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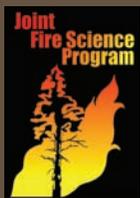


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Black Belt Landowners Respond to State-Sponsored Wildland Fire Mitigation Policies and Programs

Cassandra Johnson-Gaither, Jianbang Gan, Adam Jarrett,
Miriam S. Wyman, Sparkle Malone, Keenan J. Adams,
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Cover: Fire running uphill. (Image by Philip Juras)

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Abstract

This investigation focused on nonindustrial private forest (NIPF) landowners in selected counties across five States in the Southeastern United States (Alabama, Florida, Georgia, Mississippi, and South Carolina). These counties are located in the Southern Black Belt region, which has higher than average percentages of African-American residents and higher poverty rates than the United States as a whole. We assessed African-American and White private landowner awareness and responsiveness to State-sponsored wildland fire mitigation policies and programs. Other indicators of environmental awareness and engagement suggest that African-Americans rank lower than Whites on these measures in the South. We extend this research with a focus on awareness and responsiveness to wildland fire mitigation programming.

African-American landowners were more likely to be aware than White landowners of wildland fire mitigation programs, but less likely than Whites to use such information and less likely to engage in various other actions to reduce wildland fire threats to their property. In terms of constraints, African Americans who did not request mitigation information were more likely than Whites to say they did not do so because they did not know the information was available. However, African Americans were less likely to say lack of trust prevented them from requesting information. Overall, findings did not suggest that Black Belt African-American landowners were disadvantaged with respect to either information awareness or acquisition; but results should be taken with caution given that nonrandom sampling was used for some data collection with the African-American sample.

Keywords: African-American landowners, Black Belt, poverty, wildfire mitigation, wildland-urban interface.

Introduction

The Southern Black Belt¹ spans a geographical region descending from Virginia through the Carolinas and into Louisiana and east Texas (Rankin and Falk 1991, Wimberley and Morris 1997) (fig. 1). Booker T. Washington coined the

¹The Black Belt comprises 623 counties contained in 11 States of the former Confederacy: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia. The region holds 18 percent of the Nation's population (Allen-Smith and others 2000). These counties are mostly adjacent, although they span several States (Wimberley and Morris 1997).

descriptor at the turn of the 20th century, in reference to the region's fertile black soil. Since then, the term has come to define counties with African-American² populations at least equal to the national average (Allen-Smith and others 2000).³ In addition to demography, Webster and Bowman (2008) include other non-physiographic features such as economic, social, and political characteristics.

During the civil rights era, social and economic conditions in the South were highlighted by both grassroots and governmental efforts to end Jim Crow segregation. Forty years later, many would argue that the South as a whole is a different place, both economically and socially. However, conditions in persistently poor, rural Black Belt counties have not improved appreciatively. A study of Black Belt poverty commissioned by former Senator Zell Miller of Georgia found that in 2000, 13.6 million poor people lived in the South. This number represented 40 percent of total U.S. poverty, and this percentage is concentrated in the Black Belt (Carl Vinson Institute of Government 2002). During the 1990s, significantly fewer jobs were created in the Black Belt relative to other places in the South, and unemployment rates exceeded national averages (Gibbs 2003). Womack (2007) writes of the region: "By most definitions, the Black Belt is America's Third World....The relationship between this region and poverty is unmistakable, with 280 of the 444 persistent poverty counties being located there."

This investigation addresses Task 2 of the 2005 Joint Fire Science Program (JFSP) involving citizen knowledge and awareness of State-sponsored wildland fire mitigation programs. The JFSP was established in 1998 as an interagency project designed to fund research, development, and applications related to fire science. The JFSP is managed cooperatively between the U.S. Department of the Interior and the U.S. Department of Agriculture.

Our objective centers on African-American and White nonindustrial private forest (NIPF) landowners in selected counties across five States (Alabama, Florida, Georgia, Mississippi, and South Carolina) in the rural Black Belt.

²African American and Black are used interchangeably.

³Rankin and Falk (1991) offer a more conservative definition, specifying the Black Belt as those counties with a black population of 33 percent or more.

The Black Belt: Percentage of Black population in U.S. counties

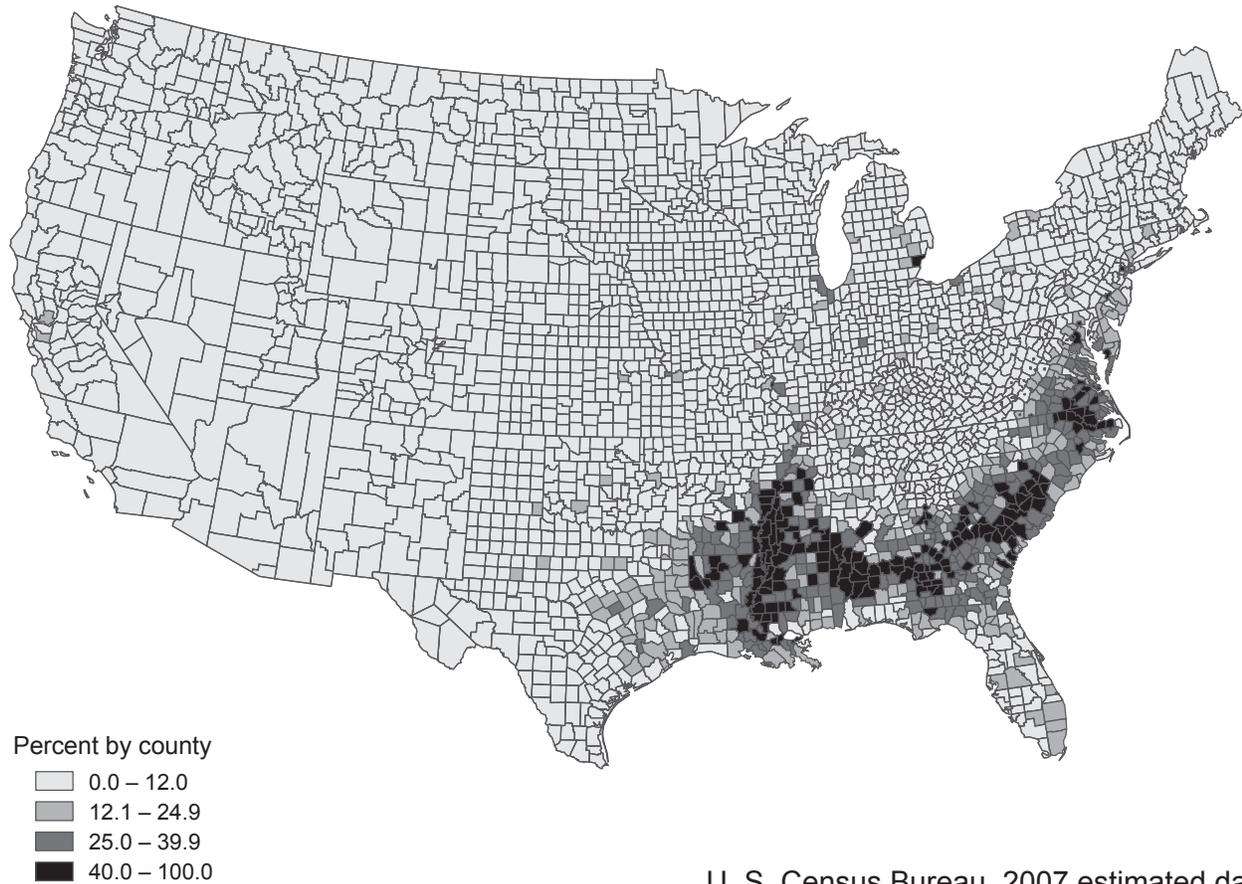


Figure 1—The Black Belt: percentage of Black population in the U.S.

To address the objective, we compared African-American and White landowner awareness and responsiveness to State-level wildland fire mitigation policies and programs in rural Black Belt counties. The audience for this publication is researchers, State and Federal fire managers, and policymakers.

Just over 71 percent of total forest land in the United States is in the South (Smith and others 2001). NIPF landowners hold 79 percent of all private timberland in the South (Wicker 2002). This figure represents about 140 million acres. The largest group of rural, minority landowners in the region is African-American (Wicker 2002). Table 1 shows that in 2003 roughly 1.7 million acres of NIPF, family-owned forests in the South were held by 121,000 African Americans. This represents a very small amount when compared to private land ownership by Whites. In terms of acreage, the ratio of African-American, family-owned forests to White, family-owned forests in the South is roughly 1 to 64.

