

BARBERVILLE CONSERVATION AREA

Mitigation Bank

RESTORATION AND MANAGEMENT PLAN

Phase 1

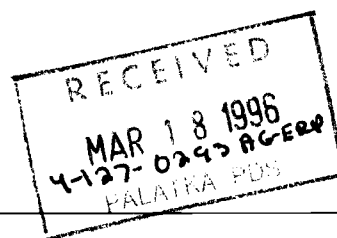


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1.0 SITE BACKGROUND INFORMATION

1.1 HISTORY

Volusia County is the owner in fee simple of a ±1449 acre tract, located in the northwestern area of the County in the St. Johns River watershed (Figure 1). The area has been known as the Barberville Conservation Area (BCA) since the County acquired ownership. Over the years, the BCA has been used for purposes of slash pine production, wetlands logging and pasturage. Such historic agricultural land management practices have served to change the natural wetland and pine flatwoods communities originally present on the site. Historic species diversity has been sacrificed, and major segments of both upland and wetland flora lack diversity in age.

The property is subject to influent flow from ditches to the central cypress wetland area, which capture a good portion of the runoff from U.S. Highway 17 to the east. Another ditch conveys stormwater from areas to the west into the central wetland. The wetland itself discharges to the south through a ditch connected to a culvert under S.R. 40. An additional outfall exists in the southwest corner, consisting of a culverted crossing of S.R. 40 which connects to a ditch draining the southwest quarter of the site. Both outfalls have had ditch blocks installed in a partially successful hydroperiod restoration effort. The penultimate receiving water for these outfalls is the Lake Woodruff National Wildlife Refuge and ultimately the St. Johns River.

Most of the wetland areas have been logged at least once, as long as 40 or 50 years ago. Within the last ten years, some of the wetland communities have been harvested and probably high graded, with most of the trees having been removed. High-grading involves the logging of larger and better quality trees, leaving a stand of inferior trees. This harvesting method discriminates against shade-intolerant species and results in a less diverse, slower growing stand of shade-tolerant species. Much of the former pine flatwoods on the BCA have been converted to dense stands of planted slash pine, which occurred less than 30 years ago. Approximately 5-7 years ago, a regeneration harvest was conducted throughout much of the forested upland portion

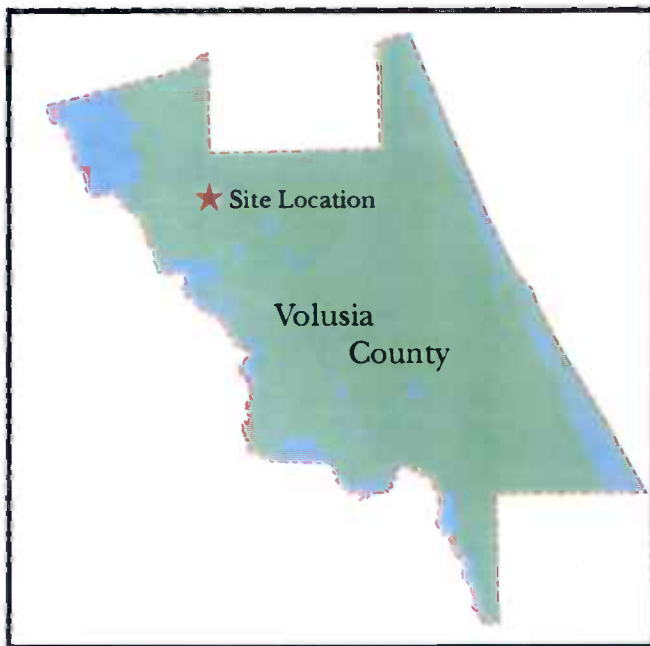


Figure 1
Barberville Conservation Area

of the BCA. Most of the mature timber was harvested except for selected seed trees.

Approximately 5-7 years ago, a regeneration harvest was conducted throughout much of the forested upland portion of the BCA. Most of the mature timber was harvested except for selected seed trees. Approximately 30 mature trees per acre were left in these areas. Natural regeneration of slash pine has proceeded vigorously. Currently, there are over 1,000 slash pine seedlings per acre.

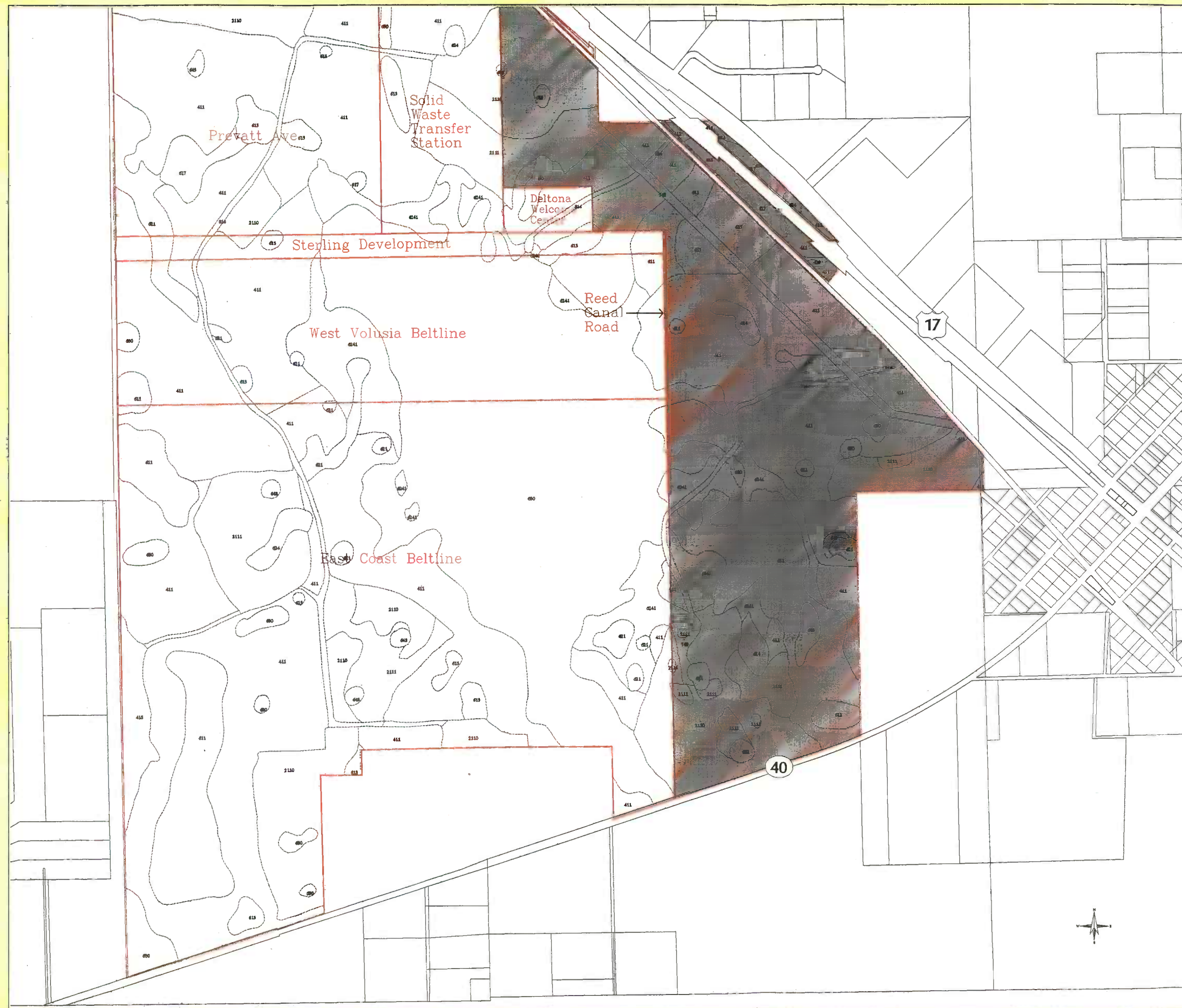
Approximately 245 acres of the BCA were cleared and planted with pasture grasses. During private ownership of the site, the pastures were well maintained by grazing and periodic burning. Sod production also occurred in these areas. Since 1992, the County has conducted periodic mowing and executed a control burn in the winter of 1994. Currently, the quality of planted pasture grasses is deteriorating and the pasture areas are being colonized by a significant amount of thistle, blackberry, briar, dog fennel, wax myrtle and slash pine.

1.2 EXISTING BCA MITIGATION OBLIGATIONS

Because the County intentionally acquired the BCA for conservation purposes, the County has made the BCA available to public and private interests that have required mitigation lands for projects located elsewhere in Volusia County. Conservation easements have been recorded to meet mitigation obligations for four county roadway or solid waste projects, for a private residential development and for a private commercial development located elsewhere in Volusia County. Approximately 366 acres of the tract remain unencumbered by any form of conservation easement. Figure 2 indicates the location of the existing easements encumbering the BCA. Tables 1 and 2 show the existing mitigation obligations encumbering the BCA, along with the related state permit numbers and the amount of original wetlands impact.

The upland restoration techniques proposed in this application are in addition to the requirements of past permit conditions which resulted in encumbering the BCA with conservation easements over $\pm$ 1083 acres. Upland management is an independent enhancing approach for the entire BCA, beyond the protective measures of the easements. Therefore, the proposed upland

management program is calculated to favorably impact 713.5 acres throughout the BCA, and mitigation credits should be issued accordingly.



EXISTING CONSERVATION EASEMENT AREAS	
PROPOSED CONSERVATION EASEMENT AREA	
TOTAL ACREAGE WITHIN THE CONSERVATION EASEMENT AREA.....365.82	
BUFFER ACREAGE.....10.86	WETLANDS ACREAGE.....144.66
	UPLANDS ACREAGE.....208.93
	POWERLINE EASEMENT ACREAGE.....12.23

PROPOSED CONSERVATION EASEMENT WITHIN THE BARBERVILLE CONSERVATION AREA MITIGATION BANK

FIGURE 2



Geographic Information Services
3/12/96 WR96124

MAP PREPARED BY:
VOLUSIA COUNTY DEPT.
OF ENVIRONMENTAL MGMT.
NATURAL RESOURCES DIV.

Table 1**Projects That Have Used The Barberville Conservation Area As Mitigation**

Project Name	State Impact (acres)	SJRWMD Permit No.	Date Issued	Date Expires	Mitigation Acreage	Conservation Easement (OR book-page #)
East Coast Beltline (Beville Road to Taylor Road)	26.5	MSSW 4-127-0093G	02/11/92	02/11/97	600	3765-2349
		MSSW 4-127-0093GM	*****	*****		
		MSSW 4-127-0093GM3	*****	*****		
		MSSW 4-127-0093GM4 (db)	07/07/92	07/07/97		
		WRM 12-127-0049AGM2	09/10/91	9/10/96		
West Beltline (Kepler Road to SR472)	9.02	MSSW 4-127-0126AGM3	10/13/92	10/13/97	204	3889-562
Stirling Chase	1.4	MSSW 4-127-0221A WRM 12-127-0086	08/11/92	08/11/97	33	3781-2606
Prevatt Avenue Roadway	6.9	MSSW 4-127-0176AG	08/10/93	08/10/98	161	3770-1680
Solid Waste Transfer Facility	3.2	MSSW 4-127-0240G WRM 12-127-0093G	03/09/93	03/09/98	72.5	3932-495
Deltona Welcome Center	4.3	General 40-127-0185	03/01/93	03/01/98	10	4035-2306
Reed Canal Road	0.12	Strmwtr 40-127-0255GW	07/03/95	07/03/2000	2.79	4035-2306

Table 2

Summary of Mitigation Activities Required by Permits for Each Tract on the BCA

1. East Volusia Beltline Roadway (600 acres)
 - Install 8 ditch blocks
 - Monitor vegetation
 - Monitor groundwater levels
 - Prohibit cattle grazing
 - Prepare upland management plan
 - Record Conservation Easement
 - Maintain pastures for Sandhill Crane
2. West Volusia Beltline Roadway (204 acres)
 - Record Conservation Easement
3. Stirling Chase (33 acres)
 - Record Conservation Easement
4. Prevatt Avenue (161 acres)
 - Restore 8 wetland acres
 - Prepare general management plan
5. Solid Waste Transfer Station (72.5 acres)
 - Record Conservation Easement
6. Deltona Welcome Center (10 acres)
 - Record Conservation Easemnt
 - Conduct prescribed burn
7. Reed Canal Road (2.79 acres)
 - Record Conservation Easement

2.0 GENERAL MANAGEMENT APPROACH FOR THE BCA

Given the current conditions of the site, the selected management approach is to restore and enhance the historical interrelatedness of upland and wetland areas on the Barberville tract. To resume the historic habitats and functions, a three-phase implementation program is proposed. In a sense, the site can be viewed as having a combination of white, black and gray characteristics. Largely because of the degree of understory fuel accumulation over the years, the upland areas must be addressed first, both for the immediate habitat improvement and to provide the ability to assess tasks that need to be undertaken in Phase II, which is to address wetlands enhancement measures for the site. Finally, the "gray" areas will be addressed in Phase III, establishing linkages between habitat zones and adjusting the boundaries of the work accomplished in Phases I and II to accommodate the natural processes that are established over time. The monitoring proposals for Phase I will help develop information as to whether any of the gray areas "prefer" upland or wetland management practices, which will then be implemented in Phase III.

2.1 MANAGEMENT GOALS

The goals of the conceptual portion of the comprehensive management plan are to be further refined as discussed below and in permit amendment proceedings during Phase II. The broad goals can be stated as follows:

1. To restore the historic upland and wetland regimes prior to silvicultural and pasturage activities on the Barberville Conservation Area tract.
2. To encourage and enhance diversity in ages and species of the native vegetation and of the vegetation planted as part of Phases I and II, while eradicating non-native or otherwise noxious floral species from the Barberville tract.
3. To retain the current populations of threatened and endangered plant and animal species, and species of special concern, that presently utilize the site, and to improve the attractiveness of the site for other such species.
4. To allow for limited recreational and scientific use.

3.0 PROPOSED MANAGEMENT PHASES

It is the proposal of this management plan to divide the management process into three (3) distinctive phases. Phase I will propose recording of a conservation easement to encompass the entire tract and restoration of the defined upland habitat. Phase II will propose the enhancement of existing wetlands. Phase III will determine the natural direction of the transitional areas and develop enhancement strategies for those areas.

3.1 PHASE I

Phase I will attempt to restore upland habitat types to recreate a longleaf pine/wiregrass habitat community. In conceptual terms, these sites would be harvested to remove existing mixed pine overstories and replanted with longleaf pine seedlings. A fire regime would be introduced and designed to provide the longleaf pine seedlings with a competitive edge at survival and to allow re-establishment of the wire grass understory. Harvesting of the overstory would be accomplished over a multiple year basis. Stands with existing longleaf pine would be selectively harvested to favor the existing longleaf pine and placed under a longleaf fire management regime. These stands would form the first approximation of a mature longleaf pine stand in the Barberville Conservation Area. Other pine stands would be treated in logical sequence to form blocks of upland management areas with differing age groupings. The objective is to create longleaf pine stands of varying sizes and ages to maximize habitat diversity within the upland communities.

It is anticipated that surrounding pines will contribute significant seed source to these upland stands. The management plan will be structured to favor establishment of the longleaf stands. However, it must be clearly understood that on-site conditions will dictate the ultimate stand makeup and that mixtures of longleaf, slash, and pond pine may result in certain areas. Management efforts in these upland stands will focus on establishing optimum conditions for establishment of longleaf/wiregrass communities but the natural course of species dominance will be accepted and accommodated as it naturally occurs.

Phase I will include a comprehensive burning program concentrating on establishing a natural fire regime and, ultimately, growing season burns, within the defined upland areas. However, the burning program will be expanded to include controlled burning programs into the wetland and transitional areas between the uplands and the wetlands.

The BCA Management Proposal will be seeking mitigation credits based on two (2) management actions proposed in Phase I:

1. We are anticipating 35 credits for establishment of the conservation easement on the ± 354 acres of the BCA not currently under easement.
2. We are anticipating 357 credits based on the habitat enhancement value of the proposed burning program and the habitat restoration plan for the upland areas within the BCA.

3.2 PHASE II

Phase II of this project will focus on the wetland component. It is anticipated that this phase will result in enhancement and preservation of existing wetland areas but will not result in substantial restoration of altered wetlands.

Phase II will require detailed hydrological studies of the area. As noted above, it is anticipated that most mitigation value in Phase II will be received due to enhancement of existing wetland areas. Removal of transitional and invasive species and management programs designed to enhance wetland species will be featured. Many of the wetland areas will not require enhancement; preservation of these areas will be the managerial objective.

Areas within the cleared pastures have been significantly altered from the original wetland state. The Phase II survey will determine if restoration opportunities exist in those areas. It is not expected that significant expansion of wetland boundaries will occur for restoration opportunities.

It should be clearly noted that the management plan featured for the upland areas is not dependent on Phase II. Any significant changes in hydroperiod or wetland boundaries will be absorbed in the transitional areas, Phase III of this proposal.

Upon completion of the Phase II planning effort, mitigation credit values will be negotiated with St. Johns River Water Management District staff.

3.3 PHASE III

Phase III of this project deals with the transitional zones between the wetland and upland habitat types. The goal of this phase of the project will be to define the habitat types that should exist naturally on these sites and reestablish and/or enhance those habitat types. No effort will be made to force a site to conform to a preconceived ideal; what exists naturally will be encouraged, enhanced, and integrated.

Fire management will be a component of this plan. As previously discussed, it is the applicant's intent to introduce fire into these stands as part of a comprehensive burning program for the BCA. It is anticipated that the burning activities themselves will establish the habitat trends that will be documented in the Phase III planning project and that mitigation credits will be issued for the enhancement activities that will occur.

Because the applicant is seeking credit only for the work proposed in Phase I for upland habitat restoration, only the specific implementation plan for Phase I is included in this application. The principles which the applicant intends to employ during Phases II and III are generally discussed above.

4.0 RECREATIONAL ACTIVITIES

Recreational elements which may be allowed on the BCA may include nature walks, wildlife observation, environmental education events and hunting through a private hunt club lease. Hunting will only be considered in light of the existing poaching problem and the need for additional site security. An added benefit of a controlled hunting lease will be accurate assessment of the status and health of the game populations which are expected to benefit from the proposed upland management. Because of the lack of information concerning the optimum conditions for the proposed longleaf/wiregrass community, it is also anticipated that there may be access requests for scientific study.

The existing 12 acre upland pasture located on the southeast corner of the property adjacent to County Road 3 will be used for parking for special permitted events and as a staging area for mitigation. Any proposed recreational use will be coordinated with the St. Johns River Water Management District mitigation staff to avoid any impacts to mitigation values.

All access to the BCA is subject to issuance of a permit by the Volusia County Land Manager. All such permits will be issued in strict accord with the BCA mitigation banking permit.

5.0 FIRE MANAGEMENT BENEFITS

Prescribed fire is essential in maintaining pine flatwoods or longleaf wiregrass communities in a sub-climax ecological condition and is vital for the reproduction of numerous ground cover plant species. Studies have shown a definite correlation between habitat diversity, wildlife production and prescribed fire. The diversity of plant and animal life increases when prescribed fires are utilized. The utilization of fire reduces fuel load and the potential for catastrophic fires, improves accessibility for wildlife migration, controls competing vegetation, improves and increases the quality, quantity and availability of herbs, legumes and browse material, thereby increasing wildlife habitat and therefore wildlife populations.

In addition to the goals and objectives for the utilization of fire, the following primary objectives include:

1. Reduction of hazardous fuels through the utilization of cool season burns.
2. Restoration and maintenance of habitat for native plant and animal species.
3. Creation of a vegetative mosaic by varying intensity, frequency and time of burns throughout the site.
4. Maintenance of natural transitions between vegetative types.
5. Reintroduction of lightning and growing season fire regimes.
6. Promotion and maintenance of the Longleaf Pine establishment.
7. Stimulation of the flowering of herbs and legumes.

The entire ecosystem of the BCA will benefit in biodiversity and productivity through the utilization of fire and long term management. Such benefits will be documented through the proposed monitoring program.

6.0 PLANT & WILDLIFE MANAGEMENT BENEFITS

6.1 WILDLIFE SPECIES ENHANCEMENT

6.1.1 PROTECTED WILDLIFE SPECIES

The Barberville Conservation Area is located within a Strategic Habitat Area identified by the Florida Game and Freshwater Fish Commission (FGFWFC) for preservation of threatened and endangered wildlife species. A GAP analysis performed by FGFWFC determined that some of the most important upland and wetland habitats in the state occur in the Ocala National Forest-Lake Woodruff region, including forested wetlands and mesic pinelands such as those located in the BCA.

