

### 3A.4 FIRE MANAGEMENT AT ARCHBOLD BIOLOGICAL STATION: BURNING TO PROMOTE HETEROGENEITY, CONSERVATION, RESEARCH, AND EDUCATION.

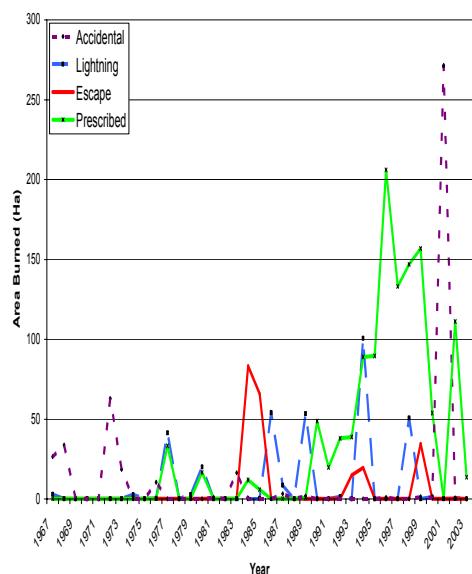
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Archbold Biological Station

We summarize fire management at Archbold Biological Station (Archbold), a non-profit institute dedicated to long-term ecological research and conservation in south-central Florida. The goals of Archbold's Fire Management Plan (Main and Menges, 1997) are: enhancing biological diversity, enhancing listed species, providing research and educational opportunities, and conducting safe burns. On an annual basis, 80-200 ha is burned under prescription, mainly during the lightning season from May to September.

Since 1967, a total of 210 fires have been documented at Archbold, ranging in size from <0.1 to 248.9 ha (Figure 1). For each

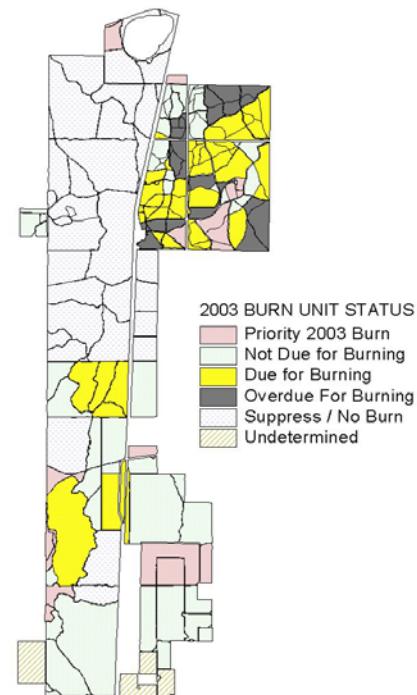
lightning-ignited or accidental fires, with a few key prescribed burns. From 1990 to the present, prescribed fires have accounted for 78.6% of all fires at the Station. Since 1984, escapes ( $n = 6$ ) from prescribed burns have accounted for 446.1 ha being burned. Lightning ignited fires are still common but have generally been suppressed because of location, extreme conditions or lack of suitable staff and equipment for control, thus seldom burning > 1 ha. Accidental fires have ranged between 0-4 per year and typically burned < 1 ha.

For prescribed burns, Archbold is divided into 176 burn units of varying size, and the status of each burn unit is updated annually based on the fire-return interval (Figure 2).



**Figure 1.** Fire history at Archbold Biological Station.

fire, we record spatial extent (ARCGIS coverage, now using Trimble GPS to map borders) and intensity (4 intensity levels). Overall, 115 of the fires were prescribed burns, 64 were started by lightning, 25 were accidental, and 6 were escapes from prescribed burns. Prior to 1990, the majority of the fires (87.8%) at Archbold were



**Figure 2.** Map showing burn units that are not due for burning, due for burning, overdue for burning in 2003. Areas designated as suppress / no burn indicate areas where long term research is being conducted.