Racial comparisons of mitigation policy and program awareness in the rural Black Belt command attention because of continuing social well-being gaps between African Americans and Whites in the region (Dyer and Bailey 2008, Dyer and others 2009, Zabawa 1991). According to Gibbs (2003), the poverty rate for Black Belt African Americans is three times the rate of White Black Belt dwellers; also, White poverty is lower in the Black Belt compared to other rural areas of the country. Moreover, research shows that predominantly African-American communities tend to have fewer environmental goods and services than White communities, and African Americans are more likely than Whites to cite lack of information about environmental resources as a reason for not engaging with these resources (Taylor 2000, Taylor and others 2007).

Southern Wildfire

Wildland fire behavior in the South varies depending on forest ecosystems (Monroe and others 2002). In marshes, swamplands, and bottomland hardwood stands fire is rare.

Table 1—Number of family-owned forests in the South and in the United States (excluding Alaska and Hawaii)

Description	Area		Ownership	
	South	United States	South	United States
	<i>(thousand acres)</i>		<i>(thousand)</i>	
Race				
White	111,874	230,688	3,924	9,345
Black or African American	1,754	1,945	121	144
American Indian/Alaska Native	732	965	41	51
Asian	196	463	8	36
Native Hawaiian/Pacific Islander	225	307	24	58
Other	244	1,042	16	47
Two or more races	2,652	5,675	146	356
No answer	9,883	20,554	304	656
Ethnicity				
Hispanic or Latino	513	1,718	38	143
Non-Hispanic/Latino	110,948	228,767	4,056	9,467
No answer	16,097	31,154	489	1,073

Source: National Woodland Owner Survey 2002-2003. <http://www.ncrs.fs.fed.us/4801/national-programs/woodland-owners>.

Fire occurs more often in pine and oak forests. Importantly, the South accounts for the largest number of wildland fires by region (National Interagency Fire Center, n.d.). In 2007, 50 percent of all wildland fires reported in the nation occurred in the South; in 2006, more than one-half of all reported wildland fires in the Nation were in the South, and 42 percent of all large wildland fires reported were in this region (Andreu and Hermansen-Báez 2008).

Historically, fire was central to the formation of southern forest ecosystems. Native Americans used prescribed fire regimes to manage wildland fires before the arrival of nonindigenous people. Early European settlers adopted these practices to help manage the landscape. The advent of plantation agriculture, turpentine/naval stores operations, logging, and railroad encroachment shifted the focus of southern landscapes from pine forests to agricultural lands (Monroe 2002). Since the 1930s, when agricultural products ceased to be the region's primary economic output, fire suppression efforts have been put in place to aid forest recovery. As a result, fuel buildup in southern forests has produced the opposite effect. The 1998 Florida wildland fires demonstrated that southern forests and adjacent communities are not immune to wildland fire devastation (Macie and Hermansen 2002).

Wildland-Urban Interface and Fire in the South

The climatic and biophysical features conducive to wildland fire in the South demand even greater attention when one considers the expanding wildland-urban interface (WUI) across the region. The WUI represents areas where human

settlement intersects with wildlands. The South is still predominantly rural and contains 40 percent of the Nation's farms, but the southern landscape is rapidly changing. The South contained 8 of the 10 fastest growing counties in the Nation, in terms of percentage population increase from 2006 to 2007 (U.S. Census Bureau 2009). Population growth increases demand for housing and other development, much of which is occurring on lands directly adjacent to wildlands. Population growth in the WUI increases the likelihood of wildland fire ignition caused by humans (Macie and Hermansen 2002). People contribute to 93 percent of all wildland fires in the South (Southern Group of State Foresters 2005).

Less densely populated rural areas of the Black Belt are also important to consider in wildland fire mitigation and containment. These areas may not coincide with the expanding WUI⁴ but have the added disadvantage of high poverty rates. In the West, non-WUI rural areas often contain communities with high poverty rates but less capacity for wildland fire mitigation compared to more densely populated WUI areas (Lynn and Gerlitz 2006). WUI expansion, typically lead by affluent migrants seeking aesthetic woodlands, has been criticized as an action that creates inequalities among lower and upper income groups (Collins 2008). WUI expansion can increase wildland fire risk for both those groups moving into the WUI and also for traditional settlements of lower income groups that may live either in the WUI or in adjacent non-WUI areas

⁴Black Belt counties coterminous with WUI counties are located in coastal South Carolina, southeastern North Carolina, and southern Mississippi (Stewart and others 2003).

(Collins 2008). Importantly, inequalities can arise in cases where middle and upper income groups are able to insulate themselves from potential wildfire losses by purchasing insurance or demanding fire services. These buffers are less likely to exist for lower income groups.

Fire-prone conditions in the South, when coupled with historical patterns of social inequity and poverty in the Black Belt, raise questions about residents' vulnerability to wildland fire and about resident engagement with wildland fire mitigation programs and policies. The following sections discuss project objectives with reference to the literature on heir property and cultural responses to wildland fire perception and mitigation. We then state research hypotheses, describe the methodology used to address our hypotheses, present analyses, and discuss findings.

Citizen Knowledge and Awareness of State-Sponsored Wildland Fire Mitigation Programs

The Forest Service's Interim Strategic Public Outreach Plan (2000) indicated that African American forest landowners (most of whom reside in the South) see themselves as underserved or underrepresented landowners. This perception relates, in part, to historical discrimination patterns practiced by governmental agencies. Federal agencies are now attempting to better serve minority populations. Little information exists, however, regarding minority groups' understanding about or participation in wildland fire mitigation programs, or about how they may differ from other minority or majority landowners in the region (Gan and others 2003). In a study of African-American forest landowners in two Alabama Black Belt counties, Gan and Kolison (1999) found that fire prevention and protection were the most needed kinds of technical assistance for this group.

Another situation that complicates land stewardship for southern African Americans is the predominance of heir property or tenancy in common (Dyer and others 2009, Mitchell 2001). When freed slaves purchased or were deeded land after slavery, they commonly treated the land as communal property within the family. In many cases, land was passed to subsequent generations without having been probated. This has occurred over successive generations. Mitchell (2001) reports that 41 percent of African-American-owned land in the Southeastern United States is heir property, although Dyer and others (2009) caution that accurate estimates of heir property have likely not been determined. This type of dispersed ownership makes it more difficult for residing landowners to follow best management practices for fire resistance or other purposes because of conflicts between residing and absentee landowners.

With respect to racial, ethnic, and cultural variation in attitudes about wildland fire, a limited number of studies

suggest minorities have less knowledge than Whites about mitigation techniques or information sources for wildland fire protection. In a national study, Bowker and others (2005) found African Americans to be less knowledgeable than Whites about basic wildland fire information, to have less supportive attitudes about the usefulness of wildland fire for ecological maintenance, and to indicate less trust in governmental agencies for managing wildland fire. More recently, Bowker and others (2008) found that African Americans indicated less trust than Whites in land management agencies charged with reducing wildland fire threats.

Hypotheses

Based on the foregoing discussion, we propose the following research hypotheses:

- H₁:** Black Belt African Americans are less likely than Black Belt Whites to be aware of wildland fire mitigation policies and programs.
- H₂:** Black Belt African Americans are less likely than Black Belt Whites to request wildland fire mitigation information.
- H₃:** Black Belt African Americans are less likely than Black Belt Whites to receive wildland fire mitigation information.
- H₄:** Black Belt African Americans are less likely than Black Belt Whites to use wildland fire mitigation information.
- H₅:** Black Belt African Americans are less likely than Black Belt Whites to take "other" actions to reduce wildland fire threats to their property.
- H₆:** Black Belt African Americans are more likely than Black Belt Whites to cite barriers to requesting wildland fire information.

Methodology

To evaluate the study hypotheses, we obtained data from several sources. We first contacted State forestry agencies in Alabama, Florida, Georgia, Mississippi, and South Carolina to ascertain what type of wildland fire mitigation and education program the agency sponsored. Information about various Federal, State, and interagency fire education programs was also obtained online at the respective State forestry agency Web sites and collectively at www.forestencyclopedia.com. We used information from these databases in addition to directly contacting State forestry agency personnel.

The survey contained questions relating to: (1) awareness of State-level wildland fire hazard mitigation programs and

policy; (2) experience with and perception of wildland fire occurrence and other natural disturbances; (3) receipt and use of information about wildland fire mitigation policies and procedures; (4) requests for mitigation information and reasons for lack of requests; (5) landowner sources of information about mitigation; (6) preferred sources of information; (7) landowner actions taken to reduce wildland fire hazards; (8) preferences for State remediation of wildland fire threat; and (9) landowner interest in and awareness of biomass.

