Tenth Year Monitoring Report for the Coffeen Nature Preserve

Years 2015-2017

Report prepared for:
Coffeen Land Trust

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INTRODUCTION

In 2004 the Sierra Club Foundation commissioned the Alabama Natural Heritage Program to prepare a management plan for the Coffeen Nature Preserve. The purpose of the plan was to establish guidelines for maintaining the ecological integrity of the Preserve, while balancing the needs and concerns of the Four Mile Village property owners. Ideally, a plan for managing the Preserve would be one in which the site is maintained in a completely natural state allowing visitors to experience the vision that Dorothy Coffeen had set forth for the property: "A place of peace, a place of quiet, and a refuge for all God's creatures." Fulfilling this vision has presented, and continues to present, various challenges, particularly in view of the residential and urban interface now impacting the Preserve. The Sierra Club Foundation served as the original administrator of the Preserve, relinquishing administrative oversight in 2015, entrusting long-term management responsibilities to the Coffeen Land Trust.

In an effort to guide management efforts and long-term protection of the Preserve, the Coffeen Land Trust was incorporated in April 2003, consisting of 10 individuals to represent the property owners of Four Mile Village, the Sierra Club, and the general public with environmental expertise, but with no connection to the Preserve. During this time a mission statement of the Coffeen Land Trust was written; it reads as follows:

It is the mission of the Coffeen Land Trust Board to honor, in perpetuity, the wishes of Dorothy B. Coffeen clearly stated in the warrantee deed transferring her property to the Sierra Club Foundation, signed on September 17, 1976: [It is] "the Grantee's expressed intensions and promise to conserve and preserve the natural beauty and characteristics of the area called the Coffeen Nature Preserve for educational, conservation, and scientific purposes limited by the size, sensitivity, and character of the land conveyed…"

The Coffeen Land Trust will continue to ensure management objectives are being met, furnishing periodic monitoring of the Preserve and the preparation of an accompanying report, adhering to a series of four provisions outlined in the "Declaration of Covenants and Restrictions" that were established for the Preserve in 2004. Of the four primary provisions, Item D specifically illuminates the decree for which monitoring is required by stating that the "Declarant further wishes to identify and establish an entity responsible for monitoring adherence of the Owner to the provisions of this Declaration. Declarant has agreed to serve as the entity with responsibility to monitor compliance with the terms and conditions of the Declaration." The preparation of this report adheres to a similar protocol followed by the Coffeen Preserve Management Plan and previous monitoring reports where interviews with Land Trust Board members, Four Mile Village residents, and the Coffeen resident managers were conducted to highlight achievements, discuss concerns, and to evaluate long-term goals for the Preserve. A site visit was conducted from June 10-12, 2017, to meet with residents and Board members, to walk all trails, and to take notes and photographs highlighting important aspects.

The premise for preparing monitoring plans is to furnish an assessment of the accomplishments and challenges relative to the restoration, management, and promotion of the Coffeen Nature Preserve, specifically addressing issues discussed in the Management Plan (hereinafter referred to as the "Plan") and expanding upon topics presented in the previous monitoring reports (nine have been completed to date). The last monitoring report was prepared in 2014 (Year 9), and will serve as a foundation from which to highlight events during the past three years (2015-2017). In addition, following the theme of earlier reports this report will also place an emphasis on the ecological integrity and biological significance of the Preserve, touching upon specific aspects of the plant and animal life and their relevance to on-site conservation efforts. Accounts highlighting noteworthy biological discoveries are also included. Photographs illustrating current site conditions, management efforts, and noteworthy biological discoveries appear throughout the report.

REGIONAL SETTING AND NATURAL VEGETATION

The Coffeen Nature Preserve is located in the western Panhandle of Florida, near the western edge of Walton County. It contains a remarkable diversity of natural environments, including forest, marshes, coastal dunes, and water. The area has, and continues to experience rapid growth in resident and tourist population, as well as commercial development. The Preserve remains as a unique remnant community of what most of the Florida panhandle was like some 50 years ago.