Volusia County manages another piece of property in this region known as the Lake George Forest Resource and Wildlife Management Area. This area consists of 7,850 acres and is presently under similar management to that proposed for the Barberville Conservation Area. Within the Lake George site approximately 235 acres of pine flatwoods are selectively thinned each year. Also, 635 acres of pine flatwoods are prescribed burned each year. Due to these management activities, a significant increase in wildlife game population and threatened/endangered species has been observed.

Some of the protected wildlife species expected to occur in and benefit from similar management of the Barberville Conservation Area are described below.

6.1.1.1 Florida Black Bear (*Ursus americanus floridanus*)

The stability of the Ocala population of black bears is considered critical to preserving statewide genetic diversity. Dispersal of black bears from the Ocala National Forest into Volusia County has been documented. Within the thinned pine stands of Volusia County's Lake George Wildlife Management Area, approximately five individual Florida black bears have been observed.

The recent public acquisition of lands south and west of the BCA by the St. Johns River Water Management District provides a travel corridor from the Ocala National Forest and Lake George

directly to the BCA. All of the BCA contains suitable habitat for bears, primarily pinelands and forested wetlands. The mitigation bank property is just slightly smaller than the 2,500 acres of territory normally used by female bears. The BCA will be even more attractive as a corridor to black bears if wildlife underpasses are installed under SR 40 when it is widened.

The habitat management plans for the BCA should benefit black bears in several ways and increase the likelihood that they will disperse into the property. Regular prescribed burning of the pine flatwoods will encourage stable food production, primarily palmetto and other berries. Thinning of the planted pine stands improves foraging and movement ability. A 1,500 acre, roadless block of properly managed forest should prove attractive to these animals. The potential is considered very high that they will occur. Their presence would be one sign that the BCA is a successful project.

6.1.1.2 *Sherman's Fox Squirrel (Sciurus niger shermani)*

The fox squirrel prefers open pine woodlands with some hardwood species in the understory. Fox squirrels will benefit by regular fires which will maintain this open condition and increased hardwood diversity in the understory. Fox squirrels have migrated into the thinned and burned pine plantation stands on Volusia County's Lake George property. Since they are cavity nesters, they will also benefit from retaining snags during timber management operations.

6.1.1.3 *Florida Sandhill Crane (Grus canadensis pratensis)*

A pair of adult sandhill cranes has been observed at the BCA usually in the northeast section of the property near the pasture and power lines. Two juveniles were seen with the adults in the summer of 1994 indicating they may be nesting in marsh-like habitat along the maintained power line easement. Other groups of sandhill cranes have been observed foraging in the pastures throughout the property.

This species will also benefit from regular fires, especially in the pastures and open pinelands, where an increased herbaceous diversity is expected to increase food sources. Restoration of pastures into marshes by the eventual elimination of Bahia grass and recruitment of

wetland marsh species preferred by the cranes will also provide potential nesting areas for new breeding pairs. The average territory for an adult pair of sandhill cranes is 400 acres, so there is sufficient acreage at the BCA for at least 2 more breeding pairs. If substantial food is available, the likelihood is greater that all chicks will be adequately fed and will reach reproductive maturity. Normally one of the two chicks hatched succumbs to pressure from its stronger sibling.

6.1.1.4 Wood Stork (*Mycteria americana*)

Wood storks have been observed flying over the BCA. Their preferred colony habitat is present in the cypress swamps and feeding habitat in the marshes and ditches. They will also benefit by the restoration of pastures into marshes and the restoration and enhancement of cypress canopy in the forested wetlands. Preservation of these wetlands in the conservation easement offsets the greatest threat to this species, habitat loss.

6.1.1.5 Red Cockaded Woodpecker (*Picoides borealis*)

Colonies of this federally endangered bird are known to occur within five miles of the BCA near Lake Dias. This species is not currently present at the BCA because its preferred habitat condition depends on large, old growth longleaf pines. Regular prescribed fire and the resulting opening of the pine understory may provide foraging habitat for the nearby colony. Preservation of existing large pines and successful restoration of longleaf pine stands will eventually provide suitable colony habitat in 10-40 years. The target acreage for potential colony sites is 5-10 acres of old trees.

6.1.1.6 Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle population of the Lake George region is expanding. Active eagle nests have increased from 12 to 17 on the County's Lake George Wildlife Management Area since 1994. As with the red cockaded woodpecker, the preferred nesting trees of the bald eagle are not currently present at the BCA. Preservation of existing large trees and protection of the mature canopy will provide additional territory at the BCA for this expanding population.

6.1.1.7 Gopher Tortoises (*Gopherus polyphemus*)

Gopher tortoise burrows and one large tortoise have been observed in the southwest corner of the BCA in the cleared sand pine habitat. This species will benefit from regular fire which will increase the diversity of herbaceous forage. Other commensal species, such as the gopher frog and the Florida mouse, may also occur at the BCA because they have been observed during relocation projects in similar habitat elsewhere in Volusia County.

6.1.1.8 Eastern Indigo Snake (*Drymarchon corais couperi*)

This species prefers large patches of forest, both pine flatwoods and forested wetlands. Although never observed at the BCA, it probably occurs due to the amount of suitable habitat available. This species will continue to benefit from the protection of large blocks of forest and restoration of forest canopy in areas where it has been essentially removed.

6.1.2 NON-GAME WILDLIFE SPECIES

The proposed habitat management of the BCA will benefit many common species of non-game species, such as raccoon, opossum, bobcat and other small mammals. Migrating songbirds and raptors also utilize both the forested and open grassland habitats at the BCA. Interesting species that have been observed at the BCA include river otter, swallow-tailed kites, tree swallows, American bittern, great-horned owl, red tailed hawks, kestrels and woodpeckers. The latter two types of birds are cavity nesters and will benefit from retaining large trees and snags during thinning operations of the pine flatwoods. Other species will benefit from the expansion and protection of large blocks of forest with a mature canopy because they are sensitive to edge effects, road traffic and adjacent land uses.

6.1.3 GAME WILDLIFE SPECIES

The deer population has increased threefold at the Lake George Forest Resource and Wildlife Management Area since Volusia County actively started management in 1992. Originally, based upon track counts and night surveys, the deer population was estimated to be 1 deer per 400 acres. The County decided at that time no hunting would be allowed until the population

could reach a sustainable harvestable population. As of December 1995, the deer population was estimated to be 1 deer per 76 acres.

On the Lake George property, innovative harvesting, a hunting prohibition and prescribed fires have increased habitat diversity, improved the quantity and quality of herbs, legumes and browse material and eased accessibility for wildlife migration. We feel these same goals can be achieved on the BCA based upon our field observations and by understanding and accommodating the natural adaptations that will stabilize over time.

Wild turkey, quail and deer have all been observed at the BCA. Signs of these species occur throughout both upland and wetland habitats. Does with fawns and buck signs have both been sighted. Quail coveys and tracks of adults with young turkeys have also been observed. Therefore, even with dense pine plantations, these species are reproducing at the BCA and this productivity is expected to increase as herbaceous forage and protection from illegal hunting is increased through implementation of the mitigation bank management plan.

6.2 PLANT SPECIES ENHANCEMENT

6.2.1 THREATENED, ENDANGERED AND RARE PLANTS

The Volusia County land management staff has compiled a database of plant species specially designated by either the federal or state government due to diminishing populations which may occur within Volusia County. Databases compiled by the Florida Natural Areas Inventory (FNAI), the Florida Game & Freshwater Fish Commission, and US Fish & Wildlife Service were evaluated. Information from FNAI, the East Central Florida Regional Planning Council and a local consultant identified those species which occur in Volusia County's habitats.

The identification of each species has not been cataloged nor has a systematic survey been conducted at the BCA. However, based on the potential occurrence outlined in these databases,

the following summarizes the plant species that have the potential to occur at the BCA and their expected habitat associations.

6.2.1.1 *Endangered and Threatened Species*

	Federal/USFWS	State/FDACS
Endangered	1	17
Threatened	1	46
Total	2	63

6.2.1.2 *Habitat Associations for Endangered & Threatened Species (by number of species)*

Forested habitat (exclusive)	39
Open habitat (exclusive)	8
Both forested & open habitats	16

Upland habitat (exclusive)	24
Wetland habitat (exclusive)	18
Both upland & wetland habitats	21

Commercially Exploited Species	7
FNAI Rare Species	5

6.2.1.3 *Species Occurrences for All Endangered, Threatened, Commercially Exploited and Rare Species, by habitat*

Pine flatwoods, wet pine flatwoods	30%
Cypress & hardwood swamps	23%
Marshes, pastures & meadows	18%
Hammocks	18%
Sand Pine Scrub	11%

At least 63 species designated as endangered and threatened have the potential to occur at the BCA. Two species have been observed on the property, the pine lily (*Lilium catesbaei*) and the hooded pitcher plant (*Sarracenia minor*). Another endangered species, the fall-flowering ixia (*Nemastylis floridana*) has also been reported from the Barberville area. Three commercially exploited species are also known to occur at the BCA (coontie, royal fern, cinnamon fern) and four others have been observed in similar habitat elsewhere in the County (giant wild pine, needle palm, dahoon holly, scrub holly).

The habitat associations indicate that these plants are potentially distributed throughout the property under the right conditions. Over 50% of the species occurrences are within the two main habitat types, pine flatwoods and swamps. According to state and federal botanists, the plants associated with pine flatwoods are listed because of fire suppression and competition with woody vegetation. Once the fuel load is reduced in the understory of the pine flatwoods at the BCA, populations of these plants are expected to appear and increase. An increase in protected plant populations can also serve as an indication of successful management of the mitigation bank. Tables 3 and 4 list the threatened, endangered, rare and commercially exploited plant species potentially occurring at the BCA.

Table 3**Threatened & Endangered Plant Species Potentially Occuring at the BCA**

Scientific Name	Common Name	USFWS	FDA	Habitat
<i>Asplenium auritum</i>	Auricled spleenwort		E	Hammocks
<i>Asplenium serratum</i>	Bird's nest spleenwort		E	Hammocks, swamps
<i>Bonamia grandiflora</i>	Florida bonamia	T	E	Sand pine scrub
<i>Calamintha ashei</i>	Ashe's savory		T	Sand pine scrub
<i>Calamovilfa curtissii</i>	Curtiss' reedgrass		T	Pine flatwoods
<i>Calopogon barbatus</i>	Bearded grass pink		T	Wet Pine flatwoods
<i>Calopogon multiflorus</i>	Many flowered grass pink		T	Wet pine flatwoods, esp. recently burned
<i>Calopogon pallidus</i>	Pale grass pink		T	Marshes, wet pine flatwoods
<i>Calopogon pulchellus</i>	Grass pink		T	Marshes, wet pine flatwoods
<i>Calopogon tuberosus</i>	Grass pink		T	Marshes, wet pine flatwoods
<i>Conradina grandiflora</i>	Large-flowered rosemary		E	Pinelands
<i>Corallorhiza wisteriana</i>	Spring coralroot		T	Hammocks
<i>Deeringothammus rugelii</i>	Rugel's pawpaw	E	E	Wet pine flatwoods
<i>Epidendrum conopseum</i>	Greenfly orchid		T	Moist hammocks, cypress and hardwood swamps
<i>Garberia heterophylla</i>	Garberia		T	Sand pine scrub
<i>Habenaria nivea</i>	Bog torch		T	Wet meadows
<i>Habenaria odontopetala</i>	Rein orchid		T	Swamps, wet pine flatwoods, wet hammocks
<i>Habenaria quinqueata</i>	Long-horn orchid		T	Marshes, wet pine flatwoods, wet hammocks
<i>Habenaria repens</i>	Water-spider orchid		T	Cypress and hardwood swamps, marshes
<i>Harrisella filiformis</i>	Orchid		T	Cypress and hardwood swamps
<i>Helianthus carnosus</i>	Lakeside sunflower		E	Wet flatwoods
<i>Hartwrightia floridana</i>	Florida Hartwrightia		T	Forested wetlands

Scientific Name	Common Name	USFWS	FDA	Habitat
<i>Hexalectris spicata</i>	Crested coralroot		E	Hammocks
<i>Ilex ambigua</i>	Carolina holly		T	Upland woods, mesic hammocks, scrub
<i>Ilex cassine</i>	Dahoon holly		CE	Margins of swamps, Flatwood depressions
<i>Ilex opaca</i>	Scrub holly		CE	Sand pine scrub
<i>Illicium parviflorum</i>	Yellow star anise		E	Wet woods, swamps
<i>Lechea cernua</i>	Nodding pinweed		T	Scrub
<i>Lechea divaricata</i>	Pine pinweed		E	Pinelands
<i>Lilium catesbaei</i>	Catesby's lily		T	Moist pine flatwoods
<i>Listera australis</i>	Southern twayblade		T	Hammocks
<i>Malaxis spicata</i>	Florida malaxis		T	Hardwood swamps, hamocks
<i>Matelea pubiflora</i>	Sandhill spiney pod		E	Sandhills, scrub
<i>Monotropis reynoldsiae</i>	Pigmy-pipes; sweet pinesap		E	Deciduous woods
<i>Nemastylis floridana</i>	Fall-flowering pleat-leaf		E	Swamps, wet pine flatwoods
<i>Ophioglossum palmatum</i>	Hand adder's tongue fern		E	Hammocks, epiphyte on cabbage palm
<i>Pinguicula caerulea</i>	Blue butterwort		T	Wet, acid pinelands
<i>Platanthera blephariglottis</i>	Large white fringed orchid		T	Marshes, wet open grassy areas
<i>Platanthera cristata</i>	Golden fringed orchid		T	Marshes, wet pine flatwoods
<i>Platanthera flava</i>	Southern tubercled orchid		T	Cypress and hardwood swamps
<i>Platanthera nivea</i>	Snowy orchid; bog torch		T	Wet pine flatwoods
<i>Platytheles querceticola</i>	Low erythroides		T	Cypress and hardwood swamps
<i>Pogonia ophioglossoides</i>	Rose pogonia		T	Marshes, wet pine flatwoods
<i>Ponthieva racemosa</i>	Shadow witch		T	Hammocks
<i>Nolina atopocarpa</i>	Florida beargrass		T	Dry pinelands, shell middens

Scientific Name	Common Name	USFWS	FDA	Habitat
<i>Sarracenia minor</i>	Hooded pitcherplant		T	Wet, open, acid pinelands
<i>Spiranthes brevilabris</i> var. <i>brevilabris</i>	Texas ladies' tresses		T	Pine flatwoods
<i>Spiranthes brevilabris</i> var. <i>floridana</i>	Florida ladies' tresses		T	Pine flatwoods
<i>Spiranthes cernua</i>	Fragrant ladies' tresses		T	Marshes, cypress and hardwood swamps
<i>Spiranthes cranichoides</i>	Ladies' tresses		T	Mesic to hydric forests
<i>Spiranthes gracilis</i>	Slender ladies' tresses		T	Woods, disturbed areas
<i>Spiranthes laciniata</i>	Lace-lip ladies' tresses		T	Marshes, cypress swamps
<i>Spiranthes lanceolata</i> var. <i>lanceolata</i>	Leafless beaked orchid		T	Woods, pastures, disturbed areas
<i>Spiranthes lanceolata</i> var. <i>luteoalba</i>	Ladies' tresses		T	Woods, pastures, disturbed areas
<i>Spiranthes longilabris</i>	Long-lip ladies' tresses		T	Marshes, wet pine flatwoods
<i>Spiranthes ovalis</i>	Oval ladies' tresses		T	Wooded hills, stream banks
<i>Spiranthes polyantha</i>	Florida Keys ladies' tresses		E	Hammocks
<i>Spiranthes praecox</i>	Giant ladies' tresses		T	Swamps, sandhills, wet pine flatwoods, marshes
<i>Spiranthes tuberosa</i>	Little ladies' tresses		T	Pine flatwoods
<i>Spiranthes vernalis</i>	Spring ladies' tresses		T	Swamps, hammocks, pine flatwoods, sandhills, marshes
<i>Stenorrhynchos orchioides</i>	Scarlet ladies' tresses		T	Woods, pastures, disturbed areas
<i>Stylisma abdita</i>	Scrun stylisma		E	Scrub
<i>Verbena tampensis</i>	Tampa vervain		E	Moist pinelands
<i>Zephyranthes simpsonii</i>	Simpson's sephyr lily		E	Wet pine flatwoods and meadows

Table 4
Plant Species Designated as Rare (FNAI) or Commercially Exploited (FGFWC) Potentially Occuring at the
Barberville Conservation Area

Scientific Name	Common Name	Designation	Habitats
<i>Minuartia godfreyi</i>	Leafy sandwort	R	Ditches, grassy banks
<i>Myriophyllum laxum</i>	Piedmont water milfoil	R	Swamps, streams, ditches
<i>Peltandra sagittifolia</i>	Spoon-flower	R	Hydric hammock
<i>Persea humilis</i>	Scrub bay, Silkbay	R	Scrub, sandhill
<i>Physotegia leptophylla</i>	Slender-leaved false dragonhead	R	Swamps, marshes
<i>Ilex cassine</i>	Dahoon holly	CE	Margins of swamps, flatwood depressions
<i>Ilex opaca</i>	Scrub holly	CE	Sand pine scrub
<i>Osmunda cinnamomea</i>	Cinnamon fern	CE	Wet woods and swamps
<i>Osmunda regalis</i>	Royal fern	CE	Wet woods and swamps
<i>Rhapidophyllum hystrix</i>	Needle palm	CE	Wet to mesic woods and hammocks
<i>Tillandsia utriculata</i>	Giant wild pine	CE	Hammocks and cypress swamps, epiphytic
<i>Zamia pumila</i>	Florida coontie	CE	Swamps and wet woods

7.0 CURRENT SITE CHARACTERISTICS

The BCA contains a substantial percentage of freshwater marshes, cypress domes, cypress stands, mixed forested wetlands, and hardwood forested wetlands. During wet seasons, stormwater often floods adjacent areas of improved pasture and pine flatwoods. The hydroperiod in these areas is very short. An interior ditch system was constructed to facilitate silviculture and cattle grazing operations when the property was in private ownership. The two major influent ditches and the general outfalls have been described previously. To maintain on-site hydroperiods, ditch blocks have been placed in the outfall ditches leading to Lake Woodruff National Wildlife Refuge and the River. Figure 3 is a topographic map of the BCA that highlights the hydrologic features in adjacent contributing and receiving areas. Aerial photography is available from 1942 and 1990, as indicated in Exhibit I.

As further discussed in this Plan, nine natural plant communities are present on the Barberville tract. They include pine flatwoods, sand pine scrub, hardwood forested wetlands, mixed forested wetlands, cypress swamp, cypress dome, wet prairies, bay swamp and gum swamp. These are typical of the major communities characteristic of this region. Table 5 lists the acreage for each of these natural habitat types. In addition to the natural plant communities, disturbed areas consisting of improved pasture, field roads and power lines also occur.

Although the historic pine harvesting practices have markedly altered the natural regime, the lack of fire management has been equally disruptive.

7.1 PINE FLATWOODS

Pine flatwoods are the most common biological community in Florida. While pine flatwoods cover approximately 30-50 percent of Florida's uplands, very few undisturbed areas remain due to silviculture, agriculture, residential development and habitat mismanagement. Typically, pine flatwoods are characterized by an open canopy forest of widely spaced pine trees. Usually, there is little or no understory and a dense ground cover consisting of herbs and shrubs.