Data on land ownership characteristics were also solicited. These included amount of acreage owned, management objectives, whether land was classified as heir property, percentage of annual household income generated from land, whether respondents had a management plan for their land, and whether respondents lived on or personally managed their land.

Demographic data on land owner age, race, gender, education, and income level were also collected. The survey questions were developed in consultation with State foresters in each of the five States.

Data Collection

We collected data with two mail surveys, a telephone survey, and two face-to-face surveys. The sample was restricted to landowners with 10 acres or more of privately held land. Because of difficulties in obtaining responses from African Americans, we employed both random and nonrandom sampling techniques for this population. The nonrandom, face-to-face survey was used to obtain African-American responses because of extremely low African-American responses to a mail survey.

The first mail survey was administered by Texas A&M University from June 2007 to September 2007. The questionnaire was distributed to a randomly selected group of NIPF landowners in the selected counties (table A.1) in the five study States. The sampling frame for Florida, Georgia, and South Carolina landowners was county tax assessor rolls. We selected a random sample of 1,500 potential respondents from these listings (500 per State). A random sample of landowners from the Mississippi and Alabama counties was supplied by project collaborators who had previously administered surveys to landowners in the counties of interest in these States. Counties within the five study States were selected based on the percentage of the population that was African-American (≥ 25 percent), percentage of forest land area in the county (≥ 33 percent), and the amount of "State" acreage burned by wildland fire over the period 1999-2003⁵ (table A.1).

⁵Fire cause and acreage calculated by year, State, and agency. Unpublished data. On file with the Southern Area Coordination Center, 1200 Ashwood Parkway, Suite 230, Atlanta, GA 30338. "State" incorporates all non-Federal acreage, including privately held land.

The Texas A&M survey was administered according to Dillman's (1978) Total Design Method, with three mailings that included an initial mailing of the survey followed by a postcard reminder and a second mailing to those who had not responded. The obtained sample size was 583 (24.7 percent response rate). This sample contained responses from only 44 African-American landowners (7.5 percent). Yet, the percentage of African-Americans in the counties we targeted ranged from 38.3 percent to 86.5 percent. We anticipated the need to augment the African-American sample with nonrandom sampling using either telephone or face-to-face methods. Past studies with African-American landowners have demonstrated the difficulty of obtaining adequate sample sizes from this population (Gan and Kolison 1999, Gan and others 2003).

A second data collection effort involved face-to-face interviews with African-American respondents. Two female, African-American interviewers were hired to administer surveys via a convenience sampling of attendees at three landowner conferences targeted to small landowners in the South: (1) the Federation of Southern Cooperatives Farmer's Conference (Albany, GA, February 2008); (2) Alcorn University/Mississippi Association of Cooperatives Small Farmers Conference (Natchez, MS, March-April 2008); and (3) the Federation of Southern Cooperatives/Land Assistance Fund Conference (Epps, AL, August 2008). The sample size was 98, with 76 African-American, two White, one Native American, and one Asian-American respondent. Eighteen respondents indicated no race. We used only those respondents identified as African-American in the analyses. Two limitations were associated with these data. First, they were obtained by nonrandom sampling. Second, the respondents could have resided in counties other than those with ≥ 25 percent African-American representation or ≥ 33 percent forest land cover.

A third effort to increase the number of Blacks in the sample was undertaken by the University of Florida (UF). This effort combined telephone and face-to-face interviews of landowners in four Florida counties (Gadsden, Hamilton, Jefferson, and Madison). These counties had been identified a priori as survey counties in Florida. Each met the criteria for inclusion in the study, in terms of percentage African American, amount of forest land area, and amount of State acreage burned by wildland fire. UF researchers worked through county extension agents in each county to obtain African-American landowner names and addresses. Interviewers then secured telephone numbers from the telephone directory in each county and contacted potential study participants either by phone or in person.

Because there were African-American landowners in the Florida counties who were unknown to the extension offices, UF researchers used cluster sampling to conduct face-to-face interviews at the respondents' residence. Researchers

identified random streets covering diverse sections of each county on county maps, and then every third house with an African-American landowner was selected for interviewing. The address was checked against the extension list to ensure that landowner had not already been contacted by phone. Household relationships were also confirmed to ensure no two households interviewed belonged to the same extended family. Of 92 African-American households contacted in all four counties (either by phone list or random house selection), 77 respondents participated in the study for an 83.6 percent response rate.

Finally, we supplemented the African-American sample with 57 observations from South Carolina. This data collection was conducted by Clemson University. The data were obtained in two ways. First, a mail survey was sent to a random sample of 250 potential respondents in Allendale, Bamberg, and Hampton Counties. These counties had also been identified as sampling areas at the beginning of the project, and each had the aforementioned qualities. The response rate was 42 percent, with eight African-American respondents. Again, a mail survey was not effective in providing an adequate African-American response rate. A second effort in South Carolina involved distributing 200 questionnaires through county extension agents to African-American landowners in Charleston, Lee, Sumter, Anderson, and Williamsburg Counties. These counties also had substantial rural populations with high concentrations of African Americans. The questionnaires were distributed nonrandomly and involved face-to-face interviews. We obtained a 24.5 percent response rate with 49 completed interviews.

Because of differences in sampling among the four datasets, we compared the African-American sample in the Texas A&M mail survey and the three supplementary African-American datasets in terms of gender, age, education, and income. The percent male for the Texas A&M mail survey was 67 percent, 63 percent for the face-to-face conference surveys, 57 percent for the UF survey, and 87 percent for the Clemson survey. The modal category of educational attainment was higher than a 4-year college degree for the Texas A&M mail survey; college for the conference surveys; and high school for the UF and Clemson samples. The modal income category was < \$30,000 for all samples. Mean age was 60 (Texas A&M), 58 (conference), 58 (UF), and 58 (Clemson).

These results indicated commonalities for income and age but larger variation for gender and education. We also recognized the potential bias, in terms of landowner awareness of wildland fire mitigation programs and policies, associated with a sample taken from attendees at conferences where the focus was landowner advocacy. Indeed, responses on a key indicator, awareness of wildland fire mitigation programs, indicated that a substantially

higher percentage of respondents in the face-to-face survey administered at landowner conferences was aware of at least one wildland fire mitigation program (75 percent). This compared to only 45 percent of African Americans in the mail sample, 56 percent for the UF sample, and 52 percent for the Clemson survey.

We acknowledge the potential biases in combining these datasets; however, we believe the commonalities contained in the data and the potential for learning about African-American landowners in the Black Belt outweigh any systematic differences that might be present. Furthermore, the difficulties of securing rural, African-American responses justify the inclusion of nonrandom data.

Statistical Analyses

We compiled descriptive statistics for gender, age, education, and income for the entire sample and for each racial group. We also examined bivariate associations between race and each of the following types of variables: (1) awareness of mitigation programs and policy; (2) experience with and perception of wildland fire occurrence and other natural disturbances; (3) receipt and use of information about wildland fire mitigation policies and procedures; (4) requests for mitigation information and reasons for lack of requests; (5) landowner sources of information about mitigation; (6) preferred sources of information; (7) landowner actions taken to reduce wildland fire hazards; (8) preferences for State remediation of wildland fire threat; and (9) landowner interest in and awareness of biomass.

The variable used to measure the dependent variable awareness (AWARE1) was derived by first composing an awareness index. The index consisted of the proportion of mitigation programs of which the average respondent was aware. The number and types of wildland fire mitigation programs varied by State although there may have been some overlap for certain programs.⁶ For instance, there were six programs in Georgia. If the respondent were aware of two of them, the respondent's awareness score would be 0.333. The second awareness variable (AWARE2) then dichotomized those scores into a binary variable. All non-zero scores were recoded as one for AWARE2; zero scores were kept at zero. AWARE2, which we used in the logistic regression analysis, was the proportion of respondents indicating awareness of wildland mitigation programs in each State (table A.2).

Other dependent variables (i.e., use of wildland fire mitigation information, receipt and request of wildland fire

⁶Because of variation in the number of mitigation programs across the five study States, "awareness" may not be comparable in different States (e.g., Georgia has only 6 mitigation programs while Florida has 13). An alternative would have been to analyze awareness for the individual States, but doing so would have resulted in unacceptably small sample sizes for the regression models.

mitigation information, and various other mitigation action) were coded as one if respondents had requested, received, or used information, or engaged in other mitigation practices. These variables were coded as zero if respondents had no engagement or interest.

