
- F. Species Requiring Large Sawtimber Trees, at Least 20" (50 CM) D.B.H. ................................................................. F-1
- G. Species Requiring Forest Interior Conditions or Areas of Extensive Forest ........................................................ G-1
- H. Species Using Slash Piles, Windrows and Downed Logs .... H-1
- I. Species Using Rock Outcrops, Caves, Crevices, and Earthen Banks ................................................................. I-1
- J. Species Using Aquatic Habitats for Foraging or Nesting .... I-1
- K. SAF Forest Types Equivalent to Vegetation Types in this Work ................................................................. K-1
- L. USFS Forest Types Equivalent to Vegetation Types in this Work ................................................................. L-1
- M. Neotropical Migratory Birds Treated in this Work ............ M-1
- N. Species Codes .............................................................. N-1

## Index to Bird Species .......................................................... Index-1
Chapter 1.
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 database 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 non-game 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-guild intentions are intended to provide insight into the biology of each species. This information is presented in order to assist the manager in prescribing treatments for 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 Droge, 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 NPS, SAF, RRE, or this scheme.
      NPS 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 suitability 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

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 Louisiana are considered equivalent to this type.

Only the grass/orb 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.

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.

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.
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW^</th>
<th>Local</th>
<th>EVER</th>
<th>TROP</th>
<th>MANG</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tplug Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pied-billed Grebe</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>N</td>
<td>N</td>
<td>FB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Pelican</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>O</td>
<td></td>
<td>S</td>
<td>N</td>
<td>FB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double-crested Cormorant</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>ND T NOE</td>
<td></td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>N</td>
<td></td>
<td>N</td>
<td>NP NP</td>
<td>PDT</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Anhinga</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>S</td>
<td>NP NP</td>
<td>FB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnificent Frigatebird</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>O</td>
<td>N</td>
<td></td>
<td></td>
<td>NP</td>
<td>FB</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>American Bittern</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>O</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least Bittern</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>S</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>FB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td>M</td>
<td>O</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Great Egret</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>A</td>
<td>F</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
<td>F</td>
<td>F</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>M</td>
<td>S</td>
<td></td>
<td>S</td>
<td>F</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>S</td>
<td>M</td>
<td></td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Reddish Egret</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>A</td>
<td>F</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>M</td>
<td>M</td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>A</td>
<td>F</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>S</td>
<td>O</td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>A</td>
<td>F</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>S</td>
<td>M</td>
<td></td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>A</td>
<td>F</td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  

(b) Specific Requirements  
Code Key  
-  All Requirements  
-  Grassy Openings  
-  Dead Trees  
-  Downed Logs  
-  Rocky Places  
-  Closed Canopy  
-  Open Canopy  
-  Living Cavity Tree  
-  All  
-  Fresh  
-  Brackish  
-  Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local</th>
<th>EVER</th>
<th>TROP</th>
<th>MANG</th>
<th>Bare Soil</th>
<th>Last Letter</th>
<th>Herbs</th>
<th>Shrubs</th>
<th>Midstory</th>
<th>Overstory</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tree Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Ibis</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>S M</td>
<td>S O</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td></td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>S M</td>
<td>S O</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td></td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>White-faced Ibis</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td>N</td>
<td>NP</td>
<td></td>
<td>FB</td>
<td>FB</td>
<td></td>
</tr>
<tr>
<td>Roseate Spoonbill</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S M</td>
<td>M O</td>
<td>N</td>
<td>N</td>
<td>NP</td>
<td>P</td>
<td></td>
<td>SB</td>
<td>SB</td>
<td></td>
</tr>
<tr>
<td>Wood Stork</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>S S</td>
<td>M S</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>P</td>
<td></td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Mallard</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td>FP</td>
<td>FB</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Black Vulture</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>M S S</td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td>FB</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>B</td>
<td>W</td>
<td>S O</td>
<td>S O</td>
<td>S O</td>
<td>M S S</td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osprey</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>S S</td>
<td></td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>P</td>
<td>ND T PT NBT PBT N46 P46</td>
<td>A</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>American Swallow-tailed Kite</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NBT PBT</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Black-shouldeered Kite</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td>F N</td>
<td>N</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snail Kite</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>NP</td>
<td>P PT</td>
<td>NBT PBT P46</td>
<td>A</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooper's Hawk</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-shouldered Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td>55</td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering
N - Nests
P - Perches
F - Forages

(b) Specific Requirements
Code Key
- All Requirements
OC - Open Canopy
LC - Living Cavity Tree

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW&lt;sup&gt;a&lt;/sup&gt;</th>
<th>EVER</th>
<th>TROP</th>
<th>MANG</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-tailed Hawk</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swainson's Hawk</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-tailed Hawk</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>*PDT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Kestrel</td>
<td>B W</td>
<td>M</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td></td>
<td>*DT F15 *35 NLC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merlin</td>
<td>B W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td></td>
<td>*PDT F15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>B W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td></td>
<td>*PDT NRP PRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>*P  P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>*GO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>B W</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*GO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Rail</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>King Rail</td>
<td>B W</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia Rail</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sora</td>
<td>B W</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple Gallinule</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Coot</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limpkin</td>
<td>B W</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
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

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

Min. Snags
15 - 15 cm Snags
25 - 25 cm Snags
35 - 35 cm Snags
46 - 46 cm Snags
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>EVER</th>
<th>TROP</th>
<th>MANG</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements b</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Snipe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Woodcock</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-crowned Pigeon</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Ground-Dove</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mangrove Cuckoo</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smooth-billed Ani</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Horned Owl</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burrowing Owl</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barred Owl</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chuck-will's-widow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruby-throated Hummingbird</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements Code Key
- All Requirements

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW&lt;sup&gt;a&lt;/sup&gt;</th>
<th>EVER</th>
<th>TROP</th>
<th>MANG</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Track Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belted Kingfisher</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>P</td>
<td>PDT, F15 FSW NEB</td>
<td>A</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>P</td>
<td>PDT, F15 FSW</td>
<td>A</td>
<td>F</td>
<td>1</td>
</tr>
<tr>
<td>Yellow-bellied Sapsucker</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>PTD N25 NLC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>PTD N25 N25 NLC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>PTD *OC N35 N35 NLC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Flicker</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>PTD *OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>B</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>PTD *BT CC 46 NLC FDL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least Flycatcher</td>
<td>B</td>
<td>O</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>PTD *OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>B</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>PTD *BT CC 46 NLC FDL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vermilion Flycatcher</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>PTD *OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ash-throated Flycatcher</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>PTD *OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>PTD N25 NLC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown-crested Flycatcher</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>FDT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Kingbird</td>
<td>B</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>FDT F15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Kingbird</td>
<td>B</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>FDT *OC F15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gray Kingbird</td>
<td>B</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>FDT F15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scissor-tailed Flycatcher</td>
<td>B</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>FDT F15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple Martin</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>FDT *OC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  

(b) Specific Requirements  
Code Key  
N - Nests  
P - Perches  
F - Forages  
* - All Requirements  

(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Local</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Bare Soil</th>
<th>Leaf Litter</th>
<th>Shrubs</th>
<th>Midstory</th>
<th>Overstory</th>
<th>Specific Requirements&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Standing Water (o)</th>
<th>Flowing Water (o)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Swallow</td>
<td>B</td>
<td>W</td>
<td>0</td>
<td>O</td>
<td>O S</td>
<td>M</td>
<td>O S</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NDT N15</td>
<td>FB</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Northern Rough-winged Swallow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M M</td>
<td>M</td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FB</td>
<td>F</td>
</tr>
<tr>
<td>Blue Jay</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M S</td>
<td>F</td>
<td>F F</td>
<td>F F</td>
<td>F F</td>
<td>F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FB</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>American Crow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>F</td>
<td>F F</td>
<td>F F</td>
<td>F F</td>
<td>NCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish Crow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M M</td>
<td>M</td>
<td>S O</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tufted Titmouse</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M M</td>
<td>F</td>
<td>F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NDT N15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>O O</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N15 NLC *SW NRP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*SW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*SW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruby-crowned Kinglet</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td></td>
<td></td>
<td>F</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*CC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Robin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td>F</td>
<td>N</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gray Catbird</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Mockingbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*OC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*OC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Starling</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NDT N25 NLC NRP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> B - Breeding, W - Wintering

<sup>b</sup> Specific Requirements:
- F - Forages
- CC - Closed Canopy
- EB - Earth Banks
- OC - Open Canopy
- LC - Living Cavity Tree

GO - Grassy Openings
DL - Downed Logs
BP - Big Trees
RP - Rocky Places
OS - Old Snags
YE - Young Snags
H - Habitat
OC - Open Canopy
LC - Living Cavity Tree

Water Codes:
- A - All
- F - Fresh
- S - Salt
- N - Nest
- B - Breeding
- W - Wintering
- D - Dead
- M - Midstory
- L - Litter
- O - Open
- C - Closed
- E - Earth
- V - Vessel
- N - Nest
- L - Litter
- C - Closed
- O - Open
- S - Salt
- F - Fresh
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local</th>
<th>EVER</th>
<th>TROP</th>
<th>MANG</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-eyed Vireo</td>
<td>B W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>F * P</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>B W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td></td>
<td>N * *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>B W</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Black-whiskered Vireo</td>
<td>B W</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange-crowned Warbler</td>
<td>B W</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>* * * * * * * *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Parula</td>
<td>B W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow Warbler</td>
<td>B W</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>O</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnolia Warbler</td>
<td>B W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cape May Warbler</td>
<td>B W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-throated Blue Warbler</td>
<td>B W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-rumped (Myrtle) Warbler</td>
<td>B W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-throated Green Warbler</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>B W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>B W</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palm Warbler</td>
<td>B W</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>B W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Redstart</td>
<td>B W</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>B W</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
* - All Requirements  
GO - Grassy Openings  
DT - Dead Trees  
DL - Downed Logs  
BT - Big Trees  
RP - Rocky Places  
CC - Closed Canopy  
OC - Open Canopy  
EB - Earth Banks  
LC - Living Cavity Tree  |  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Local</th>
<th>Evergreen</th>
<th>Temperate</th>
<th>Mangrove</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Track Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovenbird</td>
<td>B</td>
<td>W</td>
<td></td>
<td>0</td>
<td>0</td>
<td>*</td>
<td></td>
<td>P P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>B</td>
<td>W</td>
<td></td>
<td>S</td>
<td>S M</td>
<td>O O</td>
<td>*</td>
<td>P P</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Common Yellowthroat</td>
<td>B</td>
<td>W</td>
<td></td>
<td>O M S</td>
<td>S</td>
<td>S</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>#</td>
</tr>
<tr>
<td>Yellow-breasted Chat</td>
<td>S</td>
<td>W</td>
<td></td>
<td>O M</td>
<td>S M</td>
<td>*</td>
<td></td>
<td>PDT</td>
<td></td>
<td></td>
<td>#</td>
</tr>
<tr>
<td>Summer Tanager</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>M M</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>#</td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>B</td>
<td>W</td>
<td></td>
<td>S O O</td>
<td>M</td>
<td>*</td>
<td>F F</td>
<td>* OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>B</td>
<td>W</td>
<td></td>
<td>S O S M</td>
<td>M</td>
<td>*</td>
<td></td>
<td>P P</td>
<td></td>
<td></td>
<td>* OC</td>
</tr>
<tr>
<td>Painted Bunting</td>
<td>B</td>
<td>W</td>
<td></td>
<td>O M M</td>
<td></td>
<td>*</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dickcissel</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>M M</td>
<td>*</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous-sided Towhee</td>
<td>B</td>
<td>W</td>
<td></td>
<td>S S M M</td>
<td>M M</td>
<td>F</td>
<td>*</td>
<td>P P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous-crowned Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td>S S M M</td>
<td>M M</td>
<td>FP</td>
<td>*</td>
<td>P P</td>
<td></td>
<td></td>
<td>* OC RP</td>
</tr>
<tr>
<td>Chipping Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td>M M M M</td>
<td></td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay-colored Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>* OC</td>
</tr>
<tr>
<td>Field Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lark Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>* OC GO RP</td>
</tr>
<tr>
<td>Savannah Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>* OC GO</td>
</tr>
<tr>
<td>Grasshopper Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharp-tailed Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
N - Nests  
DT - Dead Trees  
BT - Big Trees  
CC - Closed Canopy  
EB - Earth Banks  
DL - Downed Logs  
RP - Rocky Places  
LC - Living Cavity Tree  
GO - Grassy Openings  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt

(b) Specific Requirements  
F - Forages  
C - Closed Canopy  
E - Earth Banks  
D - Downed Logs  
R - Rocky Places  
L - Living Cavity Tree  
O - Open Canopy  
N - Nests

* - All Requirements  
Yes

---

21
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW³</th>
<th>E1</th>
<th>E2</th>
<th>E3</th>
<th>E4</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>Bare Soil</th>
<th>Leaf Litter</th>
<th>Herbs</th>
<th>Shrubs</th>
<th>Midstory</th>
<th>Overstory</th>
<th>Specific Requirements b</th>
<th>Standing Water (c)</th>
<th>Flowing Water (d)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seaside Sparrow</td>
<td>B</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SB</td>
<td></td>
<td>SB</td>
</tr>
<tr>
<td>Song Sparrow</td>
<td>B</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SB</td>
<td></td>
<td>SB</td>
</tr>
<tr>
<td>Lincoln's Sparrow</td>
<td>B</td>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swamp Sparrow</td>
<td>B</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-winged Blackbird</td>
<td>B</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
<td>P</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>B</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes?</td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>B</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Grackle</td>
<td>B</td>
<td></td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>B</td>
<td></td>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern (Baltimore) Oriole</td>
<td>B</td>
<td></td>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
* - All Requirements  

Water Codes:  
A - All  
F - Fresh  
B - Brackish
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 ft²/acre (0.2-5 m²/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.
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SW&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Bare Soil Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Bittern</td>
<td>B</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>A</td>
<td>F</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>W</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>A</td>
<td>F</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NDT PDT</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Great Egret</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>B</td>
<td>A</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Greenbacked Heron</td>
<td>B</td>
<td>W</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Blackcrowned Night Heron</td>
<td>B</td>
<td>W</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Yellowcrowned Night Heron</td>
<td>B</td>
<td>W</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>White Ibis</td>
<td>B</td>
<td>W</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Osprey</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>American Swallowtailed Kite</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>F</td>
<td>NP</td>
<td>A</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
F - Forages
S - Salt
A - All
P - Perches
N - Nests

Water Codes
A - All
F - Fresh
B - Brackish

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

GO - Grassy Openings
DL - Downed Logs
RP - Rocky Places
EB - Earth Banks
LC - Living Cavity Tree
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local</th>
<th>PAV</th>
<th>SOSO</th>
<th>SPSO</th>
<th>LLSS</th>
<th>SHLL</th>
<th>Bare Soil</th>
<th>Late Litter</th>
<th>Herbs</th>
<th>Shrubs</th>
<th>Midstory</th>
<th>Overstory</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackshouldered Kite</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>N</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snail Kite</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td></td>
<td>NP</td>
<td>P</td>
<td>PDT, NBT, PB1, P46</td>
<td>A</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharpshinned Hawk</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooper's Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redshoudered Hawk</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shorttailed Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redtailed Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crested Caracara</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Kestrel</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td></td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merlin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Francolin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>King Rail</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FB</td>
</tr>
<tr>
<td>Limpkin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
</tr>
</tbody>
</table>

(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  
DL - Downed Logs  
RP - Rocky Places  
EB - Earth Banks  
LC - Living Cavity Tree  
GO - Grassy Openings  
15 - 15 cm Min. Snags  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local</th>
<th>PSAY</th>
<th>SDSO</th>
<th>SPSO</th>
<th>LLSO</th>
<th>SHLL</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements*</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandhill Crane</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Killdeer</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock Dove</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>F</td>
<td>F</td>
<td>NRP</td>
<td>PRP</td>
<td></td>
</tr>
<tr>
<td>White-crowned Pigeon</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whitewing Dove</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Ground Dove</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater Roadrunner</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smooth-billed Ani</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groove-billed Ani</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Barn Owl</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td></td>
<td>F</td>
<td>F</td>
<td>N</td>
<td>OC</td>
<td></td>
</tr>
<tr>
<td>Eastern Screech Owl</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Great Horned Owl</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burrowing Owl</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chuckwill's widow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
- All Requirements

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

Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tread Size (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whippoorwill</td>
<td>B W</td>
<td>2</td>
<td>PSAY</td>
<td>1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4</td>
<td>N P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubythroated Hummingbird</td>
<td>B W</td>
<td>2</td>
<td>SOSO</td>
<td>M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redheaded Woodpecker</td>
<td>B W</td>
<td>2</td>
<td>SPSO</td>
<td>M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redbellied Woodpecker</td>
<td>B W</td>
<td>2</td>
<td>LLSD</td>
<td>M S M S M S M S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellowbellied Sapsucker</td>
<td>B W</td>
<td>2</td>
<td>SHLL</td>
<td>M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redcockered Woodpecker</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Flicker</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>M M M M M M M O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern WoodPewee</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least Flycatcher</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>M S M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vermilion Flycatcher</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>S S M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashthroated Flycatcher</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td>M M M M M S S S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Browncrested Flycatcher</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Kingbird</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Kingbird</td>
<td>B W</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering
(b) Specific Requirements Code Key:
- All Requirements
(c) Water Codes:
- A - All
- F - Fresh
- B - Brackish
- S - Salt

First Letter:
- N - Nests
- P - Perches
- F - Forages
2nd and 3rd Letters:
- GO - Grassy Openings
- DL - Downed Logs
- BT - Big Trees
- CC - Closed Canopy
- OC - Open Canopy
- EB - Earth Banks
- LC - Living Cavity Tree

Substrate Utilization:
- Base Soil
- Leaf Litter
- Heats
- Shrubs
- Milesty
- Overstory

Standards:
- 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
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Routine</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. T. Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scissortailed Flycatcher</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>*DT  *OC</td>
</tr>
<tr>
<td>Purple Martin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NDT N25</td>
<td>NLC</td>
<td></td>
</tr>
<tr>
<td>Tree Swallow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NDT N15</td>
<td>FB</td>
<td>F</td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NRP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Jay</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrub Jay</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>NCC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Crow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>PCC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish Crow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>A</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Carolina Chickadee</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NDT N15 P15 NLC</td>
<td>PLC</td>
<td></td>
</tr>
<tr>
<td>Tufted Titmouse</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>PDT P15 PLC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redbreasted Nuthatch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NDT N15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whitebreasted Nuthatch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Brownheaded Nuthatch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>N25 NLC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bewick's Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td>SW</td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
- All Requirements

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local</th>
<th>PAV</th>
<th>SQSO</th>
<th>SPQO</th>
<th>LLSQ</th>
<th>SHLL</th>
<th>Bare Soil Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsh Wren</td>
<td>B</td>
<td>W</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Goldencrowned Kinglet</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubycrowned Kinglet</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bluegray Gnatcatcher</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Bluebird</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Robin</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gray Catbird</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Mockingbird</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Thrasher</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loggerhead Shrike</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-eyed Vireo</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bell's Vireo</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-whiskered Vireo</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  

(b) Specific Requirements  
Code Key  

<table>
<thead>
<tr>
<th>First Letter</th>
<th>2nd and 3rd Letters</th>
<th>GO - Grassy Openings</th>
<th>15 - 15 cm Min. Snags</th>
<th>(c) Water Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>N - Nests</td>
<td>DT - Dead Trees</td>
<td>DL - Downed Logs</td>
<td>25 - 25 cm Min. Snags</td>
<td>A - All</td>
</tr>
<tr>
<td>P - Perches</td>
<td>BT - Big Trees</td>
<td>RP - Rocky Places</td>
<td>35 - 35 cm Min. Snags</td>
<td>F - Fresh</td>
</tr>
<tr>
<td>F - Forages</td>
<td>CC - Closed Canopy</td>
<td>EB - Earth Banks</td>
<td>46 - 46 cm Min. Snags</td>
<td>B - Brackish</td>
</tr>
<tr>
<td>* - All Requirements</td>
<td>OC - Open Canopy</td>
<td>LG - Living Cavity Tree</td>
<td></td>
<td>S - Salt</td>
</tr>
<tr>
<td>Common Name</td>
<td>BW</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Orange-crowned Warbler</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
</tr>
<tr>
<td>Northern Parula</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Yellow Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Yellow-rumped (Myrtle) Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Black-throated Green Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Pine Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Palm Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Ovenbird</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Common Yellowthroat</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Yellow-breasted Chat</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Summer Tanager</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Blue Grosbeak</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>Painted Bunting</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
N - Nests
P - Perches
F - Forages
* - All Requirements

GO - Grassy Openings
DT - Dead Trees
BT - Big Trees
CC - Closed Canopy
OC - Open Canopy
LC - Living Cavity Tree

GO - Grassy Openings
DT - Dead Trees
BT - Big Trees
CC - Closed Canopy
OC - Open Canopy
LC - Living Cavity Tree

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

15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
35 - 35 cm Min. Snags
45 - 45 cm Min. Snags

Min. Tard Site (ha)
<table>
<thead>
<tr>
<th>BV²</th>
<th>Common Name</th>
<th>Dickcissel</th>
<th>Greenleted Towhee</th>
<th>Rubolusied Towhee</th>
<th>Bachman's Sparrow</th>
<th>Redwinged Sparrow</th>
<th>Chipping Sparrow</th>
<th>Claycolored Sparrow</th>
<th>Field Sparrow</th>
<th>Vesper Sparrow</th>
<th>Lark Sparrow</th>
<th>Savannah Sparrow</th>
<th>Grasshopper Sparrow</th>
<th>Hermit's Sparrow</th>
<th>Le Conte's Sparrow</th>
<th>Fox Sparrow</th>
<th>Song Sparrow</th>
<th>Lincoln's Sparrow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

- **PWS**: Planting Water Stage
- **SCSQ**: Site Characteristics
- **CSCI**: Climatic Stage
- **LSSQ**: Life Stage
- **Bv²**: Biome Code
- **PSW**: Planting Stage

---

- **1** : 15 - 16 cm Min. Snags
- **2** : 25 - 26 cm Min. Snags
- **3** : 35 - 36 cm Min. Snags
- **4** : 45 - 46 cm Min. Snags

- **GCO**: Grassy Openings
- **PL**: Perennial Grasses
- **PB**: Poachers Plots
- **EB**: Early Banks
- **LC**: Living Cavity Tree

- **B**: Breeding
- **W**: Wintering
- **P**: Present
- **F**: Foraging
- **A**: All Requirements

---

**Code Key**:
- **M**: Minimal
- **S**: Sporadic
- **O**: Occasional
- **D**: Dominant
- **F**: Frequent
- **P**: Present
- **A**: All Requirements
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW*</th>
<th>Local</th>
<th>P1</th>
<th>S2A</th>
<th>S2O</th>
<th>S3O</th>
<th>L3O</th>
<th>LLSO</th>
<th>SHL1</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Track Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swamp Sparrow</td>
<td>B W</td>
<td>M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F * *</td>
<td>*</td>
<td>*</td>
<td>FB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whitethroated Sparrow</td>
<td>B W</td>
<td>M M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F * *</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whitecrowned Sparrow</td>
<td>B W</td>
<td>M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F * *</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harris' Sparrow</td>
<td>B W</td>
<td>M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F F * *</td>
<td>*</td>
<td>*</td>
<td>P P P P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith's Longspur</td>
<td>B W</td>
<td>M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chestnut-sided Longspur</td>
<td>B W</td>
<td>M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darkeyed Junco</td>
<td>B W</td>
<td>M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F * *</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redwinged Blackbird</td>
<td>B W</td>
<td>M M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F * *</td>
<td>*</td>
<td>*</td>
<td>P P P P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>B W</td>
<td>M M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F * *</td>
<td>*</td>
<td>*</td>
<td>P P P P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Meadowlark</td>
<td>B W</td>
<td>M M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F * *</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellowheaded Blackbird</td>
<td>B W</td>
<td>M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F P P * *</td>
<td>*</td>
<td>*</td>
<td>P P * *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great-tailed Grackle</td>
<td>B W</td>
<td>M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F P *</td>
<td>*</td>
<td>*</td>
<td>P P * *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>B W</td>
<td>M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F P P * *</td>
<td>*</td>
<td>*</td>
<td>P P P P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Grackle</td>
<td>B W</td>
<td>M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F N N N P P</td>
<td>*</td>
<td>*</td>
<td>P P P P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronzed Cowbird</td>
<td>B W</td>
<td>M M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F N N N N P</td>
<td>*</td>
<td>*</td>
<td>* N D T * *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>B W</td>
<td>M M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F P P P P</td>
<td>*</td>
<td>*</td>
<td>F F * *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orchard Oriole</td>
<td>B W</td>
<td>M M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F * * * *</td>
<td>*</td>
<td>*</td>
<td>* * * *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spot-breasted Oriole</td>
<td>B W</td>
<td>M M M M M</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>F F * * * *</td>
<td>*</td>
<td>*</td>
<td>* * * *</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
*N - Nests  
P - Perches  
F - Forages  
* - All Requirements  
2nd and 3rd Letters  
GO - Grassy Openings  
DT - Dead Trees  
DL - Downed Logs  
BT - Big Trees  
RP - Rocky Places  
CC - Closed Canopy  
OC - Open Canopy  
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
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water</th>
<th>Flowing Water</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purple Finch</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Crossbill</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pine Siskin</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evening Grosbeak</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Sparrow</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>First Letter</th>
<th>2nd and 3rd Letters</th>
<th>GO - Grassy Openings</th>
<th>15 - 15 cm Min. Snags</th>
<th>(c) Water Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>N - Nests</td>
<td>DT - Dead Trees</td>
<td>DL - Downed Logs</td>
<td>25 - 25 cm Min. Snags</td>
<td>A - All</td>
</tr>
<tr>
<td>P - Perches</td>
<td>BT - Big Trees</td>
<td>RP - Rocky Places</td>
<td>35 - 35 cm Min. Snags</td>
<td>F - Fresh</td>
</tr>
<tr>
<td>F - Forages</td>
<td>CC - Closed Canopy</td>
<td>EB - Earth Banks</td>
<td>46 - 46 cm Min. Snags</td>
<td>B - Brackish</td>
</tr>
<tr>
<td>* - All Requirements</td>
<td>OC - Open Canopy</td>
<td>LC - Living Cavity Tree</td>
<td></td>
<td>S - Salt</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>State</th>
<th>Season</th>
<th>Successional stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Grass/furb</td>
</tr>
<tr>
<td>Florida</td>
<td>Breeding</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Wintering</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Georgia</td>
<td>Breeding</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Wintering</td>
<td>0</td>
</tr>
</tbody>
</table>

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 Titmouse, 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.

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

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

<table>
<thead>
<tr>
<th>State</th>
<th>Season</th>
<th>Successional stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sapling/ polelimber</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td>Breeding</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Winter</td>
<td>1 (1)</td>
<td>0</td>
</tr>
<tr>
<td>Georgia</td>
<td>Breeding</td>
<td>1 (1)</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Breeding</td>
<td>2 (2)</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Breeding</td>
<td>0</td>
</tr>
<tr>
<td>Virginia</td>
<td>Breeding</td>
<td>0</td>
</tr>
</tbody>
</table>

Entries are listed as “Plots (Years censused).”
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>BW</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLSL</th>
<th>OGCY</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double-crested Cormorant</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>O</td>
<td>N</td>
<td>N</td>
<td>NOC NDT</td>
<td>A</td>
<td>F</td>
<td>FB</td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>N</td>
<td>N</td>
<td>NP</td>
<td>NP</td>
<td>PDT</td>
</tr>
<tr>
<td>Anhinga</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>NP</td>
<td>NP</td>
<td>PDT</td>
<td>PDT</td>
<td>PDT</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>N</td>
<td>NP</td>
<td>F</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Great Egret</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Yellow-crowned Night Heron</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>White Ibis</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
<tr>
<td>White-faced Ibis</td>
<td>S</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>N</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
N - Nests  
P - Perches  
BT - Big Trees  
CC - Closed Canopy  
GO - Grassy Openings  
DL - Downed Logs  
BP - Rocky Places  
EB - Earth Banks  
LC - Living Cavity Tree  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt  

(b) Specific Requirements  
Code Key  
* - All Requirements
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLSL</th>
<th>OGCY</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (a)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-shouldered Hawk</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Short-tailed Hawk</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Red-tailed Hawk</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Ferruginous Hawk</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Rough-legged Hawk</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Golden Eagle</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>American Kestrel</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Black Francolin</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Black Rail</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>King Rail</td>
<td>BW</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

(a) B - Breeding  W - Wintering
(b) Specific Requirements
Code Key: * - All Requirements

GO - Grassy Openings DL - Downed Logs RP - Rocky Places
DL - Downed Logs BT - Big Trees EB - Earth Banks
CC - Closed Canopy LC - Living Cavity Tree
BC - Brushy Canopy OS - Open Shrubbery
OC - Open Canopy CR - Creosote Bank
SL - Silted Lakes MC - Mixed Canopy
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLSL</th>
<th>OGCY</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virginia Rail</td>
<td>B</td>
<td>W</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Sora</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Purple Gallinule</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Limpkin</td>
<td>B</td>
<td>W</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td>O</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Killdeer</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Common Snipe</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>F</td>
<td></td>
<td>FB</td>
<td>F</td>
</tr>
<tr>
<td>American Woodcock</td>
<td>B</td>
<td>W</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>B</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>White-winged Dove</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>B</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>B</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>N</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Greater Roadrunner</td>
<td>B</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groove-billed Ani</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding, W - Wintering
(b) Specific Requirements Code Key
- N - Nests, P - Perches, F - Forages
- DT - Dead Trees, BT - Big Trees, CC - Closed Canopy
- DL - Downed Logs, RP - Rocky Places, EB - Earth Banks
- OC - Open Canopy, LC - Living Cavity Tree

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

GO - Grassy Openings, 15 - 15 cm Min. Snags
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BW</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Bare Soil Leaf Litter Herbs Shrubs Military Overstory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>B W</td>
<td>M M S S M S S M S M S</td>
<td>F F P P</td>
<td>N46 NLC NRP N46</td>
<td>P46 PLC PRR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>B W</td>
<td>M O M S M M M S M S</td>
<td>F F F F * *</td>
<td>N35 NLC NDT</td>
<td>P35 PLC PDT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Horned Owl</td>
<td>B W</td>
<td>S M M M M S</td>
<td>F F F F *</td>
<td>None</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barred Owl</td>
<td>B W</td>
<td>M O S</td>
<td>S O F F F F F</td>
<td>NBT NLC</td>
<td>F F None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-eared Owl</td>
<td>B W</td>
<td>M O S</td>
<td>S O F F F F F</td>
<td>PBT PLC</td>
<td>F F None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>B W</td>
<td>M M M M M M</td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>B W</td>
<td>M M M M M M</td>
<td>F</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chuck-will's-widow</td>
<td>B W</td>
<td>M M S S S S M M</td>
<td>N</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>B W</td>
<td>M M S S M M</td>
<td>N</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>B W</td>
<td>M M M M S M</td>
<td>N</td>
<td>N35 NLC</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruby-throated Hummingbird</td>
<td>B W</td>
<td>S S S S S S S S M M M M M M</td>
<td>M</td>
<td>S S S S</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-chinned Hummingbird</td>
<td>B W</td>
<td>S S S S S S S S M M M M M M</td>
<td>M</td>
<td>S S S S</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous Hummingbird</td>
<td>B W</td>
<td>S M M</td>
<td>M S S P P</td>
<td>F15 FSW NEB PDT</td>
<td>A</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>B W</td>
<td>M M M</td>
<td>M M</td>
<td>P P</td>
<td>F15 FSW PDT</td>
<td>A</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>B W</td>
<td>M M M</td>
<td>M S P</td>
<td>M S M</td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  