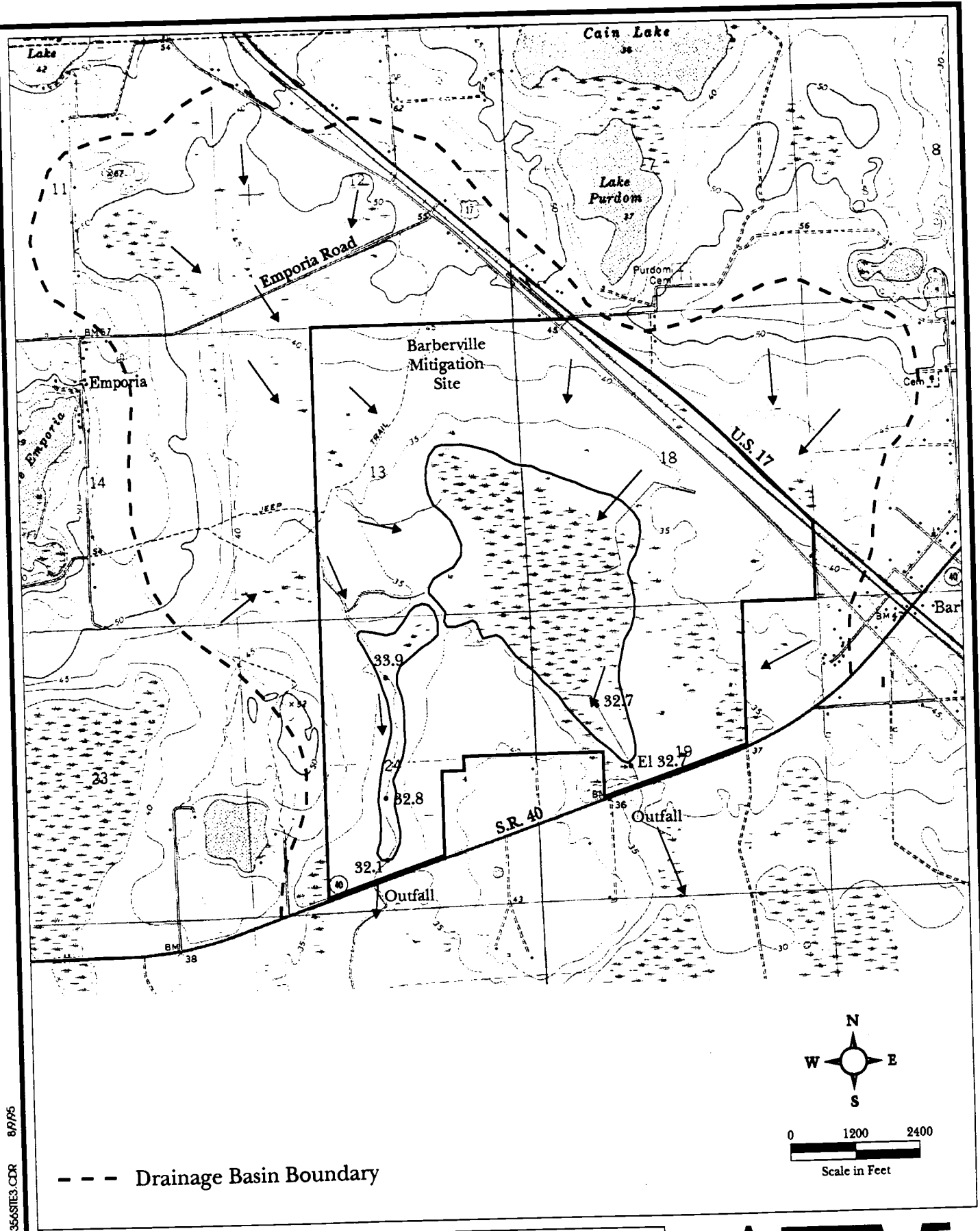


Figure 3
Topographic and Hydrologic Features Map

Table 5

Vegetation Types and Acreage on the BCA

Vegetation Type	Code	Acreage
Pine Flatwoods	411	573.67
Wetland Mixed Forest	630	299.79
Improved Pasture-Uplands	2110	153.06
Improved Pasture-Wetlands	2111	81.43
Cypress-Pine-Cabbage Palm-Pine Dominant	6241	77.62
Cypress Dome	621	76.83
Bay Swamp	611	61.74
Gum Swamp	613	21.15
Mixed Wetland Hardwood	617	20.56
Sand Pine Scrub	413	11.13
Cypress-Pine-Cabbage Palm	624	10.98
Wet Prairies	643	7.43

Longleaf pine, slash pine, pond pine, wiregrass, runner oak, saw palmetto and gallberry are all associated with healthy productive pine flatwoods communities.

Pine flatwoods occur on relatively flat and poorly drained soils. While flatwoods are generally inundated with shallow sheets of water during the rainy season, the hydroperiod usually is less than 50 days. During the dry season, however, groundwater falls to levels unattainable for most plants forming the groundcover. Thus, many of the plants comprising pine flatwoods are under the stress of water saturation during the wet season and dehydration during the dry season.

At the BCA, natural and planted slash pine is the dominant species in the overstory, although some cypress and bay are found in the wetter areas. The overstory is generally sparse and consists almost exclusively of slash pine seed trees left after the last logging operation. Other species such as longleaf or sweetgum occasionally occur in the overstory.

The understory is dominated by slash pine regeneration. These trees are generally less than ten years old and they form very dense stands in places. Palmetto and gallberry are prevalent throughout the flatwoods. The lack of fire has allowed the understory to reach medium to high densities. The woody vegetation will undoubtedly increase before fire is introduced to this community. Other understory species include small hardwoods and wax myrtle. The groundcover is sparse and generally consists of bluestems and panicums with lesser amounts of wiregrass.

Fire is an important physical factor in pine flatwoods and historically occurred about every 2-6 years. Nearly all animals and plants inhabiting this community are adapted to periodic fire. Indeed, periodic burning is essential in maintaining flatwoods in a subclimax ecological condition and is vital for the reproduction of many groundcover plant species. Without fire, flatwoods eventually succeed into hardwood-dominated forests with a dense canopy and virtually no groundcover. Fire exclusion also creates excessive fuel loads creating a fire hazard as well as impeding proper pine tree germination.

7.2 SAND PINE SCRUB

Approximately eleven acres located in the southwest portion of the BCA historically supported a scrub community. This community is found on well-drained ridges with deep sand. Characteristic vegetation includes sand pine, scrub oak and rosemary. This portion of the BCA was formerly cleared and remains in poor condition, with most of the area characterized by barren sand. Some sand pine have recruited into the area from an adjacent, off-site sand pine plantation. Large patches of blackberry and ruderal weeds occur throughout the area.

7.3 WET PRAIRIE

This community is limited throughout the BCA and occurs as open areas of grasses, sedges, and rushes. Depending on the depth and slope of the depression, an open water zone may occur at the center. This community is likely present on the BCA as a result of overstory removal. Timber may have been harvested or cleared for pasture. Several of the isolated areas probably supported cypress domes which did not regenerate.

Isolated marshes provide valuable nesting and foraging habitats for a variety of birds. This is due to the fact that the high productivity and fluctuating water levels typical of isolated marshes produce seasonal concentrations of prey organisms easily accessible at the edge of drying ponds. Birds of note which most likely utilize these ponds at the BCA include Florida scrub cranes and woodstorks.

Isolated marshes are maintained by regimes of fire and water. Fires typically burn on a 1-5 year basis under natural conditions and maintain the open herbaceous community by restricting shrub invasion; however, severe fires during drought periods will often consume the mucky peat. Normal hydroperiods must be maintained, or isolated marshes will change. Shortened hydroperiods will permit the invasion of mesophytic species, while longer hydroperiods will convert marshes into open water.

7.4 CYPRESS DOME

Cypress domes are characterized by shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while bigger trees grow in the deeper water in the interior. Cypress domes often derive much of their water through runoff from surrounding uplands. Cypress domes generally act as reservoirs which recharge the aquifer when adjacent water tables drop during periods of drought. The normal hydroperiod for cypress domes is 200 to 300 days per year with water being deepest and remaining longest near the center of the dome.

Cypress domes at the BCA are dominated by pond cypress, swamp tupelo and slash pine. Due to past logging activities, tree canopies are relatively young. Other typical plants include red maple, dahoon holly, bays, fetterbush, ferns, maidencane and buttonbush. Due to ditching and associated reduction in hydroperiod, many of the cypress dome edges have been invaded by wax myrtle and slash pine.

Periodic fire is essential for the maintenance of cypress domes. Without fire, hardwood invasion and peat accumulation convert this community to hardwood bogs. Fire frequency should be greatest at the periphery of the dome and least in the interior where long hydroperiods and deep peat maintain high moisture levels for most of the year. The normal fire cycle is as short as 3-5 years along the outer edge and as long as 100 to 150 years towards the center. The profile of the cypress dome is largely attributable to this fire regime. The shorter hydroperiods along the periphery permit fires to burn into the edge more often, occasionally killing the outer trees. Cypress is very tolerant of light surface fires, but muck fires burning into the peat can kill them, lower the ground surface, and transform a dome into a pond.

Normal hydroperiods must be maintained. Somewhat deeper than normal water levels are not likely to do much harm, but extended hydroperiods will limit tree growth and prevent reproduction. Shortened hydroperiods will permit the invasion of mesophytic species, which will change the character of the understory and eventually allow hardwoods to replace cypress.

7.5 CYPRESS SWAMP

Cypress swamps are generally characterized as relatively large and irregularly shaped basins that are not associated with rivers, but are vegetated with hydrophytic trees and shrubs that can withstand a prolonged hydroperiod. The dominant tree species are cypress, followed by blackgum, slash pine and cabbage palm. Soils are generally acidic, nutrient poor peats, often overlying a clay lens or other impervious layer. The resulting perched water table may act as a reservoir releasing groundwater as the surrounding water tables drop during periods of drought. The typical hydroperiod is approximately 200-300 days.

Cypress swamps on the BCA vary depending on the density of the overstory. Most of the cypress swamps were logged over 50 years ago. However, some have been logged much more recently and are now dominated by slash pine (6241). Vegetation in the understory includes wax myrtle, buttonbush, fetterbush, gallberry, cinnamon fern and royal fern. There are also a number of wetland herbs and grasses, including sawgrass.

Very infrequent fire is essential for the maintenance of cypress dominated swamps. Without infrequent fire, hardwood invasion and peat accumulation will eventually lead to a bottomland forest or bog. Fire frequencies in cypress swamps may exceed 100 years. Cypress are very tolerant to light surface fires, but muck fires burning into the peat can kill the trees, lower the ground surface, and transform a swamp into a lake or pond.

Like other wetland communities, normal hydroperiods must be maintained in cypress swamps. If water levels must be manipulated, slightly higher than normal levels are not likely to do much harm, but extended hydroperiods will limit tree growth and prevent regeneration. Shortened hydroperiods will permit invasion of mesophytic species and change the character of the understory or allow a devastating fire to enter, which could drastically alter the community.

7.6 *HARDWOOD FORESTED WETLAND*

Hardwood forested wetlands are characterized by a closed canopy hardwood forest of tall, straight trees with either a dense shrubby understory and little groundcover, or an open understory and ground cover of ferns, herbs and grasses. Hardwood forested wetlands occur in basins and depressions which, while often saturated, are rarely inundated. Soils are generally a mixture of clay and organic matter. The water table is high, but hardwood forested wetlands are inundated only during very heavy rains. Tree density and species diversity is high.

The hardwood forested wetlands on the BCA consist of mature tree species including bays, sweetgum, red maple, southern magnolia, black gum, tupelo, laurel oak and occasional cabbage palm. The understory varies from nearly absent to very dense. Understory species include dahoon holly, wax myrtle, swamp dogwood, gallberry, fetterbush and St. John's wort. In areas where the understory is sparse, wetland herbs, grasses and ferns are abundant.

Hardwood forested wetlands are very stable communities that require over 100 years to form. The BCA, is represented by advanced successional stages of cypress swamps or mixed forested wetlands. Consequently, fire is not required to maintain this community. In fact, its absence often is the driving force for the development of this community. Protecting this community from fire is not difficult since the dense canopy maintains a relatively high humidity and fuel moisture within the forest.

7.7 *MIXED FORESTED WETLAND*

Mixed forested wetlands represent a transition between cypress swamps and hardwood forested wetlands where neither cypress or hardwoods dominate the overstory. As characterized by the large, central wetland area, the majority of mixed forested wetlands on the BCA were originally cypress swamps which have experienced successional forces due to fire exclusion. Many of its edges have been clear-cut, drained and managed for slash pine production.

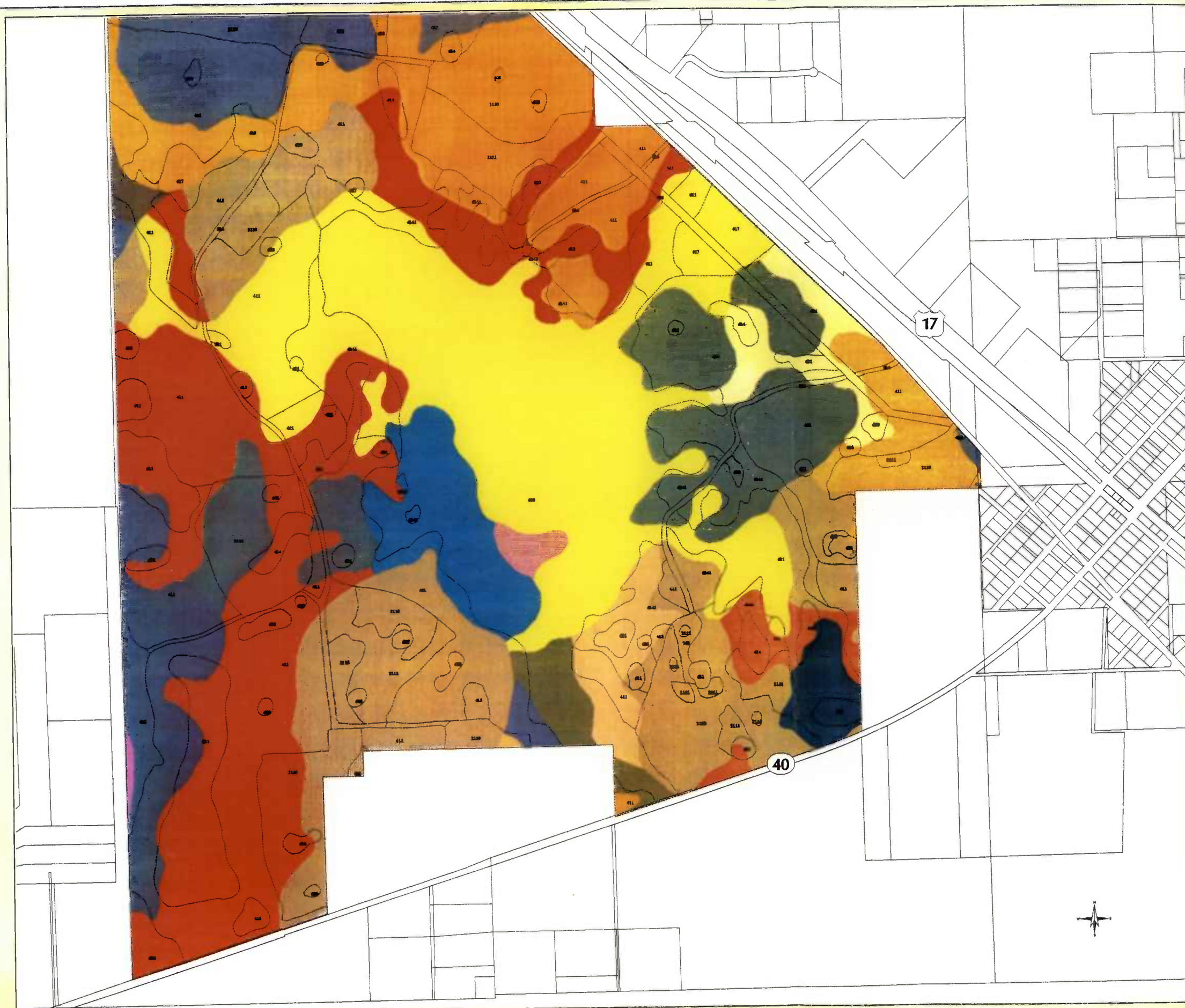
Shortened hydroperiods permit invasion of mesophytic species and change character of the understory or allow a devastating fire to enter which could drastically alter the community. At the same time, fire exclusion in wetter portions of the mixed forested wetlands will result in hardwood invasion and peat accumulation. This will eventually lead to a bottomland forest or bog.

7.8 IMPROVED PASTURE

Nearly 234 acres of the BCA has been cleared and planted with pasture grasses. The majority of improved pastures consist primarily of bahia grass. Currently, the quality of the pastures is deteriorating and the pasture areas are being colonized by a significant amount of thistle, blackberry, briar, wax myrtle and slash pine. After completion of a jurisdictional wetland evaluation, 153 acres of the pastures were determined to be upland pastures (2110) and 81 acres were determined to be wetland pastures (2111).

7.9 SOILS

Figure 4 is a soils map of the BCA. There are 15 soil mapping units included within the BCA. Soils found on the BCA are those typically of the pine flatwood and swamps in east-central Florida. The flatwoods soils are principally of the Pomona and Wachula series. These soils are poorly drained and found in broad, low flats interspersed with depressions and swamps. They have a high water table that varies seasonally. During periods of wet weather these soils may have standing surface water for extended periods.



SOIL TYPES

- BASINGER FINE SAND DEPRESSIONAL
- DELAND FINE SAND
- RIVIERA FINE SAND
- SAMSULA MUCK
- TOMOKA MUCK
- MYAKKA FINE SAND
- MYAKKA FINE SAND DEPRESSIONAL
- MYAKKA-ST JOHNS COMPLEX
- POMONA FINE SAND
- POMONA FINE SAND DEPRESSIONAL
- SMYRNA FINE SAND
- WAUCHULA FINE SAND
- WABASSO FINE SAND DEPRESSIONAL
- PINEDA FINE SAND
- DAYTONA SAND 0-5% SLOPE

VEGETATION TYPES AND ACREAGE

Type	Acreage
411 Pine Flatwoods	573.67
413 Sand Pine Scrub	11.13
611 Bay Swamp	61.74
613 Gum Swamp	21.15
617 Mixed Wetland Hardwood	20.56
621 Cypress	76.83
624 Cypress-Pine-Cabbage Palm	10.98
630 Wetland Mixed Forest	299.79
643 Wet Prairies	7.43
740 Disturbed Lands	12.27
814 Roads	30.48
2110 Improved Pasture - Uplands	153.06
2111 Improved Pasture - Wetlands	81.43
6241 Cypress-Pine-Cabbage Palm-Pine Dominate	77.62
TOTAL ACRES = 1438.14	

BARBERVILLE HABITAT MANAGEMENT AREA - SOILS

FIGURE 4



Geographic Information Services
3/14/96 WR96124

MAP PREPARED BY:
VOLUSIA COUNTY DEPT.
OF ENVIRONMENTAL MGMT.
NATURAL RESOURCES DIV.

8.0 PHASE I IMPLEMENTATION PLAN

8.1 CONSERVATION EASEMENT RECORDING

A conservation easement will be recorded for the remaining 365.82 acres of the BCA currently unencumbered by easements (Figure 2, page 4). This area includes about 209 acres of pine flatwoods and 145 acres of forested wetlands. It also includes 12 acres of a maintained electrical power line corridor. The proposed conservation easement will also incorporate 10.9 acres located between US 17 and County Road 3. This acreage is included to buffer the mitigation activities on the main tract from highway and railroad traffic. It also contains two inflow ditches which drain US 17 onto the BCA. This buffer could be developed with non-compatible activities if it is not included in the conservation easement.

The completion of the conservation easement for the entire tract guarantees management of the land for natural resources only. It will preclude Volusia County from developing non-compatible public support facilities or from selling or leasing the land to non-compatible private interests. Large wetland and upland ecosystems will be preserved from surrounding agricultural and residential development pressures. If in private hands, the tract could be subdivided into ten acre parcels, including wetlands, without being subject to Volusia County's review process. Ferneries, cattle operations and intense silviculture were also allowable uses under previous land use designations.

8.2 BACKGROUND

The upland portions of the BCA consist of pine flatwoods and improved pastures. The flatwood habitat areas are dominated by slash pine plantations that were established approximately 30 years ago. These stands were harvested under a shelterwood regeneration method leaving approximately 30 trees per acre as seed producers. The harvesting took place about seven years ago and it successfully regenerated a dominant slash pine understory. However, a statistical inventory utilizing 1/100th acre plots and a ten basal area factor prism has revealed that a percentage of the overstory in different areas contain older longleaf pines. It appears that the existing longleaf pines were left during the timber harvest approximately 33 years

ago, probably because they were not merchantable at the time. By studying old aerial photographs and soils and on-site observations, we feel that the site originally contained a larger component of longleaf pine. Therefore, Volusia County proposes to restore a large portion of the upland acreage to a longleaf pine wiregrass community through innovative harvesting techniques and reforestation. Also, a portion of the improved pastures within the upland areas will receive reforestation. The buffer area depicted in Figure 2 (page 4) will not be managed as part of the implementation plan. The site will serve as a buffer from US 17 and the railroad tracks, and will be preserved in its natural state.

8.3 UPLAND HABITAT MANAGEMENT

The uplands were broken down into twelve upland Habitat Management Units (HMU) in order to aid in the management decision process. The upland pastures are one HMU and the upland pine flatwoods consist of eleven HMU's. The wetland areas of the pasture and one upland pasture will be left and burned periodically for sandhill crane nesting areas.

The pine flatwoods HMU's were designed to include areas with enough similarity in vegetation crown cover, dominant age of overstory and a percentage of existing longleaf pines. Table 6 shows the specific characteristics of each HMU. The HMU's and acreage are depicted on the following map, Figure 5. Excluding HMU 7, 518.4 acres of the pine flatwood Management Units will be harvested over the next 3 years and reforested with longleaf pines. HMU 7 will be managed to keep the existing old age overstory and the understory vegetation will be manipulated utilizing prescribed fire to reduce the coverage of woody vegetation. Longleaf pine reforestation will occur on 131.8 acres of upland pasture HMU's. A total of 713.5 upland acres will be restored. The remaining upland pastures are reserved for sandhill crane foraging, special permitted events and for land management staging areas.