A test of the null hypothesis that no significant differences existed between the African-American and White samples was performed with chi-square analysis, including Fisher's Exact Test for nominally coded variables with only two response categories (2 x 2 table). Independent sample t-tests were conducted for the continuous variables of age and percentage of income derived from rural land. Regretfully, the number of rural acres owned was omitted from the larger Texas A&M mail survey. Results for number of acres owned are presented only for respondents to the face-to-face conference survey, the UF survey, and the Clemson survey.

Logistic Regression Models

Logistic regression models were used to test for racial differences in wildland fire mitigation awareness, information use and request, receipt of wildland fire mitigation information, actions taken to reduce wildland fire threat, and barriers to information requests (Gujarati 1988). Logistic regression accounts for nominally coded response variables that take the form $Y = 1$ or 0 . The logistic equation gives the logit of the probability of an outcome, for example, the logit pertaining to awareness of wildland fire mitigation programs. The logit derives from the equation:

$$Z = b_1 + b_2x_2 + \dots + b_ix_i,$$

where

b_1 = the intercept

$b_2 \dots b_x$ = model parameters

x = explanatory variables

The probability for a positive response is given by:

$$P = 1/1 + e^{-Z}$$

where

e = the natural log

The probability of a respondent providing a positive response, or scoring 1 on the dependent variables was modeled as a function of eight independent variables. The dependent variables were: (1) awareness of wildland fire mitigation programs; (2) request of wildland fire mitigation information; (3) receipt of wildland fire mitigation information; (4) use of wildland fire mitigation information; (5) actions to reduce wildland fire threat; and (6) barriers to information request (e.g., not aware information available, no contact information, lack of trust in agencies providing information). Independent variables were coded as follows: race (1=African-American, 0=White); gender (1=female, 0=male); education (less than high school=1, high school

Table 2—Gender of survey respondents by race

Gender	African-American	White	Total
		<i>N</i> <i>percent</i>	
Female	77 (31.7)	152 (25.9)	229 (27.6)
Male	166 (68.3)	436 (74.5)	602 (72.4)
Total	243 (29.2)	588 (70.8)	831 (100.0)

$\chi^2 = 2.93$; (df=1) $p = .089$.

graduate or equivalent=2, college or technical school graduate=3, higher than 4-year college=4); whether one had experienced property loss resulting from wildfire (1=yes, 0=no); whether one believed property could be damaged by wildfire (1=yes, 0=no); whether one managed property (1=yes, 0=no); whether one lived on land (1=yes, 0=no); and whether one had a management plan for his or her land (1=yes, 0=no).

Results

The total number of rural, NIPF landowners was 903. Of these, 849 respondents provided racial/ethnic data. White respondents totaled 589; African American, 246; Native American, 8; and Hispanic, Asian American, and Other each contributed two respondents.⁷ Respondents not identifying as either African American or White were omitted from the analysis. The final sample size was 835, with 71.5 percent White and 29.5 percent African American.

Bivariate Analyses

Demographics—Table 2 shows that the overall sample was predominantly male, roughly 70 percent overall. Slightly < 70 percent of African-American landowners were male, and about 75 percent of White landowners were male. The sample was also composed of mostly older respondents (table 3). Mean age for the total sample and for Whites was 61; it was slightly lower for African Americans at about 59.

In terms of educational attainment, the most pronounced racial differences appeared in the highest and lowest education categories. About 13 percent of African Americans did not have a high school diploma compared to only 2 percent of Whites, and 18 percent of African Americans had post-baccalaureate education compared to Whites with 28 percent (table 4). Percentages for high school completion and college or technical school completion were more comparable.

⁷The percentage of non-Black minority groups in these States owning substantial acreage would likely be too small for analysis.

Table 3—Mean age percentage of survey respondents by race

African-American	White	Total
<u>M</u> =58.6 (s.d.=14.1)	<u>M</u> =61.6 (s.d.=12.3)	<u>M</u> =60.7 (s.d.=12.9)
<u>N</u> =198	<u>N</u> =466	<u>N</u> =664

M=mean; s.d.=standard deviation; t=2.6; (df=331) p=.009.

We found extreme differences in terms of income for African Americans and Whites (table 5). Close to one-half of African Americans reported annual household income of < \$30,000, but only about 11 percent of Whites did so; and roughly 30 percent of Whites claimed income at \$120,000 or more compared to only 4 percent of African Americans. The two groups were more similar in the middle income category of \$50,000 to \$69,000, but African-American income decreased sharply after this category. White income was distributed more evenly over the upper income categories. African-American and White responses were statistically different for three of the four demographic variables, although age differences were minimal in substantive terms.

Land management—Table 6 contains results for general land management strategies. Overall, 78 percent of landowners said they personally managed their land. Significantly more African Americans than Whites indicated this was the case (89 percent compared to 73 percent). About 55 percent of landowners said they had no management plan. Only about one-third of African Americans had a plan, compared to about one-half of Whites. Also, about

60 percent of landowners said they lived on their land. Close to 80 percent of African Americans lived on their land, but only about one-half of Whites. No significant racial differences were found in terms of whether the respondent's land was heir property. However, these results should be taken with some caution as the survey did not define heir property.

Table 7 shows that, on average, about 13 percent of respondents' household income derived from their rural land. African Americans received 12 percent of household income from their land on average, and Whites received about 13 percent. However, the median percentage of income from land was only 1 percent overall, zero for African Americans, and 2 percent for Whites. The frequency distribution for this variable showed that no household income came from the land for roughly 46 percent of respondents.

Land use—Table 8 contains results for land use categories. The most common use was growing timber (52 percent), followed by farming and recreation (43 percent and 42 percent, respectively), and other (34 percent). Significantly more African Americans than Whites indicated farming as a land use; growing timber, recreation, and other uses were mentioned significantly more by Whites. About twice as many Whites as African Americans used their land for growing timber and recreation.

The demographic, land management, and land use analyses show that proportionately more White males than African-American males responded to the survey, but proportionately more African-American females than White females participated. On average, Whites were older than

Table 4—Education of survey respondents by race

Education	African-American	White	Total
		<u>N</u> percent	
Less than high school	32 (13.4)	11 (1.9)	43 (5.3)
High school graduate or equivalent	82 (35.0)	176 (30.6)	258 (31.9)
College or technical school	77 (32.9)	229 (39.8)	306 (37.8)
Higher than 4 year college	43 (18.3)	160 (27.8)	203 (25.1)
Total	234 (28.9)	576 (71.1)	810 (100.0)

$\chi^2=52.4$; (df=3) p<0.0001.

Table 5—Annual household income of survey respondents by race

Income	African-American	White <i>N</i> percent	Total sample
< \$30,000	96 (44.7)	58 (11.3)	154 (21.2)
\$30,000-\$49,000	46 (21.4)	89 (17.4)	135 (18.5)
\$50,000-\$69,000	38 (17.7)	80 (15.6)	118 (16.2)
\$70,000-\$89,000	17 (7.9)	72 (14.0)	89 (12.2)
\$90,000-\$111,999	10 (4.7)	68 (13.3)	78 (10.7)
\$120,000 or more	8 (3.7)	146 (28.5)	154 (21.2)
Total	215 (29.5)	513 (70.5)	728 (100.0)

$\chi^2=140.3$; (df=5) $p<.0001$.

African Americans. African Americans had lower education levels than Whites, and there were substantial differences in household income levels. African Americans indicated more personal involvement in land management, as they were more likely to manage their land directly and to live on their land. Whites appeared to have more formal land management arrangements, as indicated by the greater likelihood in this group for land management plans.

The following sections present bivariate analyses related to race and wildfire mitigation perception, information preferences, and actions. Dependent variables included: (1) landowner experience and perception of wildland fire occurrence and other natural disturbances; (2) landowner preventive actions and preferences for State remediation of wildland fire threat; (3) landowner sources of information about mitigation and source preferences; (4) landowner interest in and awareness of biomass; and (5) incentives to encourage mitigation participation.

Wildland fire and other natural disturbances—Table 9 shows that just under 30 percent of respondents said that wildland fire had burned on their land. The percent of landowners indicating they had experienced a wildland fire occurrence was approximately 31 percent for Whites but only 20 percent for African Americans. About 20 percent of African Americans and 30 percent of Whites reported that either they or someone they knew had experienced property loss resulting from wildland fire in the past 10 years

(table 9). Significant differences between Whites and African Americans were found for both these questions. Roughly equal percentages of Whites and African Americans believed their land could be damaged by wildland fire (table 9). About three-quarters of Whites said their land had been struck by a hurricane (table 9), about 46 percent had beetle infestations, and 34 percent said their land had been damaged by some other natural disaster. Significantly lower percentages of African Americans indicated experience with these three types of disturbance.

