



# *Seeing the Forest through the Trees*

Proceedings of the Sixth Longleaf Alliance Regional Conference  
November 13-16, 2006  
Tifton Campus Conference Center  
University of Georgia  
Tifton, GA



# Ichauway's Prescribed Fire Management Program 1994-2006: A Balanced Approach

Jonathan M. Stober<sup>1</sup> and Steven B. Jack<sup>1</sup>

<sup>1</sup>Joseph W. Jones Ecological Research Center, Ichauway, Newton, Georgia, 39870, USA

## Abstract

Ichauway, an 11,733 ha preserve in southwest Georgia, contains significant remnants of the fire dependent longleaf pine-wiregrass (*Pinus palustris*-*Aristida beyrichiana*) community. Prescribed fire is the principal forest management tool utilized at Ichauway for over 75 years. During the past 12 years the fire management program has documented all prescriptions and evaluations for all fire events. Fires are prescribed to meet specific objectives for each burn unit with an overall objective to burn 4,500-5,300 ha annually. Keystone objectives for every prescribed fire are safety, fire control, smoke management and resource protection. After each fire event fire extent and degree of crown scorch are mapped and placed in a GIS. Weather conditions, fire objectives, fire origin, containment, and subjective evaluations of fuel consumption, duff consumption, and woody plant top-kill are recorded for each burn. Stated fire objectives are often focused on fuel reduction and hardwood control, but can vary widely from educational demonstrations to wiregrass seed production. Typically 99% of all fire events are prescribed with containment median above 97% for over 1980 recorded fire events in the past 12 years. Two-thirds of the acreage is burned in the dormant season (before April) in a given year, and 87% of all prescribed fires occur with a KBDI value below 400. Overstory crown scorch averages 5% of area burned. Analyses of 11 years' data found crown scorch to be dependent on understory type, with 65% of all scorch occurring on wiregrass, 26% on oldfield and 5% on shrub-scrub groundcovers. By focusing on burn unit objectives and frequency rather than season of burn the fire management program has, over the past 12 years, consistently met the goal of burning 50% of Ichauway's landbase each year, including drought years. The current management strategy provides a balanced approach to meet objectives and sustain the ecosystem.

## Introduction

The frequent application of prescribed fire to Ichauway has created a property where high quality examples of native communities endure today. Prescribed fire is the one management tool that is uniformly applied across the entire property. The property contains more than 9,700 ha (24,000ac) of upland pine grassland habitats, with the remainder consisting of agricultural fields, wetlands, and riparian hardwood hammocks. The pine forest at

Ichauway was intensively harvested early in the 20<sup>th</sup> century and currently has basal area ranging from 9-15 m<sup>2</sup>/ha (40-60 ft<sup>2</sup>/ac) and higher with pines being widely spaced. Upland pine habitats at Ichauway are dominated by mature 75-95 year old longleaf pine and either a wiregrass or broom sedge (*Andropogon virginicus*) old field understory. Upland hardwood is generally localized to fire shadows around roads, field edges, fire breaks, wildlife food plots, old house sites and aquatic habitats.

The keystone objectives for every prescribed fire are safety, fire control, smoke management and protection of the resource. Each prescribed fire has specific objectives that guide the application and purpose for the fire which may include one or more of the following: fuel reduction and hardwood control, perpetuating fire dependent species and restoration, wildlife habitat management, research, education and demonstration, seedbed or planting preparation, wiregrass seed production, wetland management, boundary security, debris or slash burning, and hay production. The overall management strategy is to burn individual units on a 2-year rotation, but this can range anywhere from 8-months to more than 5-years depending on the location, objectives and conditions of the burn unit. A 2-year rotation helps to maintain fuel loading within a range that minimizes the risk and damaging effects of wildfire.

## Methods

At the beginning of the year a map (Figure 1) is given to the Natural Resource Manager that identifies the annual rough accumulation (fuel accumulation) for each burn unit. The Natural Resource Manager identifies and coordinates all prescribed fires on the property. Prescribed fires are executed with a team of 3-5 people, each having a two-way radio, using All-Terrain Vehicles outfitted with a drip torch and a water tank. Because current, accurate fire weather is so critical to planning and executing a successful prescribed burn, weather data are collected to help predict fire behavior. Each prescription records weather forecast information on the burn plan with information collected from on site weather stations and the Georgia Forestry Commission Fire Weather web site. Before a prescribed fire is ignited minimum weather conditions must be met or exceeded: transport winds >14kph (>9 mph), mixing height >520m (>1700ft) and smoke dispersion index >40.