The Preserve lies within the Gulf Coastal Lowlands physiographic district, a region characterized by generally flat topography. The greatest relief and elevation for most of the region occurs in the coastal dune system where elevations can exceed 25 feet above sea level. Much of the area to the west of Village Road is relatively high with elevations exceeding 25 feet, while to the east elevations are much lower. Topsail Bluff, reportedly once the highest point between Panama City and Pensacola (at 71 feet originally), is still the highest site within the Preserve. The shoreline at the Preserve has been shaped by the wave action, wind, and longshore currents generated by the Gulf of Mexico. The shoreline has experienced some degree of accretion and erosion along various portions, a naturally-occurring process, and the overall beach is stable.

Natural Communities

Natural communities are assemblages of species that occur together in space and time. These groups of plants and animals are found in recurring patterns that can be classified and described by their dominant physical and biological features. The system of classifying natural communities across Florida generally follows the "Guide to the Natural Communities of Florida" published by the Florida Natural Areas Inventory (FNAI). As with most vegetation classifications, the lines between natural communities are often obscure in the field because of the overlap and intergradation among species, floral composition, and physical features. For these reasons, probably no single natural community description featured in this report will precisely match plant associations of adjacent areas.

Presently, Coffeen Nature Preserve contains eight distinct natural plant associations, the largest of which is the mesic flatwoods, an area that encompasses approximately 86 acres (Figure 1). General descriptions of each community type, excerpted and modified from the Coffeen Preserve Management Plan, follows the FNAI classification and are presented below.