Landowner actions taken to prevent wildland fire and preferences for State mitigation—Table 10 shows that Whites were more likely to say they had done “nothing” to reduce wildland fire threats on their land but were more likely to say they had implemented “other” actions than those listed in the survey. In terms of the State providing mitigation action (table 11), higher percentages of African Americans than Whites indicated the State should control excess vegetation (57 percent versus 38 percent), provide fire risk education for property owners (66 percent versus 53 percent), or provide low cost insurance (55 percent versus 37 percent). About 30 percent of White landowners, compared to 14 percent of African Americans, indicated the State should do something “other” than one of the actions listed in table 11.

Table 6—Land management responses from survey respondents by race

Land management	Response	African- American	White	Total
		<i>N</i> ----- percent -----		
Do you personally manage your rural land? $\chi^2 = 23.7$; (df=1) $p \leq 0.0001$	Yes	210 (88.6)	423 (72.9)	633 (77.5)
	No	27 (11.4)	157 (27.1)	184 (22.5)
	Total	237 (29.0)	580 (71.0)	817 (100.0)
Do you have a management plan for your rural land? $\chi^2 = 11.9$; (df=1) $p \leq 0.001$	Yes	86 (36.0)	270 (49.3)	356 (45.2)
	No	153 (64.2)	278 (50.7)	431 (54.8)
	Total	239 (30.4)	548 (69.6)	787 (100.0)
Do you live on this land? $\chi^2 = 49.8$; (df=1) $p \leq 0.0001$	Yes	190 (79.2)	305 (52.7)	495 (60.4)
	No	50 (20.8)	274 (47.3)	324 (39.6)
	Total	240 (29.3)	579 (70.7)	819 (100.0)
Is this heir's property? $\chi^2 = 0.9$; (df=1) $p \leq 0.3503$	Yes	117 (48.8)	242 (44.9)	359 (46.1)
	No	123 (51.3)	297 (55.1)	420 (53.9)
	Total	240 (30.8)	539 (69.2)	779 (100.0)

Table 7—Mean percentage of income from land for survey respondents by race

African- American	White	Total sample
<u>M</u> =12.0 (s.d.=22.8)	<u>M</u> =13.1 (s.d.=24.3)	<u>M</u> =12.7; (s.d.=23.9)
Median 0.0	Median 2.0	Median 1.0
<u>N</u> =214	<u>N</u> =512	<u>N</u> =726

M = mena; standard deviation; t-.59; $p > 0.56$.

Table 8—Land use responses from survey respondents by race^a

Land Use	Response	African-	White	Total
		American		
		<i>N</i>		
		-----percent-----		
Timber	Yes	79 (32.9)	349 (59.8)	428 (51.9)
	No	161 (67.1)	235 (40.2)	396 (48.1)
	Total	240 (29.1)	584 (70.9)	824 (100.0)
Farming	Yes	137 (56.6)	215 (36.9)	352 (42.7)
	No	105 (43.4)	368 (63.1)	473 (57.3)
	Total	242 (29.3)	583 (70.7)	825 (100.0)
Recreation	Yes	55 (23.0)	291 (49.8)	346 (42.0)
	No	184 (77.0)	293 (50.2)	477 (58.0)
	Total	239 (29.0)	584 (71.0)	823 (100.0)
Other	Yes	68 (27.8)	215 (36.8)	283 (34.1)
	No	177 (72.2)	369 (63.2)	546 (65.9)
	Total	245 (30.0)	584 (70.5)	829 (100.0)

^a What do you use this land for?

Mitigation information sources and preferences—

Table 12 presents sources for wildland fire mitigation information. Overall, State forestry agencies (37 percent), State or county extension agents (35 percent), and family or friends (33 percent) were the sources most frequently cited for this kind of information. Results also suggested White landowners were more reliant than African Americans on informal channels for obtaining mitigation information. Significantly higher percentages of Whites relied on family/friends (37 percent versus 22 percent), developed their own fire protection methods (32 percent versus 11 percent), asked neighbors/community members for help (31 percent versus 14 percent), or used the Internet (26 percent versus 9 percent). A higher percentage of African Americans than Whites referenced State or county extension agents (42 percent compared to 33 percent). The greater tendency of White landowners to seek informal information sources is consistent with our results showing relatively lower trust levels Whites have in State agencies providing this information.

White landowners were significantly more likely than African Americans to prefer the Internet or “other” information sources, and African Americans were somewhat more likely to prefer workshops hosted by professionals (table 13).

Biomass awareness and interest—A short paragraph explaining biomass and its potential uses for energy was included in the survey. After reading the explanation, respondents were asked whether they were aware of land assistance or incentive programs in their State that encouraged biomass removal. About one-fifth of landowners said they were aware of State biomass removal programs (table 14). Significantly more Whites were aware (23 percent) than African Americans (13 percent). Overall, close to 60 percent of respondents said they would be interested in obtaining more information about such programs (table 14). Seventeen percent were uncertain. Seventy-one percent of African Americans indicated interest in these programs, while just over 50 percent of Whites were interested.

Table 9—Natural disturbance responses from survey respondents by race

Disturbance	Response	African- American	White	Total
		----- <i>N</i> ----- -----percent-----		
Has wildfire ever burned on your rural land? $\chi^2 = 11.1$; (df=2) p=0.004	Yes	49 (20.2)	182 (31.1)	231 (27.9)
	No	177 (72.8)	358 (61.2)	535 (64.4)
	Don't know	17 (7.0)	45 (7.7)	62 (7.5)
	Total	243 (29.4)	585 (70.7)	828 (100.0)
Have you or anyone you know lost property as a results of wildfire in the past 10 years? $\chi^2 = 7.3$; (df=2) p=0.026	Yes	51 (20.9)	175 (30.0)	226 (27.3)
	No	182 (74.6)	382 (65.4)	564 (68.1)
	Don't know	11 (4.5)	27 (4.6)	38 (4.6)
	Total	244 (29.5)	584 (70.5)	828 (100.0)
Do you believe your rural land could be damaged by wildfire? $\chi^2 = 4.35$; (df=2) p<0.114	Yes	183 (75.6)	412 (72.7)	595 (73.6)
	No	44 (18.2)	133 (23.5)	177 (21.9)
	Don't know	15 (6.2)	22 (3.9)	37 (4.6)
	Total	242 (29.9)	567 (70.1)	809 (100.0)
Has your rural land been hit by hurricane? $\chi^2 = 59.2$; (df=2) p<0.0001	Yes	91 (37.1)	380 (74.5)	449 (63.9)
	No	153 (62.7)	130 (25.5)	254 (36.1)
	Total	244 (29.5)	584 (70.5)	828 (100.0)
Has your rural land been hit by beetles? $\chi^2 = 78.6$; (df=2) p<0.0001	Yes	28 (11.4)	233 (45.7)	258 (36.7)
	No	216 (88.2)	277 (54.3)	445 (63.3)
	Total	244 (29.5)	584 (70.5)	828 (100.0)
Has your rural land been hit by some other natural disaster? $\chi^2 = 50.5$; (df=1) p<0.0001	Yes	25 (10.2)	200 (34.3)	225 (27.1)
	No	220 (89.8)	384 (65.8)	604 (72.9)
	Total	245 (29.6)	584 (70.5)	829 (100.0)

Table 10—Landowner actions to reduce wildland fire threat by race^a

Mitigation action	Response	African-	White	Total
		American	<i>N</i>	
			----- percent -----	
Construct fire line $\chi^2 = 2.4$; (df=1) $p \leq 0.139$	Yes	87 (35.4)	242 (41.1)	329 (39.4)
	No	159 (64.6)	347 (58.9)	506 (60.6)
	Total	246 (29.4)	589 (70.6)	835 (100.0)
Purchase fire insurance $\chi^2 = 0.03$; (df=1) $p = 0.873$	Yes	69 (28.1)	162 (27.5)	231 (27.3)
	No	177 (71.9)	427 (72.5)	604 (72.3)
	Total	246 (29.5)	589 (70.5)	835 (100)
Remove unwanted trees and shrubs $\chi^2 = 0.25$; (df=1) $p < 0.643$	Yes	104 (42.3)	238 (40.4)	342 (41.0)
	No	142 (57.7)	351 (59.6)	493 (59.0)
	Total	246 (29.5)	589 (70.5)	835 (100.0)
Nothing $\chi^2 = 39.3$; (df=1) $p \leq 0.0001$	Yes	39 (20.1)	236 (45.8)	275 (38.8)
	No	155 (79.9)	279 (54.2)	434 (61.2)
	Total	194 (27.4)	515 (72.6)	709 (100.0)
Other $\chi^2 = 30.4$; (df=1) $p \leq 0.0001$	Yes	14 (8.2)	169 (28.8)	183 (24.2)
	No	156 (91.8)	418 (71.2)	574 (75.8)
	Total	170 (22.5)	587 (77.5)	757 (100.0)

^a What things have you done to prevent wildfire on your rural land?