(b) Specific Requirements  
Code Key  
N - Nests  
P - Perches  
F - Forages  
* - All Requirements  

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

15 - 15 cm Min. Snags  
25 - 25 cm Min. Snags  
35 - 35 cm Min. Snags  
45 - 45 cm Min. Snags  

(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>HW</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LSSL</th>
<th>OGCY</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-bellied Woodpecker</td>
<td>B W</td>
<td></td>
<td>M O</td>
<td>M O</td>
<td>M M</td>
<td>M S</td>
<td>M O</td>
<td>Bare Soil</td>
<td>Leaf Herbs</td>
<td>F F</td>
<td>N36 LNC &quot;DT&quot;</td>
<td>P36 PLC &quot;DT&quot;</td>
<td>1</td>
</tr>
<tr>
<td>Yellow-bellied Sapsucker</td>
<td>B W</td>
<td></td>
<td>S O</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>M S</td>
<td></td>
<td></td>
<td>N25 LNC &quot;DT&quot;</td>
<td>25 &quot;LC&quot;</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>B W</td>
<td></td>
<td>S O</td>
<td>M S</td>
<td>M M</td>
<td>M M</td>
<td>M S</td>
<td></td>
<td></td>
<td>* &quot;15 &quot;LC&quot;</td>
<td>&quot;DT&quot;</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>B W</td>
<td></td>
<td>M O</td>
<td>M S</td>
<td>M M</td>
<td>M S</td>
<td>M O</td>
<td></td>
<td></td>
<td>* &quot;25 &quot;LC&quot;</td>
<td>&quot;DT&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-cockaded Woodpecker</td>
<td>B W</td>
<td></td>
<td>M M</td>
<td>M O</td>
<td>M S</td>
<td>M S</td>
<td>M O</td>
<td></td>
<td></td>
<td>* &quot;25 &quot;LC&quot;</td>
<td>&quot;DT&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Flicker</td>
<td>B W</td>
<td></td>
<td>M S</td>
<td>M M</td>
<td>M M</td>
<td>M S</td>
<td>M M</td>
<td></td>
<td></td>
<td>* &quot;OC N35 LNC &quot;DT&quot;</td>
<td>&quot;DT&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>B W</td>
<td></td>
<td>M O</td>
<td>S S</td>
<td>S S</td>
<td>S S</td>
<td>M M</td>
<td></td>
<td></td>
<td>* &quot;BT &quot;CC &quot;46 LNC FDL &quot;DT&quot;</td>
<td>&quot;DT&quot;</td>
<td></td>
<td>405</td>
</tr>
<tr>
<td>Eastern Wood-Pewee</td>
<td>B W</td>
<td></td>
<td>M O</td>
<td>M S</td>
<td>M M</td>
<td>M O</td>
<td>M M</td>
<td></td>
<td></td>
<td>* &quot;F15 FDT&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>B W</td>
<td></td>
<td>M O</td>
<td>M S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* &quot;OC F15 FDT&quot;</td>
<td>F F</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Willow Flycatcher</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* &quot;OC&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least Flycatcher</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* &quot;OC&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>B W</td>
<td></td>
<td>S O</td>
<td>S M</td>
<td>S S</td>
<td>S S</td>
<td>S M</td>
<td></td>
<td></td>
<td>* &quot;OC NRP&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vermilion Flycatcher</td>
<td>B W</td>
<td></td>
<td>S M</td>
<td>S S</td>
<td>S S</td>
<td>F F</td>
<td>F F</td>
<td></td>
<td></td>
<td>* &quot;OC &quot;DT&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ash-throated Flycatcher</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* &quot;OC&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>B W</td>
<td></td>
<td>M O</td>
<td>M S</td>
<td>M S</td>
<td>M S</td>
<td>M S</td>
<td></td>
<td></td>
<td>N25 LNC NDT</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
* - All Requirements  

Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLSL</th>
<th>OGCY</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Kingbird</td>
<td>B W</td>
<td>1 2 3 4 1 2 3 4</td>
<td>M M M M</td>
<td>F</td>
<td></td>
<td></td>
<td>1 2 3 4 F15 FDT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gray Kingbird</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 F15 FDT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scissor-tailed Flycatcher</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 O15 DT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horned Lark</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 OC DT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple Martin</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 N25 NLC NDT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Swallow</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 N15 NDT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 NRP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Jay</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrub Jay</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Crow</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish Crow</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina Chickadee</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tufted Titmouse</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-breasted Nuthatch</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  W - Wintering
N - Nests  P - Perches
F - Forages  * - All Requirements

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

GO - Grasses  15 - 15 cm Min. Snags
GO -開啟  15 - 15 cm Min. Snags
GO - Grassy Openings  15 - 15 cm Min. Snags

(b) Specific Requirements
Code Key
A - All  F - Fresh  B - Brackish  S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown-headed Nuthatch</td>
<td>B W</td>
<td>N15, NLC, NDT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>B W</td>
<td>N25, NLC</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>B W</td>
<td></td>
<td>N15, NLC, SW, NRP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Wren</td>
<td>B W</td>
<td></td>
<td>N15, SW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Wren</td>
<td>B W</td>
<td></td>
<td>CC, SW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh Wren</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>B W</td>
<td>CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruby-crowned Kinglet</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>Eastern Bluebird</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Robin</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gray Catbird</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
   Code Key  
   * - All Requirements  

<table>
<thead>
<tr>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMMH BSPO PPPO LLSL OGCY</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
</tr>
<tr>
<td>1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>BW</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Mockingbird</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Thrasher</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Pipit</td>
<td>B W</td>
<td>S</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprague’s Pipit</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Starling</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-eyed Vireo</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bell’s Vireo</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warbling Vireo</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachman’s Warbler</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange-crowned Warbler</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Parula</td>
<td>B W</td>
<td>M</td>
<td>SMMH 1 2 3 4 BSPO 1 2 3 4 PPPO 1 2 3 4 LLSL 1 2 3 4 OGCY 1 2 3 4</td>
<td>Leaf Litter F F F F</td>
<td>Shrubs P P P P</td>
<td>OC OC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  W - Wintering  
(b) Specific Requirements  Code Key  
F - Forages  * - All Requirements  
N - Nests  P - Perches  CC - Closed Canopy  
DT - Dead Trees  BT - Big Trees  OC - Open Canopy  
DL - Downed Logs  RP - Rocky Places  EB - Earth Banks  
15 - 15 cm Min. Snags  25 - 25 cm Min. Snags  35 - 35 cm Min. Snags  
46 - 46 cm Min. Snags  GO - Grassy Openings  
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
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (%)</th>
<th>Flowing Water (%)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow-rumped (Myrtle) Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Black-throated Gray Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Black-throated Green Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Pine Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Palm Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>American Redstart</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Prothonotary Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Swainson's Warbler</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Ovenbird</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>B</td>
<td>W</td>
<td>12341234123412341234123412341234</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
<td>Herbs</td>
<td>Shrubs</td>
<td>Midstory</td>
<td>Overstory</td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
N - Nests  
P - Perches  
F - Forages  
* - All Requirements  
2nd and 3rd Letters  
GO - Grassy Openings  
DL - Downed Logs  
BT - Big Trees  
CC - Closed Canopy  
OG - Open Canopy  
15 - 15 cm Min. Snags  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLSL</th>
<th>OGCY</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Ttact Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Louisiana Waterthrush</td>
<td>B W</td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td>M</td>
<td>M</td>
<td></td>
<td>* RP</td>
<td>F</td>
<td></td>
<td>875</td>
</tr>
<tr>
<td>Kentucky Warbler</td>
<td>B W</td>
<td></td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>M O</td>
<td>F F</td>
<td>P</td>
<td></td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Hooded Warbler</td>
<td>B W</td>
<td></td>
<td>M S</td>
<td>M S</td>
<td></td>
<td></td>
<td>M O</td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wilson's Warbler</td>
<td>B W</td>
<td></td>
<td>S S</td>
<td>M</td>
<td></td>
<td></td>
<td>S S M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-breasted Chat</td>
<td>B W</td>
<td></td>
<td></td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>*</td>
<td></td>
<td>PDT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer Tanager</td>
<td>B W</td>
<td></td>
<td>M O</td>
<td>M M</td>
<td></td>
<td></td>
<td>M S</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>B W</td>
<td></td>
<td>S O</td>
<td>S</td>
<td>S S</td>
<td>M M</td>
<td>M M M M S S S S S S S S S S</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Grosbeak</td>
<td>B W</td>
<td></td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>B W</td>
<td></td>
<td>S M</td>
<td>M M</td>
<td>M M</td>
<td>S M</td>
<td>M M M M M M M M M M M M M M</td>
<td></td>
<td>*</td>
<td>P</td>
<td>F</td>
<td>OC</td>
</tr>
<tr>
<td>Painted Bunting</td>
<td>B W</td>
<td></td>
<td>M M</td>
<td>M M</td>
<td></td>
<td></td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dickcissel</td>
<td>B W</td>
<td></td>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green-tailed Towhee</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous-sided Towhee</td>
<td>B W</td>
<td></td>
<td>O O</td>
<td>S</td>
<td>S S</td>
<td>S S</td>
<td>S S M S M M M M M M M M M M M M M</td>
<td></td>
<td>F</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachman's Sparrow</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  W - Wintering  
N - Nests  D - Dead Trees  D - Downed Logs  R - Rocky Places  E - Earth Banks  L - Living Cavity Tree
P - Perches  B - Big Trees
F - Forages  C - Closed Canopy

(b) Specific Requirements
Code Key  * - All Requirements  O - Open Canopy  E - Earth Banks

(c) Water Codes  A - All  F - Fresh  S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Tree Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chipping Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay-colored Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Sparrow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vesper Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lark Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Savannah Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grasshopper Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henslow's Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Le Conte's Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td>M</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fox Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Song Sparrow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lincoln's Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swamp Sparrow</td>
<td>B</td>
<td>W</td>
<td></td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-throated Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
N - Nests
P - Perches
F - Forages
* - All Requirements

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLLS</th>
<th>OGCY</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark-eyed Junco</td>
<td>BW</td>
<td>M M M M M M M M M M M M M M S S</td>
<td>N F F</td>
<td>* *</td>
<td>P P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-winged Blackbird</td>
<td>BW</td>
<td>M O M S S S M M M O O S Q O S M</td>
<td>* * P</td>
<td>P P</td>
<td>* *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>BW</td>
<td>M M M M M M M M M M M M M M M M</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Meadowlark</td>
<td>BW</td>
<td>M M M M M M M M M M M M M M M M</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great-tailed Grackle</td>
<td>BW</td>
<td>S S S S F F * * * * P P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>BW</td>
<td>M M M M M M M M M M M M M M M M</td>
<td>* N N N</td>
<td>* P PP P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronzed Cowbird</td>
<td>BW</td>
<td>M M M M F F M M M F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>BW</td>
<td>M M M M M M M M M M M M M M M M</td>
<td>* P P P</td>
<td>* *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spot-breasted Oriole</td>
<td>BW</td>
<td>M M</td>
<td>M M</td>
<td>M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple Finch</td>
<td>BW</td>
<td>M M</td>
<td>M M</td>
<td>M M M M</td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Crossbill</td>
<td>BW</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-winged Crossbill</td>
<td>BW</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Redpoll</td>
<td>BW</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
* - All Requirements

GO - Grassy Openings
dt - Dead Trees
dl - Downed Logs
bt - Big Trees
rp - Rocky Places
cc - Closed Canopy
oc - Open Canopy
lc - Living Cavity Tree

(c) Water Codes
a - All
f - Fresh
b - Brackish
s - Salt

15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
35 - 35 cm Min. Snags
46 - 46 cm Min. Snags
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Local Use</th>
<th>HW</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLSL</th>
<th>OGACY</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pine Siskin</td>
<td>B</td>
<td>W</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Evening Grosbeak</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>House Sparrow</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
* - All Requirements  
15 - 15 cm Min. Snags  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
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.

<table>
<thead>
<tr>
<th>State</th>
<th>Season</th>
<th>Successional stagea</th>
<th>Shrub/seedling</th>
<th>Sapling/poletimber</th>
<th>Sawtimber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td>Breeding</td>
<td>71</td>
<td>0</td>
<td>2(3)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>50</td>
<td>1 (1)</td>
<td>2 (2)</td>
<td>0</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Breeding</td>
<td>72</td>
<td>0</td>
<td>0</td>
<td>1 (1)</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>76</td>
<td>0</td>
<td>0</td>
<td>1 (3)</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Breeding</td>
<td>73</td>
<td>0</td>
<td>0</td>
<td>1 (1)</td>
</tr>
</tbody>
</table>

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 bottom 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 Gnatchatchers (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.

<table>
<thead>
<tr>
<th>NFS number</th>
<th>SAF number</th>
<th>SAF or NFS name</th>
</tr>
</thead>
<tbody>
<tr>
<td>71</td>
<td>39</td>
<td>black ash-American elm-red maple</td>
</tr>
<tr>
<td>50</td>
<td>57</td>
<td>yellow-poplar (except in Mountains)</td>
</tr>
<tr>
<td>72</td>
<td>61</td>
<td>river birch-sycamore</td>
</tr>
<tr>
<td>76</td>
<td>62</td>
<td>silver maple-American elm</td>
</tr>
<tr>
<td>73</td>
<td>63</td>
<td>cottonwood</td>
</tr>
<tr>
<td>58</td>
<td>87</td>
<td>sweetgum-yellow-poplar (except in Mountains)</td>
</tr>
<tr>
<td>63</td>
<td>93</td>
<td>sugarberry-American elm-green ash</td>
</tr>
<tr>
<td>-</td>
<td>94</td>
<td>sycamore-sweetgum-American elm</td>
</tr>
<tr>
<td>-</td>
<td>95</td>
<td>black willow</td>
</tr>
<tr>
<td>-</td>
<td>108</td>
<td>red maple (in part)</td>
</tr>
<tr>
<td>74</td>
<td>-</td>
<td>willow</td>
</tr>
<tr>
<td>75</td>
<td>-</td>
<td>sycamore pecan-American elm</td>
</tr>
<tr>
<td>82</td>
<td>-</td>
<td>black walnut</td>
</tr>
</tbody>
</table>
Table 6. Published BBC and WBPS from elm-ash-cottonwood in the Southeast in 1947-1979.

<table>
<thead>
<tr>
<th>State</th>
<th>Season</th>
<th>Successional stage*</th>
<th>Grass/forb or shrub/seedling</th>
<th>Sapling/polember</th>
<th>Sawtimber</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina</td>
<td>Breeding</td>
<td>4(19)</td>
<td>1(18)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Winter</td>
<td>4(29)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Virginia</td>
<td>Breeding</td>
<td>0</td>
<td>0</td>
<td>2(3)</td>
<td>0</td>
</tr>
<tr>
<td>Virginia</td>
<td>Winter</td>
<td>0</td>
<td>0</td>
<td>1(3)</td>
<td>0</td>
</tr>
</tbody>
</table>

*Entries are listed as “Plots (Years censused).”

**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>
<thead>
<tr>
<th>State</th>
<th>Season</th>
<th>Successional stage*</th>
<th>Grass/forb or shrub/seedling</th>
<th>Sapling/polember</th>
<th>Sawtimber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>Breeding</td>
<td>1(1)</td>
<td>0</td>
<td>2(2)</td>
<td>0</td>
</tr>
<tr>
<td>Georgia</td>
<td>Winter</td>
<td>1(1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Winter</td>
<td>1(1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Breeding</td>
<td>0</td>
<td>1(1)</td>
<td>1(1)</td>
<td>3(3)</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Winter</td>
<td>0</td>
<td>1(1)</td>
<td>1(1)</td>
<td>0</td>
</tr>
</tbody>
</table>

*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 polember 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-poecosin 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), Whippoor-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.


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

<table>
<thead>
<tr>
<th>State</th>
<th>Season</th>
<th>Grassforb</th>
<th>Shrub/seedling</th>
<th>Sapling/pole-timber</th>
<th>Saw-timber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>Breeding</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1(11)</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1(10)</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Breeding</td>
<td>1(2)</td>
<td>3(5)</td>
<td>2(5)</td>
<td>1(23)</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1(23)</td>
</tr>
<tr>
<td>Virginia</td>
<td>Winter</td>
<td>1(1)</td>
<td>1(2)</td>
<td>0</td>
<td>1(2)</td>
</tr>
</tbody>
</table>

*Entries are listed as “Plots (Years censused).”*
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>LOMA</th>
<th>EACO</th>
<th>LBSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>Bare Soil</th>
<th>Leaf Litter</th>
<th>Herbs</th>
<th>Shrubs</th>
<th>Midstory</th>
<th>Overstory</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Pelican</td>
<td>B</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double-crested Cormorant</td>
<td>B</td>
<td></td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>NDT NOC</td>
<td>A</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>PDT</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Anhinga</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>PDT</td>
<td>FB</td>
<td>FB</td>
<td>FB</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NDT PDT</td>
<td>A</td>
<td>F</td>
<td>A</td>
</tr>
<tr>
<td>Great Egret</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>PDT</td>
<td>A</td>
<td>F</td>
<td>A</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>*</td>
<td>NP</td>
<td>NP</td>
<td>FSW</td>
<td>A</td>
<td>F</td>
<td>A</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>FSW</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Yellow-crowned Night Heron</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>White Ibis</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>White-faced Ibis</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NDT N46 NLC</td>
<td>FB</td>
<td>FB</td>
<td>FB</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Wood Duck</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  

(b) Specific Requirements  
Code Key  
* - All Requirements  

(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW¹</th>
<th>Local Use</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements b</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOMA</td>
<td>EACO</td>
<td>LBSS</td>
<td>VPPT</td>
<td>MPHW</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
</tr>
<tr>
<td>Mallard</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>FP</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
</tr>
<tr>
<td>Osprey</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>American Swallow-tailed Kite</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Black-shouldered Kite</td>
<td>B</td>
<td>W</td>
<td>F</td>
<td>F</td>
<td>N</td>
<td>N</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Mississippi Kite</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>F</td>
</tr>
<tr>
<td>Cooper's Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Northern Goshawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Red-shouldered Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Short-tailed Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Red-tailed Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Ferruginous Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>FP</td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering
(b) Specific Requirements
Code Key
  - * - All Requirements

1st and 3rd Letters: GO - Grassy Openings
  DT - Dead Trees
  DL - Downed Logs
  RP - Rocky Places
  EB - Earth Banks
  LC - Living Cavity Tree

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

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

550
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>LOMA</th>
<th>EACO</th>
<th>LBSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough-legged Hawk</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golden Eagle</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Kestrel</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merlin</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Francolin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ring-necked Pheasant</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruffed Grouse</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>S</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Rail</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clapper Rail</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>King Rail</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia Rail</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sora</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple Gallinule</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

(c) Water Codes
  A - All
  F - Fresh
  B - Brackish
  S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>LOMA</th>
<th>EACQ</th>
<th>LBSS</th>
<th>VPPT</th>
<th>MPHW</th>
<th>Bare Soil</th>
<th>Leaf Layer</th>
<th>Herbs</th>
<th>Shrubs</th>
<th>Midstory</th>
<th>Overstory</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limpkin</td>
<td>B</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>B</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Killdeer</td>
<td>B</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Upland Sandpiper</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Snipe</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Woodcock</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock Dove</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-winged Dove</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Ground-Dove</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-billed Cuckoo</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater Roadrunner</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groove-billed Ani</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Horned Owl</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snowy Owl</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
- All Requirements

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BWa</th>
<th>Local Use</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirementsb</th>
<th>Standing Water (%)</th>
<th>Flooding Water (%)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barred Owl</td>
<td>B</td>
<td>N</td>
<td>S O</td>
<td>F F F F F</td>
<td>N B T N L C</td>
<td>F F F F F *</td>
<td>F F</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Long-eared Owl</td>
<td>B</td>
<td>N</td>
<td>S O S M M S M M F M F</td>
<td>F F F F F *</td>
<td>P D T P L C</td>
<td>F F F F F *</td>
<td>F</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>B</td>
<td>W</td>
<td>S M M M M M M M F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Saw-whet Owl</td>
<td>B</td>
<td>W</td>
<td>S O M S S M M M F</td>
<td>F F F F F *</td>
<td>N D T N 15</td>
<td>P D T P 15 P L C</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>B</td>
<td>W</td>
<td>M M M M M M M</td>
<td>N</td>
<td>N R P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chuck-will’s-widow</td>
<td>B</td>
<td>W</td>
<td>S S S M M S O S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>B</td>
<td>W</td>
<td>S O M M S S S S S</td>
<td>F F F F F *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td>N S 35 N L C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buff-bellied Hummingbird</td>
<td>B</td>
<td>W</td>
<td>M M M M M M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruby-throated Hummingbird</td>
<td>B</td>
<td>W</td>
<td>M S S S O O M</td>
<td>M M M F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-chinned Hummingbird</td>
<td>B</td>
<td>W</td>
<td>M M M M M M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous Hummingbird</td>
<td>B</td>
<td>W</td>
<td>S M M M M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>B</td>
<td>W</td>
<td>M M M S O M M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>B</td>
<td>W</td>
<td>M S M O M M</td>
<td>M S F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-bellied Sapsucker</td>
<td>B</td>
<td>W</td>
<td>M M M M O M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>B</td>
<td>W</td>
<td>M S S O M S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>B</td>
<td>W</td>
<td>M M M O M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
* - All Requirements  
Code Key  
GO - Grassy Openings  
DT - Dead Trees  
DL - Downed Logs  
BT - Big Trees  
BP - Rocky Places  
CC - Closed Canopy  
OC - Open Canopy  
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
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOMA</td>
<td>EACO</td>
<td>LBSPH</td>
<td>VPPT</td>
<td>MPHW</td>
</tr>
<tr>
<td>Red-cockaded Woodpecker</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern (Yellow-shafted) Flicker</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Wood-Pewee</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Willow Flycatcher</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Least Flycatcher</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Vermilion Flycatcher</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
</tr>
<tr>
<td>Ash-throated Flycatcher</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Brown-crested Flycatcher</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Kingbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Gray Kingbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Scissor-tailed Flycatcher</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
</tr>
<tr>
<td>Horned Lark</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Purple Martin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Tree Swallow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
</tr>
</tbody>
</table>

(a) B - Breeding  W - Wintering  
N - Nests  P - Perches  
F - Forages  DT - Dead Trees  BT - Big Trees  RP - Rocky Places  
CC - Closed Canopy  EB - Earth Banks  LC - Living Cavity Tree

(b) Specific Requirements  
Code Key  
* - All Requirements  
GO - Grassy Openings  15 - 15 cm Min. Snags

(c) Water Codes  
A - All  F - Fresh  B - Brackish  S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BWa</th>
<th>Local Use</th>
<th>LOMA</th>
<th>EACO</th>
<th>LBSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Ttract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank Swallow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>NEB</td>
<td>FB</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Cliff Swallow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>NRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N</td>
<td>NRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Jay</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrub Jay</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Crow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish Crow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Raven</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>P</td>
<td>NRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-capped Chickadee</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>N15, P15, PLC, PDT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina Chickadee</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>N15, P15, PLC, PDT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tufted Titmous</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>N15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-breasted Nuthatch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>N15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td>N15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown-headed Nuthatch</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>N15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>SO</td>
<td>N15</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Bewick's Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>N15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>N15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
* - All Requirements  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Specific Requirements</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Trawl Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Wren</td>
<td>B</td>
<td>W</td>
<td>LOMA 1 2 3 4 EACO 1 2 3 4 LBSH 1 2 3 4 VPPT 1 2 3 4 MPH 1 2 3 4</td>
<td>* *</td>
<td>F F P P</td>
<td>* CC * LC</td>
<td></td>
<td>SW</td>
<td></td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>B</td>
<td>W</td>
<td>M M M O O M S M M M S S</td>
<td>*</td>
<td>F F P</td>
<td>* SW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh Wren</td>
<td>B</td>
<td>W</td>
<td>M M M M M M M M M M M M</td>
<td>*</td>
<td>F P</td>
<td>* A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>B</td>
<td>W</td>
<td>M M M M S M M O O M O O M O O</td>
<td>*</td>
<td>F F</td>
<td>* CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td>B</td>
<td>W</td>
<td>M S M M M M M S M S S M O O</td>
<td>*</td>
<td>F P</td>
<td>* 37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Bluebird</td>
<td>B</td>
<td>W</td>
<td>M M M M M M M M F F</td>
<td>*</td>
<td>NDT PDT * OC N15 P15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>B</td>
<td>W</td>
<td>S S S O O S S S M M M O O</td>
<td>F * F</td>
<td>P P</td>
<td>* CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>B</td>
<td>W</td>
<td>M M S O M S M S</td>
<td>F F * P</td>
<td>P</td>
<td>* CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Robin</td>
<td>B</td>
<td>W</td>
<td>M M M M M M M F M M F</td>
<td>F N N N P</td>
<td>GO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gray Catbird</td>
<td>B</td>
<td>W</td>
<td>M M M O O S S S M M M</td>
<td>F</td>
<td>* P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Mockingbird</td>
<td>B</td>
<td>W</td>
<td>M M M M M M M M F</td>
<td></td>
<td>F F</td>
<td>* OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Thrasher</td>
<td>B</td>
<td>W</td>
<td>S M M S M M S M M</td>
<td>F F * P P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Pipit</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprague's Pipit</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>B</td>
<td>W</td>
<td>S S S M M M M M M M</td>
<td></td>
<td>*</td>
<td>* OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loggerhead Shrike</td>
<td>B</td>
<td>W</td>
<td>M M M M M M M M M M</td>
<td></td>
<td>F F</td>
<td>* 37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Starling</td>
<td>B</td>
<td>W</td>
<td>M M M M M M M M M M</td>
<td></td>
<td>F F</td>
<td>* 37</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering
N - Nests
P - Perches
DT - Dead Trees
BT - Big Trees
DR - Downed Logs
RP - Rocky Places
EB - Earth Banks
CC - Closed Canopy
OC - Open Canopy
LC - Living Cavity Tree

(b) Specific Requirements
Code Key
* - All Requirements

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOMA</td>
<td>EACO</td>
<td>LBSH</td>
<td>VPPT</td>
<td>MPHW</td>
<td>Base Soil</td>
<td>Leaf Litter</td>
</tr>
<tr>
<td>White-eyed Vireo</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Bell's Vireo</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Warbling Vireo</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Bachman's Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Blue-winged Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Golden-winged Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Orange-crowned Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Northern Parula</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Yellow Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Chestnut-sided Warbler</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Yellow-rumped (Myrtle) Warbler</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Black-throated Gray Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Black-throated Green Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Pine Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
* - All Requirements  

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

(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>Habitat Suitability by Vegetation Type and Successional Stage</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water</th>
<th>Flowing Water</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOMA</td>
<td>EACO</td>
<td>LBSH</td>
<td>VPPT</td>
<td>MPHW</td>
<td>Bare Soil</td>
<td>Leaf Litter</td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Palm Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>American Redstart</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Prothonotary Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Swainson's Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Ovenbird</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Kentucky Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Common Yellowthroat</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Hooded Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Wilson's Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Yellow-breasted Chat</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Summer Tanager</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Scarlet Tanager</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

(a) B - Breeding, W - Wintering
(b) Specific Requirements Code Key
   * - All Requirements
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>LOMA</th>
<th>EACO</th>
<th>LBSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (%</th>
<th>Flowing Water (%)</th>
<th>Min. Tactile Size (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Tanager</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-headed Grosbeak</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Grosbeak</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painted Bunting</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dickcissel</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green-tailed Towhee</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous-sided Towhee</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachman's Sparrow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Tree Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chipping Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay-colored Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Sparrow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vesper Sparrow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lark Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lark Bunting</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Savannah Sparrow</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
- All Requirements  
2nd and 3rd Letters  
GO - Grassy Openings  
DL - Downed Logs  
BT - Big Trees  
RP - Rocky Places  
OC - Closed Canopy  
EB - Earth Banks  
LC - Living Cavity Tree  
15 - 15 cm Min. Snags  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW^3</th>
<th>Local Use</th>
<th>LOMA</th>
<th>EACO</th>
<th>LBSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grasshopper Sparrow</td>
<td>B W</td>
<td>M M O O M</td>
<td>M O M</td>
<td>M O M</td>
<td>M O M</td>
<td>M O M</td>
<td>M O M</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henslow's Sparrow</td>
<td>B W</td>
<td>M M M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>FB</td>
<td>SB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Le Conte's Sparrow</td>
<td>B W</td>
<td>M O O O M</td>
<td>M O M</td>
<td>M O M</td>
<td>M O M</td>
<td>M O M</td>
<td>M O M</td>
<td>SB</td>
<td>SB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharp-tailed Sparrow</td>
<td>B W</td>
<td>M M M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>SB</td>
<td>SB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seaside Sparrow</td>
<td>B W</td>
<td>M M M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>SB</td>
<td>SB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fox Sparrow</td>
<td>B W</td>
<td>M S S S M</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>F F F F F F F F F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Song Sparrow</td>
<td>B W</td>
<td>M M S S S</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>SB</td>
<td>SB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swamp Sparrow</td>
<td>B W</td>
<td>S S M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>F F F F F F F F F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-throated Sparrow</td>
<td>B W</td>
<td>M S S S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>F F F F F F F F F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harris' Sparrow</td>
<td>B W</td>
<td>M M M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>SB</td>
<td>SB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dark-eyed Junco</td>
<td>B W</td>
<td>M S S S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>F F F F F F F F F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lapland Longspur</td>
<td>B W</td>
<td>M S S S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>F F F F F F F F F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith's Longspur</td>
<td>B W</td>
<td>M S S S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>F F F F F F F F F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chestnut-collared Longspur</td>
<td>B W</td>
<td>M S S S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>M S S</td>
<td>F F F F F F F F F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snow Bunting</td>
<td>B W</td>
<td>M M M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>SB</td>
<td>SB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bobolink</td>
<td>B W</td>
<td>M M M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>M M M</td>
<td>SB</td>
<td>SB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  

(b) Specific Requirements  
Code Key  
* - All Requirements  

GO - Grassy Openings  
DL - Downed Logs  
BP - Big Trees  
CC - Closed Canopy  
OC - Open Canopy  
LC - Living Cavity Tree  
15 - 15 cm Min. Snags  
25 - 25 cm Min. Snags  
35 - 35 cm Min. Snags  
45 - 45 cm Min. Snags  
A - All  
F - Fresh  
B - Brackish  
S - Salt  
(c) Water Codes
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>LOMA</th>
<th>EACO</th>
<th>LBSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tact Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-winged Blackbird</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>*</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Meadowlark</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-headed Blackbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Rusty Blackbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Brewer's Blackbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>*</td>
<td>*</td>
<td>P</td>
<td>O</td>
<td>P</td>
</tr>
<tr>
<td>Great-tailed Grackle</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>*</td>
<td>P</td>
<td>O</td>
<td>P</td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td>*</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Common Grackle</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>*</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Bronzed Cowbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>*</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>*</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Orchard Oriole</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spot-breasted Oriole</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern (Baltimore) Oriole</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>*</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Purple Finch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Finch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Crossbill</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-winged Crossbill</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key  
* - All Requirements  
• - All Requirements  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>LOMA</th>
<th>EACO</th>
<th>LBSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
<th>Water Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Redpoll</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pine Siskin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evening Grosbeak</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
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

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

<table>
<thead>
<tr>
<th>State</th>
<th>Season</th>
<th>Grass forb</th>
<th>Shrub-seedling</th>
<th>Sapling-pole-timber</th>
<th>Saw-timber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>Breeding</td>
<td>0</td>
<td>1(2)</td>
<td>0</td>
<td>2(2)</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Breeding</td>
<td>1(4)</td>
<td>0</td>
<td>3(9)</td>
<td>4(12)</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1(5)</td>
<td>0</td>
<td>0</td>
<td>3(5)</td>
</tr>
<tr>
<td>Virginia</td>
<td>Breeding</td>
<td>0</td>
<td>0</td>
<td>3(3)</td>
<td>7(22)</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>4(8)</td>
<td>1(4)</td>
<td>1(1)</td>
<td>3(15)</td>
</tr>
</tbody>
</table>