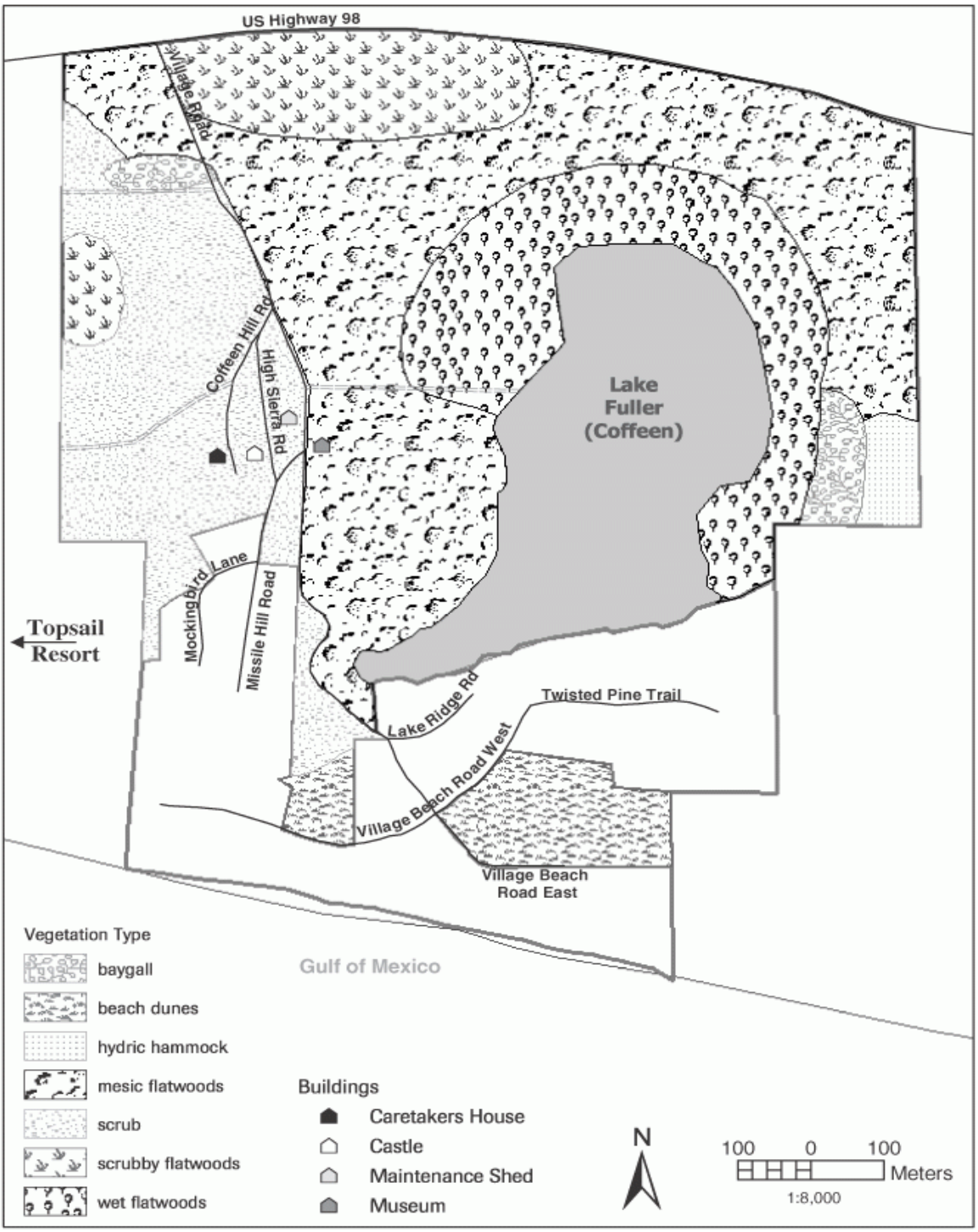

Figure 1. Map of Coffeen Nature Preserve vegetation types.

1. Beach Dunes

Beach dunes front the Gulf of Mexico and are composed of wind- and wave-deposited sands. The dunes are a highly dynamic system and susceptible to rapid changes in deposition and erosion, with bare sand often the most visible part of the community. The beach dunes at Coffeen are vegetated with various grasses such as sea oats (*Uniola paniculata*), beach grass (*Panicum amarum*), and Gulf bluestem (*Schizachyrium maritimum*); and forbs including small-leaved milkpea (*Galactia microphylla*), beach evening primrose (*Oenothera humifusa*), sea rocket (*Cakile constricta*), narrow-leaf ground-cherry (*Physalis angustifolia*), yellow-buttons (*Balduina angustifolia*), seaside goldenrod (*Solidago sempervirens* var. *mexicana*), and two species of golden asters (*Chrysopsis godfreyi* and *C. gossypina* ssp. *cruisiana*). Younger, primary dunes support fewer plant species than older, secondary dunes. Woody goldenrod (*Chrysoma pauciflosculosa*) and Florida rosemary (*Ceratiola ericoides*) appear to be the most frequently observed shrubs, but scrub mint (*Conradina canescens*), beach elder (*Iva imbricaria*), and eared brier (*Smilax auriculata*) are also well represented.

2. Scrub

Scrub occupies old stabilized dunes in the western portion of the Preserve and consists of dense thickets of stunted sand pine (*Pinus clausa*), and various oaks including live oak (*Quercus virginiana*), sand live oak (*Quercus geminata*), Chapman's oak (*Quercus chapmanii*), and myrtle oak (*Quercus myrtifolia*). Smaller shrubs are also abundant and include Florida rosemary (*Ceratiola ericoides*), scrub mint (*Conradina canescens*), shrub goldenrod (*Chrysoma pauciflosculosa*), and October-flower (*Polygonella polygama*). Lichens (*Cladina evansii* and *Cladonia leporina*) and extensive areas of bare sand are distinctive features of the Preserve's coastal scrub.

3. Scrubby Flatwoods

Scrubby Flatwoods have been classified as the convergence of scrub and mesic flatwoods and occupy the transition zone between these communities. The vegetation is representative of both associations and is generally characterized by an open canopy of longleaf pine (*Pinus palustris*) that shelters a shrubby understory comprised of small trees and shrubs, including saw palmetto (*Serenoa repens*), sand live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*), runner oak (*Quercus pumila*), gopher apple (*Licania michauxii*), and scrub mint (*Conradina canescens*). Wiregrass (*Aristida beyrichiana*), Virginia broomsedge (*Andropogon virginicus*), Carolina yellow-eyed grass (*Xyris caroliniana*), hoary-pea (*Tephrosia chrysophylla*) grass-leaf golden aster (*Pityopsis graminifolia*), green-eyes (*Berlandiera pumila*), and rough white-topped aster (*Sericocarpus tortifolius*) are some of the characteristic herbs.

4. Mesic Flatwoods

Mesic flatwoods is undoubtedly the most ubiquitous community type occurring at Coffeen, encompassing approximately 42 percent of the Preserve. High quality examples are recognized by open-canopied forests of longleaf and slash pines (*Pinus palustris* and *P. elliottii* var. *elliottii*, respectively), with minimal or no woody midstory and a dense groundcover of low growing shrubs, grasses, and forbs. Typically known for an exceptionally rich biodiversity, high quality examples support a colorful display of wildflowers and serve as habitat for a high diversity of animals.