Table 11—State actions to reduce wildland fire threat to private homes by race^a

Roles	Response	African-	White	Total
		American		
		<i>N</i>		
		----- percent -----		
Remove, burn, or otherwise control excess growth of trees, shrubs, vines $\chi^2 = 24.1$; (df=1) $p \leq 0.0001$	Yes	139 (56.5)	224 (38.0)	363 (43.5)
	No	107 (43.5)	365 (62.0)	472 (56.5)
	Total	246 (29.5)	589 (70.5)	835 (100.0)
Provide fire risk education for home and business owners $\chi^2 = 12.3$; (df=1) $p \leq 0.0001$	Yes	162 (65.9)	310 (52.6)	472 (56.5)
	No	84 (34.2)	279 (47.4)	363 (43.5)
	Total	246 (29.5)	589 (70.5)	835 (100)
Provide low cost insurance $\chi^2 = 22.6$; (df=1) $p \leq 0.0001$	Yes	134 (54.7)	217 (36.8)	351 (42.1)
	No	111 (45.3)	372 (63.2)	483 (57.9)
	Total	245 (29.4)	589 (70.6)	834 (100.0)
Other $\chi^2 = 22.9$; (df=1) $p \leq 0.0001$	Yes	35 (14.2)	177 (30.1)	212 (25.4)
	No	211 (85.8)	412 (69.9)	623 (74.6)
	Total	246 (29.5)	589 (70.5)	835 (100.0)

^aWhat roles do you think your State should play in reducing wildfire threats to your home?

Table 12—Information sources for wildland fire mitigation by race^a

Information source	Response	African- American	White	Total
		<i>N</i> ----- percent -----		
Family or friends $\chi^2=18.2$; (df=1) $p<0.0001$	Yes	52 (21.6)	217 (36.9)	269 (32.5)
	No	189 (78.4)	371 (63.1)	560 (67.6)
	Total	241 (29.1)	588 (36.9)	829 (100.0)
State or county extension agent $\chi^2=6.0$; (df=1) $p\leq 0.016$	Yes	101 (41.7)	193 (32.8)	242 (35.4)
	No	141 (58.3)	396 (67.2)	537 (64.6)
	Total	589 (70.9)	242 (29.1)	831 (100.0)
Federal forestry agency $\chi^2=1.86$; (df=1) $p\leq 0.185$	Yes	52 (21.5)	153 (26.0)	205 (24.7)
	No	190 (78.5)	436 (74.0)	626 (75.3)
	Total	242 (29.1)	589 (70.9)	831 (100.0)
Develop own fire protection methods $\chi^2=39.1$; (df=1) $p\leq 0.0001$	Yes	27 (11.2)	189 (32.1)	216 (26.0)
	No	215 (88.8)	400 (67.9)	615 (74.0)
	Total	242 (29.1)	589 (70.9)	831 (100.0)
Neighbors or other community members $\chi^2=26.7$; (df=1) $p\leq 0.0001$	Yes	33 (13.6)	182 (30.9)	215 (25.9)
	No	209 (86.4)	407 (69.1)	616 (74.1)
	Total	242 (29.1)	589 (70.9)	831 (100.0)
State forestry agencies $\chi^2=0.6$; (df=1) $p\leq 0.478$	Yes	85 (35.1)	224 (38.0)	309 (37.2)
	No	157 (64.9)	365 (62.0)	522 (62.8)
	Total	242 (29.1)	589 (70.9)	831 (100.0)
Internet $\chi^2=30.4$; (df=1) $p\leq 0.0001$	Yes	22 (9.1)	155 (26.3)	177 (21.3)
	No	220 (90.9)	434 (73.7)	654 (78.7)
	Total	242 (29.1)	589 (70.9)	831 (100.0)

^a Where do you typically get information about wildland fire protection?

Table 13—Landowner preferences for wildland fire mitigation information by race^a

Information source	Response	African- American	White	Total
		<i>N</i> ----- percent -----		
Conversation with professionals $\chi^2 = 0.9$; (df=1) $p \leq 0.363$	Yes	128 (52.2)	287 (48.7)	415 (50.2)
	No	117 (47.8)	302 (51.3)	419 (49.8)
	Total	245 (29.4)	589 (70.6)	834 (100.0)
Internet $\chi^2 = 14.2$; (df=1) $p \leq 0.0002$	Yes	42 (17.1)	175 (29.7)	217 (26.0)
	No	203 (82.9)	414 (70.3)	617 (74.0)
	Total	245 (29.4)	589 (70.6)	834 (100)
Workshop hosted by professionals $\chi^2 = 3.9$; (df=1) $p \leq 0.054$	Yes	97 (39.6)	191 (32.4)	288 (34.5)
	No	148 (60.4)	398 (67.6)	546 (65.5)
	Total	245 (29.4)	589 (70.6)	834 (100.0)
Information pamphlet $\chi^2 = 0.2$; (df=1) $p \leq 0.699$	Yes	97 (39.6)	243 (41.2)	340 (40.8)
	No	148 (60.4)	346 (58.7)	494 (59.2)
	Total	245 (29.4)	589 (70.6)	834 (100.0)
Other information source $\chi^2 = 34.2$; (df=1) $p \leq 0.0001$	Yes	13 (5.3)	130 (22.1)	143 (17.2)
	No	232 (94.7)	459 (77.9)	691 (82.9)
	Total	245 (29.4)	589 (70.6)	834 (100.0)

^a If you contact forestry professionals about managing your land, what kind of information is best for you?

Table 14—Biomass awareness and interest by race

Biomass awareness and interest	Response	African-	White	Total
		American	N ----- percent -----	
Are you aware of any landowner assistance and incentive programs in your state that encourage biomass removal? $\chi^2=9.9$; (df=1) $p \leq 0.002$	Yes	32 (13.1)	132 (22.7)	164 (19.9)
	No	212 (86.9)	449 (77.3)	661 (80.1)
	Total	244 (29.6)	581 (70.4)	825 (100.0)
Would you be interested in learning more about forest biomass and bioenergy production? $\chi^2=21.5$; (df=2) $p < 0.0001$	Yes	173 (70.9)	310 (53.6)	483 (58.8)
	No	44 (18.0)	154 (26.6)	198 (24.1)
	Don't know	27 (11.1)	114 (19.7)	141 (17.2)
	Total	244 (29.7)	578 (70.3)	822 (100.0)

Twenty-seven percent of Whites had no interest, compared to 18 percent of African Americans, and about 20 percent of Whites were uncertain compared to 11 percent of African Americans. The data suggested Whites approached this issue with more caution than African Americans.

Incentives to encourage household-level wildland fire mitigation—We asked those who said they did nothing to protect their land from wildland fire risk what incentives might encourage them to do so. Table 15 shows that more African-American landowners would be encouraged by technical assistance for fire protection and State or Federal cost-sharing measures and the ability to sell biomass. African Americans were also more likely to say some “other” incentive would encourage them to begin fire prevention practices.

Logistic Regression

Awareness—Table 16 shows roughly equal proportions of respondents who were either aware or not aware of wildland fire mitigation programs, about 52 percent compared to 48 percent (See row titled percent of “yes” responses). African Americans were significantly more likely than Whites to be aware of at least one wildland fire mitigation program. This result was similar to the finding of Jarrett and others (2009), who found greater awareness among African American landowners compared to Whites. The principal difference between Jarrett and others (2009) and the present study is the inclusion of more African-American responses and the explicit objective of examining the association between wildfire risk and race.

Respondents who had experienced a property loss were more likely than those who had not had such a loss to be aware of these programs. Interestingly, those who believed their property could be damaged by wildland fire were less likely to be aware. Also, those who managed their own land were less likely to be aware, but those with a management plan were more likely to be aware. The odds of a African-American respondent being aware of a mitigation program was about 3.3 times that of a White respondent.⁸

Information requests—About 22 percent of respondents had requested information about wildland fire mitigation (table 16). Similar to the awareness model, those with knowledge of property losses from wildland fire and those with a management plan were more likely to request information. Also, respondents who believed their property could burn and those who managed their own land were less likely to request information.