Table 6 Upland Habitat Management Unit Descriptions

HMU	ACRES	AGE	OVERSTORY	UNDERSTORY
1	106.62	30	95% Slash Pine <5% Pond Pine	60-95% Palmetto <25% Gallberry <10% Shrub 5% Pine Regeneration <5% Herbaceous
2	41.44	30	99% Slash Pine 1% Pond Pine	80-90% Gallberry 5% Palmetto 10% Herbaceous 5% Pine Regeneration
3	8.06	9	100% Slash Pine	95% Open space 5% Wax Myrtle
4	53.72	30	100% Slash Pine	50% Gallberry 30% Herbaceous 10% Palmetto 10% Various Shrubs
5	114.17	30	65-95% Slash Pine 4-25% Pond Pine 1-10% Longleaf Pine	40-45% Gallberry 35-40% Palmetto 0-15% Open Space 5-10% Herbaceous 5% Shrub 5% Pine Regeneration
6	11.13	10	50% Sand Pine 50% Slash Pine	50% Herbaceous 35% Open Space 10% Pine Regeneration <5% Palmetto <5% Various Shrubs
7	63.3	29	96% Slash Pine <5% Longleaf Pine <5% Pond Pine	50% Palmetto 50% Gallberry
8	18.56	29	85% Slash Pine 10% Pond Pine 5% Longleaf Pine	70% Gallberry 20% Palmetto 5% Herbaceous 5% Pine Regeneration
9	41.48	11	100% Slash Pine	40% Herbaceous 30% Pine Regeneration 5% Wax Myrtle <5% Various Shrubs
10	114.42	30	95% Slash Pine 5% Pond Pine	60% Palmetto 30% Gallberry 10% Herbaceous
11	8.79	35	98% Slash Pine 2% Pond Pine	35% Gallberry 30% Palmetto 20% Herbaceous 10% Various Shrubs
12	131.79	0	0%	90% Bahia 5% Wax Myrtle 5% Blackberry

8.4 FOREST RESOURCE HARVESTING WITHIN MANAGEMENT UNITS

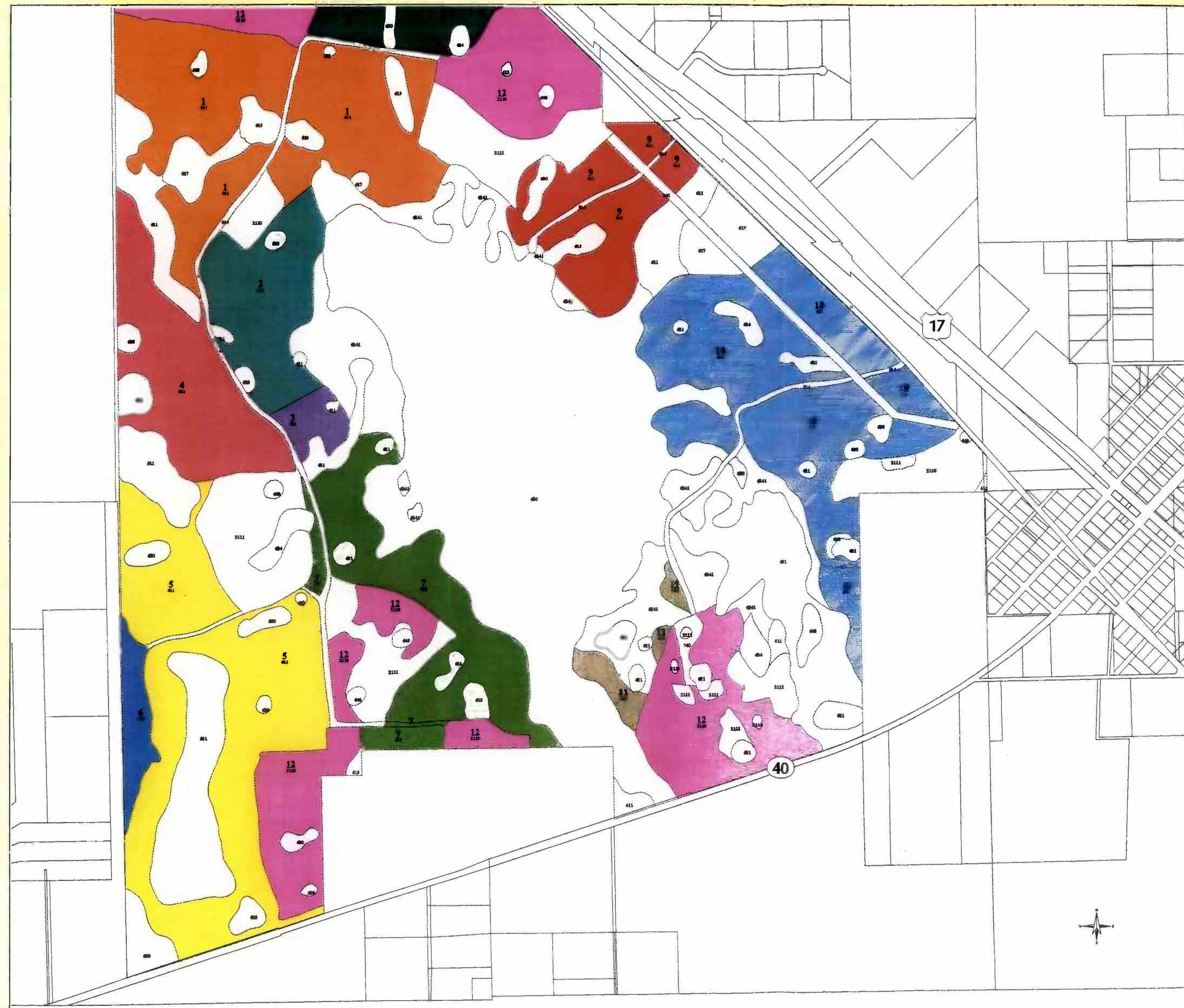
Harvesting limits for each HMU will be clearly defined by marking paint prior to the harvest. Also, the HMU's will be inventoried for existing longleaf pines, for snags for nesting cavities and possible gopher tortoise burrows, which will be clearly marked for retainment. To ensure an older pine age diversity exists within each habitat unit, a 25 foot upland buffer will be retained surrounding all jurisdictional wetland areas. This will also serve as a transitional area between the proposed upland longleaf pine communities and wetland habitats. The proposed harvest will be carefully monitored to minimize soil disturbance and no harvesting will be conducted when soils are saturated. The following chart illustrates the proposed harvest dates and acreage for each Habitat Management Unit:

FOREST RESOURCE HARVESTING SCHEDULE

Habitat Management Unit	Acres	Harvest Dates
1, 2, 8	166.62	1996
3, 4, 5, 6	187.25	1997
9, 10, 11	164.69	1998

8.5 SITE PREPARATION AND REFORESTATION WITHIN THE HABITAT MANAGEMENT UNITS

Site preparation may be completed utilizing a combination of tandem roller choppers, single roller choppers, prescribed fires and rework harrows. The first management units that are proposed for harvesting will receive different site preparation techniques. Habitat Unit 1 will receive tandem roller chopping and burning. Habitat Unit 2 will receive single roller chopping and burning. Habitat Unit 8 will receive only burning. Preferably, the site preparation will be completed in the spring, and burning will be in the summer or fall. However, this will be based upon weather conditions and fuel moisture. Habitat Management Units 1, 2, and 8 will be



HABITAT MANAGEMENT UNITS

Unit	Acreage
1	106.62
2	41.44
3	8.06
4	53.72
5	114.17
6	11.13
7	63.30
8	18.56
9	41.48
10	114.42
11	8.79
12	131.79

TOTAL ACRES = 713.48

VEGETATION TYPES AND ACREAGE

Type	Acreage
411 Pine Flatwoods	573.67
413 Sand Pine Scrub	11.13
611 Bay Swamp	61.74
613 Gum Swamp	21.15
617 Mixed Wetland Hardwood	20.56
621 Cypress	76.83
624 Cypress-Pine-Cabbage Palm	10.98
630 Wetland Mixed Forest	299.79
643 Wet Prairies	7.43
740 Disturbed Lands	12.27
814 Roads	30.48
2110 Improved Pasture - Uplands	153.06
2111 Improved Pasture - Wetlands	81.43
6241 Cypress-Pine-Cabbage Palm-Pine Dominate	77.62

TOTAL ACRES = 1438.14

BARBERVILLE HABITAT MANAGEMENT PLAN

FIGURE 5



Geographic Information Services
3/14/96 WR96124

MAP PREPARED BY:
VOLUSIA COUNTY DEPT.
OF ENVIRONMENTAL MGMT.
NATURAL RESOURCES DIV.

machine or hand planted in the winter of 1996-97 at the rate of 660 trees per acre totaling 109,969 trees. A survival rate of approximately 400 trees per acre is considered acceptable. The ultimate goal is that within 25 years the Habitat Management Units will contain trees with 60 square feet of basal area. However, thinning might be required at that time to achieve this goal. Endangered species such as the red cockaded woodpecker and sherman fox squirrel prefer this stocking. Based upon our monitoring of Habitat Management Units 1, 2 and 8, the site that has the lowest mortality rate will determine the type of site preparations to be used on all of the other Habitat Management Units.

The upland improved pastures (HMU 12) consisting of thick bahia will be replaced with native herbaceous species and replanted with longleaf pines at the rate of 660 trees per acre. Again, a survival rate of approximately 400 trees per acre and trees with 60 square feet of basal area within 25 years is the goal. The dates for site preparation and planting are illustrated in the following chart:

SITE PREPARATION/REFORESTATION SCHEDULE

Habitat Management Unit	Acres	Site Preparation/Planting
1, 2, 8, 12	298.41	1996/97
3, 4, 5, 6	187.25	1997/98
9, 10, 11	164.69	1998/99

9.0 PRESCRIBED BURNING PLAN

9.1 INTRODUCTION

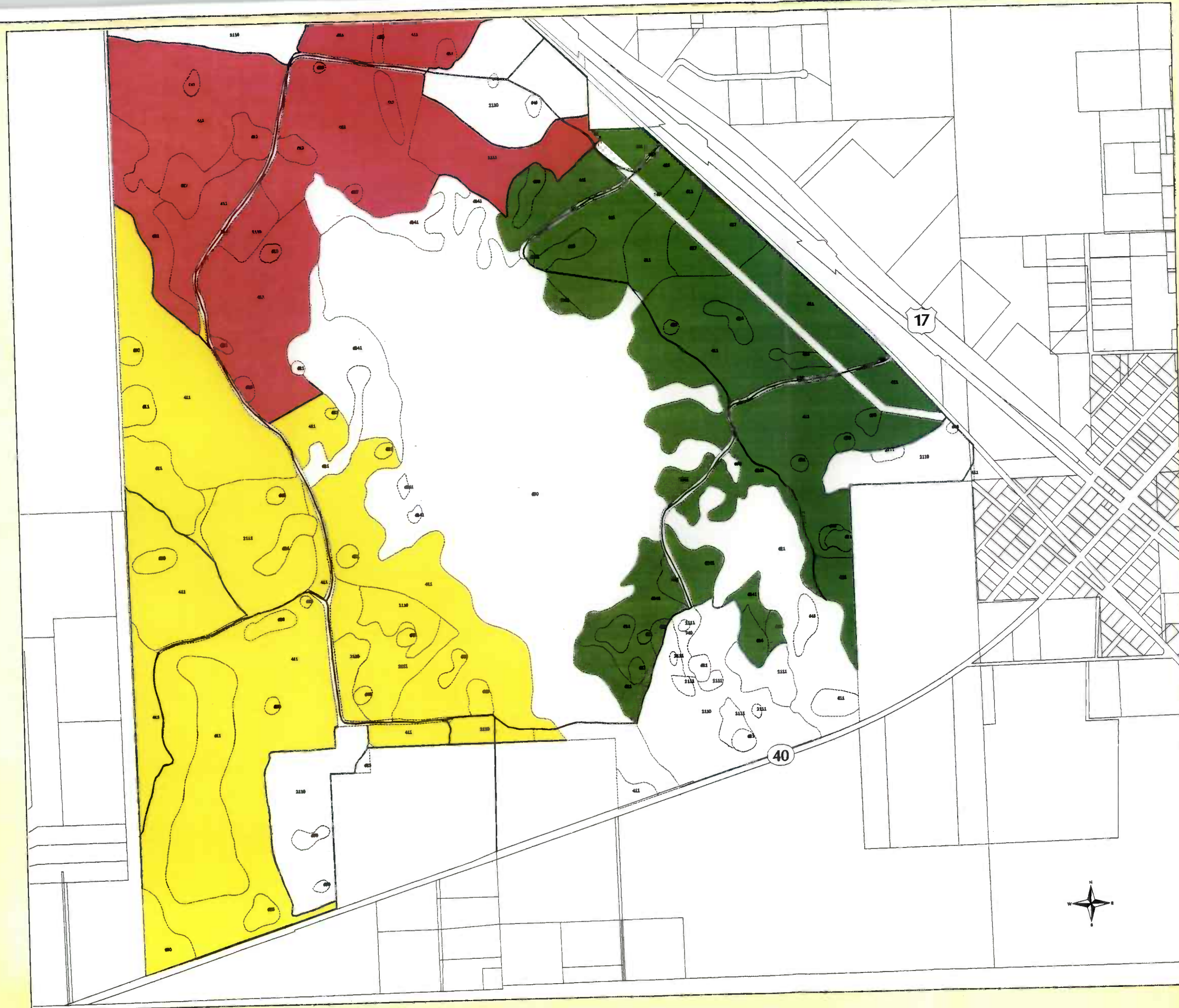
Specific areas addressed in this plan include recommendations for the locations and types of fire lines, mapping of fire lines, burning schedule and specific recommendations for conducting the burns.

9.2 FIRE LINE RECOMMENDATIONS

Existing roads, logging trails, plow lines from previous control efforts, ditches and forested wetlands within the BCA create firebreaks. To foster restoration of ecotones and increase habitat heterogeneity, fire line construction will be limited to the conservation area boundaries and existing roads and trails. However, when conducting a prescribed burn, temporary fire lines may be installed to facilitate the burn and to control the escape of the fire. This determination/decision will be made by the burn manager based upon weather conditions, the possibility of escape, possible damage to wetland resources, smoke management as needed and the fire threat to life and safety of the public. Also, the temporary lines will be disked and returned to natural grade as soon as possible. The permanent boundary fire lines will be constructed in such a way so that they can be used for access on the property where possible.

9.3 FIRE LINE LOCATIONS

The following prescribed burning map, Figure 6, depicts where the permanent fire lines will be constructed. Numerous fire lines are in place, however, priority will be given to constructing and maintaining the lines on the property boundaries where applicable. Also, the existing truck trails will be utilized.



PRESCRIBED BURN

- BURNING 1996-1997
WETLANDS = 38 ACRES
PINE FLATWOODS = 147 ACRES
PASTURE = 26 ACRES
TOTAL = 211 ACRES
- BURNING 1997-1998
WETLANDS = 96.5 ACRES
PINE FLATWOODS = 236 ACRES
PASTURE = 60 ACRES
TOTAL = 392.5 ACRES
- BURNING 1998-1999
WETLANDS = 41 ACRES
PINE FLATWOODS = 154 ACRES
PASTURE = 0 ACRES
TOTAL = 195 ACRES

TOTAL ACREAGE
TO BURN.....798.5 ACRES

- PERMANENT WOODS ROADS
- FIRELINES

VEGETATION TYPES AND ACREAGE

Type	Acreage
411 Pine Flatwoods	573.67
413 Sand Pine Scrub	11.13
611 Bay Swamp	61.74
613 Gum Swamp	21.15
617 Mixed Wetland Hardwood	20.56
621 Cypress	76.83
624 Cypress-Pine-Cabbage Palm	10.98
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6241 Cypress-Pine-Cabbage Palm-Pine Dominate	77.62

TOTAL ACRES = 1438.14

BARBERVILLE PRESCRIBED BURNING PLAN

FIGURE 6



Geographic Information Services
3/14/96 WR06124

MAP PREPARED BY:
VOLUSIA COUNTY DEPT.
OF ENVIRONMENTAL MGMT.
NATURAL RESOURCES DIV.

9.4 FIRE LINE CONSTRUCTION SPECIFICS

Permanent fire lines will be at least twelve feet in width. They will be constructed by plowing and then bladed flat. Any existing fire lines not depicted within the prescribed burning plan will be disked when the site is drier and allowed to regenerate naturally. All permanent fire lines depicted within the plan will be disked every year. The flat lines will not channel water, providing additional protection to the existing wetlands and hydrology. These lines will also provide additional security and maintenance measures. If the burn manager decides temporary fire lines are required, they will be installed utilizing a D-4 dozer and in-line plow. All temporary fire lines will be disked and allowed to regenerate naturally.

9.5 TIMING OF FIRE LINE CONSTRUCTION

A portion of the permanent fire line construction and maintenance work was completed during the month of November through December of 1995. All of the lines will be completed by January 1, 1997 to provide protection through the winter/early spring wildfire season. Temporary fire lines will be constructed based upon the burn manager's decision.

9.6 PRESCRIBED BURNING PROCEDURES

The prescribed burns will only take place when the following requirements depicted in the Prescribed Burning Act of 1990 are satisfactorily addressed. This act is included in chapter 590 of the Florida Statutes (please refer to Exhibit 2).

1. Be accomplished only when at least one certified prescribed burn manager is present on site while the burn is being conducted.
2. Require that a written prescription be prepared prior to receiving authorization to burn from the Division of Forestry (please refer to Exhibit 2).
3. Be considered in the public interest and not to constitute a public or private nuisance when conducted pursuant to State air pollution statutes and rules applicable to prescribed burning.
4. Be considered a property right of the property owner if naturally occurring vegetative fuels are used when conducting burns pursuant to the requirements of this subsection.

The personnel required for the prescribed burn will be provided by the Department of Environmental Management of Volusia County and are as follows:

1. Certified prescribed burn manager whose duties are:
 - a. Prepare prescribed burning plan.
 - b. Obtain burning authorizations.
 - c. Supervise and direct helpers.
 - d. Monitor weather and smoke conditions.
 - e. Monitor fire behavior and adjust tactics if necessary.
 - f. Monitor perimeter for escape.
 - g. Assist in suppression of escape.
 - h. String fire.
2. Two Environmental Technicians whose duties are:
 - a. String fire.
 - b. Monitor perimeter for escape.
 - c. Assist in suppression of escape.
3. One crawler tractor with plow and operator whose duties are:
 - a. Suppress escape.
 - b. Monitor perimeter for escape.
 - c. Plow additional lines as necessary.

9.7 FIRING TECHNIQUES

There are various firing techniques suitable for the prescribed burning under different weather and fuel conditions. The most appropriate technique for most of the areas proposed for burning on the Barberville Conservation Area, due to the heavy fuel conditions, is the backfire technique. As its name applies, this technique involves lighting the fire so that the fire spreads (or "backs") into the wind. This is the safest fire to control and results in the least amount of possible

resource damage. It also produces a minimal amount of smoke. This is a slow burning technique in which fire only spreads at a rate of about 100 ft. per hour.

Other firing techniques may be used occasionally as fuel and weather conditions allow. These techniques include the flank fire, the strip-head fire, and the spot fire (please refer to Exhibit 2).

9.8 BURNING SCHEDULE

Due to the heavy fuel conditions only winter burns will be conducted on the BCA at this time. Approximately 211 acres are recommended for burning in 1996/97, 392.5 acres in 1997/98 and 195 acres in 1998/99; a total of 798.5 acres to receive prescribed burns over the next 3 years. However, it should be understood that due to weather constraints, smoke sensitive areas surrounding the property, and heavy existing fuel conditions it may not be possible to complete the four year burn predictions. Therefore, the burning plan may need updating and revision after the initial burns. It should also be pointed out that if weather conditions are favorable, it may be possible to burn more acreage than depicted. Also, it may be possible to burn portions of the depicted acreage over again within the four year period. Upon completion of the proposed burns each area will be evaluated for natural burning regimes. When fuel loads are reduced significantly and weather conditions are favorable, spring and summer burns will be utilized. Based upon field observations the prescribed burning plan will be modified to encompass a more natural fire regime.

9.9 CONCLUSION

Prescribed burning is an important land management tool for ecological, silvicultural, and wildlife management purposes. Although there are some risks involved in its use, the potential benefits are many and some cannot be gained by any means other than burning. Through the careful implementation of this plan, the benefits to the wildlife and ecological communities within the Barberville Conservation Area can be realized while minimizing the potential for damage to the resource or liability to Volusia County.