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The fire management plan is built around six modal fire-return intervals (2-5 years for sandhill, swales, and cutthroat flatwoods; 6-9 years for most flatwoods and for seasonal ponds; 6-9 and 10-19 years for scrubby flatwoods; 10-19 years for hickory scrub; 20-59 years for rosemary scrub; 20-59 and 60-100 years for sand pine scrub; and 60-100 years for bayhead swamp). Each burn unit is annually categorized as being **not due (1)** if the unit has been burned within or before the modal fire-return interval, **due (2)** if the unit has not been burned within the modal fire-return interval, or **overdue (3)** if the unit has not been burned beyond the assigned modal fire-return interval for burning using an Excel spreadsheet. The plurality of land area for each vegetation type is used as the target for the modal fire-return interval for a given burn unit, although wide variation is included because of the complex landscape mosaic within and among burn units.

We conducted a GIS analysis showing the current fire status of each burn unit (as of 2003) and vegetation type (Table 1) and evaluated

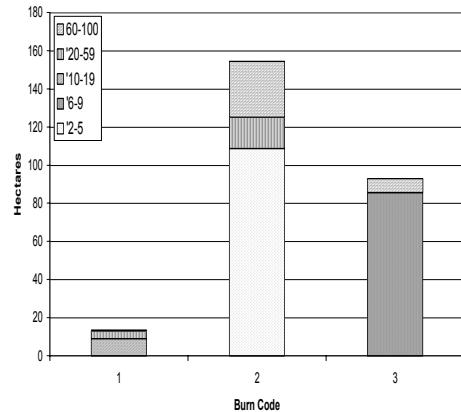
BURN CODE	1	2	3
Pine Flatwoods	59.03%	20.64%	20.34%
Scrubby Flatwoods	61.99%	18.33%	19.68%
S. Ridge Sandhill	5.20%	59.17%	35.63%
Sand Pine Scrub	16.81%	60.80%	22.39%
Rosemary Scrub	67.43%	28.54%	4.02%

**Table 1.** Percentage of major fire-dependent communities at Archbold Biological Station that are: (1) not due for burning, (2) due for burning, and (3) overdue for burning.

whether we have met fire return intervals targets. Some vegetation types remain behind in burning such as sandhill and sand pine scrub accounting for > 60% of each habitat as being due or overdue for burning (Figures 3 and 4). Due to long periods of fire suppression on Red Hill in the northeast section of Archbold Biological Station, many burn units in this area are due or overdue for burning. Most of these burn units contain sand pine scrub, southern ridge sandhill, or combinations of both natural communities. Most of the northeast section was last burned in 1927 from a wildfire. Many of the burn units that contain sand pine scrub are in the 60-100 modal fire return interval and will not be overdue until 2028. The spatial configuration of burn units selected each year for prescribed burning is a function of research and management goals as

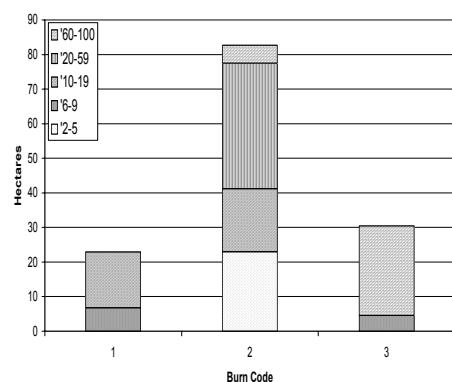
well as logistical constraints. To bring the overdue burn units on Red Hill up to date, many small burns will have to be conducted over a period of many years.

Southern Ridge Sandhill



**Figure 3.** Area (Ha) of sandhill at Archbold Biological Station that are not due (1), due (2), or overdue (3) and modal fire-return interval for sand pine scrub.