5. Wet Flatwoods

Wet flatwoods primarily occur on the north side of Lake Fuller and are characterized by a relatively open canopy of scattered slash pine (*Pinus elliottii* var. *elliottii*) and a dense groundcover of various grasses, forbs, and low shrubs. Shrubs such as buckwheat tree (*Cliftonia monophylla*), titi (*Cyrilla racemiflora*), sweetbay magnolia (*Magnolia virginiana*), wax myrtle (*Myrica cerifera*), and fetterbush (*Lyonia lucida*) can dominate the understory with either a long-term absence of fire or if cool season fires predominate. In areas receiving frequent warm season fires, the diverse herbaceous layer is dominated by graminoids that include wiregrass (*Aristida beyrichiana*), various beakrushes (*Rhynchospora* spp.), and several species of panic grasses (*Dichanthelium* spp.). An exceptional diversity of forbs also inhabit wet flatwoods, and those occurring at Coffeen include sun-bonnets (*Chaptalia tomentosa*), false blazing-star (*Carphephorus pseudoliatris*), pipeworts (*Eriocaulon compressum* and *E. decangulare*), various yellow-eyed grasses (*Xyris* spp.), Florida lobelia (*Lobelia floridana*), meadowbeauties (*Rhexia* spp.), and milkworts (*Polygala* spp.).

6. Hydric Hammock

Hydric hammock occupies a small area on the east side of Lake Fuller in the southeastern-most portion of the Preserve. A calcareous-based substrate combined with relatively wet soil conditions have created a favorable environment for this unusual natural community. The canopy and subcanopy consist primarily of water oak (*Quercus nigra*), live oak (*Quercus virginiana*), and sweetgum (*Liquidambar styraciflua*), with an occasional southern magnolia (*Magnolia grandiflora*), pignut hickory (*Carya glabra*), and red maple (*Acer rubrum*). The shrub and herbaceous layers are relatively diverse with the following species appearing most representative: red buckeye (*Aesculus pavia*), coralbean (*Erythrina herbacea*), American beautyberry (*Callicarpa americana*), and ebony spleenwort (*Asplenium platyneuron*). Resurrection fern (*Pleopeltis polypodioides* var. *michauxiana*), Spanish moss (*Tillandsia usneoides*), and greenfly orchid (*Epidendrum conopseum*) are common epiphytes.

7. Baygalls

Baygalls exhibit highly variable structural and compositional features range-wide, but are generally characterized as a densely forested, acidic wetland dependent on a continuous

seepage flow or a high water table. Hydrology, topographic variables, and soil properties exert a significant influence on the type of baygall vegetation occupying a particular site. The example represented at Coffeen is relatively uniform in composition being comprised primarily of buckwheat tree (*Cliftonia monophylla*) in the overstory. The understory is vegetated with a luxuriant growth of titi (*Cyrilla racemiflora*) and, to a lesser extent, sweetbay magnolia (*Magnolia virginiana*), swamp redbay (*Persea palustris*), and large gallberry (*Ilex coriacea*). Because of dense shade, the herbaceous component is poorly represented. The baygall trees and shrubs tend to transpire large amounts of soil moisture, and thus cause a drying of the community, with loss of some wetland species.

8. Coastal Dune Lakes

Coastal dune lakes are unique aquatic systems restricted to coastal regions of the southeastern United States. These picturesque lakes are often sought after for homesites and retreats, and as a result are globally imperiled. Lake Fuller, a 40-acre freshwater lake that occupies a significant proportion of the Preserve, represents an exemplary example of a coastal dune lake. The lake serves as an important breeding area for many species of wildlife, including a vast array of insects that form the base of numerous food chains.

The shoreline is thickly vegetated with a prominence of hydrophytic grasses and herbs, accented by various low growing trees and shrubs. Where the shoreline is shallow and gently sloping, which includes most of the lake perimeter, the band of emergent vegetation is much broader than the deep, dune-fronted margin along the south side of Lake Fuller. Submersed aquatic plants such as water lily (*Nymphaea odorata*), yellow pond lily (*Nuphur advena*), and water shield (*Brasenia schreberi*) dominate much of the water surface along the periphery of the lake.