Receipt of wildland fire mitigation information—About one-third of respondents had received information about wildland fire mitigation programs (table 16). Those with a property loss were more likely than others to get this information, the odds being roughly 1.9 to 1 that those with property losses would receive this information. Those who managed their land were less likely to get information, while those who lived on their land and those with a management plan were more likely to receive information.

⁸The odds ratio is the probability of a positive response for the dependent variable divided by the probability of a negative response.

Table 15—Incentives to encourage household-level wildland fire mitigation by race^a

Actions to encourage mitigation	Response	African-	White	Total
		American	$\frac{N}{\text{percent}}$	
Technical assistance for fire protection $\chi^2 = 10.8$; (df=1) $p \leq 0.001$	Yes	27 (71.1)	100 (42.4)	127 (46.4)
	No	11 (28.9)	136 (57.6)	147 (53.7)
	Total	38 (13.9)	236 (86.1)	274 (100.0)
State or federal cost-sharing for taking preventive measures $\chi^2 = 3.93$; (df=1) $p \leq 0.05$	Yes	23 (59.0)	99 (42.0)	122 (44.4)
	No	16 (41.0)	137 (58.1)	153 (55.6)
	Total	39 (14.2)	236 (85.8)	275 (100.0)
Ability to sell removed biomass from land $\chi^2 = 0.978$; (df=1) $p \leq 0.385$	Yes	20 (51.3)	101 (42.8)	121 (44.0)
	No	19 (48.7)	135 (57.2)	154 (56.0)
	Total	39 (14.2)	236 (85.8)	275 (100.0)
Other $\chi^2 = 18.2$; (df=1) $p \leq 0.0001$	Yes	35 (89.7)	126 (53.4)	161 (58.6)
	No	4 (10.3)	110 (46.6)	114 (41.5)
	Total	39 (14.2)	236 (85.8)	275 (100.0)

^a If you have not taken any measure to prevent fire on your land, which of the following would encourage you to begin fire prevention practices?

Information use—The sample size was reduced to 136 for those who said they had received mitigation information (table 16). Of these, just over 80 percent actually put it to some use. African Americans were less likely than Whites to use wildland fire mitigation information. Also, those who managed their land were more likely than others to use this information.

Other action to reduce wildland fire risk—Although the chi-square analyses showed no significant racial differences for specified actions for reducing wildland fire risk (e.g., constructing a fire line, purchasing insurance, or removing unwanted vegetation), there were differences for a generalized “other” category. Accordingly, we modeled “other action” as the dependent variable. Again, African Americans were less likely to say they did anything besides the specified actions to reduce wildland fire risk. Also, those

who believed their property could be hit by wildland fire and those who managed their land were less likely to employ other actions. Landowners with property loss from wildfire and those with a management plan were more likely to do other things to prevent wildfire.

A second group of logistic models examined potential constraints faced by respondents when requesting wildland fire mitigation information (table 17). These included having no awareness of programs, not knowing whom to contact about information, and lack of trust in agencies providing this information. The models included only respondents who said they had not requested wildland fire mitigation information.

Information availability—African Americans who had not requested wildland fire information were more likely

Table 16—Logistic regression estimates: Wildfire mitigation awareness, information request, receipt, use, and other mitigation action

Parameter	Awareness		Information request		Information receipt		Use requested information		Other actions to reduce threats	
	MLE coeff.	Odds ratio	MLE coeff.	Odds ratio	MLE coeff.	Odds ratio	MLE coeff.	Odds ratio	MLE coeff.	Odds ratio
Percent of “yes” responses	51.8		21.8		32.8		83.0		22.8	
Intercept	0.39		-0.92 ^a		-1.28 ^b		1.61		0.10	
Black	1.20 ^b	3.32	-0.18	0.84	0.34	1.41	-1.59 ^b	0.20	-1.26 ^b	0.28
Female	-0.12	0.89	0.17	1.18	0.12	1.13	-0.34	0.71	-0.35	0.71
Education	0.15	1.16	0.16	1.17	0.04	1.04	-0.11	0.89	0.14	1.15
Property loss	0.49 ^b	1.64	0.90 ^b	2.47	0.65 ^b	1.91	-0.30	0.74	1.04 ^b	2.84
Believe burn	-1.18 ^b	0.31	-1.49 ^b	0.23	-0.29	0.75	-0.56	0.57	-1.82 ^b	0.16
Manage land	-0.94 ^b	0.39	-1.12 ^b	0.33	-0.81 ^b	0.45	1.26 ^a	3.53	-1.16 ^b	0.32
Live on land	0.18	1.20	0.31	1.36	0.45 ^a	1.57	0.22	1.25	-0.20	0.82
Management plan	0.79 ^b	2.20	0.93 ^b	2.54	1.29 ^b	3.62	0.87	2.39	0.59 ^a	1.81
N =	728		634		585		136		658	
Model chi-square	142.48		150.45		79.54		16.44		221.63	
Significance level	<0.0001		<0.0001		<0.0001		<0.037		<0.0001	
Percent correct predictions	74.7		80.0		71.2		74.4		84.6	

MLE = Maximum likelihood coefficient.

^a $p \leq 0.05$.

^b $p \leq 0.01$.

than Whites who had not requested such information to say they did not ask for information because they did not know it existed (table 17). Those with property loss were also more likely to name this constraint. Females and those who managed land were less likely to cite this constraint.

Contact information—A related constraint to information requests is lack of knowledge about appropriate persons or agencies to contact. No significant racial differences were found here (table 17). Those who had experienced property loss were more likely to say they were constrained by this factor, and those with a management plan were less likely to say they were constrained.

Lack of trust—African Americans were less likely than Whites to indicate lack of trust in agencies as a barrier to information requests (table 17). Also, those with a management plan were less likely to indicate trust.

Discussion and Conclusion

Recalling our research hypotheses, we can use the regression analyses to address each one:

H₁: Black Belt African Americans are less likely than Black Belt Whites to be aware of wildland fire mitigation policies and programs.

H₂: Black Belt African Americans are less likely than Black Belt Whites to request wildland fire mitigation information.

H₃: Black Belt African Americans are less likely than Black Belt Whites to receive wildland fire mitigation information.

H₄: Black Belt African Americans are less likely than Black Belt Whites to use wildland fire mitigation information.

H₅: Black Belt African Americans are less likely than Black Belt Whites to take other actions to reduce wildland fire threats to their property.

H₆: Black Belt African Americans are more likely than Black Belt Whites to cite barriers requesting wildland fire information.

Results did not support hypotheses one, two, and three but did support hypotheses four and five. We found mixed support for hypothesis six. This hypothesis was assessed with the three constraints to information request (i.e., not knowing about information availability, not knowing whom to contact, and not trusting public agencies providing information). Again, African Americans were more likely than Whites to say they did not request information because they did not know it was available. However, there were no racial differences for the contact constraint, and African Americans indicated more trust than Whites.

Table 17—Logistic regression estimates: Variables constraining information request

	Information availability		No contact information		Lack of trust	
Percent of “yes” responses	19.7		23.9		38.7	
Parameter	MLE coeff.	Odds ratio	MLE coeff.	Odds ratio	MLE coeff.	Odds ratio
Intercept	-0.78		-0.41		0.30	
Black	0.84 ^b	2.32	0.23	1.26	-2.27 ^b	0.10
Female	-0.78 ^b	0.46	-0.39	0.68	0.40	1.50
Education	0.02	1.02	0.04	1.04	0.19	1.21
Property loss	0.39 ^b	1.48	0.41 ^a	1.51	0.11	1.12
Believe burn	-0.22	0.80	-0.46	0.63	-0.45	0.64
Manage land	-0.89 ^b	0.41	-0.33	0.72	0.01	1.01
Live on land	0.14	1.15	0.02	1.02	-0.36	0.70
Management plan	-0.05	0.95	-0.73 ^b	0.48	-0.90 ^b	0.41
N =	493		493		493	
Model chi-square	31.05		25.80		94.45	
Significance level	<0.0001		<0.0011		<0.0001	
Percent correct predictions	67.5		63.1		73.9	

MLE = Maximum likelihood coefficient.

^a $p \leq 0.05$.

^b $p \leq 0.01$.