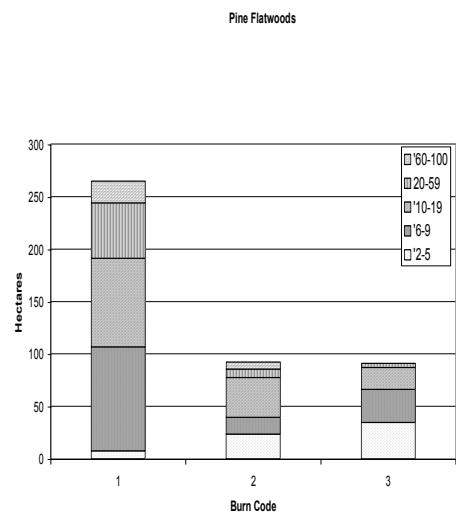
Sand Pine Scrub



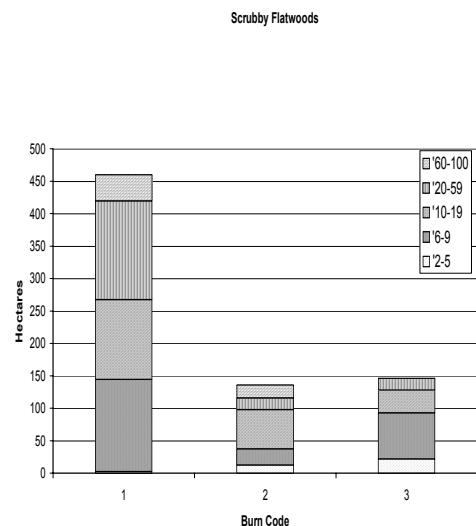
**Figure 4.** Area (Ha) of sand pine scrub at Archbold Biological Station that are not due (1), due (2), or overdue (3) and modal fire-return interval for sand pine scrub.

Other fire dependent communities such as pine flatwoods, scrubby flatwoods, and rosemary scrub account for > 60% being burned before or within the modal fire-return interval (Figures 5-7). Pine flatwoods and scrubby flatwoods constitute the majority of the natural communities at Archbold Biological Station and are dominant on

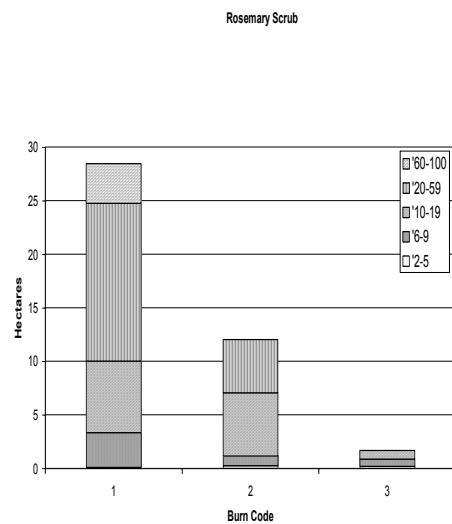
the west section and Hicoria Tract in the southeast corner of the Station. Rosemary scrub occurs in scattered islands primarily on the west side of the Station, but is very important because it supports many rare plants. In addition, a large (260 ha), intense 2001 accidental fire is causing us to adjust burning plans and postpone burning in adjacent areas of the landscape for conservation and research purposes.



**Figure 5.** Area (Ha) of pine flatwoods at Archbold Biological Station that are not due (1), due (2), or overdue (3) and modal fire-return interval for sand pine scrub.



**Figure 6.** Area (Ha) of scrubby flatwoods at Archbold Biological Station that are not due (1), due (2), or overdue (3) and modal fire-return interval for sand pine scrub.



**Figure 7.** Hectares of rosemary scrub at Archbold Biological Station that are not due (1), due (2), or overdue (3) and modal fire-return interval for sand pine scrub.

Archbold's fire management has been successful in providing habitat for endangered species, providing research and educational opportunities, providing heterogeneity in fire regimes over our landscape, and providing conditions where lightning-ignited and accidental fires can be more easily absorbed. The plan is flexible in that it uses modal fire-return intervals instead of a fixed number of years.

#### Acknowledgements

Warren Abrahamson, Jim Layne, and Ron Myers were responsible for setting the precedent on prescribed burning at Archbold. Numerous researches (permanent Station staff and visiting scientists) have produced valuable scientific information on many species of flora and fauna over the last 30+ years that has helped formulate the use of prescribed fire as a land management tool at Archbold. Kevin Main and Eric Menges compiled 30+ years of information and research to write Archbold's most recent fire management plan in 1997.

#### Literature Cited

Main, K. N., and E. S. Menges. 1997. Fire Management Plan. Archbold Biological Station. Land Management Publication 97-1. Archbold Biological Station, Lake Placid, Florida. 95+ pages.