10.0 UPLAND MONITORING PLAN

Monitoring of the Upland Management Plan on the Barberville Tract will target three major components of the vegetative community: the overstory trees, longleaf pine seedlings, and understory vegetation. On each HMU, a monitoring program will be established as follows:

1. One permanent CFI (continuous forest inventory) plot will be established for each ten acres within the HMU. These plots will be established and monitored using accepted forest management practices. The CFI plots will provide the long-term monitoring of overstory growth parameters. CFI plots will be monitored on a three-year interval.
2. Within each HMU, sample plots one, one-hundredth acre (1/100) in size will be established to monitor survival of the planted longleaf seedlings. One plot per acre will be established utilizing a grid pattern. These plots will be monitored annually for the first three to five years after planting, or until the trees leave the grass stage.
3. Within each established CFI plot square meter plots will be utilized to monitor the ground cover vegetation for the expected reduction in woody vegetation and increase in herbaceous species, especially protected plant species. Three plots will be monitored within each CFI plot using a random monitoring pattern. These plots will be monitored annually for the length of the permit or until the success criteria have been addressed.
4. Two permanent photo stations will be established within each HMU. Photos will be taken annually for the length of the permit.
5. Qualitative wildlife observations will be incorporated into the routine monitoring reports. Wildlife observations will also be recorded and physical evidence, such as tree markings, tracks, nests, scat, burrows and cavity trees will be recorded.
6. Piezometers/monitoring wells will be installed within each HMU and adjacent large wetlands. A total of 30 wells will be installed to more accurately determine the overall hydrologic effect throughout the site and future Phase II planning. This data will be collected monthly and will be included within an annual report. This distribution of hydrologic monitoring is intended to replace that required by previously issued permits. Vegetation monitoring required by previous permits will continue as required at established stations.

The annual report will include seedling survival, ground cover vegetation, photo stations and hydrologic data. Every third year the annual report will include growth parameters from the CFI plots.

11.0 ANTICIPATED PLANNING & IMPLEMENTATION SCHEDULE

Implementation of Phase I will begin in the spring of 1996 and follow the implementation schedule outlined in Section 8.0. The burning and planting segment of Phase I will take 3 years to complete. Regeneration of the longleaf through the grass stage will take 3 to 5 years after planting. Successful recreation of a young pine/wiregrass community should be realized within 25 years. The realization of an "old growth" pine/wiregrass community will not occur until 80 or 90 years after planting.

Planning for Phase II is dependent upon funding from sale of credits in Phase I. Actual implementation of Phase II will be dependent upon our first year credit demand. It is anticipated at this point that planning for Phase II will begin in year 4 of the Phase I permit and proceed to permitting in year 5.

Phase III planning will follow 3 to 5 years after permitting of phase II depending upon credit demand and revenue generation from Phase II.

12.0 LONG TERM MANAGEMENT COSTS/FINANCIAL RESPONSIBILITY

12.1 ELEMENTS OF LONG TERM MANAGEMENT COSTS

The Long Term Management Costs for Phase 1 (Upland Restoration) of the Barberville Conservation Area Mitigation Bank consist of three separate types of costs. The work associated with each element is discussed in more detail in the sections of this Management plan addressing these particular areas.

These Long Term Management Costs will be funded by way of a Resolution of the Volusia County Council establishing the existing environmental fund maintained by the County as the depository for the Long Term Management Costs (the "Dedicated Fund") set aside from the sale of each credit from the Barberville Conservation Area Mitigation Bank. The resolution adopted by the Volusia County Council establishing the Dedicated Fund will embody the requirements of Section 12.4.11 (h) of the District's rules applicable to the Financial Responsibility for Governmental, Non-Department, Mitigation Banks. Although deposited in the same Dedicated Fund, each of these Long Term Management Costs will be accounted for separately.

These costs include:

- ♦ Planting Burning & Site Preparation Costs:
- ♦ Monitoring Costs:
- ♦ Long Term Site Maintenance Costs:

12.2 THIRD PARTY COST ESTIMATE

The applicant has obtained a third party cost estimate from Central Florida Lands and Timber, a company experienced in mitigation planting and the maintenance of similar properties, for all of these Long Term Management Costs. A copy of that third party cost estimate is enclosed herewith as Exhibit 3.

The applicant is also knowledgeable and experienced regarding the Long Term Management of the Barberville Conservation Area Site and similar properties and their associated management costs.

The applicant believes that the enclosed third party cost estimate is fair, reasonable and accurately reflects the costs incurred in providing such long term management.

12.3 PERIODIC ADJUSTMENTS TO COST ESTIMATES AND FUNDING

The amount of these cost estimates and the funding of the Long Term Management Costs for this Bank will be adjusted periodically, in each instance with the approval of the District, as required by the Mitigation Banking Permit and as otherwise reasonably determined to be necessary or appropriate by the Banker.

12.4 LONG TERM SITE MAINTENANCE FUND

The Long Term Site Maintenance Costs are annual and perpetual over the life of the Mitigation Bank. A fund will be established in an amount sufficient to pay for Long Term Site Maintenance Costs in the approximate amount of \$18,700/year on an annual and perpetual basis. The applicant has determined that principal in the amount of \$300,000, invested at a rate of 6 - 6 1/2% per annum, will be adequate to fund the Long Term Site Maintenance costs attributable to Phase 1. This assumes a moderate rate of return on the maintenance fund. In addition, the preponderance of these costs will not be incurred at the beginning of the project.

12.5 FUNDING OF LONG TERM MANAGEMENT COSTS

From the proceeds of the sale of each credit issued for Phase 1, an amount determined by dividing the amount of such Long Term Management Costs by the number of Phase 1 Credits will be deposited into the Dedicated Fund. Therefore the Long Term Management Costs will be fully funded not later than the date when all credits from the Bank attributable to Phase 1 have been sold.

By way of example, assuming that 350 credits are issued to the Mitigation Bank for Phase 1 (Upland Restoration), the amount required to be deposited into the Dedicated Fund from the sale of each such credit will be as follows:

<u>Item</u>	<u>Total Cost:</u>	<u>Cost / Funding / Credit</u>
Planting, Burning & Site Preparation* (* The net cost for Planting)	\$ 72,000	\$ 206
Monitoring Plan	\$143,150	\$ 410
Long Term Site Maintenance Cost Fund Contribution	\$300,000	\$ 858
Total Contribution	\$515,150	\$1,474

The County may, of course, in its discretion, fund these costs more quickly than required by the provisions of Section 12.4.11 (h) or required by the Resolution adopting the Dedicated Fund.

EXHIBIT 1
AERIAL PHOTOGRAPHS

3-10-42 Aerial Photograph of Barberville
Conservation Area



1990 Aerial Photograph of Barberville
Conservation Area

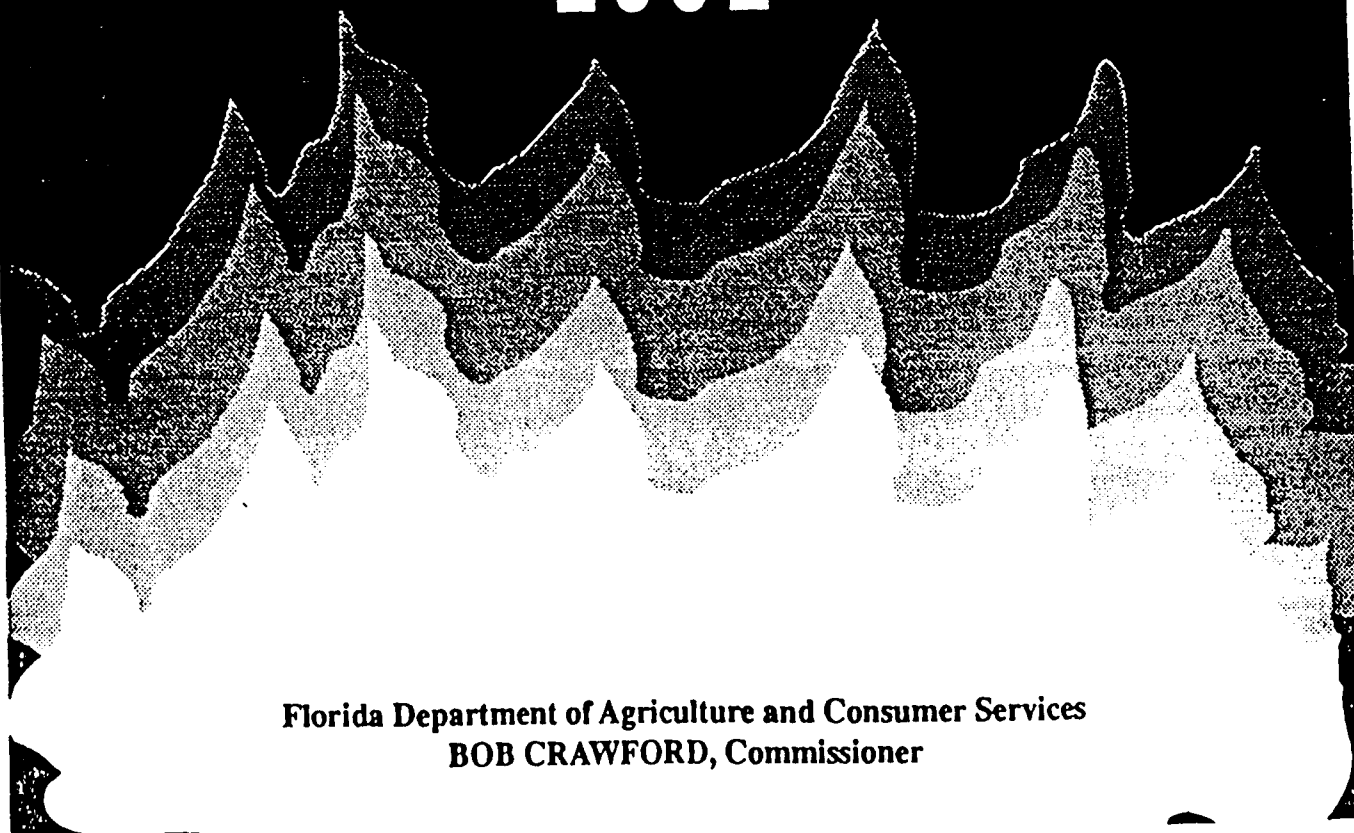


EXHIBIT 2

**FLORIDA'S FOREST FIRE LAWS AND OPEN
BURNING REGULATIONS, 1991**

Florida's Forest Fire Laws and Open Burning Regulations

1991



**Florida Department of Agriculture and Consumer Services
BOB CRAWFORD, Commissioner**

Index of Florida Statutes and Florida Administrative Code

— 1990 —

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**Florida Department of Agriculture
and Consumer Services**

**BOB CRAWFORD
Commissioner**

Division of Forestry

Printing Date: May, 1991

F 910: 5

Chapter 589 Forestry

{Excerpt}

589.04 Duties of division.—

It shall be the duty of the Division of Forestry of the Department of Agriculture and Consumer Services under such terms as will best serve the public interest to assist and cooperate with federal and state departments or institutes, county, town, corporation, or individual, to gather and disseminate information in regard to forests, their care and management, to prevent and extinguish forest fires, and enforce all laws pertaining to forests and woodlands.

Chapter 590 Forest Protection

{Excerpts related to Forest Fires}

590.02 Powers of division; appointment of forest investigators and rangers; powers and duties; entry upon lands; arrests.

(1) The Division of Forestry, in connection with the enforcement of this chapter and other forest and forest fire laws, shall have the following powers, authority, and duties:

- (a) To enforce the provisions of this chapter and other forest fire and forest protection laws of this state;
- (b) To prevent, detect, suppress, and extinguish forest fires in this state and to do all things necessary in the exercise of such powers, authority, and duties;
- (c) To provide forest firefighting crews, who shall be under the control and direction of forest rangers and other designated agents of the Division;
- (d) To appoint district foresters, assistant district foresters, investigators, rangers, and other employees;
- (e) To use the resources of the division on state-

owned parks and historic memorials wherever located within the state to prevent and suppress fires, to cut firelines, to establish regional firefighting crews who shall be authorized to support fires on state-owned park lands, and, subject to approval of the Executive Office of the Governor, to use funds not otherwise appropriated for the purchase of the necessary equipment for combating fires in state parks; and

- (f) To make rules to accomplish the purposes of this chapter.

(2) Forest rangers, and the firefighting crews under their control and direction, may enter upon any lands for the purpose of preventing and suppressing forest fires and to enforce the provisions of this chapter and other forest fire and forest protection laws of this state.

(3) Forest rangers, employees of the division, and all persons and federal and state agencies which are under contract or agreement with the division to assist in firefighting operations as well as persons, federal or state

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agencies, firms, companies, or corporations called upon by forest rangers or other authorized employees of the division to assist in firefighting under the direction or supervision of employees of the division may, in the performance of their duties, set backfires, dig trenches, cut firelines, and carry on all customary activities in the fighting of forest fires without incurring liability to any person.

- (4) (a) The Governor may, upon the application of the division, appoint a sufficient number of special officers, the exact number to be determined by the division but not to exceed 20, who shall have the power and authority of arrest. Such special officers shall furnish bond in the penal sum of \$2,500, payable to the Governor of the state and conditioned upon the faithful discharge of their duties as such special officers; such bonds must be approved by the division. In lieu of such individual bonds, the department may purchase a schedule position bond to cover all such special officers. Such special officers shall have power and authority throughout the state, under the direction and control of the division, to enforce the criminal provisions contained in this chapter and in laws relating to wild animal life and freshwater aquatic life, littering, forests, forest fires, open burning, theft of forest products, damage to forest products, livestock, farm equipment, livery tack, farm or citrus products, or trespass, or other crimes committed incidental or related thereto, or relating to crimes committed on property owned, managed, or occupied by the Department of Agriculture and Consumer Services.
- (b) Such special officers shall have the power and authority to make arrests, with or without warrants, for violations of the criminal provisions of this chapter; for violations of laws relating to wild animal life and fresh-water aquatic life, littering, forests, forest fires, open burning, theft of forest products, damage to forest products, livestock, farm equipment, livery tack, farm or citrus products, or trespass or for other crimes committed incidental or related thereto; or for crimes committed on property owned, managed, or occupied by the Department of Agriculture and Consumer Services, to the same extent and under the same limitations and duties as do peace officers under the provisions of chapter 901, as amended.
- (c) In each case in which any of the special officers effects an arrest, the sheriff of the county in which such arrest is made shall be entitled to the lawful fees, the same as though such arrest had been effected by him or his deputies.
- (d) In connection with the enforcement of such criminal provisions, such special officers may go upon

any premises, posted or otherwise, when necessary for the enforcement of such laws. All such special officers shall be ex officio forest rangers and shall be under the control and direction of the division, except that the Governor may at any time, for cause, remove any power and authority of arrest conferred by him. Such special officers shall have the same right and authority to carry arms as do the sheriffs of this state, unless otherwise provided by order of the Governor. The compensation of such special officers shall be fixed and paid by the division from its funds.

590.025 Control burning of wild land; authorization; conditions

(1) As used in this section, "wild land" means:

- (a) Uncultivated land other than fallow. Such land may be neglected altogether or maintained for such purposes as wood or forage production, wildlife, recreation, or protective plant cover.
- (b) Land virtually uninfluenced by human activity.

(2) At the request of the governing body of a county, the Division of Forestry of the Department of Agriculture and Consumer Services is authorized and empowered, subject to the provisions and qualifications contained in subsection (3), and provided the owner of the land does not object, to control burn any area of wild land within the county which is reasonably determined to be in danger of conflagration if any open and uncontrolled fires were to occur in the area.

(3) No area of wild land shall be control burned under the provisions of this section unless notice of intent to control burn, describing particularly the area to be burned and the tentative date or dates of the burning, is published in a conspicuous manner in one or more newspapers of general circulation in the area of the burn not less than 10 days prior to the burn.

(4) In addition, the Division of Forestry shall prepare, and the county tax collector shall include with the annual tax statement, a notice to be sent to all landowners in each township designated by the Division of Forestry as a high fire hazard area. Such notice shall describe particularly the area to be burned and the tentative date or dates of the burning and shall list the reasons for, and the benefits expected to result from, control burning.

590.026 Prescribed burning; requirements; liability.

(3) Definitions. As used in this section:

- (a) "prescribed burning" means the controlled application of fire to naturally occurring vegetative fuels under specified environmental conditions and following appropriate precautionary meas-

Chapter 590 Forest Protection

ures, which causes the fire to be confined to a predetermined area and accomplish the planned land management objectives.

(b) "Certified prescribed burn manager" means an individual who successfully completes the certification program of the Division of Forestry of the Department of Agriculture and Consumer Services.

(c) "Prescription" means a written plan for starting and controlling a prescribed burn.

(4) Rules.

The Division of Forestry of the Department of Agriculture and Consumer Services shall promulgate rules for the use of prescribed burning.

(5) Requirements; liability.

(a) Prescribed burning conducted under the provisions of this section shall:

[1] Be accomplished only when at least one certified prescribed burn manager is present on site while the burn is being conducted.

[2] Require that a written prescription be prepared prior to receiving authorization to burn from the Division of Forestry.

[3] Be considered in the public interest and shall not constitute a public or private nuisance when conducted pursuant to state air pollution statutes and rules applicable to prescribed burning.

[4] Be considered a property right of the property owner if naturally occurring vegetative fuels are used and when conducted pursuant to the requirements of this subsection.

(b) No property owner or his agent, conducting a prescribed burn pursuant to the requirements of this subsection, shall be liable for damage or injury caused by fire or resulting smoke, unless negligence is proven.

(6) Duties of agencies.

(a) The Department of Community Affairs, the Division of Forestry of the Department of Agriculture and Consumer Services, and the Office of the State Fire Marshal shall prepare a report to be submitted to appropriate legislative committees by February 1, 1991, that shall identify actions required to minimize the threat of wildfire in areas where new development is proposed in or adjacent to wild lands.

(b) The Office of Environmental Education of the Department of Education shall incorporate, where feasible and appropriate, the issues of prescribed burning into their educational materials.

590.05 Road crews to extinguish fires

Every member of a road construction or maintenance crew, whether employed by the Department of Transportation, or by the highway department or county commissioners of any county, and every road contractor or sub-contractor of said Department of Transportation, or the highway department or county commissioners of any county, and their employees shall keep all fires set by them under control and confined to the right-of-way and suppress all fires discovered and detected by them within two hundred feet of the center line of the right-of-way of any state, county or public road, or highway on which and adjacent to which the said crew, contractor, sub-contractor and employees are employed.

590.06 Adoption of rules for road crews

The Division of Road Operations of the Department of Transportation, and the county commissioners or highway departments of the several counties of this state shall require their construction and maintenance crews, contractors, sub-contractors and employees to comply with the provisions of this chapter and the said Division of Road Operations, county commissioners and highway department to that end may adopt and promulgate rules and regulations for the observance of said crews, contractors, sub-contractors and employees in carrying out the purposes and provisions of this chapter.

590.07 Refusal of road crews

Any road foreman or member of a road construction or maintenance crew, or any foreman, superintendent or employee of any road contractor or sub-contractor, who shall, without sufficient cause, willfully refuse or neglect to prevent and suppress fires as provided in this chapter, shall be guilty of a misdemeanor of the second degree, punishable as provided in s. 775.082 or s. 775.083.

590.08 Unlawful burning of lands

It is unlawful for any person to willfully or carelessly burn or cause to be burned, or to set fire to or cause fire to be set to, any forest, grass, woods, wild lands or marshes not owned or controlled by such person.

590.081 Emergency drought conditions; burning prohibited

(1) It is unlawful for any person to set fire to, or cause fire to be set to, any forest, grass, woods, wild lands, or marshes, or to build a campfire or bonfire or to burn trash or other debris within 600 yards of any forest, grasslands, woods, wild lands, or marsh area in any county, counties or area within a county where, because of emergency drought conditions, there is extraordinary danger from fire, unless a written permit is obtained from the Division of Forestry or its designated agent, or unless it can be established that the setting of a backfire was necessary for the purpose of saving life or property. The burden of proving such shall

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rest upon such person claiming same as a defense.

(2) The Commissioner of Agriculture, upon the advice of the director of the Division of Forestry, will advise the Governor when forests in any county, counties, or area within a county of this state, because of emergency drought conditions, are in extraordinary danger from fire. The Governor may by proclamation declare a drought emergency to exist and describe the general boundaries of the area affected.

(3) Any proclamation promulgated by the Governor under authority of this section shall be effective immediately upon filing same with the Department of State and shall remain in full force and effect until, when conditions warrant, an order of revocation of proclamation is made by the Governor and filed with the Department of State.

(4) Any person violating any of the provisions of this section shall be guilty of a misdemeanor of the second degree, punishable as provided in s. 775.082 or s. 775.083.

590.082 Extraordinary fire hazard; certain acts made unlawful; proclamations by the Governor

(1) When the Governor has by proclamation declared a drought emergency to exist and described the general boundaries of the area affected as prescribed in s. 590.081 and the drought emergency continues until the forest, grass, woods, wild lands, fields, or marshes become so dry or parched as to create an extraordinary fire hazard endangering life and property, it shall be unlawful for any person, except the owner or his agents or other persons regularly engaged in harvesting, processing, or moving forest or farm products, to enter or travel in any public or private forest lands, grasslands, woods, fields, or marshes within the area described by proclamation, except on public roads or highways or on well-defined private roads. Further, it shall be unlawful for any person to carry on any nonessential activities during such periods in the area affected.