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. carolini-ana), 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-landscape 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 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 (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.
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (d)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Vulture</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td>NCC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooper's Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td>NCC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Goshawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td>F F F F *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Red-tailed Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ferruginous Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rough-legged Hawk</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golden Eagle</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F NRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Kestrel</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F PPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F PRT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Francolin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F PRT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ring-necked Pheasant</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruffed Grouse</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F F F F P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>F</td>
<td>F F F F P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F F F F P</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering

(b) Specific Requirements  
Code Key
- All Requirements

(c) Water Codes
A - All  
F - Fresh  
B - Brackish  
S - Salt
### Habitat Suitability by Vegetation Type and Successional Stage

| Common Name             | Local Use | OKHK 1 | OKHK 2 | OKHK 3 | OKHK 4 | WPHM 1 | WPHM 2 | WPHM 3 | WPHM 4 | COVE 1 | COVE 2 | COVE 3 | COVE 4 | MABB 1 | MABB 2 | MABB 3 | MABB 4 | SPER 1 | SPER 2 | SPER 3 | SPER 4 | Bare Soil | Leaf Litter | Herbaceous | Shrubs | Midstory | Overstory | Specific Requirements | Standing Water (c) | Flowing Water (c) | Min. Treed Size (ha) | Water Codes |
|------------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|-------------|-------------|--------|----------|-----------|-------------------|------------------|-----------------|-------------------|--------------|
| Killdeer               | B W       | M      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | FB      | F         | Yes        |                    |                   |                  |                    |              |
| Upland Sandpiper       | B W       | O      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | FB      | F         | Yes        |                    |                   |                  |                    |              |
| American Woodcock      | B W       | M S    |        |        |        | M M    |        |        |        |        | M M    |        |        |        |        |        |        |        | F      | F      | F      |          |            |             |          |         |          | F       |            |            |                    |                   |                  |                    |              |
| Rock Dove              | B W       | M      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            |            |                    |                   |                  |                    |              |
| Mourning Dove          | B W       | O S    |        |        |        | M M    |        |        |        |        | M M    |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            |            |                    |                   |                  |                    |              |
| Black-billed Cuckoo    | B W       | S      |        |        |        | S S    |        |        |        |        | O O    |        |        |        |        |        |        |        |        |          |            |             |          |         |          | N       |            | No         |                    |                   |                  |                    |              |
| Yellow-billed Cuckoo   | B W       | S S    |        |        |        | M M    |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | N       |            | No         |                    |                   |                  |                    |              |
| Greater Roadrunner     | B W       | M S    |        |        |        | M M    |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Groove-billed Ani      | B W       | M S    |        |        |        | M M    |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Common Barn-Owl        | B W       | O M    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Eastern Screech-Owl    | B W       | M O    |        |        |        | M M    |        |        |        |        | M S    |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Great Horned Owl       | B W       | S      |        |        |        | S S    |        |        |        |        | M      |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Snowy Owl              | B W       | M      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Barred Owl             | B W       | M      |        |        |        | M M    |        |        |        |        | M M    |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Long-eared Owl         | B W       | M O    |        |        |        | M M    |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Short-eared Owl        | B W       | M      |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | No         |                    |                   |                  |                    |              |
| Northern Saw-whet Owl  | B W       | M      |        |        |        | M M    |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | N D T N L C  |                    |                   |                  |                    |              |
| Chuck-will's-widow     | B W       | M M    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |          |            |             |          |         |          | F       |            | P D T _ P H S _ P L C |                    |                   |                    |              |

### Notes:
- **BW**: Breeding, Wintering
- **N**: Nests
- **S**: Forages
- **P**: Perches
- **O**: Open Canopy
- **C**: Closed Canopy
- **D**: Dead Trees
- **B**: Big Trees
- **R**: Rocky Places
- **E**: Earth Banks
- **L**: Living Cavity Tree
- **G**: Grassy Openings
- **Q**: Downed Logs
- **K**: Healthy Forests
- **T**: Wetlands

### Specific Requirements
- **FB**: Fresh
- **F**: Fresh
- **PR**: Prickly Plants
- **NP**: No Plants

### Water Codes:
- **A**: All
- **B**: Brackish
- **S**: Salt

### Legend:
- **FB**: Fresh
- **F**: Fresh
- **PR**: Prickly Plants
- **NP**: No Plants
- **OC**: Open Canopy
- **C**: Closed Canopy
- **D**: Dead Trees
- **B**: Big Trees
- **R**: Rocky Places
- **E**: Earth Banks
- **L**: Living Cavity Tree
- **G**: Grassy Openings
- **Q**: Downed Logs
- **K**: Healthy Forests
- **T**: Wetlands

### Requirements:
- **FB**: Fresh
- **F**: Fresh
- **PR**: Prickly Plants
- **NP**: No Plants

### Standing Water (c) and Flowing Water (c):
- **Min. Treed Size (ha)**

### Water Codes:
- **A**: All
- **B**: Brackish
- **S**: Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (%)</th>
<th>Flowing Water (%)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whip-poor-will</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buff-bellied Hummingbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruby-throated Hummingbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-chinned Hummingbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous Hummingbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>P</td>
<td>P</td>
<td>PDT F15 FSW NEB</td>
<td>A</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td>DT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*DT N35 NLC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-bellied Sapsucker</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>*DT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>*DT N25 NLC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>*DT *25 LC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Flicker</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>*DT *25 LC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>*DT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olive-sided Flycatcher</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Wood-Pewee</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td></td>
<td></td>
<td>*FDT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alder Flycatcher</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  W - Wintering  
(b) Specific Requirements  Code Key  
* - All Requirements  
N - Nests  DT - Dead Trees  GO - Grassy Openings  DL - Downed Logs  15 - 15 cm Min. Snags  
P - Perches  BT - Big Trees  GO - Grassy Openings  RP - Rocky Places  25 - 25 cm Min. Snags  
F - Forages  CC - Closed Canopy  OC - Open Canopy  EB - Earth Banks  35 - 35 cm Min. Snags  
  Water Codes  A - All  F - Fresh  B. - Brackish  S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW^a</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willow Flycatcher</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-bellied Flycatcher</td>
<td>B W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least Flycatcher</td>
<td>B W</td>
<td>S M M M M M M M M M M S M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>B W</td>
<td>M M M M M M S M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>B W</td>
<td>M O M S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Kingbird</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scissor-tailed Flycatcher</td>
<td>B W</td>
<td>S S M M S S M M S S M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horned Lark</td>
<td>B W</td>
<td>M M M M M M M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple Martin</td>
<td>B W</td>
<td>M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank Swallow</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cliff Swallow</td>
<td>B W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>B W</td>
<td>M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Jay</td>
<td>B W</td>
<td>M O M M M M M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Crow</td>
<td>B W</td>
<td>M S M M M M M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Raven</td>
<td>B W</td>
<td>M M M M M M M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-capped Chickadee</td>
<td>B W</td>
<td>M M M M M M S S S S S O F F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina Chickadee</td>
<td>B W</td>
<td>M M M M M M M M M M M M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Specific Requirements**
- **Standing Water (c)**
- **Flowing Water (c)**
- **Min. Tract Size (ha)**

(a) B - Breeding  
W - Wintering  
(b) Specific Requirements  
Code Key
- N - Nests  
- P - Perches  
- F - Forages  
- * - All Requirements  

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

- Water Codes  
- A - All  
- F - Fresh  
- B - Brackish  
- S - Salt  

- First Letter  
- 2nd and 3rd Letters  
- 15 - 15 cm Min. Snags  
- 25 - 25 cm Min. Snags  
- 35 - 35 cm Min. Snags  
- 45 - 45 cm Min. Snags  
- Yes

- OKHK  
- WPHM  
- COVE  
- MABB  
- SPFR  

<table>
<thead>
<tr>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Soil</td>
<td>Leaf Litter</td>
</tr>
<tr>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Codes</th>
<th>15 - 15 cm Min. Snags</th>
<th>25 - 25 cm Min. Snags</th>
<th>35 - 35 cm Min. Snags</th>
<th>45 - 45 cm Min. Snags</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 2         |                       |                       |                       |

- DTC - Dry Trees  
- *OC - *OC  
- N25 NLC - N25 NLC  
- PDT - PDT  
- FDT - FDT *OC F15  
- DT *OC - DT *OC  
- NDT N25 NLC - NDT N25 NLC  
- NEB - NEB  
- FB F - FB F  
- NRP - NRP  
- Yes

- OKHK  
- WPHM  
- COVE  
- MABB  
- SPFR  

- (c) Water Codes
- (a) B - Breeding  
- (b) Specific Requirements  
- Code Key
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-breasted Nuthatch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>NDT N15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>DT *BT NLC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>DT N15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Bewick's Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>*</td>
<td>N15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Wren</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td>N15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Wren</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td>S</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruby-crowned Kinglet</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Bluebird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veery</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>* N15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swainson's Thrush</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Robin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gray Catbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Mockingbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
- All Requirements

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Bare Soil Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Thrasher</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprague’s Pipit</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
</tr>
<tr>
<td>European Starling</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>ND T N25 NLC NRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-eyed Vireo</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td>*</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Bell’s Vireo</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>O</td>
<td>N</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Warbling Vireo</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>P</td>
<td>*OC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue-winged Warbler</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Golden-winged Warbler</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nashville Warbler</td>
<td>B</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>N</td>
<td>P</td>
</tr>
<tr>
<td>Northern Parula</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1300</td>
</tr>
<tr>
<td>Yellow Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chestnut-sided Warbler</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>*</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnolia Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-throated Blue Warbler</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td></td>
<td>F</td>
<td>PDT</td>
<td>*CC</td>
</tr>
</tbody>
</table>

(a) B - Breeding  W - Wintering
(b) Specific Requirements Code Key
(c) Water Codes
- All
- Fresh
- Brackish
- Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>CCVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Bare Soil</th>
<th>Leaf Litter</th>
<th>Herbs</th>
<th>Status</th>
<th>Midstory</th>
<th>Overstory</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow-rumped (Myrtle) Warbler</td>
<td>B</td>
<td>MM</td>
<td>MM</td>
<td>MM</td>
<td>MM</td>
<td>MM</td>
<td>MM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-throated Gray Warbler</td>
<td>B</td>
<td></td>
<td>MM</td>
<td>MM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-throated Green Warbler</td>
<td>B</td>
<td></td>
<td>MM</td>
<td>MM</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackburnian Warbler</td>
<td>B</td>
<td></td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BT *CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>B</td>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>B</td>
<td></td>
<td>O</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palm Warbler</td>
<td>B</td>
<td>MM</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>B</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*BT *CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>B</td>
<td></td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Redstart</td>
<td>B</td>
<td></td>
<td>M</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>B</td>
<td></td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*CC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swainson's Warbler</td>
<td>B</td>
<td></td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ovenbird</td>
<td>B</td>
<td></td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>B</td>
<td></td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>B</td>
<td></td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*RP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky Warbler</td>
<td>B</td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mourning Warbler</td>
<td>B</td>
<td></td>
<td>M</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Yellowthroat</td>
<td>B</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering
(b) Specific Requirements
Code Key
* - All Requirements

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

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

15 - 15 cm Min. Snags
25 - 25 cm Min. Snags
35 - 35 cm Min. Snags
46 - 46 cm Min. Snags
1750
530
370
15
500
875
45
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Bare Soil Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hooded Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>FP</td>
<td></td>
<td>*</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Wilson's Warbler</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada Warbler</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>FP</td>
<td></td>
<td></td>
<td>1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-breasted Chat</td>
<td>B</td>
<td>M</td>
<td></td>
<td>O</td>
<td>M</td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer Tanager</td>
<td>B</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td></td>
<td></td>
<td>FP</td>
<td></td>
<td>**</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scarlet Tanager</td>
<td>B</td>
<td>O</td>
<td></td>
<td>M</td>
<td>M</td>
<td></td>
<td>FP</td>
<td></td>
<td>**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Tanager</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td>M</td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>FP</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rose-breasted Grosbeak</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>FP</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-headed Grosbeak</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Grosbeak</td>
<td>B</td>
<td>M</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dickcissel</td>
<td>B</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green-tailed Towhee</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous-sided Towhee</td>
<td>B</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachman's Sparrow</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rufous-crowned Sparrow</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Tree Sparrow</td>
<td>B</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
<td>FP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  W - Wintering  
N - Nests  P - Perches  
D - Dead Trees  B - Big Trees  
O - Open Canopy  C - Closed Canopy  
R - Rocky Places  E - Earth Banks  
L - Living Cavity Tree  G - Grassy Openings  
D - Downed Logs  R - Rocky Places  
15 - 15 cm Min. Snags  A - All  
F - Fresh  B - Brackish  
S - Salt

(b) Specific Requirements Code Key  
* - All Requirements  
F - Forages  
C - Closed Canopy  
E - Earth Banks  
O - Open Canopy  
L - Living Cavity Tree

(c) Water Codes
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Bare Soil</th>
<th>Leaf Litter</th>
<th>Shrubs</th>
<th>Midstory</th>
<th>Operable</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Trench Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chipping Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay-colored Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vesper Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lark Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lark Bunting</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Savannah Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grasshopper Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>O</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henslow's Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Le Conte’s Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fox Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Song Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-throated Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-crowned Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harris’ Sparrow</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dark-eyed Junco</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith’s Longspur</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chestnut-collared Longspur</td>
<td>B</td>
<td>W</td>
<td>123</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>*</td>
<td>*</td>
<td>*OC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding
W - Wintering

(b) Specific Requirements
Code Key
- All Requirements

77

(c) Water Codes
A - All
F - Fresh
B - Brackish
S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>CCVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Trel Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow Bunting</td>
<td>B</td>
<td>W</td>
<td>1 234</td>
<td>1 234</td>
<td>1 234</td>
<td>1 234</td>
<td>1 234</td>
<td>1 234</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bobolink</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-winged Blackbird</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>* P</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>B</td>
<td>W</td>
<td>O</td>
<td>M</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Meadowlark</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-headed Blackbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rusty Blackbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brewer's Blackbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great-tailed Grackle</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>* P</td>
<td>P</td>
<td>OC</td>
<td></td>
</tr>
<tr>
<td>Common Grackle</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronzed Cowbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>* P</td>
<td>P</td>
<td>OC</td>
<td></td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orchard Oriole</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern (Baltimore) Oriole</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple Finch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>* P</td>
<td>P</td>
<td>OC</td>
<td></td>
</tr>
<tr>
<td>House Finch</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Crossbill</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-winged Crossbill</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding, W - Wintering
(b) Specific Requirements
(c) Water Codes

**Code Key**
- N - Nests
- P - Perches
- D - Dead Trees
- B - Big Trees
- T - Rocky Places
- E - Earth Banks
- G - Grassy Openings
- L - Downed Logs
- O - Open Canopy
- L - Living Cavity
- C - Closed Canopy
- 15 - 15 cm Min. Snags
- 25 - 25 cm Min. Snags
- 35 - 35 cm Min. Snags
- 45 - 45 cm Min. Snags
- A - All
- F - Fresh
- B - Brackish
- S - Salt
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW</th>
<th>Local Use</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
<th>Substrate Utilization</th>
<th>Vegetation Layer</th>
<th>Specific Requirements</th>
<th>Standing Water (c)</th>
<th>Flowing Water (c)</th>
<th>Min. Tract Size (ha)</th>
<th>Water Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Redpoll</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pine Siskin</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>B</td>
<td>W</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Evening Grosbeak</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Sparrow</td>
<td>B</td>
<td>W</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>O</td>
<td>F</td>
<td>F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) B - Breeding  
W - Wintering  
N - Nests  
P - Perches  
(b) Specific Requirements  
Code Key  
F - Forages  
* - All Requirements  
2nd and 3rd Letters  
GO - Grassy Openings  
DT - Dead Trees  
DL - Downed Logs  
BT - Big Trees  
RP - Rocky Places  
CC - Closed Canopy  
EB - Earth Banks  
OC - Open Canopy  
LC - Living Cavity Tree  
(c) Water Codes  
A - All  
F - Fresh  
B - Brackish  
S - Salt
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 merit 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 digitized 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 species 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 Northeast, 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 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.

**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**


**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.
Brown Pelican
Pelicanus occidentalis

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.

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±0.41 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

Double-crested Cormorant
*Phalacrocorax auritus*  

**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.

**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**
Olivaceous Cormorant

Phalacrocorax olivaceus

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.

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

Anhinga

Anhinga anhinga

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.

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

Magnificent Frigatebird
Fregata magnificens

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.

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
American Bittern
*Botaurus lentiginosus*

**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.

**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**
Least Bittern
Ixobrychus exilis

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.

KEY HABITAT REQUIREMENTS
Marshes with tall herbaceous cover, preferably in fresh water.

SAMPLE BREEDING DENSITIES
4.5(2) grass/orb 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
Great Blue Heron
Ardea herodias

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.

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.

GUILDS
Tree nesting, aquatic stalking carnivore.

REFERENCES
Great Egret  
*Casmerodius albus*  

**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.

**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/pole timber live oak maritime, 3(1) sapling/pole timber 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**

PROTECTION STATUS


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.

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

Little Blue Heron

*Egretta caerulea*

**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.

**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 staking carnivore.

**REFERENCES**

Tricolored Heron (Louisiana Heron)
Egretta tricolor

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.

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

Reddish Egret

_Egretta rufescens_

**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 PC, 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**

Cattle Egret
*Bubulcus ibis*

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.

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/foletimber 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

Green-backed Heron (Green Heron)  
Butorides striatus  

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.

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.

GUIDE

Bush or tree nesting, aquatic stalking carnivore.

REFERENCES

Black-crowned Night Heron  
*Nycticorax nycticorax*  

**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.

**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**
Yellow-crowned Night Heron

*Nyctanassa violacea*  
YCNIH

**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.

**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±0.37 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**

White Ibis
*Eudocimus albus*

**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.

**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±0.70 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**

Glossy Ibis
Plegadis falcinellus

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.

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

White-faced Ibis

_Plegadis chihi_  

**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.

**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**

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.

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
PROTECTION STATUS


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.

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

Wood Duck
*Aix sponsa*

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.

![Abundance Map](image)

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 gleanin omnivore.

REFERENCES
Mallard
_Anas platyrhynchos_

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.

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

Hooded Merganser  
*Lophodytes cucullatus*  

**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.

**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**

Black Vulture
Coragyps atratus

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.

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/pole/tember 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

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.
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.

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±0.50 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

Osprey
Pandion haliaetus

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 else-where 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
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.

**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**


**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.
Black-shouldered Kite (White-tailed Kite)
*Elanus caeruleus* BSK1

**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**
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**

Mississippi Kite
*Ictinia mississippiensis*

**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.

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**

**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 South-east 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.

**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**

Northern Harrier  (Marsh Hawk)
*Circus cyaneus*  

**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 early September; spring departure— early April to early May.

**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**
Sharp-shinned Hawk

*Accipiter striatus*

**PROTECTION STATUS**


**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.

**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**

Cooper's Hawk

Accipiter cooperii

COHA

PROTECTION STATUS


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.

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/pole timber bay swamp-pocosin, 0.5(1) sapling/pole timber live oak maritime, 0.5(2) grass/forb or shrub-seeding 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

Northern Goshawk

*Accipiter gentilis*

**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.

**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, ground squirrels, 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**

PROTECTION STATUS


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.

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.

GUIDE

Tree nesting, soaring or pouncing carnivore on variable substrates.

REFERENCES

Broad-winged Hawk
Buteo platypterus

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.

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
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.

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

Swainson’s Hawk

*Buteo swainsoni*  

**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.

**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**


**PRIMARY HABITATS**

Generally in the vicinity of freshly plowed fields; less numerous in other types of fields; always in extensive open country.
Red-tailed Hawk
*Buteo jamaicensis*

**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—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**

Ferruginous Hawk
*Buteo regalis*

**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, ground squirrels, 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**
Rough-legged Hawk
*Buteo lagopus*

**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.

**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**

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

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.

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

American Kestrel
*Falco sparverius*

**PROTECTION STATUS**


**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.

**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/seeding 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**

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.

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

Peregrine Falcon
Falco peregrinus

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.

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

Black Francolin
Francolinus francolinus

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.

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
Ring-necked Pheasant
*Phasianus colchicus*

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.

![Map of North America showing distribution of Ring-necked Pheasants.](image)

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

Ruffed Grouse
*Bonasa umbellus*

**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.

**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.

**GUILDS**

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

**REFERENCES**

Wild Turkey  
*Meleagris gallopavo*  

**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.

**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, but substantial numbers of insects are also consumed.

**GUILD**

Ground nesting, terrestrial gleaning omnivore.

**REFERENCES**

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.

### 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


### 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.
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**

Black Rail
Laterallus jamaicensis

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. Range 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.

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
Clapper Rail
Rallus longirostris

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.

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

King Rail
*Rallus elegans*

**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.

**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**

Virginia Rail
*Rallus limicola*  
**VIRA**

**PROTECTION STATUS**
Monitored by Tennessee Natural Heritage Program, Virginia Natural Heritage Program, and 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. Full arrival— early September to early October; spring departure— late April to mid-May.

**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**
Sora
Porzana carolina

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; PC 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.

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
Purple Gallinule
Porphyryula martinica

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 October.

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
Common Moorhen  (Common Gallinule)
Gallinula chloropus

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.

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
American Coot
Fulica americana

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.

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
Limpkin
Aramus guarauna

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.

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
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.

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/orb 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

**Killdeer**

*Charadrius vociferus*

**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.

**SAMPLE BREEDING DENSITIES**


**SAMPLE WINTER DENSITIES**

2.5(13) grass/orb 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**

Upland Sandpiper
*Bartramia longicauda*

**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.

**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**

Common Snipe
*Gallinago gallinago*  

**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.

**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**
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.

**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**

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.

SAMPLE BREEDING DENSITIES

Recorded on 401 of 888 BBS routes in the region, 1966-1985; maximum route mean 179 birds, overall mean 2.50±2.901 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

**White-crowned Pigeon**

*Columba leucocephala*

**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 primarily 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**

White-winged Dove

*Zenaida asiatica*  

**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.

**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**

Mourning Dove

*Zenaida macroura*  

**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.

**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**

Common Ground Dove (Ground Dove)

Columbina passerina

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.

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

Black-billed Cuckoo
Coccyzus erythropthalmus

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.

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
Yellow-billed Cuckoo
*Coccyzus americanus*

**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.

**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**

Mangrove Cuckoo
*Coccozyzus 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.

PRIMARİY 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
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.

**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**

Smooth-billed Ani
_Crotophaga ani_

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.

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
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.

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

Common Barn-Owl

Tyto alba

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 coastaly and in southern Florida in winter than in summer, at some places being FC.

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

Eastern Screech-Owl
*Otus asio*

**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.

**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**
Great Horned Owl
Bubo virginianus

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.

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
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.

KEY HABITAT REQUIREMENTS

Winter—Extensive open areas.

SAMPLE WINTER DENSITIES

None known. Evans (1980) reports densities of 2 birds/km² in agricultural land in Ontario, and as high as 15/km² 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

Burrowing Owl

*Athene cunicularia*

**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.

**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**

**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.
Barred Owl  
\textit{Strix varia}  
\underline{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.

**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**

Long-eared Owl

*Asio otus*

**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**

SHORT-EARED OWL

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.

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 lobolly 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

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.

**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**

Common Nighthawk
Chordeiles minor

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.

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
Chuck-will's-widow
*Caprimulgus carolinensis*

**PROTECTION STATUS**
Monitored by West Virginia Natural Heritage Program.

**ABUNDANCE STATUS**
Cover 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).

**SAMPLE BREEDING DENSITIES**
0.3(2) sapling/pole timber live oak maritime, 0.6(7) sawtimber mixed pine-hardwood, 6(3) sawtimber longleaf pine-slash pine, 7(1) sapling/pole timber 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/pole timber oak-gum-cypress, 0.5(1) sapling/pole timber 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**
Whip-poor-will

Caprimulgus vociferus

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).

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
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±1.53 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**

Buff-bellied Hummingbird

Amazilia yucatanensis

ABUNDANCE STATUS
Winter—Occasional stragglers sometimes are found in the Mississippi River Delta region of Louisiana, December-February.

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

PRIMARY HABITATS
Winter—Suburban areas, evergreen thickets.
Ruby-throated Hummingbird

*Archilochus colubris*

**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.

**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 long-leaf 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**

Black-chinned Hummingbird

Archilochus alexandri

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.

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

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.

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

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.

SAMPLE WINTER DENSITIES

0.5(1) sapling/pole timber oak-gum-cypress, 0.5(1) sapling/pole timber 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

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.

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
Red-bellied Woodpecker

*Melanerpes carolinus*

**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.

**SAMPLE WINTER DENSITIES**
0.5(5) shrub-seedling elm-ash-cottonwood, 10(3) sawtimber elm-ash-cottonwood, 15(1) sapling/bole timber longleaf pine-scrub oak, 16(2) sapling/bole timber live oak maritime, 26(1) sapling/bole timber 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**
Yellow-bellied Sapsucker
*Sphyrapicus varius*

**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.

**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/pole/timber sand pine-southern scrub oak, 9.5(2) sapling/pole/timber live oak maritime, 16(1) sapling/pole/timber 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**

Downy Woodpecker

*Picoides pubescens*

**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.

**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**

Hairy Woodpecker
*Picoides villosus*

**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**


**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**

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.

**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**

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.

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 pt/15 km² 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, Buprestis, 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*

**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.

**SAMPLE WINTER DENSITIES**

0.5(1) sapling/poletimber bay swamp- pocosin, 0.5(14) grass/forb elm-ash-cottonwood, 0.5(1) shrub-seeding 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**

Pileated Woodpecker
Dryocopus pileatus

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.

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
Olive-sided Flycatcher
*Contopus borealis*

**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.

**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**

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.

SAMPLE BREEDING DENSITIES


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

Acadian Flycatcher
Empidonax virescens

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.

SAMPLE BREEDING DENSITIES
1(1) shrub-seedling lobolly 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.

GUIDE
Tree nesting, arboreal hawking insectivore.

REFERENCES
Alder Flycatcher

Empidonax alnorum

PROTECTION STATUS

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
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.

**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:**
Willow Flycatcher

*Empidonax traillii*

**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.

**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**

Least Flycatcher

*Empidonax minimus*

**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.

**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) sawt-Sahler 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**

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.

SAMPLE Winter Densities


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

Vermilion Flycatcher
*Pyrocephalus rubinus*  

**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.

**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**

Ash-throated Flycatcher
Myiarchus cinerascens

ABUNDANCE STATUS
Winter—Very Rare, early October to early April, in the Mississippi River Delta region of Louisiana and along the Texas Gulf Coast. They may also winter in the Florida Keys.

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
Great Crested Flycatcher
Myiarchus crinitus

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) sawtimmer loblolly pine-shortleaf pine, 2.3(10) sapling/poletimber oak-hickory, 12(2) sawtimmer live oak


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
Brown-crested Flycatcher
*Myiarchus tyrannulus*  

**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**

Western Kingbird
*Tyrannus verticalis*

**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**
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.

SAMPLE BREEDING DENSITIES

1(2) sapling/pole/timber longleaf pine/slash pine, 1(2) saw-timber longleaf pine/slash pine, 8(2) grass/forb mixed pine-hardwood, 1(2) sapling pole/medium (edge) elm-ash-cottonwood (small plot), 10(3) grass/forb bay swamp-pocosin. Recorded on 523 of 889 BBS routes in the region, 1966-1985; maximum route mean 36 birds, overall mean 3.32+0.65 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

Gray Kingbird
Tyrannus dominicensis

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.

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.

GUIDE
Bush or tree nesting, hawking insectivore at variable heights.

REFERENCES
Scissor-tailed Flycatcher
*Tyrannus forficatus*

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.

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), 0.64/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

Horned Lark

_Eremophila alpestris_

**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).

**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**
Purple Martin
*Progne subis*

**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.

![Map of Purple Martin distribution](image)

**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**
Tree Swallow
*Tachycineta bicolor*

**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.

**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**

Northern Rough-winged Swallow

*Stelgidopteryx semipennis*

**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.

**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**

Bank Swallow
Riparia riparia

PROTECTION STATUS
State listed as Special Concern by Kentucky Academy of Sciences and Kentucky Nature Preserves Commission. Sig- nificantly Rare in North Carolina. Monitored by Arkansas Natural Heritage Commission, Tennessee Natural Heritage Program, West Virginia Natural Heritage Program.

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 require- ment.

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
Cliff Swallow  
*Hirundo pyrrhonota*  
**CLS**

**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 Tennessee River Valley. Arrive mainly from mid-April to early May; depart mainly in August, rarely after mid-September.

**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**
Barn Swallow
_Hirundo rustica_

**ABUNDANCE STATUS**

Breeding—C to A throughout the inland physiographic 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.

**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**

Blue Jay
*Cyanocitta cristata*  

**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.

**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 is 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**

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.

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

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.

SAMPLE WINTER DENSITIES

0.5(1) Everglades, 1(1) sapling/pole timber pine savanna, 1(1) sawtimber longleaf pine-scrub oak, 1(1) sapling/pole timber 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.

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/pole timber 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.

REFERENCES

**Fish Crow**

*Corvus ossifragus*

**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.

**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**

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.

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. Nets 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

Black-capped Chickadee

Parus atricapillus

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.

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

Carolina Chickadee
Parus carolinensis

ABUNDANCE STATUS

C to VC nearly throughout; occur in mountains up to 5000 feet (1500 m) where Black-capped Chickadees are absent. Non-migratory.

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.

REFERENCES

Tufted Titmouse  
*Parus bicolor*

**ABUNDANCE STATUS**

C to VC throughout; occur in the mountains up to 5000 feet (1500 m). Non-migratory.

**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**

Red-breasted Nuthatch

*Sitta canadensis*

**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.

**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-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**

White-breasted Nuthatch
*Sitta carolinensis*

**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.

**SAMPLE BREEDING DENSITIES**
1(1) sawtimmer longleaf pine-slash pine, 1(1) sawtimmer elm-ash-cottonwood, 5.1(9) sawtimmer cove hardwoods, 5.4(3) sawtimmer white pine-hemlock, 5.6(5) sawtimmer oak-gum-cypress, 6.5(25) sawtimmer 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) sawtimmer mixed pine-hardwood, 3.7(3) sawtimmer elm-ash-cottonwood, 4.4(17) sawtimmer 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**

Brown Creeper
*Certhia americana*

**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.

**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 gleaner, insectivore.

**REFERENCES**
Carolina Wren
*Thryothorus ludovicianus* CAR

**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.

**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, gleanin insects, larvae, and other invertebrates from shrubs, herbs, and the ground.

**GUILD**
Cavity, ledge, or ground nesting, terrestrial or bush gleanin insectivore.

**REFERENCES**
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**

House Wren
*Troglodytes aedon*

**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.

**SAMPLE BREEDING DENSITIES**
1(1) shrub-seedling mixed pine-hardwood, 1(2) shrub-seedling elm-ash-cottonwood, 1(5) sapling/poletimber elm-ash-cottonwood, 1(6) 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**
Winter Wren
*Troglodytes troglodytes*

**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.

**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**
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—F 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**

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.

**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**

Golden-crowned Kinglet
Regulus satrapa

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.

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
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.

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 gleanning or hovering for prey at foliage or twigs in trees, saplings, or shrubs.

GUILD

Tree or bush foliage gleaning insectivore.