DISCUSSION AND RECOMMENDATIONS

Progress toward fulfilling the list of action items cited in the Plan, and continuing to follow the provisions identified in the "Declaration of Covenants and Restrictions" have been successfully addressed during the 2015-2017 seasons. Significant progress was made toward ecological restoration and long-term maintenance of the Preserve through the application of prescribed fire, with all units having now been successfully burned since incorporation of the Coffeen Land Trust in 2003. Accomplishments continue to be made in fulfilling other objectives of ensuring Dorothy Coffeen's vision for the Preserve is maintained, particularly in reference to trail maintenance, detection and eradication of exotic species, and the promotion of environmental education. The format of this report will follow the previous monitoring reports, where an emphasis will be placed on discussing achievements, proposed recommendations, and items of ecological importance specific to the Preserve.

PRESCRIBED BURNING

Substantial advancements have been made to achieve fuel load reduction and to further accomplish ecological restoration goals, with prescribed burns having been applied to all units since the founding of the Coffeen Land Trust in 2003. The most significant achievement was the application of fire to Unit B1 in February 2017, a 40-acre tract of wet and scrubby flatwoods on the north side of Lake Fuller (Figure 2). The burn crew demonstrated a commendable effort organizing and implementing the prescribed burn under an imposing concentration of fuels and extremely volatile conditions. An estimate of when the unit last received fire is difficult to determine; however, based on the size and density of woody vegetation in the understory a lapse of 40-45 years is a fair assessment. Extracting core samples from the largest specimens will furnish an accurate appraisal in this regard. Prescribed burning was also applied to Units B2, B3 B4, B5, and D (Figure 2) during 2015-2017 for a total of approximately 110 acres. Given the urban setting of the Preserve, instituting prescribed burns presents significant challenges and demands the highest level of expertise of fire personnel. Smoke management is particularly critical to avoid impacting the nearby hospital, businesses, and residential areas, requiring careful planning and training by personnel in weather forecasting and fire behavior. The Preserve is very fortunate to have well trained burn practitioners through on-site staff, board members, and personnel from Topsail Hill Preserve State Park to safely expedite a prescribed burning program. To assist facilitating and in further ensuring the success of prescribed fire, specifically in relation to larger burns, the Preserve hired Attack One Fire Management Services, a professionally paid fire crew specializing in wildland burning services based out of Crawfordville, Florida. Efforts should be made to continue this arrangement in the future as burn personnel see necessary. To best accomplish successful burning, attaining maximum net benefits at acceptable costs, site preparation is essential. Establishing and maintaining fire lines is critical in this regard, specifically to reduce the potential of fire spreading unintentionally into adjacent units. The Preserve managers have done an excellent job maintaining fire control lines (Figures 3 & 4), greatly reducing potential wild fires. The majority of pathways are approximately 10 feet wide, a sufficient width to curtail unintentional fires. Facilitating prescribed burning was also made easier with the acquisition of a Polaris all-terrain vehicle, portable water tank, and hand radios purchased through a generous donation of a Four Mile Village resident.