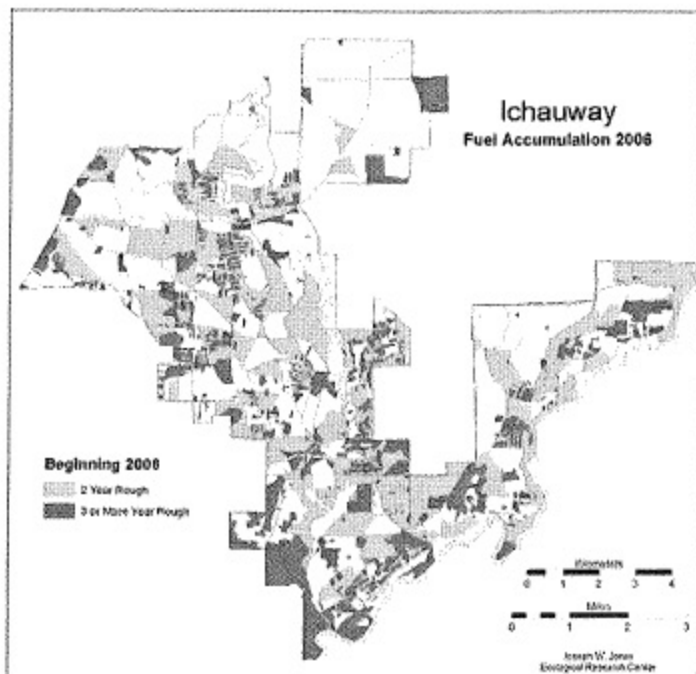


Figure 1: years or rough map (fuel accumulation) for 2006 with 2 and 3 or more years of rough mapped by burn blocks bounded by roads and firebreaks at Ichauway.

Approximately two weeks following the prescribed fire the effects of the fire are evaluated by recording the containment, origin, and assigning subjective classes for duff consumption, woody understory kill and vegetative fuel consumption. The extent of the fire and degree of crown scorch are mapped and entered into a Geographic Information System (GIS).

## Results and Discussion

Prescribed fire objectives most often include reducing fuel loads and controlling hardwoods. The principle ignition source for >99% of all fire events are prescribed with the remainder either jumps from adjacent properties or lightning strikes. Containment median is above 97% (ranges 83-99% between years) with almost all spot-overs contained during the fire. Since 2000 containment has improved with the removal of snags along burn unit boundaries. Using a subjective evaluation of fuel removed by the fire, on average 30% of the fires are categorized as "clean" meaning all fuel is removed with the remainder of the fires leaving "patchy" fuel beds with a median of 20% of the fuel remaining. Keeping the woody deciduous understory in shrub form is a primary goal of the prescribed fire program. Over the past six-years 80% of the burn units have achieved over 95% control of the woody understory contrasted with only 55% control from 1994-1999. The major factor controlling this difference is that the prescribed fires

from 1994-1999 were primarily fuel reduction fires to reduce duff accumulations so hotter maintenance fires could be subsequently introduced. Crown scorch of forested areas is divided into 5 categories: none, <1/3, 1/3-2/3, >2/3 but not all, and complete. The later three categories are mapped into a GIS. Crown scorch averages 5-6% of the total burned acreage each year. On average 58% of the crown scorch is in the 1/3-2/3 class, while the >2/3 and complete scorch classes average 38% and 4% respectively. Trends indicate that scorch has increased since 1994 and a greater proportion is scorched during the growing season. Crown scorch is also dependent on understory type with wiregrass more than twice as likely to result in scorched crowns.

Much debate surrounds the need for exclusive use of growing season prescribed fire in the southeast. Ichauway has been managed for over 75 years with March and April prescribed fires and has maintained and enhanced its fire maintained longleaf pine grasslands. It is the opinion of the Jones Center staff that fire frequency is more important than season of burn. Prescribed fires can occur any month at Ichauway but generally occur during the first seven months of the year, allowing vegetation time to recover before winter. Burn units are targeted by objective rather than season; that is, maintaining manageable fuel loads and desired future conditions for the burn unit drive the decision to burn. Increased frequency presents more opportunities to vary the season, weather and type of fire needed to move the burn unit toward maintenance condition.

Table 1: Total acreage burned during the dormant (October-March) and growing season (April-September) by year at Ichauway.