REFERENCES

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.

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

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.

**SAMPLE BREEDING DENSITIES**

0.6(2) sapling/strcasecmp 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**

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.

**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**
Swainson’s Thrush
*Catharus ustulatus*  

**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.

**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**

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.

**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**

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.

**SAMPLE BREEDING DENSITIES**


**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**

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.

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.

GUIDE

Tree or bush nesting, terrestrial gleaner insectivore (summer), tree or bush gleaner frugivore (winter).

REFERENCES

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.

**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**

Northern Mockingbird (Mockingbird)
*Mimus polyglottos*

**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.

**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.

**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.

**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**

Brown Thrasher
Toxostoma rufum

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.

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.

GUIDE
Bush nesting, terrestrial or bush gleaning insectivore-omnivore.

REFERENCES
Water Pipit  
*Anthus spinolelta*  

**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.

**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**
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.

**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**

ABUNDANCE STATUS

Breeding— U to FC in the mountains, occurring to the highest elevations; R and erratic in the Piedmont and Appalachian plateau 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.

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

Loggerhead Shrike
*Lanius ludovicianus*  

**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.

**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, 3.45(4) 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**

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.

**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**

White-eyed Vireo

Vireo griseus

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.

SAMPLE BREEDING DENSITIES


SAMPLE WINTER DENSITIES

1(2) sapling/pole timber pine savanna, 1(4) sawtimber mixed pine-hardwood, 6.8(4) sawtimber longleaf pine-slash pine, 10(1) sapling/pole timber sand pine-southern scrub oak, 17(1) sapling/pole timber 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

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 northeastern Arkansas, and Very Rare in southeastern Arkansas and northwestern Louisiana.

KEY HABITAT REQUIREMENTS

Breeding—Streamside thickets or upland scrub 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 tallgrass prairie and the rest in open canopy sawtimber elm-ash-cottonwood riparian vegetation. A single record of 1 pair/40 in sawtimber Longleaf Pine-Slash Pine has been published. Recorded on 64 of 888 BBS routes in the region, 1966-1991: 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 in shrub or small tree usually below 6 ft (2 m). The clutch 3-5, usually 4 eggs, laid in May or June. J. Neal (pers. comm.) notes a high incidence of Brown-headed Cowbird (Molothrus ater) parasitism in Arkansas nests.

FOOD HABITS

Forage at low heights in the interior of shrubs or trees, occasionally large trees, where they glean insects, particularly grasshoppers, and other small invertebrates.

GUILD

Bush nesting, herb or bush foliage gleaning insectivorous

REFERENCES

Solitary Vireo
Vireo solitarius

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.

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

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.

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

Warbling Vireo
Vireo gilvus

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.

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
Red-eyed Vireo
Vireo olivaceus

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.

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
Black-whiskered Vireo  
*Vireo altiloquus*  

**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.

**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**
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
Blue-winged Warbler
Vermivora pinus

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.

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
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.

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
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.

**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**

Nashville Warbler
Vermivora ruficapilla

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.

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
Northern Parula
Parula americana

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.

SAMPLE BREEDING DENSITIES


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

**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.

**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/pole/timber 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**

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.

**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**

**PROTECTION STATUS**


**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**

Cape May Warbler
Dendroica tigrina

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.

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

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.

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
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.

**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**

Black-throated Gray Warbler
*Dendroica nigrescens*  

**ABUNDANCE STATUS**

Winter—Very Rare, late November-mid-April along the Texas coast, in southern Louisiana, Mississippi, and western Tennessee.

**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**

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.

**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**

Blackburnian Warbler

*Dendroica fusca*  
**BLBW**

**PROTECTION STATUS**


**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.

**KEY HABITAT REQUIREMENTS**

Mature mountain forests.

**SAMPLE BREEDING DENSITIES**

6(2) sapling/pole timber 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**

Yellow-throated Warbler  
*Dendroica dominica*  
YHWA

**PROTECTION STATUS**

*D. d. stoddardii* 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.

**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**

Pine Warbler
*Dendroica pinus*

**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**


**SAMPLE WINTER DENSITIES**

1(1) sapling/woody shrub 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/woody shrub longleaf pine-slash pine, 34(1) grass/forbs loblolly pine-shortleaf pine, 35(1) sapling/woody shrub 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**

Prairie Warbler
*Dendroica discolor*

**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.

**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 885 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**

Palm Warbler
*Dendroica palmarum*  

**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.

**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**

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.

**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**

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.

**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**

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.

**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**

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.

**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 mean 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 insectivore.

**REFERENCES**

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.

**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**

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.

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

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.

**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 gleaner insectivore.

**REFERENCES**


---

**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.
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.

![Map showing breeding and wintering areas.](image)

**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/pole timber 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**

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.

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

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.

**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), gleanin insects from herbaceous vegetation, leaf litter, or soil.

**GUILD**

Ground nesting, terrestrial gleaning insectivore.

**REFERENCES**


---

**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.
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

Common Yellowthroat  
*Geothlypis trichas*  

**ABUNDANCE STATUS**

Breeding—C to VC nearly throughout, but only FC to C in the higher mountains. Wintering—C throughout Florida and southeastern Louisiana; 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.

**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**

Hooded Warbler
Wilsonia citrina

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.

SAMPLE BREEDING DENSITIES

2(2) sapling/pole timber loblolly pine-shortleaf pine, 24(3) sapling/pole timber 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

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.

**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**

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.

### 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
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.

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 (0.6-2.5 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

Summer Tanager
Piranga rubra

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.

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

Scarlet Tanager  
_Piranga olivacea_  

**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.

**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**

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.

**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**

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.

**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**

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.

**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**


**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.
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.

![Map showing distribution and abundance]

PRINCIPAL 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

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.

**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 (1-4 m) 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**

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.

SAMPLE BREEDING DENSITIES

0.7(3) sawtimber lobolly 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

Painted Bunting
Passerina ciris

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 Louisiana, Texas, and Oklahoma; U to R east to the Mississippi River into Mississippi and Tennessee. Wintering—U to locally FC, in southern Florida.

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

**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.

**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**

Green-tailed Towhee
Pipilo chlorurus

ABUNDANCE STATUS
Winter—Irregular and Very Rare in east Texas, decreasing in abundance along the Gulf Coast into Louisiana and Alabama.

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 gleanin omnivore

REFERENCES
Rufous-sided Towhee  
*Pipilo erythrophthalmus*  

**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.

**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**

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 pine-woods, especially where there is a thick cover of grasses or saw palmetto (*Serenia 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 broomedge.

**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**

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.

**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**

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.

**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**


**PRIMARY HABITATS**

Favor weedy fields, hedgerows, and other brushy areas, generally with Field Sparrows.
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.

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/pole timber pine savanna, 1(1) sapling/pole timber 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**

Clay-colored Sparrow
*Spizella pallida*  

**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.

**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**

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.

**SAMPLE BREEDING DENSITIES**


**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**

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.

**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/peletimber 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**

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.

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-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
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**

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.

**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**

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.

**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**

Henslow’s Sparrow
*Ammodramus henslowii*

**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 broomedge 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**

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**
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.

**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**
Seaside Sparrow
*Ammospiza maritima*  

**PROTECTION STATUS**

*A. m. mirabilis* federally listed as Endangered, state listed as Endangered in Florida. *A. m. juncoecoles* 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**

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.

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

Song Sparrow
Melospiza melodia

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.

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

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.

**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**

Swamp Sparrow
*Melospiza georgiana*  

**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.

**KEY HABITAT REQUIREMENTS**

Breeding—mountain bogs, usually in shrubby spots. Wintering—marshes or other damp herbaceous cover.

**SAMPLE WINTER DENSITIES**

0.5(1) sapling/pole timber 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**

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.

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, l(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
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.

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

Harris’ Sparrow
Zonotrichia querula

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.

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, gleaner granivore or omnivore; or bush or arboreal gleaner folivore.

REFERENCES

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.

**SAMPLE BREEDING DENSITIES**

6(1) sawtimber oak-hickory, 47(1) sawtimber cove hardwoods, 71(2) sawtimber spruce-fir.

**SAMPLE WINTER DENSITIES**


**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 gleaner omnivore-granivore.

**REFERENCES**

Lapland Longspur  
*Calcarius lapponicus*  

**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.

**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 gleaner granivore.

**REFERENCES**

Smith’s Longspur 
*Calcarius pictus* 

**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.

**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**
Chestnut-collared Longspur
*Calcarius ornatus*  

**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.

**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**

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**

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.

**KEY HABITAT REQUIREMENTS**
Tall grassy places in open country.

**SAMPLE BREEDING DENSITIES**
1(3) grass/orb 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**
Red-winged Blackbird

**Agelaius phoeniceus**

**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.

**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**

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.

**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**

Western Meadowlark
*Sturnella neglecta*

**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.

**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**

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.

**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**

Rusty Blackbird
*Euphagus carolinus*

**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.

**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**

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.

**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**

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).

**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**

Boat-tailed Grackle
Quiscalus major

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.

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

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.

**SAMPLE BREEDING DENSITIES**

0.2(15) shrub/seedling elm-ash-cottonwood, 28(1) sawtimber live oak-maritime, 28(2) grass/orb 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) sapling 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 topt 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, glean insects and other animal food in summer, and grain and other seeds in winter.

**GUILD**

Bush or tree nesting, terrestrial gleaning insectivore-granivore.

**REFERENCES**

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.

**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**

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.

**SAMPLE BREEDING DENSITIES**

0.4(3) shrub/seedling mixed pine-hardwood, 15(2) sapling/pole/temper 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**

Orchard Oriole
*Icterus spurius*

**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.

**SAMPLE BREEDING DENSITIES**


**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**

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.

KEY HABITAT REQUIREMENTS
Scattered trees in residential areas.

SAMPLE WINTER DENSITIES
1.8(5) sapling/pole timber 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
Northern (Baltimore) Oriole
Icterus galbula

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.

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/orb 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
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.

**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**

House Finch
Carpodacus mexicanus

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 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.

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

Red Crossbill  
*Loxia curvirostra*  

**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**

White-winged Crossbill
Loxia leucoptera

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

Common Redpoll
Carduelis flammea

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.

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

Pine Siskin
Carduelis pinus

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.

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

American Goldfinch
*Carduelis tristis*  

**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/pole timber bay swamp-pocosin, 0.5(1) shrub/seedling Virginia pine-pitch pine, 15(3) sapling/pole timber 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**

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.

**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**

House Sparrow
Passer domesticus

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.

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

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 ligustrina), 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 from the Cornell Laboratory of Ornithology, 159 Sapsucker Woods Rd., Ithaca, NY 14850 607-254-214.

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 (Acer saccharum), 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), black gum, sweet gum (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) compose 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 (carcass) 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.

TERRITORIAL—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 WPBS 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 WPBS are available from the Cornell Laboratory of Ornithology, 159 Sapsucker Woods Rd, Ithaca, NY 14850 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.
LITERATURE CITED


Bent, A. C. Life histories of North American birds:


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’ 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 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.


<table>
<thead>
<tr>
<th>Vegetation type and successional stage</th>
<th>State\textsuperscript{a}</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Florida</td>
<td>Georgia</td>
</tr>
<tr>
<td>Everglades</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>1(1)</td>
<td>-</td>
</tr>
<tr>
<td>Southern scrub oak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>2(2)</td>
<td>-</td>
</tr>
<tr>
<td>Sand pine-sthern. scrub oak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>1(1)</td>
<td>-</td>
</tr>
<tr>
<td>Longleaf pine-scrub oak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>2(6)</td>
<td>-</td>
</tr>
<tr>
<td>Bay swamp-pocosin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Longleaf pine-slash pine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>2(2)</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>1(1)</td>
<td>4(7)</td>
</tr>
<tr>
<td>Oak-gum-cypress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>1(2)</td>
<td>1(1)</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Live oak maritime</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>2(3)</td>
<td>-</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Elm-ash-cottonwood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb or Shrub/seedling</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lobolly pine-shortleaf pine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>-</td>
<td>1(1)</td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>2(2)</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vegetation type and successional stage</td>
<td>State*</td>
<td>Province</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>Mixed pine-hardwood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>1(11)</td>
</tr>
<tr>
<td>Oak-hickory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>-</td>
<td>1(2)</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>2(2)</td>
</tr>
<tr>
<td>White pine-hemlock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cove hardwoods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>1(10)</td>
</tr>
<tr>
<td>Spruce-fir</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>10(16)</td>
<td>15(38)</td>
</tr>
</tbody>
</table>

*Entries are listed as “Plots (Years censused).”
<table>
<thead>
<tr>
<th>Vegetation type and successional stage</th>
<th>State ( ^a )</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Florida</td>
<td>Georgia</td>
</tr>
<tr>
<td>Everglades</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>1(1)</td>
<td>-</td>
</tr>
<tr>
<td>Pine savanna</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>1(9)</td>
<td>-</td>
</tr>
<tr>
<td>Southern scrub oak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>2(2)</td>
<td>-</td>
</tr>
<tr>
<td>Sand pine-southern scrub oak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>1(1)</td>
<td>-</td>
</tr>
<tr>
<td>Longleaf pine-scrub oak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>1(1)</td>
<td>-</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>1(2)</td>
</tr>
<tr>
<td>Bay swamp-pocosin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>1(1)</td>
</tr>
<tr>
<td>Longleaf pine-slash pine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>1(2)</td>
<td>-</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>1(1)</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>1(4)</td>
<td>-</td>
</tr>
<tr>
<td>Oak-gum-cypress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>1(1)</td>
<td>-</td>
</tr>
<tr>
<td>Live oak maritime</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>1(1)</td>
<td>-</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>2(2)</td>
<td>-</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>1(3)</td>
</tr>
<tr>
<td>Elm-ash-cottonwood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb or Shrub/seedling</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Loblolly pine-shortleaf pine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>-</td>
<td>1(1)</td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vegetation type and successional stage</td>
<td>State</td>
<td>Total</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>----------------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>Florida</td>
<td>Georgia</td>
</tr>
<tr>
<td>Virginia pine-pitch pine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mixed pine-hardwood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>1(10)</td>
</tr>
<tr>
<td>Oak-hickory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass/forb</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Shrub/seedling</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sapl./poletimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sawtimber</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>12(24)</strong></td>
<td><strong>4(13)</strong></td>
</tr>
</tbody>
</table>

*Entries are listed as “Plots (Years censused).”*
## Appendix B.
Species Occurrence by Vegetation Type, Habitat Quality, and Season.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>B/W&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Highest Habitat Quality By Vegetation Type For Any Successional Stage&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EVGL</td>
<td>TROP</td>
</tr>
<tr>
<td>Pied-billed Grebe</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Brown Pelican</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Double-crested Cormorant</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Anhinga</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Magnificent Frigatebird</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>American Bittern</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Great Egret</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Reddish Egret</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Yellow-crowned Night Heron</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>White Ibis</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>B</td>
<td>W</td>
</tr>
</tbody>
</table>

---

(a) B - Breeding  
(a) W - Wintering  
(b) Cover Type  
LLSO - Longleaf pine-scrub oak  
SHLL - Sandhills longleaf pine  
SMLH - Southern mixed mesic hardwoods  
BSPO - Bay swamp-pocosin  
PPPO - Pond pine pocosin  
LLSL - Longleaf pine-slash pine  
OGGY - Oak-gum-cypress  
LOMA - Live oak-maritime  
EACO - Elm-ash-cottonwood  
LPSH - Loblolly pine-shortleaf pine  
VPPT - Virginia pine-pitch pine  
MPWH - Mixed pine-hardwood  
OKHK - Oak-hickory  
WPHM - White pine-hemlock  
COVE - Cove hardwoods  
MABB - Maple-beech-birch  
SPFR - Spruce-fir  

S - Marginal  
O - Optimal
<table>
<thead>
<tr>
<th>Common Name</th>
<th>B/W</th>
<th>EVGL</th>
<th>TROP</th>
<th>MANG</th>
<th>PSAV</th>
<th>SOSO</th>
<th>SPPO</th>
<th>LLSO</th>
<th>SHLL</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLSS</th>
<th>OGCY</th>
<th>LOMA</th>
<th>EACO</th>
<th>LPSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MAFF</th>
<th>SPFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roseate Spoonbill</td>
<td>B</td>
<td>S</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>B</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Wood Duck</td>
<td>B</td>
<td>O</td>
<td>S</td>
<td>O</td>
<td>O</td>
<td>M</td>
<td>O</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>B</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>B</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>B</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Osprey</td>
<td>B</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>American Swallow-tailed</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Mississippi Kite</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>B</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Cooper’s Hawk</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Northern Goshawk</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Red-shouldered Hawk</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Short-tailed Hawk</td>
<td>B</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

(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
MAFF - Maple-beech-birch
SPFR - Spruce-fir

M - Marginal
S - Suitable
O - Optimal
| Common Name               | BW<sup>a</sup> | EVGL | TROP | MANG | PSAV | SOSO | SPSO | LLSO | SHLL | SMMH | BSPO | PPPO | LLSL | OGCV | LOMA | EACO | LPSH | VPPT | MPHW | OKHK | WPHM | COVE | MABB | SPFR |
|--------------------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Swainson's Hawk          | B               | W    | M    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Red-tailed Hawk          | B               | W    | M    | M    | M    | M    | M    | S    | M    | M    | M    | M    | M    | M    | O    | O    | O    | M    | M    |      |      |      |      |      |      |      |
| Ferruginous Hawk         | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | M    | M    | M    | M    | M    |      |      |      |
| Rough-legged Hawk        | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Golden Eagle             | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Crested Caracara         | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| American Kestrel         | B               | W    |      |      |      |      |      |      | M    | M    | M    | M    | M    | M    | O    | O    | O    | M    | M    | M    | M    | M    | M    | M    |      |      |      |
| Merlin                   | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Peregrine Falcon         | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Black Francolin          | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Ring-necked Pheasant     | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Ruffed Grouse            | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Wild Turkey              | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Northern Bobwhite        | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Yellow Rail              | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Black Rail               | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Clapper Rail             | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| King Rail                | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Virginia Rail            | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Sora                     | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Purple Gallinule         | B               | W    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

(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
BSPO - Bay swamp-pocosin
PPPO - Pond pine pocosin
OGCV - Oak-gum-cypress
LOMA - Live oak-maritime
EACO - Elm-sha-hickory
LPSH - Loblolly pine-shortleaf pine
VPPT - Virginia pine-pitch pine
MPHW - Mixed pine-hardwood
OKHK - Oak-hickory
WPHM - White pine-hemlock
COVE - Cedar hickory
MABB - Maple-beech-birch
SPFR - Spruce-fir

M - Marginal
S - Suitable
O - Optimal
<table>
<thead>
<tr>
<th>Common Name</th>
<th>B/W</th>
<th>Highest Habitat Quality By Vegetation Type For Any Successional Stageb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Moorhen</td>
<td>B</td>
<td>EVGL</td>
</tr>
<tr>
<td>American Coot</td>
<td>W</td>
<td>M</td>
</tr>
<tr>
<td>Limpkin</td>
<td>B</td>
<td>S</td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>W</td>
<td>M</td>
</tr>
<tr>
<td>Killdeer</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Upland Sandpiper</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Common Snipe</td>
<td>B</td>
<td>S</td>
</tr>
<tr>
<td>American Woodcock</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>W</td>
<td>M</td>
</tr>
<tr>
<td>White-crowned Pigeon</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>White-winged Dove</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Common Ground-Dove</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Black-billed Cuckoo</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Mangrove Cuckoo</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Greater Roadrunner</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Smooth-billed Ani</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Groove-billed Ani</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>B</td>
<td>W</td>
</tr>
</tbody>
</table>

(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  
LLSD - Longleaf pine-scrub oak  
SHLL - Sandhills longleaf pine  
SMMH - Southern mixed  
BSPO - Bay swamp-pocosin  
PPPO - Pond pine pocosin  
OGCKY - 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  
WPMB - White pine-hemlock  
COVE - Cove hardwoods  
MABB - Maple-beech-birch  
SPFR - Spruce-fir  
M - Marginal  
S - Suitable  
O - Optimal
<table>
<thead>
<tr>
<th>Common Name</th>
<th>BW &lt;sup&gt;a&lt;/sup&gt;</th>
<th>Highest Habitat Quality By Vegetation Type For Any Successional Stageb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EVGL</td>
<td>TROP</td>
</tr>
<tr>
<td>Snowy Owl</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Burrowing Owl</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Barred Owl</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Long-eared Owl</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Northern Saw-whet Owl</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Chuck-will’s-widow</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Buff-bellied Hummingbird</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Ruby-throated Hummingbird</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Black-chinned Hummingbird</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Rufous Hummingbird</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Yellow-bellied Sapsucker</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>B</td>
<td>W</td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>B</td>
<td>W</td>
</tr>
</tbody>
</table>

**Notes:**
- **B** - Breeding
- **W** - Wintering
- **EVGL** - Everglades
- **TROP** - Tropical Hardwoods
- **MANG** - Mangroves
- **PSAV** - Pine savanna
- **SOSO** - Southern scrub oak
- **SPSO** - Sand pine-southern scrub oak
- **LLLO** - Longleaf pine-scrub oak
- **SHLL** - Sandhills longleaf pine
- **SMHH** - Southern mixed mesic hardwoods
- **BSPO** - Bay swamp pocosin
- **PPPO** - Pond pine pocosin

**Marginal**
- **O** - Optimal
- **S** - Suitable
- **M** - Marginal

**敬请阅读自然语言表示的文档。**
| Common Name                  | B/W | EVGL | TROP | MANG | PSAV | SOSO | SPSO | LLSO | SHLL | SMMH | BSPO | PPPO | LSSL | OGCY | LOMA | EACO | LPSH | VPPT | MPHW | OKHK | WPHM | COVE | MABB | SPFR |
|-----------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Willow Flycatcher           | B   | W    | S    | M    | O    | M    | M    | M    | M    | M    | M    | M    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Least Flycatcher            | B   | W    | O    | M    | M    | M    | M    | M    | M    | M    | M    | M    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Vermilion Flycatcher        | B   | W    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Ash-throated Flycatcher     | B   | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Western Kingbird            | B   | W    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Eastern Kingbird            | B   | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Gray Kingbird               | B   | W    | O    | O    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Scissor-tailed Flycatcher   | B   | W    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Horned Lark                 | B   | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Purple Martin               | B   | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | 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 | EVGL | TROP | MANG | PSAV | SOSO | SPSSO | LLSO | SHLL | SMMH | BSPO | PPPO | LLSL | OGCY | LOMA | EACO | LPSH | VPPT | MPHW | OKHK | WPHM | COVE | MABB | SPFR |
|-------------------------|-----|------|------|------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Tree Swallow            | B W | O    | O    | O    | M    |      |       | M    | S    | M    | M    |      | M    |      | M    |      | M    |      |      |      |      |      |      |      |      |
| Northern Rough-winged Swallow | B W | S    | M    | M    |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Bank Swallow            | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Cliff Swallow           | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Barn Swallow            | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Blue Jay                | B W | S    | S    | S    | S    | S    | O     | S    | S    | S    | M    | S    | M    | S    | M    | O    | O    | S    |      |      |      |      |      |      |      |
| Scrub Jay               | B W | S    | S    | S    | O     | S    |       | S    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| American Crow           | B W | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | O    | S    | O    | S    | S    | S    | S    | S    | S    | S    |
| Fish Crow               | B W | S    | M    | O    | S    | M    | S    | M    | O    | M    | O    | S    |      |      |      |      |      |      |      |      |      |      |      |      |
| Common Raven            | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Black-capped Chickadee  | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Carolina Chickadee      | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Tufted Titmouse         | B W | M    | M    | M    | O    | S    | M    | M    | M    | O    | S    | M    | S    | S    | M    |      |      |      |      |      |      |      |      |
| Red-breasted Nuthatch   | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| White-breasted Nuthatch | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Brown-headed Nuthatch   | B W | S    | S    | O    | O    | S    | O    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Brown Creeper           | B W | S    | S    | O    | O    | S    | O    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Carolina Wren           | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Bewick's Wren           | B W | O    | M    | O    | S    | M    | O    | O    | O    | O    | O    | S    | M    | O    | M    | S    |      |      |      |      |      |      |      |
| House Wren              | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Winter Wren             | B W |      |      |      |      |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

(a) B - Breeding
W - Wintering

(b) Cover Type
EVGL - Everglades
TROP - Tropical Hardwoods
MANG - Mangroves
PSAV - Pine savanna
SOSO - Southern scrub oak
SPSSO - Sand pine-southern scrub oak
LLSO - Longleaf pine-scrub oak
SHLL - Sandhills longleaf pine
SMMH - Southern mixed
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
LPSPH - Lobolly 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 | EVGL | TROP | MANG | PSAV | SOSO | SPSO | LLLO | SHLL | SMMH | BSPO | PPPO | LLSL | OGCY | LOMA | EACO | LPSH | VPPT | MPWH | OKHK | WPHM | COVE | MABB | SPFR |
|--------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Marsh Wren               | B   | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Blue-gray Gnatcatcher    | B   | M    | M    | O    | O    | M    | O    | S    | O    | S    | M    | O    | M    | O    | M    | M    | O    | M    | S    | S    | S    | S    | S    | S    | S    | S    |
| Eastern Bluebird         | B   | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Veery                    | B   | M    | S    | S    | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Swainson's Thrush        | B   | W    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    |
| Hermit Thrush            | B   | W    | S    | M    | M    | M    | M    | O    | O    | S    | M    | S    | S    | O    | S    | M    | O    | S    | S    | M    | M    | M    | M    | M    | M    | M    |
| Wood Thrush              | B   | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| American Robin           | B   | W    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Northern Mockingbird     | B   | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | O    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Water Pipit              | B   | W    | O    | O    | O    | O    | O    | O    | M    | M    | S    | S    | S    | S    | S    | S    | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Sprague's Pipit          | B   | W    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Loggerhead Shrike        | B   | W    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| White-eyed Vireo         | B   | W    | M    | M    | M    | M    | M    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | O    | O    | O    | O    | O    | O    | O    | O    |
| Bell's Vireo             | B   | W    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |

(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
LLLO - 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
MPWH - 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 | EVGL | TROP | MANG | PSAV | SOSO | SPSO | LLSO | SHLL | SMMH | BSPO | PPPO | LLSL | OGCY | LOMA | EACO | LPSH | VPPT | MPHW | OKHK | WPHM | COVE | MABB | SPFR |
|---------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Warbling Vireo            | B   | O    | M    |     | S    | O    |     | O    | M    |     | S    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Red-eyed Vireo            | B   | M    |     |     |     | O    | S    | O    | S    | M    | S    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Black-whiskered Vireo     | B   | O    | O    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Bachman's Warbler         | B   |     | S    | M    | O    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Blue-winged Warbler       | B   |     | M    |     | M    | O    | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Orange-crowned Warbler    | B   |     | M    |     |     | O    | S    | M    | M    | O    | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Nashville Warbler         | B   |     | O    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Northern Parula           | B   |     | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Yellow Warbler            | B   |     | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Chestnut-sided Warbler    | B   |     | S    | O    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Magnolia Warbler          | B   |     | M    | O    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Cape May Warbler          | B   |     | O    | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Black-throated Blue Warbler| B   |     | O    | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Yellow-rumped (Myrtle) Warbler | B   |     | M    | O    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Black-throated Gray Warbler| B   |     | M    |     | M    | M    | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Black-throated Green Warbler| B   |     | M    |     | M    | M    | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Blackburnian Warbler      | B   |     | M    |     | M    | M    | M    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Yellow-throated Warbler   | B   |     | M    |     | 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
BSPO - Bay swamp-pocosin
PPPO - Pond pine pocosin
LLSL - Longleaf pine-slash pine
OGCY - Oak-gum-cypress
LOMA - Live oak-maritime
EACO - Elm-ashe-cottonwood
LPSH - Lobolly 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 | EVGL | TROP | MANG | PSAV | SOSO | SPSO | LLSO | SHLL | SMMH | BSPO | PPPO | LLSL | OGCY | LOMA | EACO | LPSH | VPPT | MPHW | OKHK | WPHM | COVE | MABB | SPFRL |
|--------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Pine Warbler             | B/W | S    | S    | S    | S    | S    | O    | O    | M    | O    | O    | O    | O    | M    | O    | M    | S    | O    | M    |
| Prairie Warbler          | B/W | O    | O    | S    | O    | S    | S    | M    | S    | O    | S    | M    | M    | O    | M    | S    | O    | M    |
| Palm Warbler             | B/W | M    | O    | S    | S    | S    | S    | M    | M    | S    | M    | S    | O    | M    | S    |
| Cerulean Warbler         | B/W | O    | M    | M    | M    | M    | S    | O    | M    | O    | S    | S    | M    | O    | O    |
| American Redstart        | B/W | O    | O    | S    | M    | S    | S    | O    | S    | S    | S    | S    | S    | S    |
| Prothonotary Warbler     | B/W | O    | O    | S    | M    | M    | S    | O    | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Prothonotary Warbler     | B/W | O    | O    | S    | M    | M    | S    | O    | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Worm-eating Warbler      | B/W | O    | M    | M    | M    | M    | S    | O    | M    | O    |
| Swainson’s Warbler       | B/W | O    | M    | M    | M    | M    | O    | O    | O    | O    |
| Ovenbird                 | B/W | O    | O    | S    | M    | M    | S    | O    | M    | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Northern Waterthrush      | B/W | O    | M    | M    | M    | M    | O    | O    | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Louisiana Waterthrush     | B/W | O    | M    | M    | M    | M    | O    | O    | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Kentucky Warbler          | B/W | O    | M    | M    | M    | M    | O    | O    | O    | O    |
| Mourning Warbler          | B/W | O    | M    | M    | M    | M    | O    | O    | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Common Yellowthroat      | B/W | O    | S    | M    | M    | M    | M    | O    | S    | M    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Hooded Warbler            | B/W | O    | S    | M    | M    | M    | M    | O    | S    | M    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Wilson’s Warbler          | B/W | O    | S    | M    | M    | M    | M    | O    | S    | M    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Canada Warbler            | B/W | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Yellow-breasted Chat      | B/W | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Summer Tanager            | B/W | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Scarlet Tanager           | B/W | O    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |

(a) B - Breeding
W - Wintering

(b) Cover Type
EVGL - Everglades
TROP - Tropical Hardwoods
MANG - Mangroves
SOSO - Southern scrub oak
SPSO - Sand pine-southern scrub oak
LLSO - Longleaf pine-scrub oak
SHLL - Sandhills longleaf pine
SMNH - Southern mixed
BSPO - Bay swamp-pocosin
PPPO - Pond pine-pocosin
LLSL - Longleaf pine-slash pine
OGCY - Oak-gum-cypress
LOMA - Live oak-maritime
EACO - Elm-ashe-cottonwood
LPSP - 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

S - Suitable
M - Marginal
O - Optimal
S - Suitable
| Common Name            | BW | EVGL | TROP | MANG | PSAV | SOSO | SPSO | LLSS | SMMH | BSPO | PPPO | LSSL | OGCL | LOMA | EACO | LPSH | VPPT | MPHW | OKHK | WPHM | COVE | MABB | SPFR |
|-----------------------|----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Western Tanager       | B  | W    | M    | M    | M    | S    | S    | S    | M    | S    | O    | S    | S    | M    | O    | S    | M    | M    | M    | M    | M    | M    | M    | M    |
| Blue Grosbeak         | B  | W    | S    | M    | M    | S    | S    | S    | M    | S    | S    | S    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Dickcissel            | B  | W    | M    | M    | M    | S    | S    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Green-tailed Towhee   | B  | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Rufous-sided Towhee   | B  | W    | S    | M    | M    | S    | S    | M    | M    | S    | M    | O    | S    | S    | M    | O    | S    | M    | O    | S    | S    | M    | M    | M    |
| Bachman's Sparrow     | B  | W    | S    | M    | M    | S    | S    | M    | M    | S    | M    | O    | S    | S    | M    | O    | S    | M    | O    | S    | S    | M    | M    | M    |
| Clay-colored Sparrow  | B  | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Field Sparrow         | B  | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Vesper Sparrow        | B  | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Lark Sparrow          | B  | W    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Savannah Sparrow      | B  | W    | M    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |
| Grasshopper Sparrow   | B  | W    | M    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    | S    |