(2) The Commissioner of Agriculture, upon the advice of the director of the Division of Forestry, will, with the consent of the chairman of the board of county commissioners of the affected county or counties, advise the Governor when forests, grass, woods, wild lands, fields, or marshes in any county, counties, or area within a county of this state, because of prolonged emergency drought conditions, become so dry or parched as to create an extraordinary fire hazard endangering life or property. The Governor may by proclamation declare an extraordinary fire hazard to exist and describe the general boundaries of the area affected.

(3) Any proclamation promulgated by the Governor under authority of this section shall be effective immediately upon filing same with the Department of State and shall remain in effect until, when conditions warrant, an order of revocation of proclamation is made by the Governor

and filed with the Department of State.

(4) Any person violating any of the provisions of this section shall be punished as for a misdemeanor as provided by s. 590.14.

590.09 Setting fire on rights-of-way

It is unlawful for any person to set or cause to be set willfully or carelessly a fire within the confines of the rights-of-way of any public road, state road, railroad, or in any other place and allow it to escape onto and burn over any adjoining land.

590.091 Designation of railroad rights-of-way as fire hazard areas

(1) The Division of Forestry, with the concurrence of the governing body of each affected county or city, is authorized to annually designate, on or before October 1, those railroad rights-of-way in this state which are known fire hazard areas.

(2) In addition to the requirements of subpart B of part 213, Chapter 11, Title 49, Code of Federal Regulations, it shall be the duty of all railroad companies operating in this state to maintain their rights-of-way designated as provided in subsection (1), as known high fire hazard areas, in an approved condition as shall be prescribed by rule of the division and to provide adequate firebreaks where needed, so as to prevent fire from igniting or spreading from rights-of-way to adjacent property.

590.10 Disposing of lighted cigars, etc.

It is unlawful for any person to throw or drop from an automobile or vehicle, or otherwise, a lighted match, cigarette, cigar, ashes, or other flaming or glowing substance, or any substance or thing which may or does cause a forest, grass, or woods fire.

590.11 Camp fires

It is unlawful for any individual or groups of individuals to build a warming or camp fire and leave same unextinguished.

590.12 Unlawful burning prohibited; penalty

(1) It is unlawful for any person:

- (a) To burn or cause to be burned, or to set fire to or cause fire to be set to, any forest, grass, woods, wild lands, marshes, or vegetative land clearing debris owned or controlled by such person without first obtaining authorization from the Division of Forestry; or
- (b) To fail to provide adequate fire lines, manpower and firefighting equipment for the control of such fire; or
- (c) To fail to watch over a fire authorized under paragraph (a) until it is extinguished; or
- (d) To permit a fire authorized under paragraph (a) to

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escape from the authorized area. However, no authorization shall be required for the setting of fire in a forest protection district where written permission to set such fire has been obtained from a duly appointed fire warden.

(2) A person who violates any provision of this section is guilty of a misdemeanor of the second degree, punishable as provided in s. 775.082, s. 775.083, or s. 775.084.

590.13 Civil liability

Any person violating any of the provisions of this chapter shall be liable for all damages caused by such violation, which damages shall be recoverable in any court of competent jurisdiction. The civil liability shall obtain whether there be criminal prosecution and conviction or not.

590.14 Penalties

(1) Whoever willfully or intentionally violates any of the provisions of this chapter shall be guilty of a felony of the third degree, punishable as provided in s. 775.082, s. 775.083, or s. 775.084.

(2) Whoever carelessly violates any of the provisions of this chapter, shall be guilty of a misdemeanor of the second degree, punishable as provided in s. 775.082 or s. 775.083.

(3) The penalties herein provided shall extend to both the actual violator and the person or persons, firm or corporation causing, directing, or permitting such violation.

590.15 Burden of proof

In any prosecution or civil action brought under the provisions of this chapter it shall not be necessary for the state or plaintiff to allege and prove absence of the right or authority of the defendant to set or cause to be set the fire, but such right and authority shall be a matter of affirmative defense to be alleged and proved by the defendant.

590.16 Rewards

The Division, in its discretion, may offer and pay rewards for information leading to the arrest and conviction of any person violating any of the provisions of this chapter.

590.25 Penalty for preventing or obstructing extinguishment of woods fires

Whoever shall interfere with, obstruct or commit any act aimed to obstruct the extinguishment of forest fires by the employees of the Division of Forestry or any other person engaged in the extinguishment of a woods fire or who injures, or destroys any equipment being used for such purpose, shall be guilty of a felony of the third degree, punishable as provided in s. 775.082, s. 775.083, or s. 775.084.

590.26 Liability for costs of suppressing fires

Whoever causes an unauthorized forest, grass, woods, wild lands, marsh, leaves, or vegetative land clearing debris fire, or permits any fire to escape, shall, in addition

to all other penalties provided by law, be liable for payment of all reasonable costs and expenses incurred in suppressing same. Said costs and expenses shall be payable to the Division of Forestry. When such costs and expenses are not paid in a reasonable time after demand, it shall be the duty of the said Division to take proper legal proceedings for the collection thereof. The liability for costs of suppression shall obtain whether there be criminal prosecution or not and the liability shall extend to the person or persons, firm, or corporation causing, directing, or permitting such activity as well as to the actual violator.

590.27 Penalty for mutilating or destroying state forestry or fire control signs and posters

Whoever intentionally breaks down, mutilates, removes or destroys any fire control or forestry sign or poster of the Division of Forestry erected in the administration of its lawful duties and authorities, shall be guilty of a misdemeanor of the second degree, punishable as provided in s. 775.082 or s. 775.083.

590.28 Willful, malicious or intentional burning of lands

(1) Whoever willfully, maliciously or intentionally burns, sets fire to, or causes to be burned or any fire to be set to, any forest, grass, or woodlands not owned by, or in the lawful possession of, the person setting such fire or burning such lands or causing such fire to be set or lands to be burned shall, upon conviction thereof, be deemed guilty of a felony and punished as provided in s. 590.30.

(2) The terms "willful," "malicious" and "intentional" as used in this section mean not merely gross negligence or disregard for the rights of others and not merely general criminal intent, but a specific intent to damage or destroy public property or the property of another, such intent being engendered by malice or spite or by the hope of material gain or employment to be derived either directly or indirectly.

590.29 Illegal possession of incendiary device

(1) Whoever, being outside the corporate limits of any municipality, has in his possession any incendiary device as defined by subsection (3) with the intent to use such device for the purpose of burning or setting fire to any forest, grass, or wood land, if such person is not the owner of, nor, as under a lease, in lawful possession of, the forest, grass, or wood land, shall, upon conviction thereof, be deemed guilty of a felony and punished as provided in s. 590.30.

(2) The possession of any incendiary device as defined by subsection (3) shall be prima facie evidence of the intent of the person possessing such device to use such device for the purpose of burning or setting fire to forest, grass, or wood lands which forest, grass, or wood lands such person possessing such device is not the owner of, nor in posses-

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sion of lawfully, as under a lease.

(3) The term "incendiary device" as used in this section is included but not limited to any "slow match" which is any device contrived to accomplish the delayed ignition of a match or matches or other inflammable material by the use of a cigarette, rope, or candle to which such match or matches are attached, or a magnifying glass so focused as to intensify heat on inflammable material and thus cause a fire to start at a subsequent time, and any chemicals or chemically treated paper or material, or other combustible material so arranged or designed as to make possible its use as a delayed firing device.

590.30 Penalties for violating ss. 590.28 and 590.29

(1) Whoever violates any of the provisions of s. 590.28 or s. 590.29 or both such sections of this chapter shall be guilty of a felony of the third degree, punishable as provided in s. 775.082, s. 775.083, or s. 775.084.

(2) Neither the provisions of s. 590.14 nor the penalties provided thereby shall apply to violations of the provisions of s. 590.28 or 590.29 or both such ss. 590.28 and 590.29, but such violations shall be punished by the penalties provided in s. 590.30 only.

Chapter 823 Public Nuisances

(Excerpts related to Forest Fires)

823.02 Building bonfires

Whoever is concerned in causing or making a bonfire within 10 rods of any house or building shall be guilty of a misdemeanor of the second degree, punishable as provided in s. 775.082 or s. 775.083.

823.041 Disposal of bodies of dead animals; penalty

(1) Any owner, custodian, or person in charge of domestic animals, upon the death of such animals due to disease, shall dispose of the carcasses of such animals by burning or burying at least 2 feet below the surface of the ground;

provided, however, nothing in this section shall prohibit the disposal of such animal carcasses to rendering companies licensed to do business in this state.

823.145 Disposal by open burning of mulch plastic used in agricultural operations

Polyethylene mulch plastic used in agricultural operations may be disposed of by open burning provided that no public nuisance or any condition affecting the public health is created thereby and that state and federal national ambient air quality standards are not violated.

Chapter 877 Miscellaneous Crimes

(Excerpts related to Forest Fires)

877.15 Failure to control or report dangerous fire

Any person who knows, or has reasonable grounds to believe, that a fire is endangering the life or property of another, and who fails to take reasonable measures to put out or control the fire when he can do so without substantial risk to himself, or who fails to give a prompt fire alarm, is

guilty of a misdemeanor of the second degree, punishable as provided in s. 775.082, s. 775.083, or s. 775.084, if:

(1) He knows that he is under an official, contractual, or other legal duty to control or combat the fire.

(2) The fire was started lawfully by him or with his assent and was started on property in his custody or control.

Chapter 403 Environmental Control

(Excerpts related to Forest Fires)

403.413 Florida litter law

(2) Definitions. — As used in this section:

(a) "litter" means any garbage; rubbish; trash; refuse; can; bottle; box; container; paper; tobacco product; tire; appliance; mechanical equipment or part; building or construction material; tool; machinery; wood; motor vehicle or motor vehicle part;

vessel; aircraft; farm machinery or equipment; sludge from a waste treatment facility, water supply treatment plant, or air pollution control facility; or substance in any form resulting from domestic, industrial, commercial, mining, agricultural, or governmental operations.

(b) "person" means any individual, firm, sole pro-

prietorship, partnership, corporation, or unincorporated association.

(g) "dump" means to dump, throw, discard, place, deposit, or dispose of.

(4) Dumping litter prohibited. — Unless otherwise authorized by law or permit, it is unlawful for any person to dump litter in any manner or amount:

(a) In or on any public highway, road, street, alley, or thoroughfare, including any portion of the right-of-way thereof, or any other public lands, except in containers or areas lawfully provided therefor. When any litter is thrown or discarded from a motor vehicle, the operator or owner of the motor vehicle, or both, shall be deemed in violation of this section;

(b) In or on any freshwater lake, river, canal, or stream or any tidal or coastal water of the state, including canals. When any litter is thrown or discarded

from a boat, the operator or owner of the boat, or both, shall be deemed in violation of this section;

(c) In or on any private property, unless prior consent of the owner has been given and unless such litter will not cause a public nuisance or be in violation of any other state or local law, rule or regulation.

Any person who violates any provision of this section is guilty of a misdemeanor of the second degree, punishable as provided in ss. 775.082 and 775.083.

Note — Any person who dumps litter in violation of subsection (4) in an amount of less than 15 pounds is guilty of a noncriminal infraction, punishable by a civil penalty of \$50. An amount exceeding 15 pounds or 27 cubic feet in volume is a misdemeanor of the first degree, punishable as provided in s. 775.082, s. 775.083, s. 775.084. An amount exceeding 500 pounds or 100 cubic feet in volume is a felony of the third degree, punishable as provided in s. 775.082 or s. 775.083. (See section (5) of 403.413 for additional details on penalties and enforcement).

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Chapter 5I-2 Rural Open Burning

5I-2.003 Definitions

The following words, phrases, or terms when used in this chapter shall, unless the content otherwise indicates, have the following meanings:

- (1) "Air pollution" is the presence in the outdoor atmosphere of any one or more substances or contaminants in quantities which are or may be potentially harmful or injurious to human health or welfare, animal or plant life, or property, or unreasonably interfere with the enjoyment of life or property, including outdoor recreation.
- (2) "Certified Burn Manager" is an individual who successfully completes the certification program of the Division of Forestry of the Department.
- (3) "Department" is the Department of Agriculture and Consumer Services.
- (4) "Excessive visible emissions" are air pollutants emitted in such quantity as to obscure an observer's view to a degree equal to or greater than Number Two (or 40% opacity) on the Ringelmann Smoke Chart as published in the U.S. Bureau of Mines Information Circular No. 7718.
- (5) "Fine fuel moisture" is the amount of moisture, usually expressed as a percentage, found in fast-drying, dead fuels such as grass, leaves, draped pine needles, and small twigs.

- (6) "Flame length" is the distance between the flame tip and the base of the flame measured generally at the ground surface.
- (7) "Forced draft" is an adequate current of air, blown or forced by a fan or other mechanical means, which is directed or arranged in relation to the open burning in such a manner as to increase the temperature of the fire and to reduce or minimize the resultant pollution.
- (8) "Land clearing operation" means the uprooting or clearing of vegetation in connection with construction for buildings and rights-of-way, mineral operations, control of weeds, or enhancement of property value, but does not include site preparation; i.e., fires for the growing, raising, or harvesting of crops, timber, or wildlife.
- (9) "Mixing height", as supplied daily by the National Weather Service, is the height to which relatively vigorous mixing of the atmosphere occurs.
- (10) "Open burning" means any outdoor fire or open combustion of material which produces or may produce air pollution.
- (11) "Outdoor heating device" means any apparatus, machine, equipment, or other contrivance in which is burned any type of fuel capable of producing air pollution, used outdoors for the purpose of giving

Chapter 51-2 Rural Open Burning

protection from cold or frost.

- (12) "Prescribed burning" is the controlled application of fire to naturally occurring vegetative fuels under specified environmental conditions, and following appropriate precautionary measures, which causes the fire to be confined to a predetermined area and accomplished planned land management objectives.
- (13) "Prescription" is a written plan for starting and controlling a prescribed burn.
- (14) "Relative humidity" is the ratio, expressed as a percentage of the amount of moisture in the air, to the maximum amount of moisture the air is capable of holding under the same conditions.
- (15) "Sunset" is official sunset as set forth by the U.S. Naval Observatory (tables are available at National Weather Service offices).
- (16) "Silvicultural burning" is prescribed burning in accordance with that phase of forestry that deals with the establishment, development, reproduction, and care of forests flora and fauna.
- (17) "Smoke sensitive areas" are areas within which, for reasons of visibility, health or human welfare, smoke could have an adverse impact.
- (18) "Surface wind speeds" are those wind speeds measured 20 feet above the average local vegetation. Wind speeds supplied by the National Weather Service are "Surface Wind Speeds".
- (21) "Transport wind speed" is a measure of the average rate of the horizontal movement of air throughout the mixing layer.

51-2.006 Agricultural and silvicultural fires.

(1) Open burning between the hours of 9:00 a.m. and one hour before sunset (except fires for cold or frost protection) in connection with agricultural, silvicultural or forestry operations related to the growing, harvesting or maintenance of crops or in connection with wildlife management is allowed, provided that permission is secured from the Division of Forestry of the Department of Agriculture and Consumer Services prior to burning. The burning must not be ignited so as to cause it to continue spreading after one hour before sunset. Division of Forestry may allow open burning at other times when there is reasonable assurance that atmospheric and meteorological conditions in the vicinity of the burning will allow good and proper diffusion and dispersment of air pollutants, and ready control of such fires within the designated boundaries.

(2) The Division of Forestry may suspend after reasonable notice any such permission whenever atmospheric or meteorological conditions change so that there is improper diffusion and dispersion of air pollutants which create a condition deleterious to health, safety, or general welfare,

or which obscure visibility of vehicular or air traffic.

(3) Fires must be attended at all times.

51-2.061 Prescribed Burning; Burn Manager Certification.

(1) Prescribed Burning

(a) Any prescribed burning conducted under this chapter must include the development of a written prescription. This prescription must be on site during the burn and available for inspection by a Department representative. As a minimum, the prescription will contain the following: 1. Stand or Site Description; 2. Map of the area to be burned; 3. Personnel and Equipment to be used on the burn; 4. Desired Weather Factors, including but not limited to surface wind speed and direction, transport wind speed and direction, minimum mixing height, minimum relative humidity, maximum temperature, and fine fuel moisture; 5. Fire Behavior Factors, such as type of burn technique, flame length, and rate of spread; and 6. the signature of the Certified Burn Manager.

(b) No Certified Burn Manager shall approve a prescription unless and until such Certified Burn Manager has evaluated and approved the impact of the burn on related smoke sensitive areas.

(c) A Certified Burn Manager must be on site during the entire burn.

(d) All burning conducted under this section will be within the provisions of section 51-2.006.

(2) Burn Manager Certification

(a) Certification as a Burn Manager is accomplished by satisfactory completion of the Division of Forestry's Certified Burner Course and direct experience in 3 prescribed burns prior to taking the course or satisfactory completion of the Florida Inter-Agency Basic Prescribed Fire course and direct experience in 3 prescribed burns.

(b) Decertification. Individuals who have been certified hereunder may be decertified in accordance with Chapter 120, Florida Statutes.

51-2.007 Rural Land Clearing

(1) Pursuant to the Florida Environmental Reorganization Act of 1975, Chapter 75.22, Section 8, Laws of Florida, 1975, this section applies to rural land clearing. See Section 17-256.500, Florida Administrative Code, for non-rural land clearing. The following rules apply to rural land clearing open burning:

(2) Open burning of wooden material or vegetation generated by a land clearing operation (except for agricultural, silvicultural, or forestry operations) or the demolition of a structure is allowed provided one of the following alternatives is satisfied:

(a) The open burning is fifty yards or more from any

occupied building or public highway and is performed between 9:00 a.m.(standard time) and one hour before sunset.

(b) At other times when:

[1] The open burning is fifty yards or more from any occupied building or public highway and a forced draft system is used; or,

[2] The open burning is five hundred yards or more from any occupied building or a public highway and the Department has given permission because of reasonable assurance that atmospheric and meteorological conditions in the vicinity of the burning will allow good and proper diffusion and dispersement of air pollutants, or

(c) The burning is conducted under the supervision of the Department of Transportation, a forced

draft is used, and visibility on roadways is not artificially reduced to less than 500 feet.

(3) If the burning site is situated in a rural area or is adjacent to or near forest, grass, woods, wild lands or marshes, the Division of Forestry shall be notified and consulted prior to any burning.

(4) All open burning under this section shall be conducted in the following manner:

(a) The piles of material to be burned shall be of such size that the burning will be completed within the designated time given in paragraph 5I-2.007 (2)(a).

(b) The moisture content and composition of the material to be burned shall be favorable to good burning which will minimize air pollution.

(c) The starter fuel and materials to be ignited shall not emit excessive visible emissions when burned.

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Chapter 5I-3 Railroad Rights-of-Way

(Excerpts related to Forest Fires)

5I-3.03 Definitions

The following words, phrases, or terms when used in this chapter shall, unless the content otherwise indicates, have the following meanings:

(1) "Department" is the Department of Agriculture and Consumer Services.

(2) "Division" is the Division of Forestry of the Department of Agriculture and Consumer Services.

(3) "Firebreak" is a natural or constructed barrier utilized to stop or check fires that may occur or to provide a control line from which to work. Constructed barriers may consist of lines plowed by a standard fireline plow or prepared by the application of fire retardant chemicals or by prescribed burning.

(4) "High fire hazard area" refers to that portion of a railroad right-of-way with a fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition or of suppression difficulty and/or has exhibited a past history of concentrated fire occurrence.

(5) "Prescribed burning" is the skillful application of fire to natural fuels under conditions of weather, fuel moisture, soil moisture, etc., that allow confinement of the fire to a predetermined area and at the same time will produce the intensity of heat and rate of spread required to accomplish certain planned objectives and, in this reference speci-

cally, hazard reduction.

5I-3.05 Right-of-Way Maintenance

The Division will maintain an inventory of all known railroad right-of-way high fire hazard areas and, after concurrence of the governing body of each county or city, will notify annually, on or before October 1, each railroad company of the existence of such high fire hazard areas on their property that require maintenance. Such notifications will include recommendations for treatment of the designated areas for the purpose of fire prevention and control. Treatment will consist of any one or combination of the following:

(1) firebreaks only;

(2) firebreaks and prescribed burning;

(3) prescribed burning using natural barriers;

(4) fire retardant chemical treatment. Each affected railroad company will implement and complete these recommended treatments, or other alternative practices if approved by the Division, within a reasonable time after receiving notification. The Division may grant extensions if it agrees that circumstances warrant.

5I-3.06 Penalty

Whoever violates the provisions of this rule may be referred to local prosecuting authorities and, if found guilty, may be subject to the penalties provided in section 590.14, Florida Statutes.