Year	Dormant Season	Growing Season	Total Acres	Percent Growing Season
2006	7765	5868	13632	43
2005	11332	2726	14058	19
2004	7054	4175	11229	37
2003	9822	3886	13708	28
2002	6830	3196	10026	32
2001	8734	2623	11356	23
2000	8796	2740	11535	24
1999	6294	2936	9230	32
1998	4943	5449	10393	52
1997	3153	4813	7966	60
1996	4994	5706	10700	53
1995	8199	2377	10576	22
1994	13473	1850	15323	12
Averages	7799	3719	11518	34

Weather patterns in the southeast dictate that the most consistent weather to control and perform prescribed fires occur from December through the end of March (Figure 2). Thus the majority of prescribed fires take advantage of these conditions in order to meet yearly objectives for acreage burned. After the end of March the drought index predictably increases and intensifies depending on spring and summer precipitation amounts. During the growing season as drought index values increase prescribed fires become more difficult to control and execute, especially if drought conditions occur and fuel loads are excessive. If management executed prescribed fires exclusively during the growing season weather conditions would dictate the acreage burned each year. When drought conditions occurred this would push the prescribed fire team further behind goals and result in increased fuel loads during the next growing season. Under the current management strategy at Ichauway an average of 34% of all burning is conducted during the growing season over the past 13 years (Table 1). Once fuel

loads were brought under control in 1994 and 1995 more growing season prescribed fire has been utilized. From 1999-2001 growing season burning was reduced due to the drought conditions in the region. The low acreage typically burned during May and June are due to the spring droughts that often suspend all prescribed burning in the region.

### Summary and Conclusions

Prescribed fire is embedded in Ichauway's culture. For over 75 years prescribed fire has actively been used as a land management tool. During each of the past 12 years our objective of placing prescribed fire on approximately 50% of the property has been achieved (Figure 3). The ability to consistently meet objectives is due to manpower and equipment being readily available to exploit weather opportunities when they occur. Despite drought conditions from 1999-2001 the prescribed fire program continued to meet its objectives by taking advantage of weather conditions as they occurred regardless of season. By burning frequently and not constraining management to growing season fires, fuel loads are kept in check, fires are kept under control and smoke is managed when conditions are optimal. This keeps the prescribed fire team setting prescribed fire rather than fighting wildfire. The current management strategy offers a balanced approach to meet objectives, accomplish goals and sustain an ecosystem. For more information

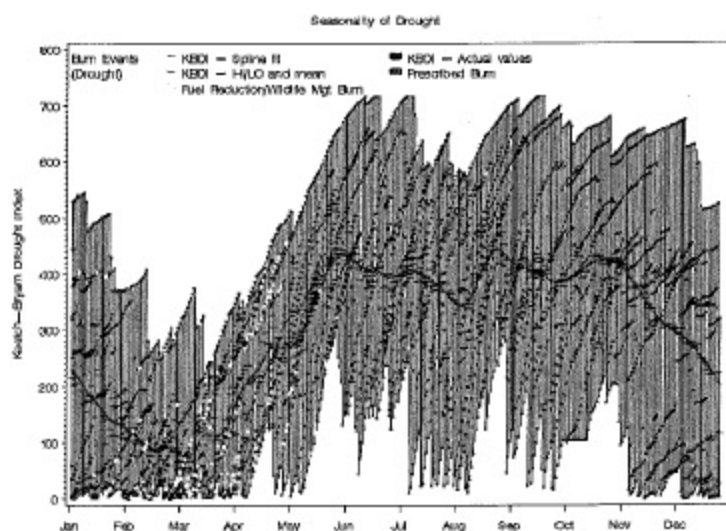


Figure 2: Summary of all KBDI values over the past 13 years for a calendar year are illustrated with a normalized trend line and all prescribed fires (red dots) occurring between 1995 and 2006. White dots indicated fires set for fuel reduction and wildlife management, particularly bobwhite quail management.

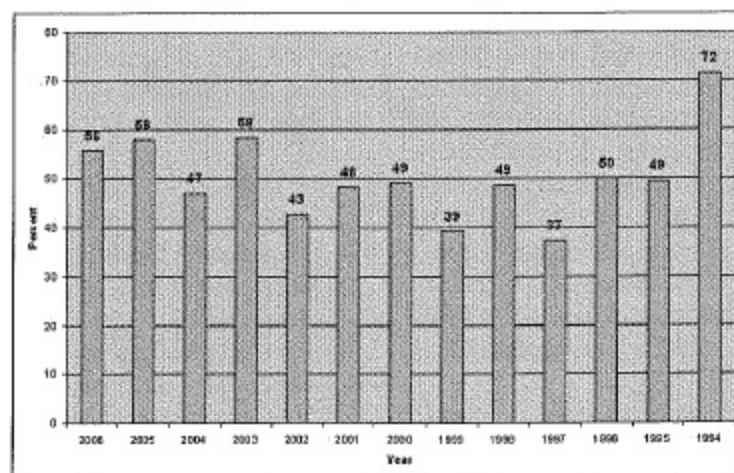


Figure 3: The percentage of prescribed fire acreage burned per year was based on a 5-year cumulative burn extent defined by burn mapping 1994-1998, 1999-2003 and the total cumulative extent thereafter divided by the total acreage burned for each year.