(a) B - Breeding  
W - Wintering  
(b) Cover Type  
| EVGL - Everglades  | LLSS - Longleaf pine-scrub oak  | LSSL - Longleaf pine-slash pine  | M - Marginal  
| TROP - Tropical Hardwoods | SHLL - Sandhills longleaf pine  | OGCY - Oak-gum-cypress  | S - Suitable  
| MANG - Mangroves | SMMH - Southern mixed  | LOMA - Live oak-maritime | O - Optimal  
| PSAV - Pine savanna | BSPO - Bay swamp-pocosin  | EACO - Elm-ashe-cottonwood |  
| SOSO - Southern scrub oak | PPPO - Pond pine pocosin  | COVE - Cove hardwoods |  
| SPSSO - Sand pine-southern scrub oak | VPPT - Virginia pine-pitch pine  | MABB - Maple-beech-birch |  
|                      |                                  | SPFR - Spruce-fir |  

| Common Name                  | B/W | EVGL | TROP | MANG | PSAV | SOSO | SPSO | LLSO | SHLL | SMMH | BSPO | PPPO | LLSL | OGCO | LOMA | EACO | LPSH | VPPT | MPHW | OKHK | WPWH | COVE | MABB | SPFR |
|-----------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Henslow's Sparrow           | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Le Conte's Sparrow          | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Sharp-tailed Sparrow        | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Seaside Sparrow             | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Fox Sparrow                 | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Song Sparrow                | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Lincoln's Sparrow           | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Swamp Sparrow               | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| White-throated Sparrow      | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| White-crowned Sparrow       | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Harris' Sparrow             | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Dark-eyed Junco             | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Lapland Longspur            | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Smith's Longspur            | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Chestnut-collared Longspur  | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Snow Bunting                | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Bobolink                    | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Eastern Meadowlark          | B/W | S    | M    | O    | M    | M    | M    | M    | M    | M    | O    | S    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    | O    |
| Western Meadowlark          | B/W | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    | M    |
| Yellow-headed Blackbird     | B/W |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

(a) B - Breeding  W - Wintering
<table>
<thead>
<tr>
<th>Common Name</th>
<th>B/W</th>
<th>EVGL</th>
<th>TROP</th>
<th>MANG</th>
<th>PSAV</th>
<th>SOSO</th>
<th>SPPO</th>
<th>LLSO</th>
<th>SHLL</th>
<th>SMMH</th>
<th>BSPO</th>
<th>PPPO</th>
<th>LLSL</th>
<th>OGCY</th>
<th>LOMA</th>
<th>EACO</th>
<th>LPSH</th>
<th>VPPT</th>
<th>MPHW</th>
<th>OKHK</th>
<th>WPHM</th>
<th>COVE</th>
<th>MABB</th>
<th>SPFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rusty Blackbird</td>
<td>B W</td>
<td>M O</td>
<td>M O</td>
<td>S</td>
<td>M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brewer's Blackbird</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>S S S</td>
<td>M M S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great-tailed Grackle</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>S S S</td>
<td>M M S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>B O</td>
<td>M</td>
<td>M</td>
<td>M O M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Grackle</td>
<td>B W</td>
<td>M S</td>
<td>M M</td>
<td>S S S</td>
<td>S S S</td>
<td>M M S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronzed Cowbird</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>S S S</td>
<td>S M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orchard Oriole</td>
<td>B W</td>
<td>M M</td>
<td>M</td>
<td>M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spot-breasted Oriole</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern (Baltimore) Oriole</td>
<td>B W</td>
<td>S</td>
<td>M</td>
<td>M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple Finch</td>
<td>B W</td>
<td>M M</td>
<td>M S</td>
<td>S M S</td>
<td>M O</td>
<td>S S S</td>
<td>O S</td>
<td>S M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Finch</td>
<td>B W</td>
<td>M</td>
<td>M</td>
<td>S S S</td>
<td>M</td>
<td>M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Crossbill</td>
<td>B W</td>
<td>M M</td>
<td>M</td>
<td>M</td>
<td>S</td>
<td>S O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-winged Crossbill</td>
<td>B W</td>
<td>M M</td>
<td>M</td>
<td>S S M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Redpoll</td>
<td>B W</td>
<td>S</td>
<td>M S</td>
<td>S M S</td>
<td>S S S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pine Siskin</td>
<td>B W</td>
<td>M M</td>
<td>M M</td>
<td>M M S</td>
<td>M M O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>B W</td>
<td>S M</td>
<td>M M</td>
<td>M M M</td>
<td>M M O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evening Grosbeak</td>
<td>B W</td>
<td>M M</td>
<td>M M</td>
<td>M M M</td>
<td>M O S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Sparrow</td>
<td>B W</td>
<td>M M</td>
<td>M M</td>
<td>M M M</td>
<td>M M M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(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
BSPO - Bay swamp-pocosin
PPPO - Pond pocosin
SMMH - Southern mixed
LPSH - Loblolly pine-slash pine
OGCY - Oak-gum-cypress
LOMA - Live oak maritime
EACO - Elm-ash-cottonwood
LPMH - Shingle pine-hemlock
OKHK - Oak-hickory
MPHW - Mixed pine-hardwood
WPHM - Shingle pine-hemlock
COVE - Cove hardwoods
MABB - Maple-beech-birch
SPFR - Spruce-fir

M - Marginal
S - Suitable
O - Optimal
# Appendix C.


<table>
<thead>
<tr>
<th>Species</th>
<th>Season</th>
<th>Total sample&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Density range&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Breeding: pairs/40 ha; Winter: birds/40ha</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pied-billed Grebe</td>
<td>Winter</td>
<td>3</td>
<td>1.7</td>
</tr>
<tr>
<td>American Anhinga</td>
<td>Breeding</td>
<td>5</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>3</td>
<td>2.3</td>
</tr>
<tr>
<td>American Bittern</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>Breeding</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>Breeding</td>
<td>9</td>
<td>Visitor in nine habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>11</td>
<td>1.0</td>
</tr>
<tr>
<td>Great Egret</td>
<td>Breeding</td>
<td>5</td>
<td>Visitor in four habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>8</td>
<td>1.3</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>Breeding</td>
<td>2</td>
<td>Visitor in two habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>Breeding</td>
<td>3</td>
<td>Visitor in two habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>Breeding</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>Winter</td>
<td>12</td>
<td>2.1</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>Breeding</td>
<td>26</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>6</td>
<td>2.7</td>
</tr>
<tr>
<td>Black-cro. Night Heron</td>
<td>Breeding</td>
<td>2</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>4</td>
<td>9.0</td>
</tr>
<tr>
<td>Yellow-cro. Night Heron</td>
<td>Breeding</td>
<td>2</td>
<td>Visitor in two habitats</td>
</tr>
<tr>
<td>White Ibis</td>
<td>Breeding</td>
<td>2</td>
<td>Visitor in two habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>3</td>
<td>6.3</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Wood Duck</td>
<td>Breeding</td>
<td>22</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>5</td>
<td>2.1</td>
</tr>
<tr>
<td>Mallard</td>
<td>Winter</td>
<td>5</td>
<td>4.4</td>
</tr>
<tr>
<td>Black Duck</td>
<td>Winter</td>
<td>4</td>
<td>1.8</td>
</tr>
<tr>
<td>Mottled Duck</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Gadwall</td>
<td>Winter</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Blue-winged Teal</em></td>
<td>Breeding</td>
<td>1</td>
<td>30.0</td>
</tr>
<tr>
<td>American Wigeon</td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>Breeding</td>
<td>5</td>
<td>Visitor in four habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>17</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>Breeding</td>
<td>24</td>
<td>Visitor in twelve habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>48</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osprey</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>Winter</td>
<td>12</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>Breeding</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>14</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooper's Hawk</td>
<td>Breeding</td>
<td>9</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>8</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-shouldered Hawk</td>
<td>Breeding</td>
<td>22</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>31</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>Breeding</td>
<td>31</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>31</td>
<td>1.0</td>
</tr>
<tr>
<td>Swainson's Hawk</td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-tailed Hawk</td>
<td>Breeding</td>
<td>30</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>33</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Kestrel</td>
<td>Breeding</td>
<td>13</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>36</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merlin</td>
<td>Winter</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruffed Grouse</td>
<td>Breeding</td>
<td>13</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>4</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>Breeding</td>
<td>8</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>Breeding</td>
<td>109</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>38</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>King Rail</td>
<td>Breeding</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia Rail</td>
<td>Breeding</td>
<td>1</td>
<td>15.0</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Total sample&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Density range&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------</td>
<td>--------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Breeding: pairs/40 ha; Winter: birds/40ha</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sora</td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Purple Gallinule</td>
<td>Breeding</td>
<td>4</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>Breeding</td>
<td>1</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>American Coot</td>
<td>Winter</td>
<td>4</td>
<td>3.1</td>
</tr>
<tr>
<td>Limpkin</td>
<td>Breeding</td>
<td>3</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>3</td>
<td>0.8</td>
</tr>
<tr>
<td>Killdeer</td>
<td>Breeding</td>
<td>6</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>21</td>
<td>14.9</td>
</tr>
<tr>
<td>Greater Yellowlegs</td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Lesser Yellowlegs</td>
<td>Winter</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Common Snipe</td>
<td>Winter</td>
<td>9</td>
<td>2.7</td>
</tr>
<tr>
<td>American Woodcock</td>
<td>Breeding</td>
<td>15</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>4</td>
<td>1.0</td>
</tr>
<tr>
<td>Black-headed Gull</td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Ring-billed Gull</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>11</td>
<td>36.2</td>
</tr>
<tr>
<td>Herring Gull</td>
<td>Winter</td>
<td>2</td>
<td>Visitor in two habitats</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>Winter</td>
<td>13</td>
<td>28.5</td>
</tr>
<tr>
<td>White-winged Dove</td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>Breeding</td>
<td>112</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>93</td>
<td>24.6</td>
</tr>
<tr>
<td>Common Ground-Dove</td>
<td>Breeding</td>
<td>6</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>10</td>
<td>4.0</td>
</tr>
<tr>
<td>Black-billed Cuckoo</td>
<td>Breeding</td>
<td>4</td>
<td>Visitor in two habitats</td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>Breeding</td>
<td>101</td>
<td>6.1</td>
</tr>
<tr>
<td>Smooth-billed Ani</td>
<td>Winter</td>
<td>3</td>
<td>16.0</td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>Breeding</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Total sample&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Density range&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------</td>
<td>---------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>S. E.</td>
</tr>
<tr>
<td>Breeding: pairs/40 ha; Winter: birds/40ha</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>Breeding</td>
<td>60</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>16</td>
<td>2.1</td>
</tr>
<tr>
<td>Great Horned Owl</td>
<td>Breeding</td>
<td>26</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>13</td>
<td>1.0</td>
</tr>
<tr>
<td>Barred Owl</td>
<td>Breeding</td>
<td>50</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>28</td>
<td>1.9</td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>Winter</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td>Northern Saw-whet Owl</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>Breeding</td>
<td>14</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>28</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Chuck-will's-widow</td>
<td>Breeding</td>
<td>64</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>Breeding</td>
<td>15</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>15</td>
<td>1.6</td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>Breeding</td>
<td>16</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>4</td>
<td>1.8</td>
</tr>
<tr>
<td>Ruby-thr. Hummingbird</td>
<td>Breeding</td>
<td>116</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>84</td>
<td>5.6</td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>59</td>
<td>3.2</td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>Breeding</td>
<td>134</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>92</td>
<td>2.8</td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>Breeding</td>
<td>73</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>43</td>
<td>2.2</td>
</tr>
<tr>
<td>Red-cockaded Woodpecker</td>
<td>Breeding</td>
<td>4</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Northern Flicker</td>
<td>Breeding</td>
<td>127</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>68</td>
<td>3.5</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>Breeding</td>
<td>89</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>49</td>
<td>2.4</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Total sample&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Density range&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------</td>
<td>--------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Breeding: pairs/40 ha; Winter: birds/40ha</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Wood-Pewee</td>
<td>Breeding</td>
<td>98</td>
<td>7.4</td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>Breeding</td>
<td>102</td>
<td>14.5</td>
</tr>
<tr>
<td>*Willow Flycatcher</td>
<td>Breeding</td>
<td>22</td>
<td>31.9</td>
</tr>
<tr>
<td>*Least Flycatcher</td>
<td>Breeding</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>Breeding</td>
<td>25</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>36</td>
<td>2.3</td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>Breeding</td>
<td>135</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>4</td>
<td>2.4</td>
</tr>
<tr>
<td>Eastern Kingbird</td>
<td>Breeding</td>
<td>25</td>
<td>3.8</td>
</tr>
<tr>
<td>Gray Kingbird</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td>Horned Lark</td>
<td>Breeding</td>
<td>6</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>20</td>
<td>36.2</td>
</tr>
<tr>
<td>Purple Martin</td>
<td>Breeding</td>
<td>10</td>
<td>Visitor in nine habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Tree Swallow</td>
<td>Winter</td>
<td>11</td>
<td>11.4</td>
</tr>
<tr>
<td>North. Rough-winged Swallow</td>
<td>Breeding</td>
<td>26</td>
<td>0.1</td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>Breeding</td>
<td>33</td>
<td>0.7</td>
</tr>
<tr>
<td>Blue Jay</td>
<td>Breeding</td>
<td>138</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>86</td>
<td>9.6</td>
</tr>
<tr>
<td>Scrub Jay</td>
<td>Breeding</td>
<td>3</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>3</td>
<td>25.0</td>
</tr>
<tr>
<td>American Crow</td>
<td>Breeding</td>
<td>94</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>97</td>
<td>26.4</td>
</tr>
<tr>
<td>Fish Crow</td>
<td>Breeding</td>
<td>34</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>27</td>
<td>10.9</td>
</tr>
<tr>
<td>Common Raven</td>
<td>Breeding</td>
<td>7</td>
<td>Visitor in four habitats</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Black-capped Chickadee</td>
<td>Breeding</td>
<td>5</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Carolina Chickadee</td>
<td>Breeding</td>
<td>137</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>83</td>
<td>11.8</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Total sample</td>
<td>Density range</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Breeding: pairs/40 ha; Winter: birds/40ha</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Tufted Titmouse</td>
<td>Breeding</td>
<td>143</td>
<td>12.1</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>87</td>
<td>10.2</td>
</tr>
<tr>
<td>Red-breasted Nuthatch</td>
<td>Breeding</td>
<td>5</td>
<td>14.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>21</td>
<td>3.2</td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>Breeding</td>
<td>79</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>53</td>
<td>3.3</td>
</tr>
<tr>
<td>Brown-headed Nuthatch</td>
<td>Breeding</td>
<td>18</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>9</td>
<td>2.7</td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>Breeding</td>
<td>10</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>53</td>
<td>2.5</td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>Breeding</td>
<td>155</td>
<td>16.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>93</td>
<td>6.0</td>
</tr>
<tr>
<td>Bewick's Wren</td>
<td>Winter</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>House Wren</td>
<td>Breeding</td>
<td>14</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>14</td>
<td>5.0</td>
</tr>
<tr>
<td>Winter Wren</td>
<td>Breeding</td>
<td>3</td>
<td>22.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>36</td>
<td>2.8</td>
</tr>
<tr>
<td>Marsh Wren</td>
<td>Winter</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>Breeding</td>
<td>2</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>61</td>
<td>5.9</td>
</tr>
<tr>
<td>Ruby-crowned Kinglet</td>
<td>Winter</td>
<td>52</td>
<td>11.1</td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td>Breeding</td>
<td>96</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>18</td>
<td>20.7</td>
</tr>
<tr>
<td>Eastern Bluebird</td>
<td>Breeding</td>
<td>28</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>43</td>
<td>3.8</td>
</tr>
<tr>
<td>Veery</td>
<td>Breeding</td>
<td>9</td>
<td>12.9</td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>Winter</td>
<td>59</td>
<td>2.9</td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>Breeding</td>
<td>114</td>
<td>14.2</td>
</tr>
<tr>
<td>American Robin</td>
<td>Breeding</td>
<td>101</td>
<td>14.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>94</td>
<td>18.7</td>
</tr>
<tr>
<td>*Gray Catbird</td>
<td>Breeding</td>
<td>89</td>
<td>17.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>11</td>
<td>20.4</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Total sample</td>
<td>Density range</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Breeding: pairs/40 ha; Winter: birds/40 ha</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Mockingbird</td>
<td>Breeding</td>
<td>62</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>56</td>
<td>5.8</td>
</tr>
<tr>
<td>*Brown Thrasher</td>
<td>Breeding</td>
<td>97</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>26</td>
<td>5.3</td>
</tr>
<tr>
<td>Water Pipit</td>
<td>Winter</td>
<td>5</td>
<td>19.0</td>
</tr>
<tr>
<td>*Cedar Waxwing</td>
<td>Breeding</td>
<td>9</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>22</td>
<td>33.3</td>
</tr>
<tr>
<td>Loggerhead Shrike</td>
<td>Breeding</td>
<td>8</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>25</td>
<td>2.3</td>
</tr>
<tr>
<td>European Starling</td>
<td>Breeding</td>
<td>39</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>61</td>
<td>85.6</td>
</tr>
<tr>
<td>White-eyed Vireo</td>
<td>Breeding</td>
<td>65</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>17</td>
<td>4.8</td>
</tr>
<tr>
<td>Bell’s Vireo</td>
<td>Breeding</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>Breeding</td>
<td>24</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>12</td>
<td>1.6</td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>Breeding</td>
<td>83</td>
<td>5.1</td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>Breeding</td>
<td>142</td>
<td>22.7</td>
</tr>
<tr>
<td>Black-whiskered Vireo</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td>Blue-winged Warbler</td>
<td>Breeding</td>
<td>1</td>
<td>Visitor in one habitat</td>
</tr>
<tr>
<td>Golden-winged Warbler</td>
<td>Breeding</td>
<td>2</td>
<td>14.5</td>
</tr>
<tr>
<td>Orange-crowned Warbler</td>
<td>Winter</td>
<td>12</td>
<td>1.4</td>
</tr>
<tr>
<td>Northern Parula Warbler</td>
<td>Breeding</td>
<td>71</td>
<td>13.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>11.0</td>
</tr>
<tr>
<td>*Yellow Warbler</td>
<td>Breeding</td>
<td>26</td>
<td>40.4</td>
</tr>
<tr>
<td>Chestnut-sided Warbler</td>
<td>Breeding</td>
<td>13</td>
<td>11.9</td>
</tr>
<tr>
<td>Black-thr. Blue Warbler</td>
<td>Breeding</td>
<td>14</td>
<td>35.5</td>
</tr>
<tr>
<td>Yellow-rumped Warbler</td>
<td>Winter</td>
<td>59</td>
<td>29.4</td>
</tr>
<tr>
<td>Black-thr. Green Warbler</td>
<td>Breeding</td>
<td>14</td>
<td>25.7</td>
</tr>
<tr>
<td>Blackburnian Warbler</td>
<td>Breeding</td>
<td>12</td>
<td>17.2</td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>Breeding</td>
<td>41</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>13</td>
<td>4.4</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Total sample</td>
<td>Density range</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Pine Warbler</td>
<td>Breeding</td>
<td>59</td>
<td>8.9</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>21</td>
<td>12.3</td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>Breeding</td>
<td>28</td>
<td>14.6</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>5</td>
<td>1.8</td>
</tr>
<tr>
<td>Palm Warbler</td>
<td>Winter</td>
<td>28</td>
<td>5.8</td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>Breeding</td>
<td>6</td>
<td>9.8</td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>Breeding</td>
<td>58</td>
<td>10.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>17</td>
<td>3.6</td>
</tr>
<tr>
<td>American Redstart</td>
<td>Breeding</td>
<td>32</td>
<td>8.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Prothonotary Warbler</td>
<td>Breeding</td>
<td>14</td>
<td>14.9</td>
</tr>
<tr>
<td>Swainson's Warbler</td>
<td>Breeding</td>
<td>14</td>
<td>8.5</td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>Breeding</td>
<td>26</td>
<td>13.8</td>
</tr>
<tr>
<td>Ovenbird</td>
<td>Breeding</td>
<td>88</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>5</td>
<td>4.0</td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>Winter</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>Breeding</td>
<td>45</td>
<td>5.6</td>
</tr>
<tr>
<td>Kentucky Warbler</td>
<td>Breeding</td>
<td>41</td>
<td>4.8</td>
</tr>
<tr>
<td>*Common Yellowthroat</td>
<td>Breeding</td>
<td>73</td>
<td>14.6</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>19</td>
<td>12.1</td>
</tr>
<tr>
<td>Hooded Warbler</td>
<td>Breeding</td>
<td>77</td>
<td>16.0</td>
</tr>
<tr>
<td>Canada Warbler</td>
<td>Breeding</td>
<td>9</td>
<td>28.9</td>
</tr>
<tr>
<td>*Yellow-breasted Chat</td>
<td>Breeding</td>
<td>56</td>
<td>17.0</td>
</tr>
<tr>
<td>Summer Tanager</td>
<td>Breeding</td>
<td>87</td>
<td>6.1</td>
</tr>
<tr>
<td>Scarlet Tanager</td>
<td>Breeding</td>
<td>80</td>
<td>8.2</td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>Breeding</td>
<td>179</td>
<td>23.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>108</td>
<td>9.3</td>
</tr>
<tr>
<td>Rose-breasted Grosbeak</td>
<td>Breeding</td>
<td>10</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Blue Grosbeak</td>
<td>Breeding</td>
<td>29</td>
<td>4.4</td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>Breeding</td>
<td>87</td>
<td>12.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>5</td>
<td>8.6</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Total sample</td>
<td>Density range</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>Breeding: pairs/40 ha; Winter: birds/40ha</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painted Bunting</td>
<td>Breeding</td>
<td>12</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>5</td>
<td>18.3</td>
</tr>
<tr>
<td>Rufous-sided Towhee</td>
<td>Breeding</td>
<td>121</td>
<td>15.9</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>62</td>
<td>14.8</td>
</tr>
<tr>
<td>Bachman's Sparrow</td>
<td>Breeding</td>
<td>10</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>American Tree Sparrow</td>
<td>Winter</td>
<td>7</td>
<td>11.8</td>
</tr>
<tr>
<td>Chipping Sparrow</td>
<td>Breeding</td>
<td>25</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>4</td>
<td>7.2</td>
</tr>
<tr>
<td>Field Sparrow</td>
<td>Breeding</td>
<td>58</td>
<td>17.4</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>50</td>
<td>7.1</td>
</tr>
<tr>
<td>Vesper Sparrow</td>
<td>Breeding</td>
<td>4</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>3</td>
<td>15.7</td>
</tr>
<tr>
<td>Savannah Sparrow</td>
<td>Winter</td>
<td>13</td>
<td>8.9</td>
</tr>
<tr>
<td>Grasshopper Sparrow</td>
<td>Breeding</td>
<td>17</td>
<td>6.6</td>
</tr>
<tr>
<td>Henslow's Sparrow</td>
<td>Breeding</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Fox Sparrow</td>
<td>Winter</td>
<td>33</td>
<td>7.7</td>
</tr>
<tr>
<td>*Song Sparrow</td>
<td>Breeding</td>
<td>62</td>
<td>12.3</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>67</td>
<td>8.4</td>
</tr>
<tr>
<td>Swamp Sparrow</td>
<td>Winter</td>
<td>10</td>
<td>6.8</td>
</tr>
<tr>
<td>White-throated Sparrow</td>
<td>Winter</td>
<td>78</td>
<td>16.3</td>
</tr>
<tr>
<td>White-crowned Sparrow</td>
<td>Winter</td>
<td>9</td>
<td>0.7</td>
</tr>
<tr>
<td>Dark-eyed Junco</td>
<td>Breeding</td>
<td>10</td>
<td>27.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>65</td>
<td>7.7</td>
</tr>
<tr>
<td>Bobolink</td>
<td>Breeding</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red-winged Blackbird</td>
<td>Breeding</td>
<td>58</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>35</td>
<td>17.1</td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>Breeding</td>
<td>36</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>44</td>
<td>16.0</td>
</tr>
<tr>
<td>Rusty Blackbird</td>
<td>Winter</td>
<td>11</td>
<td>2.7</td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>Breeding</td>
<td>3</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>14</td>
<td>10.9</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Total sample</td>
<td>Density range</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>S. E.</td>
</tr>
<tr>
<td><strong>Breeding</strong></td>
<td><strong>Winter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Grackle</td>
<td>107</td>
<td>15.5</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>10.2</td>
<td>4.8</td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>73</td>
<td>5.1</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>8.0</td>
<td>3.6</td>
</tr>
<tr>
<td>Orchard Oriole</td>
<td>16</td>
<td>6.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Spotted Oriole</td>
<td>7</td>
<td>2.0</td>
<td>0.65</td>
</tr>
<tr>
<td>Northern Oriole</td>
<td>9</td>
<td>1.0</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>Purple Finch</td>
<td>54</td>
<td>7.6</td>
<td>1.3</td>
</tr>
<tr>
<td>House Finch</td>
<td>2</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>Red Crossbill</td>
<td>2</td>
<td>Visitor in two habitats</td>
<td>-</td>
</tr>
<tr>
<td>Common Redpoll</td>
<td>1</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>Pine Siskin</td>
<td>8</td>
<td>3.4</td>
<td>1.3</td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>71</td>
<td>5.2</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>4.9</td>
<td>0.84</td>
</tr>
<tr>
<td>Evening Grosbeak</td>
<td>15</td>
<td>6.2</td>
<td>5.3</td>
</tr>
<tr>
<td>House Sparrow</td>
<td>11</td>
<td>12.3</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>23.2</td>
<td>5.0</td>
</tr>
</tbody>
</table>

* Total Sample includes all censuses made in forested habitats in Florida, Georgia, North Carolina, South Carolina, and Virginia 1947-1979. Entries that were published in Audubon Field Notes or in American Birds.

* Entries are listed as “Average density (No. of censuses)”. Each entry indicates the mean and sample size of censuses recorded from a single habitat (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.

<table>
<thead>
<tr>
<th>Nest site category</th>
<th>Category no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behind loose bark</td>
<td>D-1.1</td>
</tr>
<tr>
<td>Burrows</td>
<td>D-1.2</td>
</tr>
<tr>
<td>Bushes (or shrubs)</td>
<td>D-1.3</td>
</tr>
<tr>
<td>Cavities</td>
<td>D-1.4</td>
</tr>
<tr>
<td>Ground or ground covering vegetation</td>
<td>D-1.5</td>
</tr>
<tr>
<td>Ledges</td>
<td>D-1.6</td>
</tr>
<tr>
<td>Trees</td>
<td>D-1.7</td>
</tr>
<tr>
<td>Vertical surfaces</td>
<td>D-1.8</td>
</tr>
</tbody>
</table>

D-1.1. Nests placed behind loose bark.
Brown Creeper

D-1.2. Nests placed in burrows.
Burrowing Owl                                            | Northern Rough-winged Swallow
Belted Kingfisher                                       | Bank Swallow

D-1.3. Nests placed in bushes.
Brown Pelican                                            | Mangrove Cuckoo
Olivaceous Cormorant                                     | Greater Roadrunner
Anhinga                                                 | Smooth-billed Ani
Magnificent Frigatebird                                  | Groove-billed Ani
Snowy Egret                                              | Ruby-throated Hummingbird
Little Blue Heron                                         | Alder Flycatcher
Tricolored Heron                                         | Willow Flycatcher
Reddish Egret                                            | Gray Kingbird
Cattle Egret                                             | Scissor-tailed Flycatcher
Green-backed Heron                                       | Scrub Jay
Black-crowned Night Heron                                | Fish Crow
Yellow-crowned Night Heron                               | Swainson’s Thrush
White Ibis                                               | Wood Thrush
Glossy Ibis                                              | American Robin
White-faced Ibis                                         | Gray Catbird
Roseate Spoonbill                                        | Northern Mockingbird
Snail Kite                                               | Brown Thrasher
Crested Caracara                                         | Loggerhead Shrike
Limpkin                                                  | White-eyed Vireo
White-crowned Pigeon                                     | Bell’s Vireo
White-winged Dove                                        | Solitary Vireo
Mourning Dove                                            | Black-whiskered Vireo
Common Ground-Dove                                       | Bachman’s Warbler
Black-billed Cuckoo                                      | Yellow Warbler
### D-1.4. Nests placed in cavities.