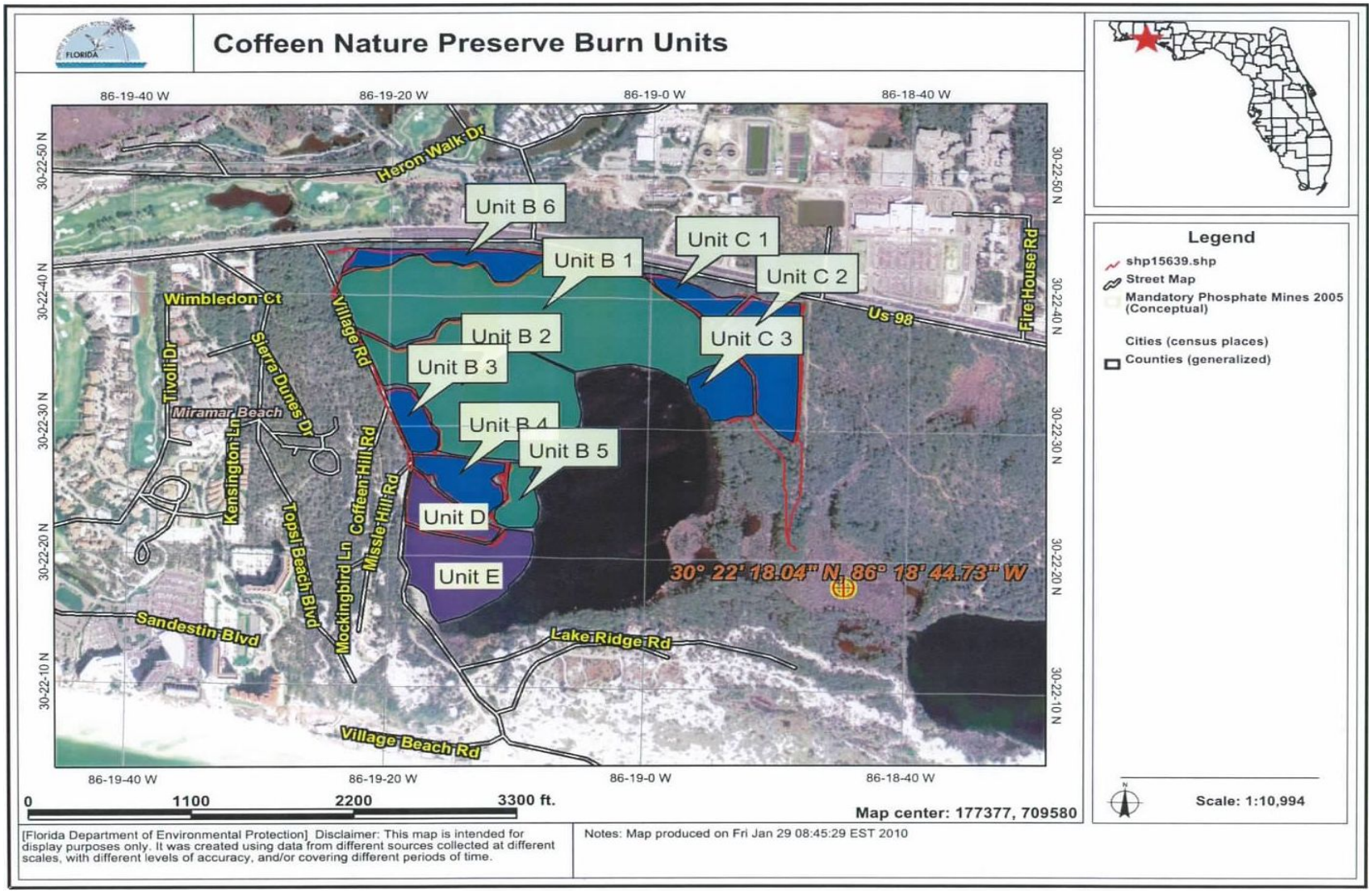

Figure 2. Burn units of the Coffeen Nature Preserve. Map courtesy of Bruce Paladini.

Figure 3. Fireline work.

Figure 4. Fireline work.

Overall, the burns were successfully implemented, significantly decreasing a dense understory while causing only minimal damage to the canopy (Figure 5). To maintain low fuel loads and to facilitate ongoing burning efforts two- to three-year rotations are recommended for incorporating fire in each unit. Some board members have expressed interest in reference to the necessity of winter burns (December to early March). Because of long-term fire exclusion, the need of winter burning will largely remain an active restoration strategy at the Preserve for several years to come to reduce high fuel loads (e.g., dense vegetation in understory, branches, needles) as an effort to lessen the potential of uncontrolled fire and subsequent damage to the canopy cover (pine trees). As fuel loads are reduced and the danger of wildfire is diminished, a long-term controlled burning program that sanctions the transition

from winter to growing season burns (primarily April to June) will be followed in an ongoing effort to Figure 5. Burned Flatwoods, Unit B1

improve and maintain the biological integrity of the Preserve. Unit D (behind post office) having received frequent fire during the past 10 years has a significantly reduced woody understory and can now safely accommodate and will benefit from growing season burns. While achieving growing season burn status for all units is the ultimate goal of restoration efforts, it is important to emphasize that winter burns will always be essential to promote biodiversity, not only to reduce fuel loads but to also accommodate the growth and reproduction requirements of specific plant species; some species such as the many-flowered grasspink (*Calopogon multiflorus*), a globally imperiled fire-dependent orchid (Figure 6), will only flower following winter fire. Additionally, many fire ecologists encourage staggering burns throughout the season as an important means to stimulate the growth and reproduction of plants and animals with highly specialized environmental requirements. Supporting this argument is the strikingly abundant flowering response of wiregrass (*Aristida stricta*) when burned in late spring and early summer, and the near absence of flowering when burning occurs at other times of the year. This physiological response might be viewed as an adaptive strategy to produce seed only when the ground has been recently cleared of vegetation, increasing chances of germination.