Florida Administrative Code

Chapter 17-256 Open Burning and Frost Protection Fires

In accordance with an interagency agreement between the Department of Environmental Regulation and the Department of Agriculture and Consumer Services dated October 1, 1981, the Department of Agriculture and Consumer Services assumed the duty and authority to implement the following sections of Chapter 17-256, Florida Administrative Code, "Open Burning and Frost Protection Fires".

17-256.200 Definitions

The following words, phrases, or terms when used in this chapter shall, unless the content otherwise indicates, have the following meanings:

- (1) "Air curtain incinerator" is a portable or stationary combustion device that directs a plane of high velocity forced draft air through a manifold head into a pit with vertical walls in such a manner as to maintain a curtain of air over the surface of the pit and a recirculating motion of air under the curtain. An air curtain incinerator is controlled burning as defined in Florida Administrative Code Rule 17-7.02(15).
- (2) "Air pollution" is the presence in the outdoor atmosphere of the state of any one or more substances or contaminants in quantities which are or may be potentially harmful or injurious to human health or welfare, animal or plant life, or property, or unreasonably interfere with the enjoyment of life or property, including outdoor recreation.
- (3) "Air pollution episode" is any occurrence of elevated levels of pollutants in the atmosphere which require hasty and unusual abatement action.
- (4) "Approved fuel" shall mean fuel approved by the Department to emit or release a minimum of pollutants when burned.
- (5) "Clean dry wood" means wood (including lighter pine), lumber or tree and shrub trunks, branches, and limbs which is free of paint, pentachlorophenol, creosote, tar, asphalt, or other wood preservatives and which when burned does not emit excessive visible emissions.
- (6) "Department" is the Department of Environmental Regulation.
- (7) "Department air stagnation advisory" is a temporary prohibition of open burning activities by the Department that is based upon a Department forecast of a stagnant atmospheric meteorological condition that does not allow the dispersion of air pollutants.
- (8) "Excessive visible emissions" are air pollutants emitted in such quantity as to obscure an observer's view to a degree equal to or greater than number two (or 40% opacity) on the Ringelmann Smoke Chart as published in the U.S. Bureau of Mines Information Circular No. 7718.
- (9) "Extinguished" means the absence of any visible flames, smoke or emissions.
- (10) "Forced draft" is an adequate current of air, blown or forced by a fan or other mechanical means, which is directed or arranged in relation to the open burning in such a manner as to increase the temperature of the fire and to reduce or minimize the resultant pollution.
- (11) "Garbage" means all kitchen and table food waste, animal or vegetative waste that is attendant with or results from the storage, packaging, preparation, cooking or handling of food materials.
- (12) "Group I containers" means combustible containers which formerly contained organic or metallo-organic pesticides, except organic mercury, lead, cadmium, or arsenic compounds.
- (13) "Land clearing debris" is uprooted or cleared vegetation resulting from a land clearing operation and does not include yard trash.
- (14) "Land clearing operation" means the uprooting or clearing of vegetation in connection with construction for buildings, rights-of-way, residential, commercial, or industrial development, or the initial clearing of vegetation to enhance property value; but does not include the maintenance burning of yard trash resulting from fallen limbs, branches, or leaves, or any other routine property clean-up activities.
- (15) "National Weather Service air stagnation advisory" is an advisory issued by the National Weather Service to caution local and regional agencies of meteorological conditions which are conducive to poor dispersion and that are expected to persist for at least 36 hours.
- (16) "Non-rural land clearing" is any land clearing operation that is conducted in urban or residential areas, incorporated or unincorporated cities or towns, or in any non-rural area as designated by the Department and shall not include any land clearing operation that is associated with country, livestock or with agricultural activities.
- (17) "Nuisance" means any open burning activity which is potentially harmful or injurious to human health or property or which is annoying or offensive to occupants of three or more occupied residences.
- (18) "Open burning" means the burning of any matter in such a manner that the products of combustion

Chapter 17-256 Open Burning and Frost Protection Fires

resulting from the burning are emitted directly into the outdoor atmosphere without passing through a stack or chimney.

- (19) "Open field" means any location in a well ventilated cleared area that is at least 200 feet in all directions from any wooded area or occupied building(s), and 100 feet from any public road.
- (20) "Outdoor heating device" means any apparatus, machine, equipment, or other contrivance in which is burned any type of fuel capable of producing air pollution, used outdoors for the purposes of giving protection from cold or frost.
- (21) "Pesticide" means any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, nematodes, fungi, woods, or other forms of plant or animal life or viruses, except viruses or fungi on or in living man or other animals, which the Department of Agriculture and Consumer Services shall declare to be a pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.
- (22) "Residential land clearing" is a land clearing operation that is conducted by the homeowner or an individual contracted by the homeowner of an existing residential dwelling of not more than two family units for the purpose of initially clearing vegetation on the property.

¹Note: The Department's intent was to say "proposed" residential dwelling rather than "existing"; therefore, "proposed" will be the interpretation used by the Division of Forestry.

- (23) "Sunset" is official sunset as set forth by the U.S. Naval Observatory (tables are available at National Weather Service offices).
- (24) "Trash" means construction or demolition debris, and other debris such as paper, cardboard, cloth, glass, street sweepings, vehicle tires and other like matter.
- (25) "Waste pesticide container" means any containers made of combustible materials, including but not limited to paper, plastic, or burlap, which formerly contained pesticides and which the manufacturer or formulator provided as an end user conveyance for the specified product.
- (26) "Yard trash" means vegetative matter resulting from landscaping and yard maintenance operations and includes materials such as tree and shrub trimmings, grass clippings, palm fronds, trees and tree stumps.

17-256.300 Prohibitions

- (1) Any open burning not specifically allowed by this chapter or by Florida Administrative Code Rule 51-2 is

prohibited. No person shall ignite, cause to be ignited, permit to be ignited, suffer, allow, burn, conduct or maintain any prohibited open burning. The Division of Forestry or any authorized fire control agency empowered by law or ordinance to extinguish unlawful burning may extinguish or cause to be extinguished, any fire that is unauthorized or does not comply with this rule. Any person responsible for unlawful open burning shall bear any applicable costs involved in extinguishing the fire.

- (2) No person shall use or operate any outdoor heating device or burn any unapproved fuel for cold or frost protection except as provided in this chapter.

(3) The open burning of tires, rubber material, Bunker C residual oil, asphalt, roofing material, tar, railroad cross ties, other creosoted lumber, plastics, garbage, or trash other than yard trash and household paper products is prohibited. Open burning of yard trash and household paper products is prohibited except as provided in Florida Administrative Code Rule 17-256.700(1). Open burning of waste pesticide containers is prohibited except as provided in Florida Administrative Code Rule 17-256.700(6).

(4) Any open burning that is allowed by this Chapter such as the burning of waste pesticide containers, yard trash, and land clearing debris is restricted to the site where the material was generated and may not be transported to another property to be open burned, with the following exceptions:

- (a) Land clearing debris that is generated by the commercial land clearing activities of a person may be transported offsite to be burned by an Air Curtain Incinerator that is owned or operated by that person and without a Florida Administrative Code Rule 17-2 air pollution permit provided that it:

- [1] Will be transported to property that is owned or leased by the person who generated the land clearing debris, and
- [2] Meets a setback distance of 300 feet from occupied buildings for air curtain incinerators with vertical refractory-lined walls and with forced underdraft air, or
- [3] Meets a setback distance of 1,000 feet from occupied buildings for all other air curtain incinerators.

- (b) Land clearing debris generated from the activities of one or more persons may be transported offsite to be burned by an air curtain incinerator with an appropriate Department air pollution permit.

(5) Open burning within one thousand (1000) feet of any active runway of a Department of Transportation approved public airport is prohibited. The Division of Forestry or any fire control agency authorized by law or ordinance to extinguish unlawful burning may extinguish or cause to be

Chapter 17-256 Open Burning and Frost Protection Fires

extinguished, any open burning that is within one thousand (1000) feet of an active airport runway that reduces or potentially reduces visibility at the airport.

(6) Open burning in particulate and ozone Nonattainment Areas or in the area of influence as defined in Florida Administrative Code Rule 17-2 may be temporarily suspended when the Department determines that ambient air concentrations of total suspended particulate or ozone may near or exceed the primary or secondary standards for these pollutants.

(7) No open burning may be conducted during a National Weather Service Air Stagnation Advisory, a Department Air Stagnation Advisory, an Air Pollution Episode, or if the Division of Forestry determines that weather conditions are unfavorable for safe burning.

(8) Open burning which reduces visibility on public roadways to less than one thousand (1000) feet is prohibited.

(9) Nothing in this Chapter may be construed to allow open burning which violates other laws, rules, regulations, or ordinances.

17-256.400 Agricultural and Silvicultural Fires

Pursuant to Section 8 of the Florida Environmental Reorganization Act, Chapter 75-22, Laws of Florida, 1975, this section has been transferred to the State of Florida Department of Agriculture and Consumer Services, Division of Forestry. See Chapter 51-2, Florida Administrative Code.

17-256.500 Land Clearing (non-rural)

The following rules apply to non-rural land clearing open burning:

(1) Open burning of wooden material or vegetation generated by a land clearing operation (except for agricultural, silvicultural, or forestry operations) or the demolition of a structure is allowed provided that all the following conditions are met:

(a) The open burning meets one of the following setback requirements:

[1] Three hundred (300) feet or more away from any occupied building for residential land clearing, or

[2] Three hundred (300) feet or more away from any occupied building if an air curtain incinerator is used, or

[3] One thousand (1,000) feet or more away from any occupied building if an air curtain incinerator is not used.

(b) The open burning is set back one hundred (100) feet or more away from any public highway or road and the prevailing winds direct the smoke away from the public highway or road.

(c) The open burning is ignited after 9:00 a.m. and is extinguished one hour before sunset.

(d) The open burning is attended at all times.

(e) The open burning authorized herein is not intended to relieve any person from complying with any other applicable laws, rules, or ordinances, including Chapter 590, Florida Statutes, and rules of the Division of Forestry.

(f) The piles of materials to be burned shall be of such size that the burning will be completed within the designated time given in paragraph 17-256.500(1)(c). Restrictions of the size and number of piles may be imposed by the appropriate local fire control authorities.

(g) The moisture content and composition of the material to be burned shall be favorable to good burning which will minimize air pollution. Wet or green vegetative materials shall not be burned.

(h) The starter fuel and materials to be ignited shall not emit excessive visible emissions when burned. Tires or other prohibited materials listed in Florida Administrative Code Rule 17-256.300 shall not be used as starter fuel.

(i) The amount of dirt in a land clearing open burning operation shall be minimized to enhance combustion and reduce emissions.

(j) Prior to open burning for the demolition of a structure, all insulation, electrical wiring, linoleum, carpeting, roofing material such as tar paper and asphalt shingles, or other excessive smoke producing or potentially air toxic material shall be removed.

(2) The use of air curtain incinerators is allowed for the combustion of land clearing debris. No Department permits are required for air curtain incinerators that are designed and used as portable units and that will not operate on any one site for more than six months in any year. Prior authorization to use a portable air curtain incinerator must be obtained from the Division of Forestry and where necessary, the local fire control authority. Air curtain incinerators may operate as portable units provided that the following conditions are met:

(a) Pit width, length, and side walls shall be properly maintained so that the combustion of the waste within the pit will be maintained at an adequate temperature and with sufficient air recirculation to provide enough residence time and mixing for complete combustion and control of emissions. Pit width shall not exceed twelve (12) feet, and vertical side walls shall be maintained.

(b) No waste may be positioned to be burned above the level of the air curtain in the pit.

(c) The types of materials to be burned are restricted

Chapter 17-256 Open Burning and Frost Protection Fires

long as excessive visible emissions are not emitted.

(4) Open burning for the flaring of waste gases is allowed for reasons of safety, as long as excessive visible emissions are not emitted.

(5) Open burning is allowed for the instruction and training of organized fire fighters or industrial employees under the supervision of the appropriate public fire control official provided that:

(a) The burning activities are for the sole purpose of fire suppression training for non-hazardous liquid fires such as gasoline, jet fuel, etc. and for structural fires. All materials that are determined to be potentially toxic by the appropriate fire control authority shall be removed from a structure prior to burning.

(b) The Division of Forestry, the Department, and local fire control officials are notified in advance of the time and place of the burning exercise.

(6) Subject to all of the following conditions, wasted pesticide containers may be burned in open fields by the owner of the crops, the owner's authorized employee or caretaker, or by commercial pesticide applicators hired by the owner or caretaker.

(a) Plastic containers must be the original container provided by the pesticide manufacturer or formulator as end user conveyance for the specific product, and not reused containers designed for other products.

(b) Containers must be classified as Group I Containers and bear label instructions stating that small quantities of the containers may be burned in open fields by the user of the pesticide when such open burning is permitted by state and local regulations.

(c) The quantity of containers to be burned each day per parcel treated shall not exceed the amount accumulated during one day's use of pesticide. No more than 500 pounds of pesticide containers shall be burned per day at any specific location. If more than one fire is to be set in any area each specific burning location shall be at least 1,000 yards from each other location at which burning will occur concurrently.

(d) All Group I Containers which are to be disposed of by open burning shall be completely empty and free of residual material pursuant to the following criteria:

[1] Plastic containers including inner liners shall be triple rinsed with the same kind of solvent used to dilute the spray mixture in the field. The rinse liquids from the containers shall be added to the spray mixture in the field.

[2] Paper containers shall be emptied by a final shaking and tapping of the sides and bottom to

remove clinging particles. All loosened particles shall be added to the spray mixture or application in the field.

(e) The open burning shall meet the following conditions:

[1] The open burning does not produce smoke, soot, odors, visible emissions, heat, flame, radiation, or other conditions to such a degree as to create a nuisance.

[2] The open burning is two hundred (200) feet or more away from any farm workers or occupied buildings and is one hundred (100) feet or more away from any public road.

[3] The fire is ignited after 9:00 a.m. and is extinguished one hour before sunset of the same day.

[4] The person responsible for the burning is in attendance at an upwind location from the fire for the entire period of the burn (until all flame and smoke have dissipated).

[5] The open burning is enclosed in a noncombustible container or ground excavation covered by a metal grill.

[6] Nothing herein shall relieve any person from complying with any other applicable laws, rules and ordinances, including Chapter 590, Florida Statutes, and rules of the Division of Forestry.

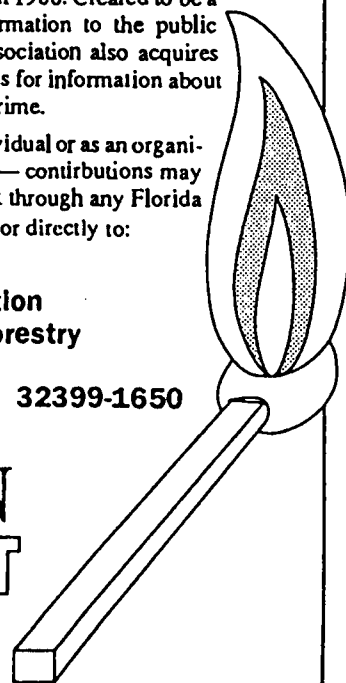
The Florida Forestry Arson Alert Association is a non-profit organization formed in 1986. Created to be a vehicle for supplying information to the public about woods arson, the Association also acquires funds and distributes rewards for information about incidents of this senseless crime.

You are invited, as an individual or as an organization, to join in this effort — contributions may be made in cash or by check through any Florida Division of Forestry office, or directly to:

**Florida Forestry
Arson Alert Association
Florida Division of Forestry
Fire Control Bureau
Tallahassee, Florida 32399-1650**

**ARSON
ALERT
HotLine**

1(800)282-7669



Chapter 17-256 Open Burning and Frost Protection Fires

to land clearing debris. The Department may approve requests for the burning of other similar types of wastes such as clean dry wood on a case-by-case basis.

- (d) Excessive visible emissions are not allowed except for a period of up to 30 minutes during startups, shutdowns and temporary malfunctions, as those terms are defined in Chapter 17-2 Florida Administrative Code.

(3) Air curtain incinerators that are intended to be stationary units, i.e. continuously operate at one site for more than six months, or operate at any Department-permitted landfill, must obtain a Department air pollution permit pursuant to Florida Administrative Code Rule 17-2.

(4) If the open burning resulting from a land clearing operation is creating a nuisance, or if changing weather or atmospheric conditions create a real or potential fire safety or air pollution problem, the Department may suspend or defer open burning until conditions change.

(5) Exceptions to the setback requirements shall be granted by the Department if the applicant obtains a signed affidavit from every affected resident within the setback area that waives his objections to the open burning associated with the land clearing operation. Affidavits must be received by the Department 48 hours in advance of the burning.

(6) Notwithstanding the provisions of Florida Administrative Code Rules 17-256.300(4)(a)2, 17-256.500 (1)(a)2 and 17-256.500(1)(c), refractory-lined air curtain incinerators with forced underdraft air may commence burning at sunrise and may be charged until sunset, provided they maintain a setback distance of 1000 feet from occupied building located off-site and do not create a nuisance. During such times as the air curtain incinerator is not in operation, public access to the air curtain incinerator shall be restricted.

17-256.700 Open Burning Allowed

(1) Open burning to reduce yard trash and household paper products generated on occupied residential premises of not more than two family units is allowed in ozone attainment areas as specified in Florida Administrative Code Rule 17-2 without Department authorization provided that all of the following conditions are met:

- (a) The open burning does not produce smoke, soot, odors, visible emissions, heat, flame, radiation, or other conditions to such a degree as to create a nuisance.
- (b) The open burning is one hundred (100) feet or more from any occupied building other than that owned or leased by the individual doing the burning and fifty (50) feet or more from any public highway or road and is ignited after 9:00 a.m. and is extinguished one hour before sunset providing that no visible smoke will be allowed over any

adjacent residence or over the road that would cause a nuisance. These setback requirements apply in counties that are not specifically listed in 17-256.700(1)(c).

- (c) The open burning is three hundred (300) feet or more from any occupied building other than that owned or leased by the individual doing the burning and one hundred (100) feet or more from any public highway or road and is ignited after 9:00 a.m. and is extinguished one hour before sunset providing that no visible smoke will be allowed over any adjacent residence or over the road that would cause a nuisance. The requirements in this section apply in the following counties:

Dade, Brevard, Broward, Pinellas, Hillsborough, Palm Beach, Duval, Orange, Polk, Volusia, Escambia, Lee, Sarasota, Pasco, Seminole, Alachua, Manatee, Leon, Marion, Okaloosa, Lake, Bay, St. Lucie and Collier.

- (d) The open burning is fifty (50) feet or more from any residence on the property where the burning is being conducted.
- (e) The open burning is attended and adequate fire extinguishing equipment is readily available at all times.
- (f) The moisture content and composition of material to be burned shall be favorable to good burning which will minimize air pollution. Green or wet materials may not be burned.
- (g) The open burning is not prohibited by any local, county, municipal, or other governmental rule, regulation, law, or ordinance.
- (h) The open burning is enclosed in a noncombustible container or ground excavation covered by a metal mesh or grill, and is set back at least 25 feet from any woodlands, forest, or brush.

(2) Open burning to reduce yard trash generated on occupied residential premises of not more than two family units in areas that are designated as non-attainment or maintenance areas for ozone² as defined in Florida Administrative Code Rule 17-2 is allowed if a municipal, county or commercial solid waste collection service for yard trash is not available on a periodic basis of at least once a week. The open burning must comply with all the conditions contained in Florida Administrative Code 17-256.700(1), and prior authorization must be obtained from the Department or the authorized local fire control agency.

² Note: Counties designated — Broward, Dade, Duval, Hillsborough, Orange, Palm Beach and Pinellas Counties.

(3) A camp fire, bonfire or other fire will be allowed that is used solely for recreational purposes, for ceremonial occasions, for outdoor non-commercial preparation of food, or on cold days for warming of outdoor workers, as

Prescribed Burning Plan

State _____ County _____ DOF District _____ Resource Unit _____
 Stand No. _____ Twp. _____ Rge. _____ Sec. _____
 Gross Acres _____ Net Acres _____ Authorization Number: _____

(Draw map on back or attach)

A. Record of Previous Burning: Date _____ Type _____ Results _____

B. Description of Stand:

1. Overstory: Type, density, size _____
2. Height to bottom of crown (if no overstory, write NONE for 1 & 2) _____
3. Understory: Type, density, height _____
4. Fuels: Type, density, age _____
5. Soil type and topography _____

C. Purpose(s): _____

(Hazard Reduction, Site Preparation, Wildlife Habitat, Manage Understory, Disease Control, Forage, Accessibility, etc.)