<table>
<thead>
<tr>
<th>Bird Name</th>
<th>Nesting Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood Duck</td>
<td>Great Crested Flycatcher</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>Purple Martin</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>Tree Swallow</td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>Black-capped Chickadee</td>
</tr>
<tr>
<td>American Kestrel</td>
<td>Carolina Chickadee</td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>Tufted Titmouse</td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>Red-breasted Nuthatch</td>
</tr>
<tr>
<td>Barred Owl</td>
<td>White-breasted Nuthatch</td>
</tr>
<tr>
<td>Northern Saw-whet Owl</td>
<td>Brown-headed Nuthatch</td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>Brown Creeper</td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>Carolina Wren</td>
</tr>
<tr>
<td>Yellow-bellied Sapsucker</td>
<td>Bewick's Wren</td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>House Wren</td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>Eastern Bluebird</td>
</tr>
<tr>
<td>Red-cockaded Woodpecker</td>
<td>European Starling</td>
</tr>
<tr>
<td>Northern (Yellow-shafted) Flicker</td>
<td>Prothonotary Warbler</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>House Sparrow</td>
</tr>
</tbody>
</table>

### D-1.5. Nests placed on ground or in ground covering vegetation.

<table>
<thead>
<tr>
<th>Bird Name</th>
<th>Nesting Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pied-billed Grebe</td>
<td>King Rail</td>
</tr>
<tr>
<td>Brown Pelican</td>
<td>Virginia Rail</td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>Sora</td>
</tr>
<tr>
<td>American Bittern</td>
<td>Purple Gallinule</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>Common Moorhen</td>
</tr>
<tr>
<td>Mallard</td>
<td>American Coot</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>Limpkin</td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>Sandhill Crane</td>
</tr>
<tr>
<td>Snail Kite</td>
<td>Killdeer</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>Upland Sandpiper</td>
</tr>
<tr>
<td>Black Francolin</td>
<td>American Woodcock</td>
</tr>
<tr>
<td>Ring-necked Pheasant</td>
<td>White-winged Dove</td>
</tr>
<tr>
<td>Ruffed Grouse</td>
<td>Common Ground-Dove</td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>Greater Roadrunner</td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>Short-eared Owl</td>
</tr>
<tr>
<td>Black Rail</td>
<td>Common Nighthawk</td>
</tr>
<tr>
<td>Clapper Rail</td>
<td>Chuck-will's-widow</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>Dickcissel</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Yellow-bellied Flycatcher</td>
<td>Rufous-sided Towhee</td>
</tr>
<tr>
<td>Horned Lark</td>
<td>Bachman's Sparrow</td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>Rufous-crowned Sparrow</td>
</tr>
<tr>
<td>Winter Wren</td>
<td>Field Sparrow</td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>Vesper Sparrow</td>
</tr>
<tr>
<td>March Wren</td>
<td>Lark Sparrow</td>
</tr>
<tr>
<td>Veery</td>
<td>Savannah Sparrow</td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>Grasshopper Sparrow</td>
</tr>
<tr>
<td>Blue-winged Warbler</td>
<td>Henslow's Sparrow</td>
</tr>
<tr>
<td>Golden-winged Warbler</td>
<td>Sharp-tailed Sparrow</td>
</tr>
<tr>
<td>Nashville Warbler</td>
<td>Seaside Sparrow</td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>Song Sparrow</td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>Swamp Sparrow</td>
</tr>
<tr>
<td>Ovenbird</td>
<td>Dark-eyed Junco</td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>Bobolink</td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>Red-winged Blackbird</td>
</tr>
<tr>
<td>Kentucky Warbler</td>
<td>Eastern Meadowlark</td>
</tr>
<tr>
<td>Mourning Warbler</td>
<td>Western Meadowlark</td>
</tr>
<tr>
<td>Common Yellowthroat</td>
<td>Great-tailed Grackle</td>
</tr>
<tr>
<td>Canada Warbler</td>
<td></td>
</tr>
</tbody>
</table>

**D-1.6. Nests placed on ledges.**

<table>
<thead>
<tr>
<th>Black Vulture</th>
<th>Eastern Phoebe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey Vulture</td>
<td>Barn Swallow</td>
</tr>
<tr>
<td>Osprey</td>
<td>Common Raven</td>
</tr>
<tr>
<td>Golden Eagle</td>
<td>Carolina Wren</td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>Bewick's Wren</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>European Starling</td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>House Sparrow</td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td></td>
</tr>
</tbody>
</table>

**D-1.7. Nests placed in trees.**

<table>
<thead>
<tr>
<th>Double-crested Cormorant</th>
<th>Osprey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olivaceous Cormorant</td>
<td>American Swallow-tailed Kite</td>
</tr>
<tr>
<td>Anhinga</td>
<td>Black-shouldered Kite</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>Mississippi Kite</td>
</tr>
<tr>
<td>Great Egret</td>
<td>Bald Eagle</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>Sharp-shinned Hawk</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>Cooper's Hawk</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>Red-shouldered Hawk</td>
</tr>
<tr>
<td>Reddish Egret</td>
<td>Broad-winged Hawk</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>Short-tailed Hawk</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>Red-tailed Hawk</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>White-crowned Pigeon</td>
</tr>
<tr>
<td>Yellow-crowned Night Heron</td>
<td>Mourning Dove</td>
</tr>
<tr>
<td>White Ibis</td>
<td>Black-billed Cuckoo</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>Yellow-billed Cuckoo</td>
</tr>
<tr>
<td>White-faced Ibis</td>
<td>Mangrove Cuckoo</td>
</tr>
<tr>
<td>Roseate Spoonbill</td>
<td>Smooth-billed Ani</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>Groove-billed Ani</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Foraging substrate and behavioral category</th>
<th>Category no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>aerial piracy over marine habitats</td>
<td>D-2.1</td>
</tr>
<tr>
<td>airborne prey, capturing during sustained flight.</td>
<td>D-2.2</td>
</tr>
<tr>
<td>bushes, gleaning in.</td>
<td>D-2.9</td>
</tr>
<tr>
<td>bushes, hawking from.</td>
<td>D-2.16</td>
</tr>
<tr>
<td>bushes, probing in.</td>
<td>D-2.24</td>
</tr>
<tr>
<td>canopies of trees, gleaning in.</td>
<td>D-2.12</td>
</tr>
<tr>
<td>canopies of trees, probing in various substrates in.</td>
<td>D-2.25</td>
</tr>
<tr>
<td>capturing airborne prey during sustained flight.</td>
<td>D-2.2</td>
</tr>
<tr>
<td>crepuscular.</td>
<td>D-2.3</td>
</tr>
<tr>
<td>diurnal.</td>
<td>D-2.4</td>
</tr>
<tr>
<td>diving from the surface of water.</td>
<td>D-2.5</td>
</tr>
<tr>
<td>filter-feeding in water.</td>
<td>D-2.6</td>
</tr>
<tr>
<td>foliage of trees, gleaning from the.</td>
<td>D-2.10</td>
</tr>
<tr>
<td>gleaning at various heights.</td>
<td>D-2.7</td>
</tr>
<tr>
<td>gleaning from the water surface.</td>
<td>D-2.8</td>
</tr>
<tr>
<td>gleaning in bushes.</td>
<td>D-2.9</td>
</tr>
<tr>
<td>gleaning in foliage of trees.</td>
<td>D-2.10</td>
</tr>
<tr>
<td>gleaning in herbaceous vegetation.</td>
<td>D-2.11</td>
</tr>
<tr>
<td>gleaning in tree canopies.</td>
<td>D-2.12</td>
</tr>
<tr>
<td>gleaning on the ground.</td>
<td>D-2.13</td>
</tr>
<tr>
<td>gleaning on trunks of trees.</td>
<td>D-2.14</td>
</tr>
<tr>
<td>ground, gleaning on the.</td>
<td>D-2.13</td>
</tr>
<tr>
<td>ground, pouncing onto the.</td>
<td>D-2.21</td>
</tr>
<tr>
<td>ground, probing into the.</td>
<td>D-2.28</td>
</tr>
<tr>
<td>ground, stalking on the.</td>
<td>D-2.36</td>
</tr>
<tr>
<td>habitats, SEE marine habitats, terrestrial habitats</td>
<td>D-2.15</td>
</tr>
<tr>
<td>hawking at various heights.</td>
<td>D-2.16</td>
</tr>
<tr>
<td>hawking from bushes.</td>
<td>D-2.17</td>
</tr>
<tr>
<td>herbageous vegetation, gleaning in.</td>
<td>D-2.11</td>
</tr>
<tr>
<td>herbageous vegetation, pouncing into.</td>
<td>D-2.20</td>
</tr>
<tr>
<td>herbageous vegetation, probing into.</td>
<td>D-2.27</td>
</tr>
<tr>
<td>herbageous vegetation, soaring over.</td>
<td>D-2.30</td>
</tr>
<tr>
<td>herbageous vegetation, stalking in.</td>
<td>D-2.34</td>
</tr>
<tr>
<td>hovering.</td>
<td>D-2.18</td>
</tr>
<tr>
<td>marine habitats, aerial piracy over.</td>
<td>D-2.1</td>
</tr>
<tr>
<td>nocturnal.</td>
<td>D-2.19</td>
</tr>
<tr>
<td>piracy, aerial, over marine habitats.</td>
<td>D-2.1</td>
</tr>
<tr>
<td>plunging or pouncing into water.</td>
<td>D-2.23</td>
</tr>
<tr>
<td>pouncing into herbaceous vegetation.</td>
<td>D-2.20</td>
</tr>
<tr>
<td>pouncing onto the ground.</td>
<td>D-2.21</td>
</tr>
<tr>
<td>pouncing onto various substrates.</td>
<td>D-2.22</td>
</tr>
<tr>
<td>pouncing or plunging into water.</td>
<td>D-2.23</td>
</tr>
<tr>
<td>probing in bushes.</td>
<td>D-2.24</td>
</tr>
<tr>
<td>probing in various substrates in tree canopies.</td>
<td>D-2.25</td>
</tr>
<tr>
<td>probing in water.</td>
<td>D-2.26</td>
</tr>
<tr>
<td>probing into herbaceous vegetation.</td>
<td>D-2.27</td>
</tr>
</tbody>
</table>
probing into the ground. D-2.28.
probing into trunks of trees. D-2.29.
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, 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, 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, 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-6
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
Oliveaceous Cormorant
American Anhinga
Wood Duck
Hooded Merganser
American Coot


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


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
<table>
<thead>
<tr>
<th>Birds (Hooded Warbler)</th>
<th>Others (Green-tailed Towhee)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilson’s Warbler</td>
<td>Rufous-sided Towhee</td>
</tr>
<tr>
<td>Canada Warbler</td>
<td>Clay-colored Sparrow</td>
</tr>
<tr>
<td>Yellow-breasted Chat</td>
<td>White-throated Sparrow</td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>Harris’ Sparrow</td>
</tr>
<tr>
<td>Blue Grosbeak</td>
<td>House Finch</td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>Pine Siskin</td>
</tr>
</tbody>
</table>

**D-2.10. Foraging by gleaning in foliage of trees.**

<table>
<thead>
<tr>
<th>Birds (White-crowned Pigeon)</th>
<th>Others (Black-throated Green Warbler)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black-billed Cuckoo</td>
<td>Blackburnian Warbler</td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>Yellow-throated Warbler</td>
</tr>
<tr>
<td>Mangrove Cuckoo</td>
<td>Pine Warbler</td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>Cerulean Warbler</td>
</tr>
<tr>
<td>Ruby-crowned Kinglet</td>
<td>American Redstart</td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td>Wilson’s Warbler</td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>Summer Tanager</td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>Scarlet Tanager</td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>Rose-breasted Grosbeak</td>
</tr>
<tr>
<td>Warbling Vireo</td>
<td>Black-headed Grosbeak</td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>Orchard Oriole</td>
</tr>
<tr>
<td>Black-whiskered Vireo</td>
<td>Spot-breasted Oriole</td>
</tr>
<tr>
<td>Bachman’s Warbler</td>
<td>Northern (Baltimore) Oriole</td>
</tr>
<tr>
<td>Northern Parula</td>
<td>Purple Finch</td>
</tr>
<tr>
<td>Magnolia Warbler</td>
<td>Red Crossbill</td>
</tr>
<tr>
<td>Cape May Warbler</td>
<td>White-winged Crossbill</td>
</tr>
<tr>
<td>Black-throated Blue Warbler</td>
<td>Pine Siskin</td>
</tr>
<tr>
<td>Yellow-rumped (Myrtle) Warbler</td>
<td>Evening Grosbeak</td>
</tr>
<tr>
<td>Black-throated Gray Warbler</td>
<td></td>
</tr>
</tbody>
</table>

**D-2.11. Foraging by gleaning in herbaceous vegetation.**

<table>
<thead>
<tr>
<th>Birds (American Bittern)</th>
<th>Others (Marsh Wren)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least Bittern</td>
<td>Sprague’s Pipit</td>
</tr>
<tr>
<td>Black Francolin</td>
<td>Bell’s Vireo</td>
</tr>
<tr>
<td>Ring-necked Pheasant</td>
<td>Orange-crowned Warbler</td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>Palm Warbler</td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>Mourning Warbler</td>
</tr>
<tr>
<td>Black Rail</td>
<td>Common Yellowthroat</td>
</tr>
<tr>
<td>Clapper Rail</td>
<td>Blue Grosbeak</td>
</tr>
<tr>
<td>King Rail</td>
<td>Indigo Bunting</td>
</tr>
<tr>
<td>Virginia Rail</td>
<td>Painted Bunting</td>
</tr>
<tr>
<td>Sora</td>
<td>Dickcissel</td>
</tr>
<tr>
<td>Purple Gallinule</td>
<td>Green-tailed Towhee</td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>Bachman’s Sparrow</td>
</tr>
<tr>
<td>Upland Sandpiper</td>
<td>American Tree Sparrow</td>
</tr>
<tr>
<td>Greater Roadrunner</td>
<td>Clay-colored Sparrow</td>
</tr>
<tr>
<td>Groove-billed Ani</td>
<td>Field Sparrow</td>
</tr>
<tr>
<td>Buff-bellied Hummingbird</td>
<td>Vesper Sparrow</td>
</tr>
<tr>
<td>Rufous Hummingbird</td>
<td>Lark Sparrow</td>
</tr>
<tr>
<td>Vermilion Flycatcher</td>
<td>Lark Bunting</td>
</tr>
<tr>
<td>Bewick’s Wren</td>
<td>Savannah Sparrow</td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>Grasshopper Sparrow</td>
</tr>
</tbody>
</table>

D-8
Henslow's Sparrow  Bobolink
Le Conte's Sparrow  Chestnut-collared Longspur
Sharp-tailed Sparrow  Red-winged Blackbird
Seaside Sparrow  Eastern Meadowlark
Song Sparrow  Western Meadowlark
Lincoln's Sparrow  Yellow-headed Blackbird
Swamp Sparrow  Bronzed Cowbird
White-crowned Sparrow  House Finch
Smith's Longspur  Great-tailed Grackle

Ash-throated Flycatcher  Brown-headed Nuthatch
Blue Jay  American Robin
Black-capped Chickadee  Swainson's Thrush
Carolina Chickadee  Hooded Warbler
Tufted Titmouse  Harris' Sparrow
Red-breasted Nuthatch  

D-2.13. Foraging by gleaning on the ground.
Cattle Egret  Palm Warbler
Mallard  Worm-eating Warbler
Black Francolin  Swainson's Warbler
Ring-necked Pheasant  Ovenbird
Ruffed Grouse  Northern Waterthrush
Wild Turkey  Louisiana Waterthrush
Northern Bobwhite  Kentucky Warbler
Sandhill Crane  Northern Cardinal
Kildeer  Green-tailed Towhee
Rock Dove  Rufous-sided Towhee
White-winged Dove  Rufous-crowned Sparrow
Mourning Dove  Chipping Sparrow
Common Ground-Dove  Clay-colored Sparrow
Greater Roadrunner  Vesper Sparrow
Smooth-billed Ani  Lark Sparrow
Groove-billed Ani  Lark Bunting
Horned Lark  Savannah Sparrow
American Crow  Sharp-tailed Sparrow
Fish Crow  Seaside Sparrow
Common Raven  Fox Sparrow
Carolina Wren  Song Sparrow
Winter Wren  White-throated Sparrow
Veery  White-crowned Sparrow
Swainson's Thrush  Harris' Sparrow
Hermit Thrush  Dark-eyed Junco
Wood Thrush  Lapland Longspur
American Robin  Smith's Longspur
Northern Mockingbird  Chestnut-collared Longspur
Brown Thrasher  Snow Bunting
Water Pipit  Red-winged Blackbird
Sprague's Pipit  Eastern Meadowlark
European Starling  Western Meadowlark
Pine Warbler (W)  Yellow-headed Blackbird
Rusty Blackbird            Common Grackle
Brewer’s Blackbird        Bronzed Cowbird
Great-tailed Grackle      Brown-headed Cowbird
Boat-tailed Grackle

Red-breasted Nuthatch     Yellow-throated Warbler
White-breasted Nuthatch   Brown Creeper
Brown-headed Nuthatch     Black-and-white Warbler

D-2.15. Foraging by hawking at various heights.
Sharp-shinned Hawk        Brown-crested Flycatcher
Cooper’s Hawk              Western Kingbird
Northern Goshawk           Eastern Kingbird
Eastern Phoebe             Gray Kingbird
Vermilion Flycatcher       Scissor-tailed Flycatcher
Ash-throated Flycatcher

D-2.16. Foraging by hawking from bushes.
Alder Flycatcher           Wilson’s Warbler
Willow Flycatcher          Canada Warbler
Hooded Warbler

D-2.17. Foraging by hawking from trees
Olive-sided Flycatcher     Great Crested Flycatcher
Eastern Wood-Pewee         American Redstart
Acadian Flycatcher         Hooded Warbler
Least Flycatcher           Wilson’s Warbler

D-2.18. Foraging by hovering.
Buff-bellied Hummingbird   Black-chinned Hummingbird
Ruby-throated Hummingbird  Rufous Hummingbird

Black-crowned Night Heron  Barred Owl
American Woodcock          Long-eared Owl
Common Barn-Owl            Short-eared Owl
Eastern Screech-Owl        Northern Saw-whet Owl
Great Horned Owl           Common Nighthawk
Snowy Owl                  Chuck-will’s-widow
Burrowing Owl              Whip-poor-will

D-2.20. Foraging by pouncing into herbaceous vegetation.
Snail Kite                 Rough-legged Hawk
Northern Harrier           Common Barn-Owl
Red-tailed Hawk            Short-eared Owl
Ferruginous Hawk

D-10
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

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

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

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.

<table>
<thead>
<tr>
<th>Diet category&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Category no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnivores</td>
<td>D-3.1.</td>
</tr>
<tr>
<td>Folivores</td>
<td>D-3.2.</td>
</tr>
<tr>
<td>Frugivores</td>
<td>D-3.3.</td>
</tr>
<tr>
<td>Granivores</td>
<td>D-3.4.</td>
</tr>
<tr>
<td>Insectivores</td>
<td>D-3.5.</td>
</tr>
<tr>
<td>Nectarivores</td>
<td>D-3.6.</td>
</tr>
<tr>
<td>Omnivores</td>
<td>D-3.7.</td>
</tr>
<tr>
<td>Scavengers</td>
<td>D-3.8.</td>
</tr>
</tbody>
</table>

<sup>a</sup> Birds whose diets change depending upon seasonal availability of food items are marked (S) - summer diet, and (W) - winter diet.

D-3.1. Carnivores.

<table>
<thead>
<tr>
<th>Species</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pied-billed Grebe</td>
<td>Cooper's Hawk</td>
</tr>
<tr>
<td>Brown Pelican</td>
<td>Northern Goshawk</td>
</tr>
<tr>
<td>Double-crested Cormorant</td>
<td>Red-shouldered Hawk</td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>Broad-winged Hawk</td>
</tr>
<tr>
<td>Anhinga</td>
<td>Short-tailed Hawk</td>
</tr>
<tr>
<td>Magnificent Frigatebird</td>
<td>Swainson's Hawk</td>
</tr>
<tr>
<td>American Bittern</td>
<td>Red-tailed Hawk</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>Ferruginous Hawk</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>Rough-legged Hawk</td>
</tr>
<tr>
<td>Great Egret</td>
<td>Golden Eagle</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>Crested Caracara</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>American Kestrel (W)</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>Merlin</td>
</tr>
<tr>
<td>Reddish Egret</td>
<td>Peregrine Falcon</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>Clapper Rail</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>King Rail (S)</td>
</tr>
<tr>
<td>Yellow-crowned Night Heron</td>
<td>Virginia Rail</td>
</tr>
<tr>
<td>White Ibis</td>
<td>Limpkin</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>Greater Roadrunner</td>
</tr>
<tr>
<td>White-faced Ibis</td>
<td>Common Barn-Owl</td>
</tr>
<tr>
<td>Roseate Spoonbill</td>
<td>Eastern Screech-Owl</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>Great Horned Owl</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>Snowy Owl</td>
</tr>
<tr>
<td>Osprey</td>
<td>Burrowing Owl</td>
</tr>
<tr>
<td>American Swallow-tailed Kite</td>
<td>Barred Owl</td>
</tr>
<tr>
<td>Black-shouldered Kite</td>
<td>Long-eared Owl</td>
</tr>
<tr>
<td>Snail Kite</td>
<td>Short-eared Owl</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>Northern Saw-whet Owl</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>Belted Kingfisher</td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>Loggerhead Shrike</td>
</tr>
</tbody>
</table>

D-3.2. Folivores.

<table>
<thead>
<tr>
<th>Species</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruffed Grouse</td>
<td>Harris' Sparrow</td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>Purple Finch (W)</td>
</tr>
</tbody>
</table>
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
- Kildeer
- 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

<table>
<thead>
<tr>
<th>Species</th>
<th>Cavity use</th>
<th>Snag use&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Use&lt;sup&gt;a&lt;/sup&gt; of living cavity trees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Excavator</td>
<td>Secondary</td>
<td>Uses</td>
</tr>
<tr>
<td>Wood Duck</td>
<td>*</td>
<td>N</td>
<td>F</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>*</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Black Vulture&lt;sup&gt;b&lt;/sup&gt;</td>
<td>*</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Turkey Vulture&lt;sup&gt;c&lt;/sup&gt;</td>
<td>*</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Osprey</td>
<td>N,P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>N,P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Kestrel</td>
<td>*</td>
<td>F</td>
<td>N</td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>*</td>
<td>N,P</td>
<td>N</td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>*</td>
<td>N,P</td>
<td>N</td>
</tr>
<tr>
<td>Barred Owl</td>
<td>*</td>
<td>N,P</td>
<td>N</td>
</tr>
<tr>
<td>Northern Saw-whet Owl</td>
<td>*</td>
<td>N,P</td>
<td>N</td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>*</td>
<td>N,P</td>
<td>N</td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>*</td>
<td>*</td>
<td>N,P</td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>*</td>
<td>*</td>
<td>N,P</td>
</tr>
<tr>
<td>Yellow-bellied Sapsucker</td>
<td>*</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>*</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>*</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Red-cockaded Woodpecker</td>
<td>*</td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>Northern Flicker</td>
<td>*</td>
<td>*</td>
<td>N,P</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>*</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Olive-sided Flycatcher&lt;sup&gt;d&lt;/sup&gt;</td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Eastern Wood-Pewee</td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>*</td>
<td>N,P</td>
<td>N</td>
</tr>
<tr>
<td>Western Kingbird</td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Eastern Kingbird</td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Gray Kingbird</td>
<td>F</td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Purple Martin</td>
<td>*</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Tree Swallow</td>
<td>*</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Black-capped Chickadee</td>
<td>*</td>
<td>*</td>
<td>N,P</td>
</tr>
<tr>
<td>Species</td>
<td>Cavity use</td>
<td>Snag use&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Use&lt;sup&gt;a&lt;/sup&gt; of living cavity trees</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------</td>
<td>-----------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Excavator</td>
<td>Secondary</td>
<td>Uses</td>
</tr>
<tr>
<td>Carolina Chickadee</td>
<td>*</td>
<td>*</td>
<td>N,P</td>
</tr>
<tr>
<td>Tufted Titmouse</td>
<td>*</td>
<td>*</td>
<td>N,P</td>
</tr>
<tr>
<td>Red-breasted Nuthatch</td>
<td>*</td>
<td>*</td>
<td>N</td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>*</td>
<td>*</td>
<td>N</td>
</tr>
<tr>
<td>Brown-headed Nuthatch</td>
<td>*</td>
<td>*</td>
<td>N</td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>*</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>*</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Bewick's Wren</td>
<td>*</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>House Wren</td>
<td>*</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Eastern Bluebird</td>
<td>*</td>
<td></td>
<td>N,P</td>
</tr>
<tr>
<td>&lt;sup&gt;b&lt;/sup&gt;Loggerhead Shrike</td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>European Starling</td>
<td>*</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Prothonotary Warbler</td>
<td>*</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>&lt;sup&gt;b&lt;/sup&gt;Brown-headed Cowbird</td>
<td></td>
<td></td>
<td>P</td>
</tr>
</tbody>
</table>

<sup>a</sup>Symbols are: N - breeding activities and nest site; P - resting roosting or singing perches; F - foraging sites; *I - all activities.

<sup>b</sup>Explanatory notes:

Black Vulture
Turkey Vulture
Belted Kingfisher
Olive-sided Flycatcher
Eastern Wood-Pewee
Acadian Flycatcher
Western Kingbird
Eastern Kingbird
Gray Kingbird
Loggerhead Shrike
Brown-headed Cowbird

Frequently nest in hollow logs and cavities at base of hollow trees
Frequently nest in hollow logs and cavities at base of hollow trees
Require perches with unobstructed view of water for foraging
Require exposed perches above canopy for foraging and territory defense
Require exposed perches for foraging
Require exposed perches in midstory for foraging
Require exposed perches for foraging
Require exposed perches for foraging and territory defense
Require exposed perches for foraging and territory defense
Require exposed perches for foraging
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.

<table>
<thead>
<tr>
<th>Species</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osprey</td>
<td>Nesting and perching</td>
</tr>
<tr>
<td>American Swallow-tailed Kite</td>
<td>Nesting and perching</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>Nesting and perching</td>
</tr>
<tr>
<td>Barred Owl</td>
<td>Nesting and perching</td>
</tr>
<tr>
<td>Red-cockaded Woodpecker</td>
<td>Nesting and perching</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>All activities</td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>All activities</td>
</tr>
<tr>
<td>Blackburnian Warbler</td>
<td>All activities</td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>All activities</td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>All activities</td>
</tr>
</tbody>
</table>
Appendix G.
Species Requiring Forest Interior Conditions or Areas of Extensive Forest.

<table>
<thead>
<tr>
<th>Species</th>
<th>Utilization of foresta</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Big Trees</td>
</tr>
<tr>
<td>American Swallow-tailed Kite</td>
<td>X</td>
</tr>
<tr>
<td>Mississippi Kite</td>
<td></td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>X</td>
</tr>
<tr>
<td>Cooper’s Hawk</td>
<td>X</td>
</tr>
<tr>
<td>Red-shouldered Hawk</td>
<td></td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td></td>
</tr>
<tr>
<td>Ruffed Grouse</td>
<td></td>
</tr>
<tr>
<td>Wild Turkey</td>
<td></td>
</tr>
<tr>
<td>Black-billed Cuckoo</td>
<td></td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td></td>
</tr>
<tr>
<td>Great Horned Owl</td>
<td></td>
</tr>
<tr>
<td>Barred Owl</td>
<td>X</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td></td>
</tr>
<tr>
<td>Ruby-throated Hummingbird</td>
<td></td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td></td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td></td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>X</td>
</tr>
<tr>
<td>Olive-sided Flycatcher</td>
<td></td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>X</td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td></td>
</tr>
<tr>
<td>Blue Jay</td>
<td></td>
</tr>
<tr>
<td>Tufted Titmouse</td>
<td></td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>X</td>
</tr>
<tr>
<td>Brown Creeper</td>
<td></td>
</tr>
<tr>
<td>Winter Wren</td>
<td>X</td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>X</td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td></td>
</tr>
<tr>
<td>Veery</td>
<td>X</td>
</tr>
<tr>
<td>Swainson’s Thrush</td>
<td>X</td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>X</td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>X</td>
</tr>
<tr>
<td>Species</td>
<td>Utilization of forest&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td></td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td></td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td></td>
</tr>
<tr>
<td>Bachman's</td>
<td></td>
</tr>
<tr>
<td>Northern Parula</td>
<td></td>
</tr>
<tr>
<td>Chestnut-sided Warbler</td>
<td></td>
</tr>
<tr>
<td>Magnolia Warbler</td>
<td></td>
</tr>
<tr>
<td>Black-throated Blue Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Black-throated Green Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Blackburnian Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Pine Warbler</td>
<td></td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td></td>
</tr>
<tr>
<td>American Redstart</td>
<td></td>
</tr>
<tr>
<td>Prothonotary Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Swainson's Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Ovenbird</td>
<td>X</td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td></td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>X</td>
</tr>
<tr>
<td>Kentucky Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Hooded Warbler</td>
<td>X</td>
</tr>
<tr>
<td>Canada Warbler</td>
<td></td>
</tr>
<tr>
<td>Summer Tanager</td>
<td></td>
</tr>
<tr>
<td>Scarlet Tanager</td>
<td></td>
</tr>
<tr>
<td>Rose-breasted Grosbeak</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> 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.

<table>
<thead>
<tr>
<th>Species</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green-backed Heron</td>
<td>Use slash at water's edge for foraging perches</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>Frequently nest in downed logs and cavities at base of hollow trees</td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>Frequently nest in downed logs and cavities at base of hollow trees</td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>Require perches with unobstructed view of water for foraging</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>Forage on downed logs</td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>All activities</td>
</tr>
<tr>
<td>Bewick's Wren</td>
<td>All activities</td>
</tr>
<tr>
<td>House Wren</td>
<td>All activities</td>
</tr>
<tr>
<td>Winter Wren</td>
<td>All activities</td>
</tr>
</tbody>
</table>
# Appendix I.

Species Using Rock Outcrops, Caves, Crevices, and Earthen Banks.

<table>
<thead>
<tr>
<th>Species</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golden Eagle</td>
<td>Nest and roost on cliffs and rock outcrops</td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>Nest and roost on cliffs and rock outcrops</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>Nest and roost on rock outcrops, especially on buildings</td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>Nest and roost in caves and crevices</td>
</tr>
<tr>
<td>Burrowing Owl</td>
<td>Nest in burrows dug in sand by other animals</td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>Nest on gravel surfaces, such as roofs of buildings</td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>Excavate nesting burrows in earthen banks near water</td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>Nest on rock outcrops, buildings, bridges, and other sites</td>
</tr>
<tr>
<td>Northern Rough-winged Swallow</td>
<td>Excavate nesting burrows in earthen banks, or use existing cavities there</td>
</tr>
<tr>
<td>Bank Swallow</td>
<td>Excavate nesting burrows in earthen banks</td>
</tr>
<tr>
<td>Cliff Swallow</td>
<td>Build nests on vertical surfaces</td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>Build nests on buildings, bridges, or other sites</td>
</tr>
<tr>
<td>Common Raven</td>
<td>Nest and roost on cliffs and rock outcrops</td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>Nest in a variety of crevices</td>
</tr>
<tr>
<td>Bewick's Wren</td>
<td>Nest in a variety of crevices</td>
</tr>
<tr>
<td>European Starling</td>
<td>Nest in a variety of crevices</td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>Frequently breed along rocky streams</td>
</tr>
</tbody>
</table>
## Appendix J.
Species Utilizing Aquatic Habitats for Foraging or Nesting.

<table>
<thead>
<tr>
<th>Species</th>
<th>Season</th>
<th>Water type&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Standing</th>
<th>Flowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pied-billed Grebe</td>
<td>Breeding</td>
<td>Fresh</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>Fresh, Brackish</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Brown Pelican</td>
<td>All</td>
<td>Salt</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Double-crested Cormorant</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>American Anhinga</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Magnificent Frigatebird</td>
<td>All</td>
<td>Salt</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>American Bittern</td>
<td>All</td>
<td>All</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Great Egret</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>All</td>
<td>All</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Reddish Egret</td>
<td>All</td>
<td>Salt, Brackish</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>All</td>
<td>Fresh</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Yellow-crowned Night Heron</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>White Ibis</td>
<td>All</td>
<td>All</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>All</td>
<td>All</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>White-faced Ibis</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>All</td>
<td>All</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Roseate Spoonbill</td>
<td>All</td>
<td>Salt, Brackish</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Wood Duck</td>
<td>All</td>
<td>Fresh</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Mallard</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>Breeding</td>
<td>Fresh</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>Fresh, Brackish</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Osprey</td>
<td>All</td>
<td>All</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>American Swallow-tailed Kite</td>
<td>Breeding</td>
<td>Fresh</td>
<td></td>
<td>Fresh</td>
</tr>
<tr>
<td>Snail Kite</td>
<td>All</td>
<td>Fresh</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Water type&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Standing</td>
<td>Flowing</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
<td>------------------------</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>Mississippi Kite</td>
<td>Breeding</td>
<td>Fresh</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>All</td>
<td>All</td>
<td>Fresh</td>
<td>Fresh</td>
</tr>
<tr>
<td>Red-shouldered Hawk</td>
<td>All</td>
<td>Fresh</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>Winter</td>
<td>All</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>Black Rail</td>
<td>All</td>
<td>All</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Clapper Rail</td>
<td>All</td>
<td>Salt, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>King Rail</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Virginia Rail</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sora</td>
<td>All</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Purple Gallinule</td>
<td>All</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>All</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>American Coot</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Limpkin</td>
<td>All</td>
<td>Fresh</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>All</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Common Snipe</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>American Woodcock</td>
<td>All</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Barred Owl</td>
<td>All</td>
<td>Fresh</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>All</td>
<td>All</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>Breeding</td>
<td>Fresh</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Willow Flycatcher</td>
<td>Breeding</td>
<td>Fresh</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Vermilion Flycatcher</td>
<td>Winter</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tree Swallow</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Northern Rough-winged Swallow</td>
<td>All</td>
<td>Fresh, Brackish</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Bank Swallow</td>
<td>Breeding</td>
<td>Fresh, Brackish</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Fish Crow</td>
<td>All</td>
<td>All</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>Breeding</td>
<td>Salt, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Marsh Wren</td>
<td>All</td>
<td>All</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Prothonotary Warbler</td>
<td>Breeding</td>
<td>Fresh</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>Breeding</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>Fresh</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>Breeding</td>
<td>-</td>
<td>Fresh</td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Season</td>
<td>Water type&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Standing</td>
<td>Flowing</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------</td>
<td>------------------------</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>Henslow’s Sparrow</td>
<td>Breeding</td>
<td>Fresh, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sharp-tailed Sparrow</td>
<td>All</td>
<td>Salt, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Seaside Sparrow</td>
<td>All</td>
<td>Salt, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Lincoln’s Sparrow</td>
<td>Winter</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Swamp Sparrow</td>
<td>Breeding</td>
<td>Fresh</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>Fresh, Brackish</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>All</td>
<td>All</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> All - Any salinity  
Brackish - Brackish water  
Fresh - Fresh water  
Salt - Salt water  

<sup>b</sup> 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.