In terms of the trust variable, our results contrasted with the nationwide analyses of Bowker and others (2008). These authors showed that African Americans had less trust than Whites in the effectiveness of governmental agencies in managing wildland fire. The difference in results may have to do with sample differences. Bowker and others (2008) sampled the general U.S. population, whereas our data were specific to southern landowners. Still, we might expect southern rural African-American landowners to demonstrate a distancing from governmental agencies given recent controversies about discrimination by the U.S. Department of Agriculture (USDA) against African-American farmers in the South. African Americans have lost land over the past century due to various factors including northward migration, lack of understanding of the law, and also through various forms of discrimination. The 1997 class action law suit (Pigford versus Glickman) initiated by African-American farmers alleging systematic discrimination on the part of the U.S. Department of Agriculture exemplifies this latter problem.

Our sample included both non-farm landowners as well as farmers. Supplementary data obtained from two focus groups conducted with African-American landowners in Sumter and Dorchester Counties, SC, revealed an important

distinction between rural landowners who primarily farmed and those who held land for other purposes.⁹ In the farmer focus group, the discussion around land meanings and values focused almost singularly on issues of race and racism embedded in local branches of resource management and extension agencies. In stark contrast, discussion in the general landowner focus group centered more on landowners attempting to acquire more information about their land. Institutional racism was not raised by this group.

The overriding aim of this JFSP project was to examine awareness and engagement by historically marginalized groups in the Black Belt South with State-level wildland fire mitigation policies and programs. African Americans were actually more aware than Whites of State-level programs, and we found no differences for information request or receipt. The only variable suggesting African-American marginalization relates to information use; African

⁹Keenan Adams conducted two focus groups in Mayesville, SC, and Ridgeville, SC, on January 30, 2009 and February 6, 2009. The first session lasted 1 hour and 14 minutes and the second, 47 minutes. Open-ended data were solicited with phenomenological questioning (Moerer-Urdahl and Creswell 2004).

Americans who requested information were less likely than Whites to use it. Also, for the subsample that did not request information, more African Americans said lack of awareness of mitigation information was a barrier to requesting such information.

Overall, our findings do not suggest that Black Belt African-American landowners are disadvantaged with respect to either information awareness or acquisition. Our results should be taken with some caution because portions of the African-American sample were selected from small landowner advocacy conferences. Although the focus was not wildland fire mitigation, the fact that these landowners attended a land ownership conference suggested they may also be engaged with various kinds of land management and protection programs and policies.

As discussed, our study was limited by our ability to obtain an unobjectionable random sample from African-American landowners, although the African-American sample obtained may be defended. A related sampling limitation arises from the mixing of telephone and mail surveys for the African-American sample. In order for land management agencies to make the most use of the kinds of information solicited in this study, it would be helpful to provide comparisons for specific parts of a State or for communities within given counties. As the data are, they provide very general racial comparisons that may operate differently across the five States.

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Appendix

Table A.1—Percentage of African-American population and forest land area for sampled counties

Location	African-American ^a	Forest land ^b
	----- percent -----	
Alabama		
Greene	80.3	69
Hale	59.0	64
Marengo	51.7	72
Perry	68.4	78
Sumter	73.2	74
Florida		
Gadsden	57.1	77
Hamilton	37.7	74
Jefferson	38.3	75
Madison	40.3	74
Georgia		
Greene	44.4	80
Hancock	77.8	91
Taliaferro	60.3	87
Warren	59.5	84
Wilkes	43.1	76
Mississippi		
Adams	52.8	71
Claiborne	84.1	81
Copiah	51.0	77
Jefferson	86.5	79
Wilkinson	68.2	80
South Carolina		
Allendale	71.0	64
Bamberg	62.5	66
Hampton	55.7	71

Sample size for each State = 100.

^a U.S. Bureau of the Census. 2002. State and county quick facts. Washington, DC: Available online at <http://quickfacts.census.gov/qfd/states/01000.html>. [Date accessed: November 2004].

^b Forest statistics for the five States were consulted in the computation of these percentages. Forest statistics for Southern States are published through the Southern Forest Experiment Station in Asheville, NC and are also available online. See first principal investigator for exact reference.

Appendix

Table A.2—State-level wildland fire mitigation programs and policies

State	Agency	Program/Policy
Alabama	Alabama Forestry Commission	<p>Prescribed Burning or Fire Break Services:</p> <ul style="list-style-type: none"> • Fire prevention advice with burn permit • Firewise communities <p>Publication:</p> <ul style="list-style-type: none"> • “Firewise landscaping for woodland homes” • “Living with fire” • “Safety guidelines for woodland homes” <p>Internet:</p> <ul style="list-style-type: none"> • Fire prevention publications on Alabama Forestry Commission Web site (www.forestry.state.al.us) • Alabama Wildland Urban Interface councils • Alabama Wildfire Mitigation Program
	Alabama Rural Community Fire Protection Institute and Alabama Fire College	<p>Publication:</p> <ul style="list-style-type: none"> • “Learn not to burn”
	Alabama Cooperative Extension Service	<p>Course:</p> <ul style="list-style-type: none"> • Prescribed burning certification course <p>Internet:</p> <ul style="list-style-type: none"> • Private Forest Management Team Web site
Florida	Florida Department of Community Affairs	<p>Handbook:</p> <ul style="list-style-type: none"> • “Best development practices for wildfire mitigation in Florida”
	Florida Division of Forestry	<p>Prevention:</p> <ul style="list-style-type: none"> • Wildfire prevention clowns • Smokey Bear • Firewise communities • Prescribed burning or fire break services • Fire prevention advice with burn permit <p>Internet:</p> <ul style="list-style-type: none"> • Florida Risk Assessment System • Smoke screening tool • Forestry fire management <p>Other:</p> <ul style="list-style-type: none"> • Fire in Florida’s ecosystem (for teachers) • Living on the edge in Florida (CD) • Wildfire Risk Assessment Guide
	Florida Cooperative Extension Service	<p>Internet:</p> <ul style="list-style-type: none"> • Landscaping with Florida in mind
Georgia	Georgia Forestry Commission	<p>Firewise Program:</p> <ul style="list-style-type: none"> • Firewise mobile exhibit • Firewise Risk Assessment <p>Prescribed Burning or Fire Break Services</p> <ul style="list-style-type: none"> • Fire prevention advice with burn permit <p>Internet:</p> <ul style="list-style-type: none"> • Internet video: “Working Together for Safer Communities” <p>Other:</p> <ul style="list-style-type: none"> • Georgia National Fire Plan Mitigation Projects

continued

Appendix

Table A.2—State-level wildland fire mitigation programs and policies (continued)

State	Agency	Program/Policy
Mississippi	Mississippi Forestry Commission	Internet: <ul style="list-style-type: none"> • “The role of prescribed burning in managing your southern pine forest” • Prescribed burning or fire break services • Fire prevention advice with burn permit Firewise Program: <ul style="list-style-type: none"> • Teacher’s Wildfire Prevention Workshops • Firewise Community Workshop • Firewise Radio and TV public service announcements
South Carolina	South Carolina Forestry Commission	<ul style="list-style-type: none"> • “Living on the edge in South Carolina” community workshop Internet Fact Sheets: <ul style="list-style-type: none"> • “Fire and burning” information • “Firewise” information • “Protecting your home from wildfire” • “Your home in the line of fire” • Prescribed burning or fire break services • Fire prevention advice with burn permit • “How to have a firewise home” • “Think before you burn”

Johnson-Gaither, Cassandra; Gan, Jianbang; Jarrett, Adam [and others], 2011. Black belt landowners respond to State-sponsored wildland fire mitigation policies and programs. Gen. Tech. Rep. SRS-139. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 25 p.

This investigation focused on nonindustrial private forest (NIPF) landowners in selected counties across five States in the Southeastern United States (Alabama, Florida, Georgia, Mississippi, and South Carolina). These counties are located in the Southern Black Belt region, which has higher than average percentages of African-American residents and higher poverty rates than the United States as a whole. We assessed African-American and White private landowner awareness and responsiveness to State-sponsored wildland fire mitigation policies and programs. Other indicators of environmental awareness and engagement suggest that African-Americans rank lower than Whites on these measures in the South. We extend this research with a focus on awareness and responsiveness to wildland fire mitigation programming.

African-American landowners were more likely to be aware than White landowners of wildland fire mitigation programs, but less likely than Whites to use such information and less likely to engage in various other actions to reduce wildland fire threats to their property. In terms of constraints, African Americans who did not request mitigation information were more likely than Whites to say they did not do so because they did not know the information was available. However, African Americans were less likely to say lack of trust prevented them from requesting information. Overall, findings did not suggest that Black Belt African-American landowners were disadvantaged with respect to either information awareness or acquisition; but results should be taken with caution given that nonrandom sampling was used for some data collection with the African-American sample.

Keywords: African-American landowners, Black Belt, poverty, wildfire mitigation, wildland-urban interface.



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