D. Desired Fire Behavior: _____

(1) Fire Intensity, (2) percent litter to leave, (3) amount of brush to be consumed, (4) others _____

E. Pre-Burn Factors:

1. Chains to plow: Exterior _____ Interior _____ Total _____
2. Chains to fire: Exterior _____ Interior _____ Total _____
3. Crew Size: _____ Type of Fire _____ Procedure _____
4. Expected rate of spread _____ No hours to complete _____
5. Special Precautions _____
6. Notify: _____
7. Regulations that Apply _____
8. List smoke sensitive areas and locate on map: _____

F. Range of Desired Weather:

- | | |
|---|----------------------------------|
| 1. Surface wind (direction & speed) _____ | 7. Fine fuel moisture _____ |
| 2. Transport wind (direction & speed) _____ | 8. Litter moisture content _____ |
| 3. Stability _____ | 9. Temperature _____ |
| 4. Mixing height _____ | 10. Days since rain _____ |
| 5. Relative Humidity _____ | 11. Time of day to start _____ |
| 6. Stagnation index _____ | 12. Best month to burn _____ |

G. Summary of Burn:

1. Acres burned: _____ Type fire used _____ In Charge _____
2. Dates burned: _____ Time set _____ Days since rain _____
3. Actual Weather Factors:

1. Surface wind (dir. & speed) _____	7. Fine Fuel Moisture _____
2. Transport wind (dir. & speed) _____	8. Litter moisture content _____
3. Stability _____	9. Temperature _____
4. Mixing height _____	10. Days since rain _____
5. Relative Humidity _____	11. Time of day started _____
6. Stagnation index _____	12. Month burned _____

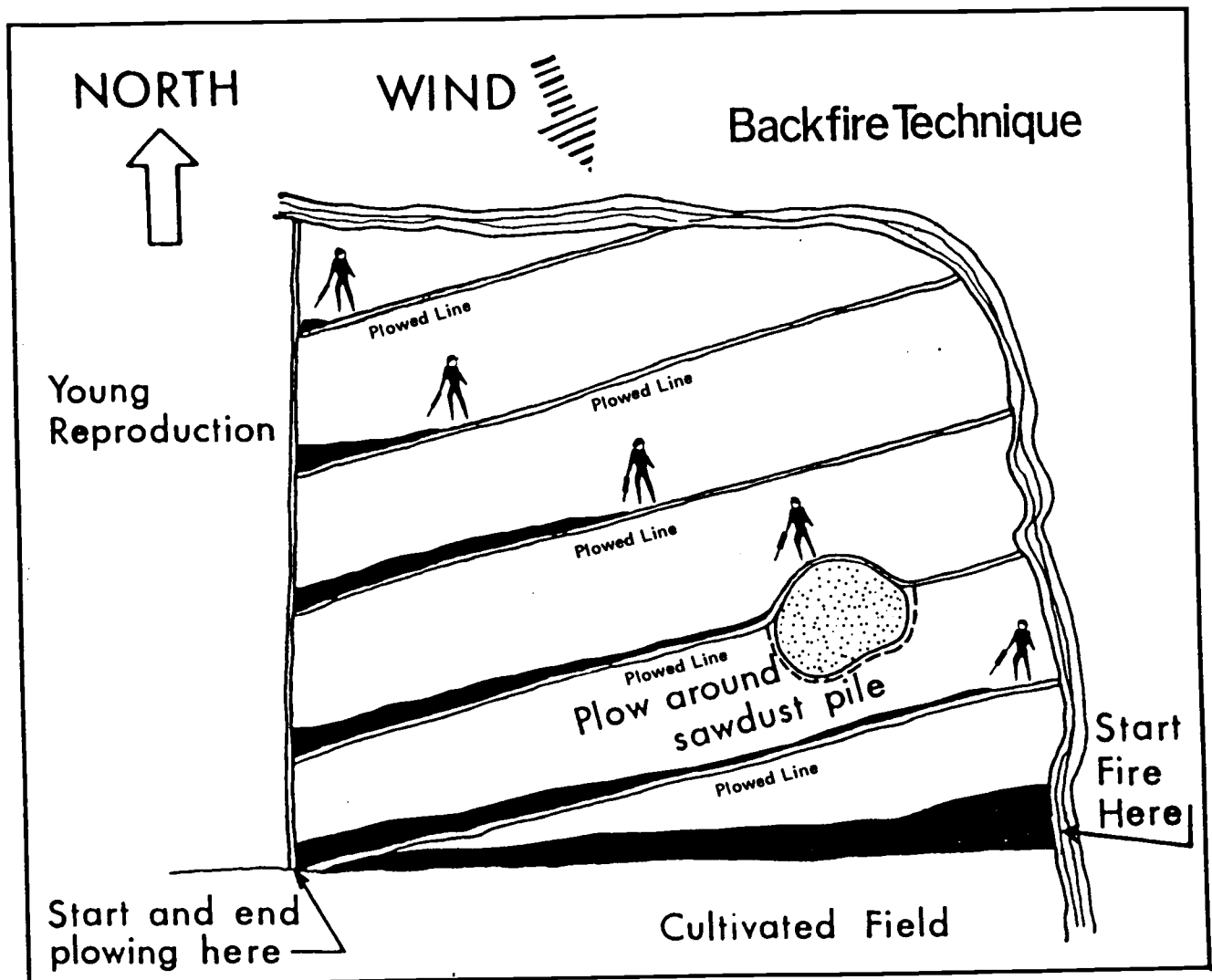
H. Evaluation:

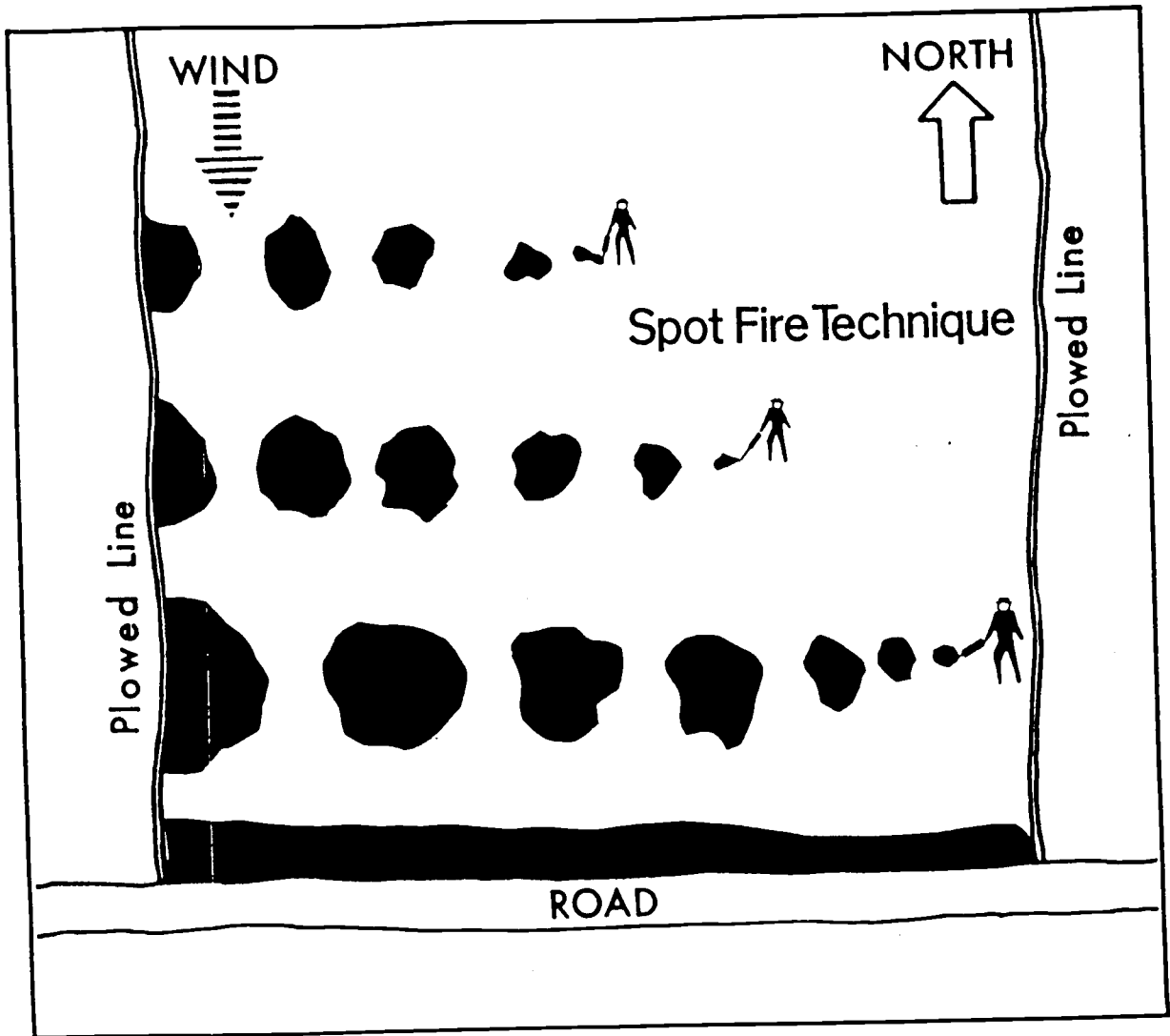
Immediately after burn

1. Needle discoloration _____
2. Bark char (height) _____
3. Amount litter left _____
4. Fuel consumption _____
5. Flame height _____
6. Fire behavior _____
7. Smoke dispersion _____
8. Any escape _____
9. Adverse publicity _____
10. Objectives reached _____
11. Techniques correct _____
12. Remarks _____

Future Evaluation

1. Date made _____
2. Crown scorch _____
3. Bole damage _____
4. Understory kill _____
5. Soil movement or other adverse effects _____
6. Remarks _____





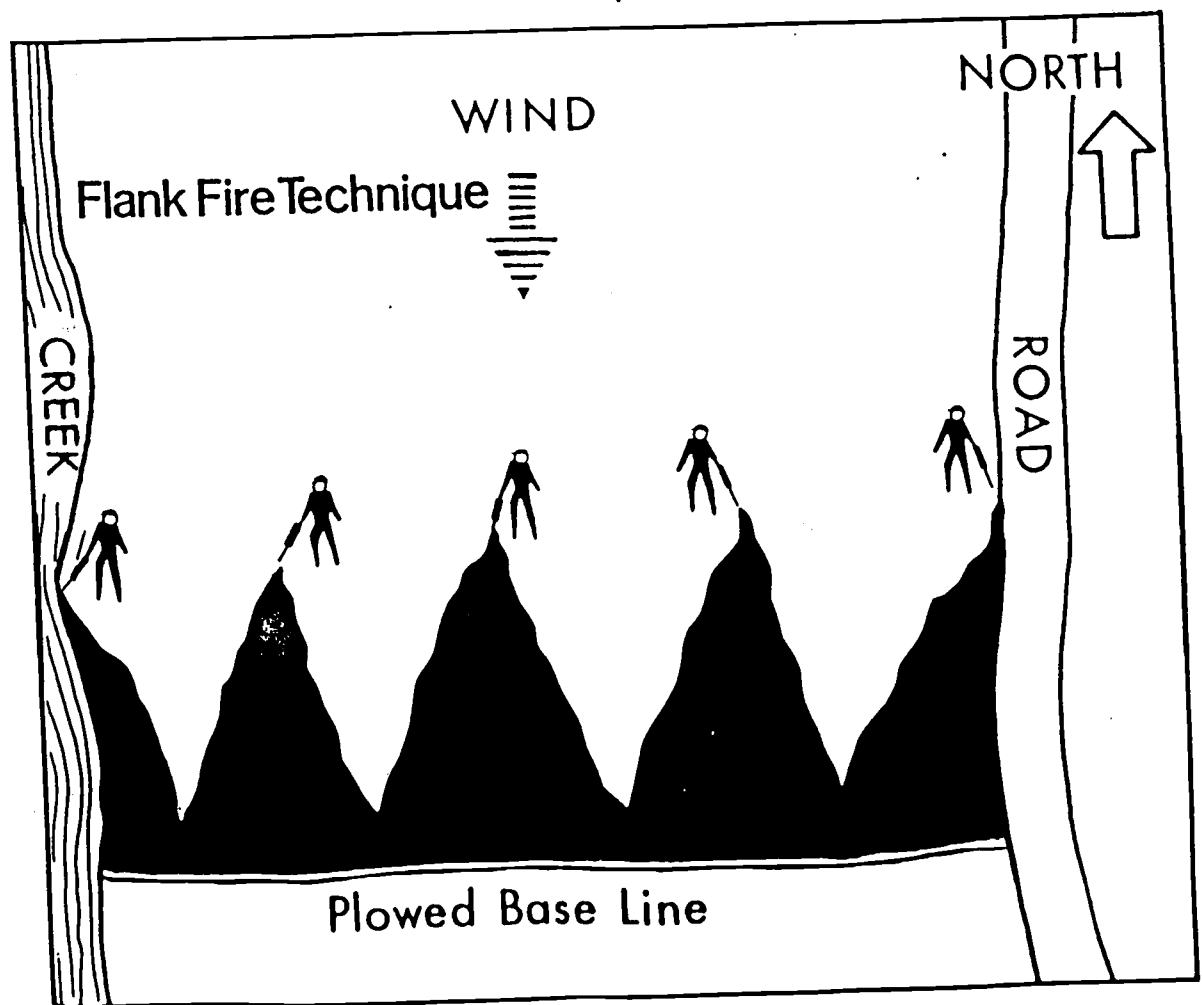
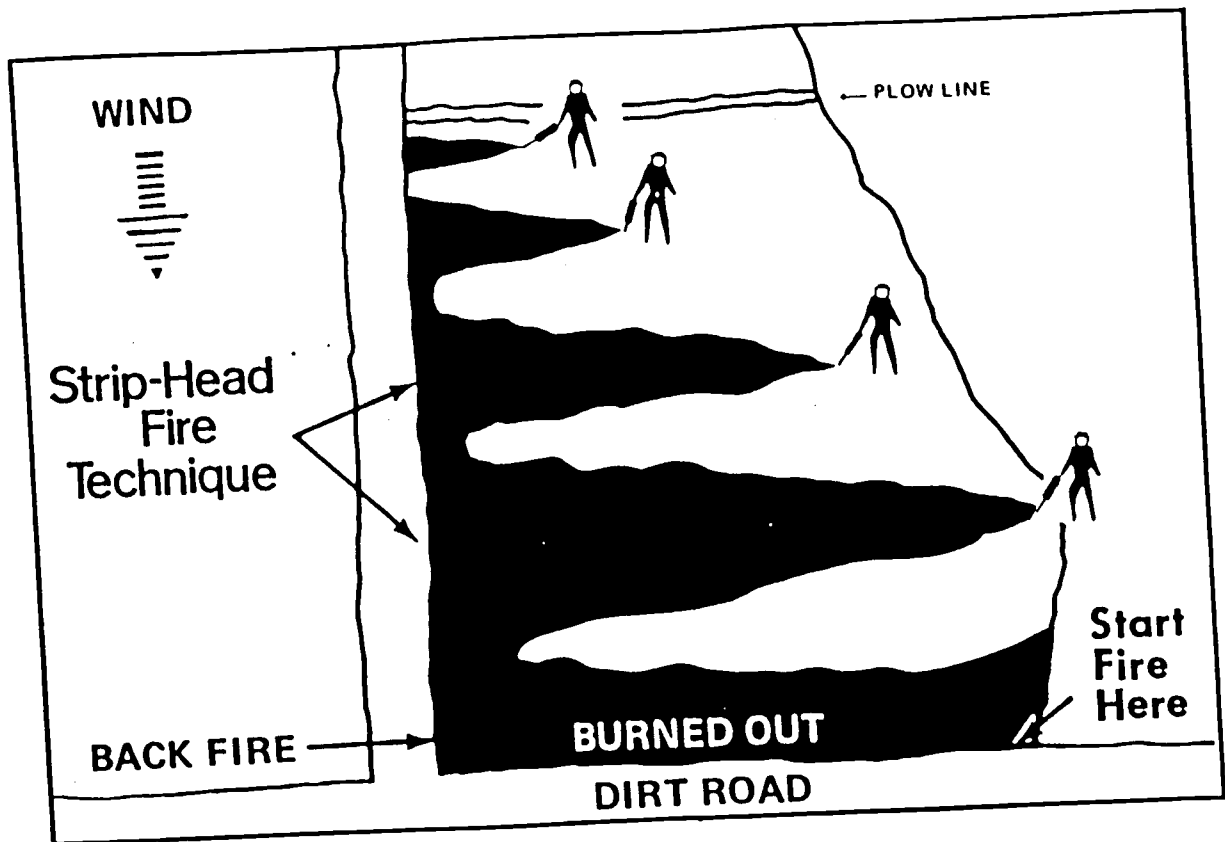


EXHIBIT 3
THIRD PARTY COST ESTIMATE



Route 1 Box 899
Mayo, Florida 32066

LCEI
d/b/a

CENTRAL FLORIDA LANDS & TIMBER NURSERY

Registration # 04720918

BARE-ROOT SEEDLINGS, CONTAINERIZED TREES,
TREE PLANTING (INSTALLATION), PROMOTIONS



Phone: (904) 294-1211
FAX: (904) 294-3416

March 14, 1996

Ed Schrank
Environmental Planning & Management
125 East Indiana Avenue
Suite D
Deland, Florida 32720

REFERENCE: Barberville Mitigation Bank Improvement Project

Dear Ed and Mark:

I have reviewed the information you provided, outlining the Long Term Management of the Barberville Mitigation Bank.

Following are the costs for each of the elements:

I. <u>PLANTING, BURNING, AND SITE PREPARATION ACCORDING TO SPECS</u>		
A. Burning	798 acres @ \$ 37/acre	= \$ 29,526.00
B. Site Preparation and Planting (including seedlings)	650 acres @ \$250/acre	= <u>162,500.00</u>
C. TOTAL COSTS		<u>\$192,026.00</u>
II. <u>TIMBER HARVESTING OVER THREE YEAR PERIOD</u>		
Estimate value based on cruise with growth		<u>\$120,000.00</u>
III. <u>NET COST</u>		<u>\$ 72,026.00</u>
IV. <u>MONITORING COSTS FOR FIVE YEAR PERIOD</u>		<u>\$143,150.00</u>
(see attached Exhibit "A"-Pages 1 and 2)		

CONTINUED ON PAGE TWO.....

AMERICAN
FORESTS



EPM
March 14, 1996
Page Two

V. ANNUAL LONG TERM SITE MAINTENANCE

A. Annual Burns (after initial 3 years) 450 acres @ \$ 18/acre	= \$ 8,100.00
B. Fence Repair - 600' @ \$1.05/foot	= 630.00
C. Road Maintenance	= 3,500.00
D. Pasture Maintenance (2 mowings per year) 131 acres @ \$ 48/acre	= 12,576.00
E. Long Term Monitoring (CFI and square meter plots, after initial 5 years)	= <u>6,700.00</u>
TOTAL ANNUAL COSTS	<u>\$ 31,506.00</u>

With 25 years experience in land management, CFL&T allies itself with appropriate businesses and vendors to ensure the job is finished timely, meeting the most exacting specifications. With this "teamwork" approach, we can perform every facet of the Barberville Improvement Project from selective harvesting through selective regeneration, to monitoring and reporting.

We are committed to the success of the project via the "Tree Team".

Please let me know if you have any questions.

Sincerely,



Marvin Buchanan
President

MB:jb

Enclosures

EXHIBIT "A" (Page 1)
MONITORING PLAN COSTS

<u>YEAR</u>	<u>ITEM</u>	<u>AMOUNT</u>
1	A	\$ 8,000.00
	B	8,000.00
	D	3,200.00
	E	800.00
	F	9,600.00
	G	<u>12,150.00</u>
	Year 1 Total	\$ 41,750.00
2	B	\$ 8,000.00
	D	3,200.00
	E	800.00
	F	<u>9,600.00</u>
	Year 2 Total	\$ 21,600.00
3	B	\$ 8,000.00
	C	12,000.00
	D	3,200.00
	E	800.00
	F	<u>9,600.00</u>
	Year 3 Total	\$ 33,600.00
4	B	\$ 8,000.00
	D	3,200.00
	E	800.00
	F	<u>9,600.00</u>
	Year 4 Total	\$ 21,600.00
5	B	\$ 8,000.00
	D	3,200.00
	E	800.00
	F	<u>9,600.00</u>
	Year 5 Total	\$ 21,600.00
	TOTAL 5 YEAR PERIOD	<u>\$140,150.00</u>

EXHIBIT "A" (Page 2)
MONITORING PLAN DETAILS

ITEM A - Establish permanent CFI plots (72 plots)

ITEM B - Monitor square meter plots (216 plots)

ITEM C - Monitor CFI plots

ITEM D - One (1) 1/100th survival plot per acre

ITEM E - Compute results and complete annual report

ITEM F - Monthly monitoring of wells/piezometer

ITEM G - Piezometer wells and staff guages (30 wells)

- (1) Construction
- (2) Mobilization charge
- (3) Supervision