<table>
<thead>
<tr>
<th>SAF No.</th>
<th>SAF forest type(^a)</th>
<th>Vegetation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Pin cherry</td>
<td>Maple-beech-birch</td>
</tr>
<tr>
<td>20</td>
<td>White pine-northern red oak-red maple</td>
<td>White pine-hemlock</td>
</tr>
<tr>
<td>21</td>
<td>Eastern white pine</td>
<td>White pine-hemlock</td>
</tr>
<tr>
<td>22</td>
<td>White pine-hemlock</td>
<td>White pine-hemlock</td>
</tr>
<tr>
<td>23</td>
<td>Eastern hemlock</td>
<td>White pine-hemlock</td>
</tr>
<tr>
<td>24</td>
<td>Hemlock-yellow birch</td>
<td>White pine-hemlock (in part), Maple-beech-birch (in part)</td>
</tr>
<tr>
<td>25</td>
<td>Sugar maple-beech-yellow birch</td>
<td>Maple-beech-birch</td>
</tr>
<tr>
<td>26</td>
<td>Sugar maple-basswood</td>
<td>Maple-beech-birch (in part), Cove hardwoods (in part)</td>
</tr>
<tr>
<td>27</td>
<td>Sugar maple</td>
<td>Maple-beech-birch</td>
</tr>
<tr>
<td>28</td>
<td>Black cherry-maple</td>
<td>Maple-beech-birch (in part), Cove hardwoods (in part)</td>
</tr>
<tr>
<td>30</td>
<td>Red spruce-yellow birch</td>
<td>Spruce-fir (in part), Maple-beech-birch (in part)</td>
</tr>
<tr>
<td>31</td>
<td>Red spruce-sugar maple-beech</td>
<td>Spruce-fir (in part), Maple-beech-birch (in part)</td>
</tr>
<tr>
<td>32</td>
<td>Red spruce</td>
<td>Spruce-fir</td>
</tr>
<tr>
<td>34</td>
<td>Red spruce-Fraser fir</td>
<td>Spruce-fir</td>
</tr>
<tr>
<td>39</td>
<td>Black ash-American elm-red maple</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>40</td>
<td>Post oak-blackjack oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>43</td>
<td>Bear oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>44</td>
<td>Chestnut oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>45</td>
<td>Pitch pine</td>
<td>Virginia pine-pitch pine</td>
</tr>
<tr>
<td>46</td>
<td>Eastern redcedar</td>
<td>Loblolly pine-shortleaf pine</td>
</tr>
<tr>
<td>50</td>
<td>Black locust</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>51</td>
<td>White pine-chestnut oak</td>
<td>White pine-hemlock (in part), Oak-hickory (in part)</td>
</tr>
<tr>
<td>52</td>
<td>White oak-black oak-northern red oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>53</td>
<td>White oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>55</td>
<td>Northern red oak</td>
<td>Oak-hickory (upland sites), Cove hardwoods (in coves)</td>
</tr>
<tr>
<td>57</td>
<td>Yellow-poplar</td>
<td>Cove hardwoods (in the Mountains), Elm-ash-cottonwood (elsewhere)</td>
</tr>
<tr>
<td>58</td>
<td>Yellow-poplar-eastern hemlock</td>
<td>Cove hardwoods</td>
</tr>
<tr>
<td>59</td>
<td>Yellow-poplar-white oak-northern red oak</td>
<td>Cove hardwoods</td>
</tr>
<tr>
<td>60</td>
<td>Beech-sugar maple</td>
<td>Maple-beech-birch (in the Mountains), Cove hardwoods (in coves), Oak-hickory (elsewhere)</td>
</tr>
<tr>
<td>61</td>
<td>River birch-sycamore</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>62</td>
<td>Silver maple-American elm</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>63</td>
<td>Cottonwood</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>64</td>
<td>Sassafras-persimmon</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>65</td>
<td>Pin oak-sweetgum</td>
<td>Oak-gum-cypress (in part), Elm-ash-cottonwood (in part)</td>
</tr>
<tr>
<td>69</td>
<td>Sand pine</td>
<td>Sand pine-southern scrub oak</td>
</tr>
<tr>
<td>70</td>
<td>Longleaf pine</td>
<td>Sandhills longleaf pine (in part), Longleaf pine-slash pine (in part)</td>
</tr>
<tr>
<td>SAF No.</td>
<td>SAF forest type&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Vegetation type</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>71</td>
<td>Longleaf pine-scrub oak</td>
<td>Longleaf pine-scrub oak</td>
</tr>
<tr>
<td>72</td>
<td>Southern scrub oak</td>
<td>Southern scrub oak</td>
</tr>
<tr>
<td>73</td>
<td>Southern redcedar</td>
<td>Live oak maritime</td>
</tr>
<tr>
<td>74</td>
<td>Cabbage palmetto</td>
<td>Live oak maritime (on the Coast), Bay swamp-pocosin (elsewhere)</td>
</tr>
<tr>
<td>75</td>
<td>Shortleaf pine</td>
<td>Loblolly pine-shortleaf pine</td>
</tr>
<tr>
<td>76</td>
<td>Shortleaf pine-oak</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>78</td>
<td>Virginia pine-oak</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>79</td>
<td>Virginia pine</td>
<td>Virginia pine-pitch pine</td>
</tr>
<tr>
<td>80</td>
<td>Loblolly pine-shortleaf pine</td>
<td>Loblolly pine-shortleaf pine</td>
</tr>
<tr>
<td>81</td>
<td>Loblolly pine</td>
<td>Loblolly pine-shortleaf pine</td>
</tr>
<tr>
<td>82</td>
<td>Loblolly pine-hardwood</td>
<td>Mixed pine-hardwood (on uplands), Loblolly pine-shortleaf pine (on bottomlands, in part), Oak-gum-cypress (on bottomlands, in part)</td>
</tr>
<tr>
<td>83</td>
<td>Longleaf pine-slash pine</td>
<td>Longleaf pine-slash pine</td>
</tr>
<tr>
<td>84</td>
<td>Slash pine</td>
<td>Longleaf pine-slash pine</td>
</tr>
<tr>
<td>85</td>
<td>Slash pine-hardwood</td>
<td>Longleaf pine-slash pine (in part), Bay swamp-pocosin (in part)</td>
</tr>
<tr>
<td>87</td>
<td>Sweetgum-yellow-poplar</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>88</td>
<td>Willow oak-water oak-diarr ootleaf oak</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>91</td>
<td>Swamp chestnut oak-cherrybark oak</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>92</td>
<td>Sweetgum-willow oak</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>93</td>
<td>Sugarberry-American elm-green ash</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>94</td>
<td>Sycamore-sweetgum-American elm</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>95</td>
<td>Black willow</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>96</td>
<td>Overcup oak-water hickory</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>97</td>
<td>Atlantic white-cedar</td>
<td>Pond pine pocosin</td>
</tr>
<tr>
<td>98</td>
<td>Pond pine</td>
<td>Pond pine pocosin</td>
</tr>
<tr>
<td>100</td>
<td>Pondcypress</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>101</td>
<td>Baldcypress</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>102</td>
<td>Baldcypress-tupelo</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>103</td>
<td>Water tupelo-swamp tupelo</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>104</td>
<td>Sweetbay-swamp tupelo-re dbay</td>
<td>Bay swamp-pocosin</td>
</tr>
<tr>
<td>105</td>
<td>Tropical hardwoods</td>
<td>Tropical hardwoods</td>
</tr>
<tr>
<td>106</td>
<td>Mangrove</td>
<td>Mangroves</td>
</tr>
<tr>
<td>108</td>
<td>Red maple</td>
<td>Bay swamp-pocosin (in the Coastal Plain), Cove hardwoods (in Mountains), Elm-ash-cottonwood (elsewhere)</td>
</tr>
<tr>
<td>110</td>
<td>Black oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>111</td>
<td>South Florida slash pine</td>
<td>Longleaf pine-slash pine</td>
</tr>
</tbody>
</table>

<sup>a</sup> SAF forest types from Eyre (1980).
## Appendix L.

**USFS Forest Types Equivalent to Vegetation Types in this Work.**

<table>
<thead>
<tr>
<th>USFS No.</th>
<th>USFS forest typea</th>
<th>Vegetation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>White pine</td>
<td>White pine-hemlock</td>
</tr>
<tr>
<td>04</td>
<td>White pine-hemlock</td>
<td>White pine-hemlock</td>
</tr>
<tr>
<td>05</td>
<td>Hemlock</td>
<td>White pine-hemlock</td>
</tr>
<tr>
<td>06</td>
<td>Fraser fir</td>
<td>Spruce-fir</td>
</tr>
<tr>
<td>07</td>
<td>Red spruce-Fraser fir</td>
<td>Spruce-fir</td>
</tr>
<tr>
<td>08</td>
<td>Hemlock-hardwood</td>
<td>White pine-hemlock (in part), Cove hardwoods (in part)</td>
</tr>
<tr>
<td>09</td>
<td>White pine-cove hardwoods</td>
<td>White pine-hemlock (in part), Cove hardwoods (in part)</td>
</tr>
<tr>
<td>10</td>
<td>White pine-upland hardwoods</td>
<td>White pine-hemlock (in part), Oak-hickory (in part)</td>
</tr>
<tr>
<td>11</td>
<td>Eastern red cedar-hardwood</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>12</td>
<td>Shortleaf pine-oak</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>13</td>
<td>Loblolly pine-hardwood</td>
<td>Mixed pine-hardwood (on uplands), Oak-gum-cypress (on bottomlands, in part), Loblolly pine-shortleaf pine (on bottomlands, in part)</td>
</tr>
<tr>
<td>14</td>
<td>Slash pine-hardwood</td>
<td>Longleaf pine-slash pine (in part), Bay swamp-pocosin (in part)</td>
</tr>
<tr>
<td>15</td>
<td>Pitch pine-oak</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>16</td>
<td>Virginia pine-oak</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>17</td>
<td>Red spruce-northern hardwoods</td>
<td>Spruce-fir (in part), Maple-beech-birch (in part)</td>
</tr>
<tr>
<td>18</td>
<td>Pond pine-hardwood</td>
<td>Pond pine pocosin (in part), Bay swamp-pocosin (in part)</td>
</tr>
<tr>
<td>19</td>
<td>Sand pine-hardwood</td>
<td>Sand pine-southern scrub oak</td>
</tr>
<tr>
<td>20</td>
<td>Table Mountain pine-hardwood</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>21</td>
<td>Longleaf pine</td>
<td>Longleaf pine-scrub oak, Sandhills longleaf pine, or Longleaf pine-slash pine, depending upon site and associated understory species</td>
</tr>
<tr>
<td>22</td>
<td>Slash pine</td>
<td>Longleaf pine-slash pine</td>
</tr>
<tr>
<td>23</td>
<td>Pond cypress</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>24</td>
<td>Bald cypress</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>25</td>
<td>Loblolly pine</td>
<td>Loblolly pine-shortleaf pine</td>
</tr>
<tr>
<td>26</td>
<td>Shortleaf pine</td>
<td>Loblolly pine-shortleaf pine</td>
</tr>
<tr>
<td>27</td>
<td>Virginia pine</td>
<td>Virginia pine-pitch pine</td>
</tr>
<tr>
<td>28</td>
<td>Sand pine</td>
<td>Sand pine-southern scrub oak</td>
</tr>
<tr>
<td>29</td>
<td>Eastern red cedar</td>
<td>Loblolly pine-shortleaf pine</td>
</tr>
<tr>
<td>30</td>
<td>Pond pine</td>
<td>Pond pine pocosin</td>
</tr>
<tr>
<td>31</td>
<td>Spruce pine</td>
<td>Loblolly pine-shortleaf pine</td>
</tr>
<tr>
<td>32</td>
<td>Pitch pine</td>
<td>Virginia pine-pitch pine</td>
</tr>
<tr>
<td>33</td>
<td>Table Mountain pine</td>
<td>Virginia pine-pitch pine</td>
</tr>
<tr>
<td>34</td>
<td>Hardwood-pond pine</td>
<td>Pond pine pocosin (in part), Bay swamp-pocosin (in part)</td>
</tr>
<tr>
<td>35</td>
<td>Cove hardwoods-white pine-hemlock</td>
<td>Cove hardwoods (in part), White pine-hemlock (in part)</td>
</tr>
<tr>
<td>36</td>
<td>Upland hardwoods-white pine</td>
<td>White pine-hemlock (in part), Oak-hickory (in part)</td>
</tr>
<tr>
<td>USFS No.</td>
<td>USFS forest type&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Vegetation type</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>43</td>
<td>Oak-eastern red cedar</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>44</td>
<td>Southern red oak-yellow pine</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>45</td>
<td>Chestnut oak-scarlet oak-yellow pine</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>46</td>
<td>Bottomland hardwood-yellow pine</td>
<td>Oak-gum-cypress (in part), Mixed pine-hardwood (in part)</td>
</tr>
<tr>
<td>47</td>
<td>White oak-black oak-yellow pine</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>48</td>
<td>Northern red oak-hickory-yellow pine</td>
<td>Mixed pine-hardwood</td>
</tr>
<tr>
<td>49</td>
<td>Bear oak-southern scrub oaks-yellow pine</td>
<td>Sand pine-southern scrub, oak, Longleaf pine-scrub oak, Southern scrub oak, or Mixed pine-hardwood depending upon location and which “yellow pine” involved</td>
</tr>
<tr>
<td>50</td>
<td>Yellow-poplar</td>
<td>Cove hardwoods (in the Mountains), Elm-ash-cottonwood (elsewhere)</td>
</tr>
<tr>
<td>51</td>
<td>Post oak-black oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>52</td>
<td>Chestnut oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>53</td>
<td>White oak-red oak-hickory</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>54</td>
<td>White oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>55</td>
<td>Northern red oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>56</td>
<td>Yellow-poplar-white oak-northern red oak</td>
<td>Cove hardwoods</td>
</tr>
<tr>
<td>57</td>
<td>Scrub oak</td>
<td>Southern scrub oak</td>
</tr>
<tr>
<td>58</td>
<td>Sweetgum-yellow-poplar</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>59</td>
<td>Scarlet oak</td>
<td>Oak-hickory</td>
</tr>
<tr>
<td>61</td>
<td>Swamp chestnut oak-cherrybark oak</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>62</td>
<td>Sweetgum-Nuttall oak-willow</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>63</td>
<td>Sugarberry-American elm-green ash</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>64</td>
<td>Laurel oak-willow oak</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>65</td>
<td>Overcup oak-water hickory</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>66</td>
<td>Atlantic white cedar</td>
<td>Pond pine pocosin</td>
</tr>
<tr>
<td>67</td>
<td>Bald cypress-water tupelo</td>
<td>Oak-gum-cypress</td>
</tr>
<tr>
<td>68</td>
<td>Sweetbay-swamp tupelo-red maple</td>
<td>Bay swamp-pocosin (in part), Oak-gum-cypress (in part)</td>
</tr>
<tr>
<td>69</td>
<td>Beech-magnolia</td>
<td>Southern mixed mesic hardwoods</td>
</tr>
<tr>
<td>71</td>
<td>Black ash-American elm-red maple</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>72</td>
<td>River birch-sycamore</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>73</td>
<td>Cottonwood</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>74</td>
<td>Willow</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>75</td>
<td>Sycamore-pecan-American elm</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>76</td>
<td>Silver maple-American elm</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>81</td>
<td>Sugar maple-beech-yellow birch</td>
<td>Maple-beech-birch</td>
</tr>
<tr>
<td>82</td>
<td>Black walnut</td>
<td>Elm-ash-cottonwood</td>
</tr>
<tr>
<td>98</td>
<td>Undrained flatwoods</td>
<td>Pine savanna</td>
</tr>
</tbody>
</table>

<sup>a</sup>USFS forest types from the *Compartment Prescription Handbook* (USDA 1979).
Appendix M.

Neotropical Migratory Birds Treated in this Worka.

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)

*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

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Species Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pied-billed Grebe</td>
<td>PBGR</td>
</tr>
<tr>
<td>Brown Pelican</td>
<td>BFPE</td>
</tr>
<tr>
<td>Double-crested Cormorant</td>
<td>DCCO</td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>OLCO</td>
</tr>
<tr>
<td>Anhinga</td>
<td>ANHI</td>
</tr>
<tr>
<td>Magnificent Frigatebird</td>
<td>MAFR</td>
</tr>
<tr>
<td>American Bittern</td>
<td>AMBI</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>LEBI</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>GTBH</td>
</tr>
<tr>
<td>Great Egret</td>
<td>GREG</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>SNEG</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>LBHE</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>TRHE</td>
</tr>
<tr>
<td>Reddish Egret</td>
<td>REEG</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>CAEG</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>GNBH</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>BCNH</td>
</tr>
<tr>
<td>Yellow-crowned Night Heron</td>
<td>YCNH</td>
</tr>
<tr>
<td>White Ibis</td>
<td>WHIB</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>GLIB</td>
</tr>
<tr>
<td>White-faced Ibis</td>
<td>WFBIB</td>
</tr>
<tr>
<td>Roseate Spoonbill</td>
<td>ROSP</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>WOST</td>
</tr>
<tr>
<td>Wood Duck</td>
<td>WODU</td>
</tr>
<tr>
<td>Mallard</td>
<td>MALL</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>HOME</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>BLVU</td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>TUVU</td>
</tr>
<tr>
<td>Osprey</td>
<td>OSPR</td>
</tr>
<tr>
<td>American Swallow-tailed Kite</td>
<td>ASTK</td>
</tr>
<tr>
<td>Black-shouldered Kite</td>
<td>BSKI</td>
</tr>
<tr>
<td>Snail Kite</td>
<td>SNKI</td>
</tr>
<tr>
<td>Mississippi Kite</td>
<td>MIKI</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>BAEA</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>NOHA</td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>SSAH</td>
</tr>
<tr>
<td>Cooper's Hawk</td>
<td>COHA</td>
</tr>
<tr>
<td>Northern Goshawk</td>
<td>NOGO</td>
</tr>
<tr>
<td>Red-shouldered Hawk</td>
<td>RSHA</td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>BWAH</td>
</tr>
<tr>
<td>Short-tailed Hawk</td>
<td>STAHA</td>
</tr>
<tr>
<td>Swainson's Hawk</td>
<td>SWHA</td>
</tr>
<tr>
<td>Red-tailed Hawk</td>
<td>RTHA</td>
</tr>
<tr>
<td>Ferruginous Hawk</td>
<td>FEHA</td>
</tr>
<tr>
<td>Rough-legged Hawk</td>
<td>RLHA</td>
</tr>
<tr>
<td>Golden Eagle</td>
<td>GOEA</td>
</tr>
<tr>
<td>Crested Caracara</td>
<td>CFCA</td>
</tr>
<tr>
<td>American Kestrel</td>
<td>AMKE</td>
</tr>
<tr>
<td>Merlin</td>
<td>MERL</td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>PEFA</td>
</tr>
<tr>
<td>Black Francolin</td>
<td>BLFR*</td>
</tr>
<tr>
<td>Ring-necked Pheasant</td>
<td>RNPH*</td>
</tr>
<tr>
<td>Ruffed Grouse</td>
<td>RURG*</td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>WITU*</td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>NOBO*</td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>YERA</td>
</tr>
<tr>
<td>Black Rail</td>
<td>BLRA</td>
</tr>
<tr>
<td>Clapper Rail</td>
<td>CLRA</td>
</tr>
<tr>
<td>King Rail</td>
<td>KIRA</td>
</tr>
<tr>
<td>Virginia Rail</td>
<td>VIRA</td>
</tr>
<tr>
<td>Sora</td>
<td>SORA</td>
</tr>
<tr>
<td>Purple Gallinule</td>
<td>PUGA</td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>COMO</td>
</tr>
<tr>
<td>American Coot</td>
<td>AMCO</td>
</tr>
<tr>
<td>Limpkin</td>
<td>LIMP</td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>SACR</td>
</tr>
<tr>
<td>Killdeer</td>
<td>KILL</td>
</tr>
<tr>
<td>Upland Sandpiper</td>
<td>UPSA</td>
</tr>
<tr>
<td>Common Snipe</td>
<td>COSN</td>
</tr>
<tr>
<td>American Woodcock</td>
<td>AMWO</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>RODO*</td>
</tr>
<tr>
<td>White-crowned Pigeon</td>
<td>WCPW</td>
</tr>
<tr>
<td>White-winged Dove</td>
<td>WWDO</td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>MODO</td>
</tr>
<tr>
<td>Common Ground-Dove</td>
<td>CGDO</td>
</tr>
<tr>
<td>Black-billed Cuckoo</td>
<td>BBCU</td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>YBCU</td>
</tr>
<tr>
<td>Mangrove Cuckoo</td>
<td>MACU</td>
</tr>
<tr>
<td>Greater Roadrunner</td>
<td>GRRO</td>
</tr>
<tr>
<td>Smooth-billed Ani</td>
<td>SBAN</td>
</tr>
<tr>
<td>Groove-billed Ani</td>
<td>GBAN</td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>COBO</td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>EASO</td>
</tr>
<tr>
<td>Great Horned Owl</td>
<td>GHOW</td>
</tr>
<tr>
<td>Snowy Owl</td>
<td>SNOW</td>
</tr>
<tr>
<td>Burrowing Owl</td>
<td>BUOW</td>
</tr>
<tr>
<td>Barred Owl</td>
<td>BAOOW</td>
</tr>
<tr>
<td>Long-eared Owl</td>
<td>LEOW</td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>SEOW</td>
</tr>
<tr>
<td>Northern Saw-whet Owl</td>
<td>NSWO</td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>CONI</td>
</tr>
<tr>
<td>Chuck-will's-widow</td>
<td>CWWI</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>WPWI</td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>CHSW</td>
</tr>
<tr>
<td>Buff-bellied Hummingbird</td>
<td>BUFH</td>
</tr>
<tr>
<td>Ruby-throated Hummingbird</td>
<td>RTHU</td>
</tr>
<tr>
<td>Black-chinned Hummingbird</td>
<td>BCHU</td>
</tr>
<tr>
<td>Rufous Hummingbird</td>
<td>RUHU</td>
</tr>
<tr>
<td>Common Name</td>
<td>Species Code</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>Beki</td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>RHWO</td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>RBWO</td>
</tr>
<tr>
<td>Yellow-bellied Sapsucker</td>
<td>YBSA</td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>DOWO</td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>HAWO</td>
</tr>
<tr>
<td>Red-cockaded Woodpecker</td>
<td>RCWO</td>
</tr>
<tr>
<td>Northern (Yellow-shafted) Flicker</td>
<td>YSFL*</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>PIWO</td>
</tr>
<tr>
<td>Olive-sided Flycatcher</td>
<td>OSFL</td>
</tr>
<tr>
<td>Eastern Wood-Pewee</td>
<td>EAWP</td>
</tr>
<tr>
<td>Acadian Flycatcher</td>
<td>ACFI</td>
</tr>
<tr>
<td>Alder Flycatcher</td>
<td>ALFL</td>
</tr>
<tr>
<td>Yellow-bellied Flycatcher</td>
<td>YBFL</td>
</tr>
<tr>
<td>Willow Flycatcher</td>
<td>WIFL</td>
</tr>
<tr>
<td>Least Flycatcher</td>
<td>LEFL</td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>EAPH</td>
</tr>
<tr>
<td>Vermilion Flycatcher</td>
<td>VEFL</td>
</tr>
<tr>
<td>Ash-throated Flycatcher</td>
<td>ATFL</td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>GCFL</td>
</tr>
<tr>
<td>Brown-crested Flycatcher</td>
<td>BCFI</td>
</tr>
<tr>
<td>Western Kingbird</td>
<td>WEKI</td>
</tr>
<tr>
<td>Eastern Kingbird</td>
<td>EAKI</td>
</tr>
<tr>
<td>Gray Kingbird</td>
<td>GRAK</td>
</tr>
<tr>
<td>Scissor-tailed Flycatcher</td>
<td>STFL</td>
</tr>
<tr>
<td>Horned Lark</td>
<td>HOLA</td>
</tr>
<tr>
<td>Purple Martin</td>
<td>PUMA</td>
</tr>
<tr>
<td>Tree Swallow</td>
<td>TRES</td>
</tr>
<tr>
<td>Northern Rough-winged Swallow</td>
<td>NRWS</td>
</tr>
<tr>
<td>Bank Swallow</td>
<td>BANS</td>
</tr>
<tr>
<td>Cliff Swallow</td>
<td>CLSW</td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>BARS</td>
</tr>
<tr>
<td>Blue Jay</td>
<td>BLJA</td>
</tr>
<tr>
<td>Scrub Jay</td>
<td>SCJA</td>
</tr>
<tr>
<td>American Crow</td>
<td>AMCR</td>
</tr>
<tr>
<td>Fish Crow</td>
<td>FICR</td>
</tr>
<tr>
<td>Common Raven</td>
<td>CORA</td>
</tr>
<tr>
<td>Black-capped Chickadee</td>
<td>BCCH</td>
</tr>
<tr>
<td>Carolina Chickadee</td>
<td>CACH</td>
</tr>
<tr>
<td>Tufted Titmouse</td>
<td>ETTI*</td>
</tr>
<tr>
<td>Red-breasted Nuthatch</td>
<td>RBNU</td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>WBNU</td>
</tr>
<tr>
<td>Brown-headed Nuthatch</td>
<td>BHNU</td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>BCRF</td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>CARW</td>
</tr>
<tr>
<td>Bewick’s Wren</td>
<td>BEWR</td>
</tr>
<tr>
<td>House Wren</td>
<td>HOWR</td>
</tr>
<tr>
<td>Winter Wren</td>
<td>WIWR</td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>SEWR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Species Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsh Wren</td>
<td>MAWR</td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>GCKI</td>
</tr>
<tr>
<td>Ruby-crowned Kinglet</td>
<td>RCKI</td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td>BGGN</td>
</tr>
<tr>
<td>Eastern Bluebird</td>
<td>EABL</td>
</tr>
<tr>
<td>Veery</td>
<td>VEER</td>
</tr>
<tr>
<td>Swainson’s Thrush</td>
<td>SWTH</td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>HETH</td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>WOTH</td>
</tr>
<tr>
<td>American Robin</td>
<td>AMRO</td>
</tr>
<tr>
<td>Gray Catbird</td>
<td>GRCA</td>
</tr>
<tr>
<td>Northern Mockingbird</td>
<td>NMO</td>
</tr>
<tr>
<td>Brown Thrasher</td>
<td>BRTH</td>
</tr>
<tr>
<td>Water Pipit</td>
<td>WAPI</td>
</tr>
<tr>
<td>Sprague’s Pipit</td>
<td>SPPM</td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>CEDW</td>
</tr>
<tr>
<td>Loggerhead Shrike</td>
<td>LOSH</td>
</tr>
<tr>
<td>European Starling</td>
<td>EUST</td>
</tr>
<tr>
<td>White-eyed Vireo</td>
<td>WEVI</td>
</tr>
<tr>
<td>Bell’s Vireo</td>
<td>BEVI</td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>SOVI</td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>YTVI</td>
</tr>
<tr>
<td>Warbling Vireo</td>
<td>WAVI</td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>REVI</td>
</tr>
<tr>
<td>Black-whiskered Vireo</td>
<td>BWVI</td>
</tr>
<tr>
<td>Bachman’s Warbler</td>
<td>BAWA</td>
</tr>
<tr>
<td>Blue-winged Warbler</td>
<td>BWWA</td>
</tr>
<tr>
<td>Golden-winged Warbler</td>
<td>GWWA</td>
</tr>
<tr>
<td>Orange-crowned Warbler</td>
<td>OCAW</td>
</tr>
<tr>
<td>Nashville Warbler</td>
<td>NAWA</td>
</tr>
<tr>
<td>Northern Parula</td>
<td>NOPA</td>
</tr>
<tr>
<td>Yellow Warbler</td>
<td>YWAR</td>
</tr>
<tr>
<td>Chestnut-sided Warbler</td>
<td>CSWA</td>
</tr>
<tr>
<td>Magnolia Warbler</td>
<td>MAWA</td>
</tr>
<tr>
<td>Cape May Warbler</td>
<td>CMWA</td>
</tr>
<tr>
<td>Black-throated Blue Warbler</td>
<td>BTBW</td>
</tr>
<tr>
<td>Yellow-rumped (Myrtle) Warbler</td>
<td>MYWA</td>
</tr>
<tr>
<td>Black-throated Gray Warbler</td>
<td>BTTY</td>
</tr>
<tr>
<td>Black-throated Green Warbler</td>
<td>BTNW</td>
</tr>
<tr>
<td>Blackburnian Warbler</td>
<td>BLBW</td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>YTWA</td>
</tr>
<tr>
<td>Pine Warbler</td>
<td>PIWA</td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>PRAW</td>
</tr>
<tr>
<td>Palm Warbler</td>
<td>PAWA*</td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>CERW</td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>BAWW</td>
</tr>
<tr>
<td>American Redstart</td>
<td>AMRE</td>
</tr>
<tr>
<td>Prothonotary Warbler</td>
<td>PROW</td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>WEWA</td>
</tr>
<tr>
<td>Common Name</td>
<td>Species Code</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Swainson's Warbler</td>
<td>SWWA</td>
</tr>
<tr>
<td>Ovenbird</td>
<td>OVEN</td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>NOWA</td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>LOWA</td>
</tr>
<tr>
<td>Kentucky Warbler</td>
<td>KEWA</td>
</tr>
<tr>
<td>Mourning Warbler</td>
<td>MOWA</td>
</tr>
<tr>
<td>Common Yellowthroat</td>
<td>COYE</td>
</tr>
<tr>
<td>Hooded Warbler</td>
<td>HOWA</td>
</tr>
<tr>
<td>Wilson's Warbler</td>
<td>WIWA</td>
</tr>
<tr>
<td>Canada Warbler</td>
<td>CAWA</td>
</tr>
<tr>
<td>Yellow-breasted Chat</td>
<td>YBCH</td>
</tr>
<tr>
<td>Summer Tanager</td>
<td>SUTA</td>
</tr>
<tr>
<td>Scarlet Tanager</td>
<td>SCTA</td>
</tr>
<tr>
<td>Western Tanager</td>
<td>WETA</td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>NOCA</td>
</tr>
<tr>
<td>Rose-breasted Grosbeak</td>
<td>RBGR</td>
</tr>
<tr>
<td>Black-headed Grosbeak</td>
<td>BHGR</td>
</tr>
<tr>
<td>Blue Grosbeak</td>
<td>BLGR</td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>INBU</td>
</tr>
<tr>
<td>Painted Bunting</td>
<td>PABU</td>
</tr>
<tr>
<td>Dickcissel</td>
<td>DICK</td>
</tr>
<tr>
<td>Green-tailed Towhee</td>
<td>GTTO</td>
</tr>
<tr>
<td>Rufous-sided Towhee</td>
<td>RSTO</td>
</tr>
<tr>
<td>Bachman's Sparrow</td>
<td>BACS</td>
</tr>
<tr>
<td>Rufous-crowned Sparrow</td>
<td>RCSP</td>
</tr>
<tr>
<td>American Tree Sparrow</td>
<td>ATSP</td>
</tr>
<tr>
<td>Chipping Sparrow</td>
<td>CHSP</td>
</tr>
<tr>
<td>Clay-colored Sparrow</td>
<td>CCSP</td>
</tr>
<tr>
<td>Field Sparrow</td>
<td>FISP</td>
</tr>
<tr>
<td>Vesper Sparrow</td>
<td>VESP</td>
</tr>
<tr>
<td>Lark Sparrow</td>
<td>LASP</td>
</tr>
<tr>
<td>Lark Bunting</td>
<td>LARB</td>
</tr>
<tr>
<td>Savannah Sparrow</td>
<td>SAVS</td>
</tr>
<tr>
<td>Grasshopper Sparrow</td>
<td>GRSP</td>
</tr>
<tr>
<td>Henslow's Sparrow</td>
<td>HESP</td>
</tr>
<tr>
<td>Le Conte's Sparrow</td>
<td>LCSP</td>
</tr>
<tr>
<td>Sharp-tailed Sparrow</td>
<td>STSP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Species Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seaside Sparrow</td>
<td>SESP</td>
</tr>
<tr>
<td>Fox Sparrow</td>
<td>FOSP</td>
</tr>
<tr>
<td>Song Sparrow</td>
<td>SOSP</td>
</tr>
<tr>
<td>Lincoln's Sparrow</td>
<td>LISP</td>
</tr>
<tr>
<td>Swamp Sparrow</td>
<td>SWSP</td>
</tr>
<tr>
<td>White-throated Sparrow</td>
<td>WTSP</td>
</tr>
<tr>
<td>White-crowned Sparrow</td>
<td>WCSP</td>
</tr>
<tr>
<td>Harris' Sparrow</td>
<td>HASP</td>
</tr>
<tr>
<td>Dark-eyed Junco</td>
<td>SCJU*</td>
</tr>
<tr>
<td>Lapland Longspur</td>
<td>LALO</td>
</tr>
<tr>
<td>Smith's Longspur</td>
<td>SMLO</td>
</tr>
<tr>
<td>Chestnut-collared Longspur</td>
<td>CCL0</td>
</tr>
<tr>
<td>Snow Bunting</td>
<td>SNBU</td>
</tr>
<tr>
<td>Bobolink</td>
<td>BOBO</td>
</tr>
<tr>
<td>Red-winged Blackbird</td>
<td>RWBL</td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>EAME</td>
</tr>
<tr>
<td>Western Meadowlark</td>
<td>WEME</td>
</tr>
<tr>
<td>Yellow-headed Blackbird</td>
<td>YHBL</td>
</tr>
<tr>
<td>Rusty Blackbird</td>
<td>RUBL</td>
</tr>
<tr>
<td>Brewer's Blackbird</td>
<td>BRBL</td>
</tr>
<tr>
<td>Great-tailed Grackle</td>
<td>GTGR</td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>BTGR</td>
</tr>
<tr>
<td>Common Grackle</td>
<td>COGR</td>
</tr>
<tr>
<td>Bronzed Cowbird</td>
<td>BROC</td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>BHCO</td>
</tr>
<tr>
<td>Orchard Oriole</td>
<td>OROR</td>
</tr>
<tr>
<td>Spot-breasted Oriole</td>
<td>SPOO</td>
</tr>
<tr>
<td>Northern (Baltimore) Oriole</td>
<td>BAOR*</td>
</tr>
<tr>
<td>Purple Finch</td>
<td>PEFI</td>
</tr>
<tr>
<td>House Finch</td>
<td>HOFI</td>
</tr>
<tr>
<td>Red Crossbill</td>
<td>RECR</td>
</tr>
<tr>
<td>White-winged Crossbill</td>
<td>WWCR</td>
</tr>
<tr>
<td>Common Redpoll</td>
<td>CORE</td>
</tr>
<tr>
<td>Pine Siskin</td>
<td>PISI</td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>AMGO</td>
</tr>
<tr>
<td>Evening Grosbeak</td>
<td>EVGR</td>
</tr>
<tr>
<td>House Sparrow</td>
<td>HOSP</td>
</tr>
</tbody>
</table>