Instituting fire west of Village Road has received much apprehension, and rightly so, for the challenge of averting property damage on and off the Preserve is significant. The potential for catastrophic fire is high, and should be addressed as soon as time and resources allow. This section of the Preserve is represented by a mix of wet pine flatwoods (closest to Highway 98) and coastal scrub (location of residence managers and Four Mile Village residents) that currently contains a highly flammable shrub understory. Currently, the Land Trust Board has prohibited burning in this section due to the close proximity of the Tops'L Resort and Four Mile Village residences, but has reconsidered limited burning in the extreme northern portion of the parcel. If burning is permitted small sections of no larger than 0.25 acres are advised to avert potential conflagrations, reduce smoke management concerns, and to acquire a greater understanding of fire behavior in mechanically treated areas. Once fire behavior can be determined, the size can be expanded upon at the burn crews' discretion. The reintroduction of fire in the northern portion of the parcel is a good idea and should be instituted as schedules and resources allow. However, applying fire under current conditions is not recommended, and should be considered

only following the reduction of the understory in an effort to reduce the potential of conflagrations and spot fires (fires ignited outside of a burn unit as a result of windborne embers). Mechanical removal and animal grazing are two methods of fuel reduction that have been widely used and serve as viable options for the Preserve.

Figure 6. Many-Flowered Grass-Pink (*Calopogon multiflorus*)

Each method can reduce fuel loads and ladder fuels (live or dead vegetation that allows a fire to climb up from the forest floor into the tree canopy) in the understory. Mechanical thinning is usually achieved through a combination of mechanical and manual processes with bush hogs, or heavy duty choppers, chainsaws, loppers, and brush cutters. Animal grazing will be best accomplished in using goats for their ability to consume woody vegetation, and will require fencing to constrain the animals in a specific area. Some local ordinances, however, do not allow domestic livestock in residential areas. Prior to considering this method, local ordinances should be consulted. As referenced in the Plan, the use of goats has been proposed in the past to help reduce fuel loads, but appears to have been largely discouraged because of logistical concerns regarding animal maintenance and potential impacts to native vegetation, namely rare species. Given the size and age of the understory vegetation, mechanical removal will serve as the best option. Goats will have minimal impact to the larger trees and shrubs responsible for fostering the greatest fire intensity. The use of a gyrotrac has been proposed in the past to further reduce fire fuel, particularly in reference to the westernmost portion of the Preserve. While this may be the only option to safely reduce fuel loads, caution is advised regarding its use. The gyrotrac's soil churning capabilities can be damaging to the root systems of plants, causing the greatest harm to the herbaceous component whose shallow roots rarely extend well below the surface. Equipment that causes the least amount of soil disturbance, such as the Bobcat for removal of understory vegetation, appears to be a good choice. Maintaining adequate fire lines along property boundaries, specifically adjacent to the Tops'l Resort and along Highway 98, will also be critical to reduce the potential of wildfire from entering neighboring properties and impeding traffic flow. Ensuring that fire lines are well maintained along Highway 98 will further reduce the potential of wildlife becoming ignited from discarded cigarettes.

Some board members and residents have expressed interest in safeguarding the southern magnolias (*Magnolia grandiflora*) that are commonly distributed throughout the Preserve. The species, in spite of its inherent beauty, is not a natural component of high quality, fire-maintained systems (such as slash pine woodlands) and should be removed. Preserving a small number of trees along footpaths and trailside rest areas as a source of shade is acceptable. It is important to emphasize however, that southern magnolia occurring in the hammock on the east side of Lake Fuller is a typical tree species of that habitat type and should be protected as such. Through the establishment of a long-term burning program that promotes growing season fire, magnolias and other hardwoods will be kept at low levels, favoring a rich diversity of wildflowers and grasses, reminiscent of the original landscape