* Non-standard code, see Chapter IV for explanation.
<table>
<thead>
<tr>
<th>Common Name</th>
<th>SP Code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acadian Flycatcher</td>
<td>ACFL</td>
<td>193</td>
</tr>
<tr>
<td>Alder Flycatcher</td>
<td>ALFL</td>
<td>194</td>
</tr>
<tr>
<td>American Coot</td>
<td>AMCO</td>
<td>146</td>
</tr>
<tr>
<td>American Swallow-tailed Kite</td>
<td>ASTK</td>
<td>112</td>
</tr>
<tr>
<td>American Tree Sparrow</td>
<td>ATSP</td>
<td>305</td>
</tr>
<tr>
<td>American Crow</td>
<td>AMCR</td>
<td>216</td>
</tr>
<tr>
<td>American Woodcock</td>
<td>AMWO</td>
<td>152</td>
</tr>
<tr>
<td>American Redstart</td>
<td>AMRE</td>
<td>277</td>
</tr>
<tr>
<td>American Kestrel</td>
<td>AMKE</td>
<td>130</td>
</tr>
<tr>
<td>American Robin</td>
<td>AMRO</td>
<td>240</td>
</tr>
<tr>
<td>American Goldfinch</td>
<td>AMGO</td>
<td>351</td>
</tr>
<tr>
<td>American Bittern</td>
<td>AMBI</td>
<td>89</td>
</tr>
<tr>
<td>Anhinga</td>
<td>ANHI</td>
<td>87</td>
</tr>
<tr>
<td>Ash-throated Flycatcher</td>
<td>ATFL</td>
<td>200</td>
</tr>
<tr>
<td>Bachman’s Sparrow</td>
<td>BACS</td>
<td>303</td>
</tr>
<tr>
<td>Bachman’s Warbler</td>
<td>BAWA</td>
<td>256</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>BAEA</td>
<td>116</td>
</tr>
<tr>
<td>Bank Swallow</td>
<td>BANS</td>
<td>211</td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>BARS</td>
<td>213</td>
</tr>
<tr>
<td>Barred Owl</td>
<td>BAOW</td>
<td>169</td>
</tr>
<tr>
<td>Bell’s Vireo</td>
<td>BEVI</td>
<td>250</td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>BEKI</td>
<td>181</td>
</tr>
<tr>
<td>Bewick’s Wren</td>
<td>BEWR</td>
<td>227</td>
</tr>
<tr>
<td>Black-throated Blue Warbler</td>
<td>BTBW</td>
<td>266</td>
</tr>
<tr>
<td>Black Francolin</td>
<td>BLFR*</td>
<td>133</td>
</tr>
<tr>
<td>Black-capped Chickadee</td>
<td>BCCH</td>
<td>219</td>
</tr>
<tr>
<td>Black-throated Gray Warbler</td>
<td>BTYW</td>
<td>268</td>
</tr>
<tr>
<td>Black-throated Green Warbler</td>
<td>BTNW</td>
<td>269</td>
</tr>
<tr>
<td>Black Rail</td>
<td>BLRA</td>
<td>139</td>
</tr>
<tr>
<td>Black-and-white Warbler</td>
<td>BAWW</td>
<td>276</td>
</tr>
<tr>
<td>Black-chinned Hummingbird</td>
<td>BCHU</td>
<td>179</td>
</tr>
<tr>
<td>Black-crowned Night Heron</td>
<td>BCNH</td>
<td>99</td>
</tr>
<tr>
<td>Black-headed Grosbeak</td>
<td>BHGR</td>
<td>296</td>
</tr>
<tr>
<td>Black-whiskered Vireo</td>
<td>BWVI</td>
<td>255</td>
</tr>
<tr>
<td>Black-shouldered Kite</td>
<td>BSKI</td>
<td>113</td>
</tr>
<tr>
<td>Black-billed Cuckoo</td>
<td>BBCU</td>
<td>158</td>
</tr>
<tr>
<td>Black Vulture</td>
<td>BLVU</td>
<td>109</td>
</tr>
<tr>
<td>Blackburnian Warbler</td>
<td>BLBW</td>
<td>270</td>
</tr>
<tr>
<td>Blue Jay</td>
<td>BLJA</td>
<td>214</td>
</tr>
<tr>
<td>Blue Grosbeak</td>
<td>BLGR</td>
<td>297</td>
</tr>
<tr>
<td>Blue-gray Gnatcatcher</td>
<td>BGGN</td>
<td>234</td>
</tr>
<tr>
<td>Blue-winged Warbler</td>
<td>BWWA</td>
<td>257</td>
</tr>
<tr>
<td>Boat-tailed Grackle</td>
<td>BTGR</td>
<td>338</td>
</tr>
<tr>
<td>Bobolink</td>
<td>BOBO</td>
<td>330</td>
</tr>
<tr>
<td>Brewer’s Blackbird</td>
<td>BRBL</td>
<td>336</td>
</tr>
<tr>
<td>Broad-winged Hawk</td>
<td>BWHA</td>
<td>122</td>
</tr>
<tr>
<td>Bronzed Cowbird</td>
<td>BROC</td>
<td>340</td>
</tr>
<tr>
<td>Brown Thrasher</td>
<td>BRTH</td>
<td>243</td>
</tr>
<tr>
<td>Brown-headed Nuthatch</td>
<td>BHNU</td>
<td>224</td>
</tr>
<tr>
<td>Brown-crested Flycatcher</td>
<td>BCFL</td>
<td>202</td>
</tr>
<tr>
<td>Brown-headed Cowbird</td>
<td>BHCO</td>
<td>341</td>
</tr>
<tr>
<td>Brown Pelican</td>
<td>BRPE</td>
<td>84</td>
</tr>
<tr>
<td>Brown Creeper</td>
<td>BRCR</td>
<td>225</td>
</tr>
<tr>
<td>Buff-bellied Hummingbird</td>
<td>BUFH</td>
<td>177</td>
</tr>
<tr>
<td>Burrowing Owl</td>
<td>BUOW</td>
<td>168</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common Name</th>
<th>SP Code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada Warbler</td>
<td>CAWA</td>
<td>289</td>
</tr>
<tr>
<td>Cape May Warbler</td>
<td>CMWA</td>
<td>265</td>
</tr>
<tr>
<td>Carolina Wren</td>
<td>CARW</td>
<td>226</td>
</tr>
<tr>
<td>Carolina Chickadee</td>
<td>CACH</td>
<td>220</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>CAEG</td>
<td>97</td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>CEDW</td>
<td>246</td>
</tr>
<tr>
<td>Cerulean Warbler</td>
<td>CERW</td>
<td>275</td>
</tr>
<tr>
<td>Chestnut-collared Longspur</td>
<td>CCLO</td>
<td>328</td>
</tr>
<tr>
<td>Chestnut-sided Warbler</td>
<td>CSWA</td>
<td>263</td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>CHSW</td>
<td>176</td>
</tr>
<tr>
<td>Chipping Sparrow</td>
<td>CHSP</td>
<td>306</td>
</tr>
<tr>
<td>Chuck-will’s-widow</td>
<td>CWWI</td>
<td>174</td>
</tr>
<tr>
<td>Clapper Rail</td>
<td>CLRA</td>
<td>140</td>
</tr>
<tr>
<td>Clay-colored Sparrow</td>
<td>CCSP</td>
<td>307</td>
</tr>
<tr>
<td>Cliff Swallow</td>
<td>CLSW</td>
<td>212</td>
</tr>
<tr>
<td>Common Ground-Dove</td>
<td>CGDO</td>
<td>157</td>
</tr>
<tr>
<td>Common Barn-Owl</td>
<td>COBO</td>
<td>164</td>
</tr>
<tr>
<td>Common Redpoll</td>
<td>CORE</td>
<td>349</td>
</tr>
<tr>
<td>Common Yellowthroat</td>
<td>COYE</td>
<td>286</td>
</tr>
<tr>
<td>Common Moorhen</td>
<td>COMO</td>
<td>145</td>
</tr>
<tr>
<td>Common Raven</td>
<td>CORA</td>
<td>218</td>
</tr>
<tr>
<td>Common Snipe</td>
<td>COSN</td>
<td>151</td>
</tr>
<tr>
<td>Common Grackle</td>
<td>COGR</td>
<td>339</td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td>CONI</td>
<td>173</td>
</tr>
<tr>
<td>Cooper’s Hawk</td>
<td>COHA</td>
<td>119</td>
</tr>
<tr>
<td>Crested Caracara</td>
<td>CRCA</td>
<td>129</td>
</tr>
<tr>
<td>Dark-eyed Junco</td>
<td>SCIU*</td>
<td>325</td>
</tr>
<tr>
<td>Dickcissel</td>
<td>DICK</td>
<td>300</td>
</tr>
<tr>
<td>Double-crested Cormorant</td>
<td>DCCO</td>
<td>85</td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>DOWO</td>
<td>185</td>
</tr>
<tr>
<td>Eastern Wood-Pewee</td>
<td>EAWP</td>
<td>192</td>
</tr>
<tr>
<td>Eastern Phoebe</td>
<td>EAPH</td>
<td>198</td>
</tr>
<tr>
<td>Eastern Bluebird</td>
<td>EABL</td>
<td>235</td>
</tr>
<tr>
<td>Eastern Kingbird</td>
<td>EAKI</td>
<td>204</td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>EAME</td>
<td>332</td>
</tr>
<tr>
<td>Eastern Screech-Owl</td>
<td>EASO</td>
<td>165</td>
</tr>
<tr>
<td>European Starling</td>
<td>EUST</td>
<td>248</td>
</tr>
<tr>
<td>Evening Grosbeak</td>
<td>EVGR</td>
<td>352</td>
</tr>
<tr>
<td>Ferruginous Hawk</td>
<td>FEHA</td>
<td>126</td>
</tr>
<tr>
<td>Field Sparrow</td>
<td>FISP</td>
<td>308</td>
</tr>
<tr>
<td>Fish Crow</td>
<td>FICR</td>
<td>217</td>
</tr>
<tr>
<td>Fox Sparrow</td>
<td>FOSP</td>
<td>318</td>
</tr>
<tr>
<td>Glossy Ibis</td>
<td>GLIB</td>
<td>102</td>
</tr>
<tr>
<td>Golden-crowned Kinglet</td>
<td>GCKI</td>
<td>232</td>
</tr>
<tr>
<td>Golden Eagle</td>
<td>GOEA</td>
<td>128</td>
</tr>
<tr>
<td>Golden-winged Warbler</td>
<td>GWWA</td>
<td>258</td>
</tr>
<tr>
<td>Grasshopper Sparrow</td>
<td>GRSP</td>
<td>313</td>
</tr>
<tr>
<td>Gray Kingbird</td>
<td>GRAK</td>
<td>205</td>
</tr>
<tr>
<td>Gray Catbird</td>
<td>GRCA</td>
<td>241</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>GTBH</td>
<td>91</td>
</tr>
<tr>
<td>Great-tailed Grackle</td>
<td>GTGR</td>
<td>337</td>
</tr>
<tr>
<td>Great Horned Owl</td>
<td>GHOW</td>
<td>166</td>
</tr>
<tr>
<td>Great Egret</td>
<td>GREG</td>
<td>92</td>
</tr>
<tr>
<td>Great Crested Flycatcher</td>
<td>GCFL</td>
<td>201</td>
</tr>
<tr>
<td>Greater Roadrunner</td>
<td>GRRO</td>
<td>161</td>
</tr>
<tr>
<td>Common Name</td>
<td>SP Code</td>
<td>Page</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>Green-backed Heron</td>
<td>GNBH</td>
<td>98</td>
</tr>
<tr>
<td>Green-tailed Towhee</td>
<td>GTTO</td>
<td>301</td>
</tr>
<tr>
<td>Groove-billed Ani</td>
<td>GBAN</td>
<td>163</td>
</tr>
<tr>
<td>Hairy Woodpecker</td>
<td>HAWO</td>
<td>186</td>
</tr>
<tr>
<td>Harris’ Sparrow</td>
<td>HASP</td>
<td>324</td>
</tr>
<tr>
<td>Henslow’s Sparrow</td>
<td>HESP</td>
<td>314</td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>HETH</td>
<td>238</td>
</tr>
<tr>
<td>Hooded Warbler</td>
<td>HOWA</td>
<td>287</td>
</tr>
<tr>
<td>Hooded Merganser</td>
<td>HOME</td>
<td>108</td>
</tr>
<tr>
<td>Horned Lark</td>
<td>HOLA</td>
<td>207</td>
</tr>
<tr>
<td>House Finch</td>
<td>HOFI</td>
<td>346</td>
</tr>
<tr>
<td>House Wren</td>
<td>HOWR</td>
<td>228</td>
</tr>
<tr>
<td>House Sparrow</td>
<td>HOSP</td>
<td>353</td>
</tr>
<tr>
<td>Indigo Bunting</td>
<td>INBU</td>
<td>298</td>
</tr>
<tr>
<td>Ivory-billed Woodpecker</td>
<td>IBOW</td>
<td>188</td>
</tr>
<tr>
<td>Kentucky Warbler</td>
<td>KEWA</td>
<td>284</td>
</tr>
<tr>
<td>Killdeer</td>
<td>KILL</td>
<td>149</td>
</tr>
<tr>
<td>King Rail</td>
<td>KIRA</td>
<td>141</td>
</tr>
<tr>
<td>Lapland Longspur</td>
<td>LALO</td>
<td>326</td>
</tr>
<tr>
<td>Lark Bunting</td>
<td>LARB</td>
<td>311</td>
</tr>
<tr>
<td>Lark Sparrow</td>
<td>LASP</td>
<td>310</td>
</tr>
<tr>
<td>Le Conte’s Sparrow</td>
<td>LCSP</td>
<td>315</td>
</tr>
<tr>
<td>Least Flycatcher</td>
<td>LEFL</td>
<td>197</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>LEBI</td>
<td>90</td>
</tr>
<tr>
<td>Limpkin</td>
<td>LIMP</td>
<td>147</td>
</tr>
<tr>
<td>Lincoln’s Sparrow</td>
<td>LISP</td>
<td>320</td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td>LBHE</td>
<td>94</td>
</tr>
<tr>
<td>Loggerhead Shrike</td>
<td>LOSH</td>
<td>247</td>
</tr>
<tr>
<td>Long-eared Owl</td>
<td>LEOW</td>
<td>170</td>
</tr>
<tr>
<td>Louisiana Waterthrush</td>
<td>LOWA</td>
<td>283</td>
</tr>
<tr>
<td>Magnificent Frigatebird</td>
<td>MAFR</td>
<td>88</td>
</tr>
<tr>
<td>Magnolia Warbler</td>
<td>MAWA</td>
<td>264</td>
</tr>
<tr>
<td>Mallard</td>
<td>MALL</td>
<td>107</td>
</tr>
<tr>
<td>Mangrove Cuckoo</td>
<td>MACU</td>
<td>160</td>
</tr>
<tr>
<td>Marsh Wren</td>
<td>MAWR</td>
<td>231</td>
</tr>
<tr>
<td>Merlin</td>
<td>MERL</td>
<td>131</td>
</tr>
<tr>
<td>Mississippi Kite</td>
<td>MIKI</td>
<td>115</td>
</tr>
<tr>
<td>Mourning Warbler</td>
<td>MOWA</td>
<td>285</td>
</tr>
<tr>
<td>Mourning Dove</td>
<td>MODO</td>
<td>156</td>
</tr>
<tr>
<td>Nashville Warbler</td>
<td>NAWA</td>
<td>260</td>
</tr>
<tr>
<td>Northern Mockingbird</td>
<td>NOMO</td>
<td>242</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td>NOHA</td>
<td>117</td>
</tr>
<tr>
<td>Northern Goshawk</td>
<td>NGOG</td>
<td>120</td>
</tr>
<tr>
<td>Northern (Yellow-shafted) Flicker</td>
<td>YSFL*</td>
<td>189</td>
</tr>
<tr>
<td>Northern Rough-winged Swallow</td>
<td>NRWS</td>
<td>210</td>
</tr>
<tr>
<td>Northern Bobwhite</td>
<td>NOBO</td>
<td>137</td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>NOCA</td>
<td>294</td>
</tr>
<tr>
<td>Northern Waterthrush</td>
<td>NOWA</td>
<td>282</td>
</tr>
<tr>
<td>Northern (Baltimore) Oriole</td>
<td>BAOR*</td>
<td>344</td>
</tr>
<tr>
<td>Northern Parula</td>
<td>NOPA</td>
<td>261</td>
</tr>
<tr>
<td>Northern Saw-whet Owl</td>
<td>NSWO</td>
<td>172</td>
</tr>
<tr>
<td>Olivaceous Cormorant</td>
<td>OLCO</td>
<td>86</td>
</tr>
<tr>
<td>Olive-sided Flycatcher</td>
<td>OSFL</td>
<td>191</td>
</tr>
<tr>
<td>Orange-crowned Warbler</td>
<td>OCWA</td>
<td>259</td>
</tr>
<tr>
<td>Orchard Oriole</td>
<td>OROR</td>
<td>342</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common Name</th>
<th>SP Code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osprey</td>
<td>OSPR</td>
<td>111</td>
</tr>
<tr>
<td>Ovenbird</td>
<td>OVEN</td>
<td>281</td>
</tr>
<tr>
<td>Painted Bunting</td>
<td>PABU</td>
<td>299</td>
</tr>
<tr>
<td>Palm Warbler</td>
<td>PAWA*</td>
<td>274</td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>PAWA</td>
<td>132</td>
</tr>
<tr>
<td>Pied-billed Grebe</td>
<td>PBGR</td>
<td>83</td>
</tr>
<tr>
<td>Pileated Woodpecker</td>
<td>PITW</td>
<td>190</td>
</tr>
<tr>
<td>Pine Siskin</td>
<td>PISI</td>
<td>350</td>
</tr>
<tr>
<td>Pine Warbler</td>
<td>PIVA</td>
<td>272</td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>PRAW</td>
<td>273</td>
</tr>
<tr>
<td>Prothonotary Warbler</td>
<td>PROW</td>
<td>278</td>
</tr>
<tr>
<td>Purple Finch</td>
<td>PUFI</td>
<td>345</td>
</tr>
<tr>
<td>Purple Gallinule</td>
<td>PUGA</td>
<td>144</td>
</tr>
<tr>
<td>Purple Martin</td>
<td>PUMA</td>
<td>208</td>
</tr>
<tr>
<td>Red-shouldered Hawk</td>
<td>RSHA</td>
<td>121</td>
</tr>
<tr>
<td>Red-cockaded Woodpecker</td>
<td>RCWO</td>
<td>187</td>
</tr>
<tr>
<td>Red Crossbill</td>
<td>REC</td>
<td>347</td>
</tr>
<tr>
<td>Red-breasted Nuthatch</td>
<td>RBNU</td>
<td>222</td>
</tr>
<tr>
<td>Red-bellied Woodpecker</td>
<td>RBWO</td>
<td>183</td>
</tr>
<tr>
<td>Red-winged Blackbird</td>
<td>RWBL</td>
<td>331</td>
</tr>
<tr>
<td>Red-eyed Vireo</td>
<td>REV</td>
<td>254</td>
</tr>
<tr>
<td>Red-tailed Hawk</td>
<td>RTH</td>
<td>125</td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>RHWO</td>
<td>182</td>
</tr>
<tr>
<td>Reddish Egret</td>
<td>REEG</td>
<td>96</td>
</tr>
<tr>
<td>Ring-necked Pheasant</td>
<td>RNPH</td>
<td>134</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>RODO</td>
<td>153</td>
</tr>
<tr>
<td>Rose-breasted Grosbeak</td>
<td>RBGR</td>
<td>295</td>
</tr>
<tr>
<td>Roseate Spoonbill</td>
<td>ROSP</td>
<td>104</td>
</tr>
<tr>
<td>Rough-legged Hawk</td>
<td>RLHA</td>
<td>127</td>
</tr>
<tr>
<td>Ruby-throated Hummingbird</td>
<td>RTH</td>
<td>178</td>
</tr>
<tr>
<td>Ruby-crowned Kinglet</td>
<td>RCKI</td>
<td>233</td>
</tr>
<tr>
<td>Ruffed Grouse</td>
<td>RUGR</td>
<td>135</td>
</tr>
<tr>
<td>Rufous Hummingbird</td>
<td>RUHU</td>
<td>180</td>
</tr>
<tr>
<td>Rufous-sided Towhee</td>
<td>RSTO</td>
<td>302</td>
</tr>
<tr>
<td>Rufous-crowned Sparrow</td>
<td>RCSP</td>
<td>304</td>
</tr>
<tr>
<td>Rusty Blackbird</td>
<td>RUBL</td>
<td>335</td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>SACR</td>
<td>148</td>
</tr>
<tr>
<td>Savannah Sparrow</td>
<td>SAVS</td>
<td>312</td>
</tr>
<tr>
<td>Scarlet Tanager</td>
<td>SCTA</td>
<td>292</td>
</tr>
<tr>
<td>Scissor-tailed Flycatcher</td>
<td>STFL</td>
<td>206</td>
</tr>
<tr>
<td>Scrub Jay</td>
<td>SCJA</td>
<td>215</td>
</tr>
<tr>
<td>Seaside Sparrow</td>
<td>SESP</td>
<td>317</td>
</tr>
<tr>
<td>Sedge Wren</td>
<td>SEWR</td>
<td>230</td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>SSH</td>
<td>118</td>
</tr>
<tr>
<td>Sharp-tailed Sparrow</td>
<td>STSP</td>
<td>316</td>
</tr>
<tr>
<td>Short-tailed Hawk</td>
<td>STA</td>
<td>123</td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>SEOW</td>
<td>171</td>
</tr>
<tr>
<td>Smith’s Longspur</td>
<td>SMLO</td>
<td>327</td>
</tr>
<tr>
<td>Smooth-billed Ani</td>
<td>SBAN</td>
<td>162</td>
</tr>
<tr>
<td>Snail Kite</td>
<td>SNKI</td>
<td>114</td>
</tr>
<tr>
<td>Snow Bunting</td>
<td>SNBU</td>
<td>329</td>
</tr>
<tr>
<td>Snowy Owl</td>
<td>SNOW</td>
<td>167</td>
</tr>
<tr>
<td>Snowy Egret</td>
<td>SNEG</td>
<td>93</td>
</tr>
<tr>
<td>Solitary Vireo</td>
<td>SOVI</td>
<td>251</td>
</tr>
<tr>
<td>Song Sparrow</td>
<td>SOSP</td>
<td>319</td>
</tr>
<tr>
<td>Common Name</td>
<td>SP Code</td>
<td>Page</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>Sora</td>
<td>SORA</td>
<td>143</td>
</tr>
<tr>
<td>Spot-breasted Oriole</td>
<td>SPOO</td>
<td>343</td>
</tr>
<tr>
<td>Sprague’s Pipit</td>
<td>SPPI</td>
<td>245</td>
</tr>
<tr>
<td>Summer Tanager</td>
<td>SUTA</td>
<td>291</td>
</tr>
<tr>
<td>Swainson’s Warbler</td>
<td>SWWA</td>
<td>280</td>
</tr>
<tr>
<td>Swainson’s Hawk</td>
<td>SWHA</td>
<td>124</td>
</tr>
<tr>
<td>Swainson’s Thrush</td>
<td>SWTH</td>
<td>237</td>
</tr>
<tr>
<td>Swamp Sparrow</td>
<td>SWSP</td>
<td>321</td>
</tr>
<tr>
<td>Tree Swallow</td>
<td>TRES</td>
<td>209</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>TRHE</td>
<td>95</td>
</tr>
<tr>
<td>Tufted Titmouse</td>
<td>ETIT*</td>
<td>221</td>
</tr>
<tr>
<td>Turkey Vulture</td>
<td>TUVU</td>
<td>110</td>
</tr>
<tr>
<td>Upland Sandpiper</td>
<td>UPSA</td>
<td>150</td>
</tr>
<tr>
<td>Veery</td>
<td>VEER</td>
<td>236</td>
</tr>
<tr>
<td>Vermilion Flycatcher</td>
<td>VEFL</td>
<td>199</td>
</tr>
<tr>
<td>Vesper Sparrow</td>
<td>VESP</td>
<td>309</td>
</tr>
<tr>
<td>Virginia Rail</td>
<td>VIRA</td>
<td>142</td>
</tr>
<tr>
<td>Warbling Vireo</td>
<td>WAPI</td>
<td>253</td>
</tr>
<tr>
<td>Water Pipit</td>
<td>WAPI</td>
<td>244</td>
</tr>
<tr>
<td>Western Meadowlark</td>
<td>WEME</td>
<td>333</td>
</tr>
<tr>
<td>Western Kingbird</td>
<td>WEKI</td>
<td>203</td>
</tr>
<tr>
<td>Western Tanager</td>
<td>WETA</td>
<td>293</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>WPWI</td>
<td>175</td>
</tr>
<tr>
<td>White-winged Dove</td>
<td>WWDO</td>
<td>155</td>
</tr>
<tr>
<td>White-crowned Pigeon</td>
<td>WCPI</td>
<td>154</td>
</tr>
<tr>
<td>White-breasted Nuthatch</td>
<td>WBNU</td>
<td>223</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common Name</th>
<th>SP Code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-faced Ibis</td>
<td>WFIB</td>
<td>103</td>
</tr>
<tr>
<td>White Ibis</td>
<td>WHIB</td>
<td>101</td>
</tr>
<tr>
<td>White-crowned Sparrow</td>
<td>WCSP</td>
<td>323</td>
</tr>
<tr>
<td>White-throated Sparrow</td>
<td>WTSP</td>
<td>322</td>
</tr>
<tr>
<td>White-winged Crossbill</td>
<td>WCRC</td>
<td>348</td>
</tr>
<tr>
<td>White-eyed Vireo</td>
<td>WEVI</td>
<td>249</td>
</tr>
<tr>
<td>Wild Turkey</td>
<td>WITU*</td>
<td>136</td>
</tr>
<tr>
<td>Willow Flycatcher</td>
<td>WIFL</td>
<td>195</td>
</tr>
<tr>
<td>Wilson’s Warbler</td>
<td>WIWA</td>
<td>288</td>
</tr>
<tr>
<td>Winter Wren</td>
<td>WIWR</td>
<td>229</td>
</tr>
<tr>
<td>Wood Duck</td>
<td>WODU</td>
<td>106</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>WOST</td>
<td>105</td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>WOTH</td>
<td>239</td>
</tr>
<tr>
<td>Worm-eating Warbler</td>
<td>WEWA</td>
<td>279</td>
</tr>
<tr>
<td>Yellow-billed Cuckoo</td>
<td>YBCU</td>
<td>159</td>
</tr>
<tr>
<td>Yellow-bellied Flycatcher</td>
<td>YBFL</td>
<td>196</td>
</tr>
<tr>
<td>Yellow-breasted Chat</td>
<td>YBCH</td>
<td>290</td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>YERA</td>
<td>138</td>
</tr>
<tr>
<td>Yellow-rumped (Myrtle) Warbler</td>
<td>MYWA</td>
<td>267</td>
</tr>
<tr>
<td>Yellow Warbler</td>
<td>YWAR</td>
<td>262</td>
</tr>
<tr>
<td>Yellow-bellied Sapsucker</td>
<td>YBSA</td>
<td>184</td>
</tr>
<tr>
<td>Yellow-throated Warbler</td>
<td>YTWA</td>
<td>271</td>
</tr>
<tr>
<td>Yellow-crowned Night Heron</td>
<td>YCNH</td>
<td>100</td>
</tr>
<tr>
<td>Yellow-headed Blackbird</td>
<td>YHBL</td>
<td>334</td>
</tr>
<tr>
<td>Yellow-throated Vireo</td>
<td>YTVI</td>
<td>252</td>
</tr>
</tbody>
</table>