The Role of Fire

Fire has been an integral part of Florida's natural environment for millennia. The peninsular shape of Florida places most of Florida within the influences of sea breezes; that combined with its subtropical climate makes thunderstorms a common summer occurrence. The thunderstorms in turn are ready producers of lightning, and this common fire starter has resulted in the adaptation of Florida's flora (e.g., longleaf pine and pitcher-plants) and fauna (e.g., gopher tortoise) to adapt to frequent fires. In fact, many of Florida's upland habitats are dependent upon fire to maintain their health and biodiversity. These include the coastal scrub and pine flatwoods present on the Preserve, though other habitats such as marsh along the margins of Lake Fuller also benefit from fire. Fire serves a number of purposes in these habitats. First, it eliminates competitive vegetation that has not adapted to survive fires. Second, it converts fallen material such as branches, leaves, needles, and logs back into nutrients and minerals that the surviving plants can now easily absorb. It also clears out underbrush and opens the soil, thus allowing seeds to germinate and grow. Finally, the vigorous regrowth of surviving plants and the stimulated germination of new seedlings provides a more nutritious food for the animals such as deer, gopher tortoises, and insects which feed on vegetation.

Native Americans recognized the value of fire and often utilized it to sustain desirable wildlife populations or edible plants. Early pioneers of Florida also recognized its value, but over time, as Florida's residents became less dependent on the local environment for survival, the use of fire as a habitat maintenance tool fell out of favor. In fact, recognition of fire as a tool changed to the perception that fire was an enemy to be suppressed whenever it occurred on natural lands. The suppression of fire resulted in environmental changes both subtle and drastic. The lack of fire allowed fire-vulnerable vegetation (e.g., oaks and southern magnolias) to survive and in time dominate the former scrub and pine flatwoods of Walton County and elsewhere in Florida. The oaks because of their denser, light-blocking canopy and ground covering leaf litter reduced or eliminated the grasses, wildflowers, and forbs that once made up the bulk of the groundcover, and necessary for carrying fire, in fire-dependent habitat. This in turn changed the wildlife composition, and scrub/flatwood species such as gopher tortoises declined in population.

Equally important, the lack of fire allowed combustible fuels such as pine needles, branches, and downed trees to accumulate. Whereas naturally occurring, frequent wildfires burned quickly and low to the ground, when fire broke out in these suppressed areas the accumulated debris fueled fierce large fires, consuming both understory and overstory vegetation. The catastrophic fires of the East Coast of Florida in the late 1990s were an example of the devastation that can occur in a fire-dependent habitat when fire is excluded for long periods. To restore these natural habitats and reduce the lands' vulnerability to uncontrollable wildfires, land managers have restored the use of fire as a habitat management tool. Today's land managers use prescribed fires on a frequent basis to maintain the health and biodiversity of many of the state's conservation lands.

For this reason, it is valuable for the citizens of the Florida Panhandle counties to recognize the importance of prescribed burns and tolerate the occasional inconveniences associated with it. There are several webpages devoted to informing residents of the purpose, considerations, and factors that influence when, where, and what time prescribed burns are set. An example of these websites are presented below and will be particularly useful in providing general overviews of prescribed fire:

U.S. Forest Service (https://www.fs.fed.us/fire/management/rx.html)

Florida Department of Agriculture and Consumer Services (http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Wildland-Fire/Prescribed-Fire/The-Natural-Role-of-Fire)

Georgia Forestry Commission (www.gfc.state.ga.us/forest-management/prescribed-fire)

NON-NATIVE INVASIVE SPECIES

The detection and eradication of non-native invasive species (NNIS) continues to present challenges to preserve managers. The incursion of exotic and native invasive species will incite a perpetual ire of land managers and conservationists dedicated to preserving Florida's wildlands, with the Coffeen Preserve being no exception. The Preserve is fortunate to be relatively free of NNIS, largely attributed to the efforts of the resident managers and board members being watchful of suspecting infestations. Torpedo grass (*Panicum repens*) (Figure 7) currently presents the greatest challenge, having become well established along the southern margin of Lake Fuller. Presumably native to the Old World, the plant is an enterprising species that is rapidly expanding its range in the Florida panhandle, where it now inhabits the margins of various aquatic systems, as well as interdunal swales, spreading by long runners over the surface of the water and moist soil. Websites highlighting the biology, environmental impacts, and control methods associated with torpedo grass are provided under the section on Lake Fuller on page 14.

Continuous progress has been made in detecting and eliminating Chinese tallow or popcorn trees (*Triadica* [*Sapium*] *sebifera*) (Figure 8), with a notable accomplishment in 2015 where homeowners partnered with the Coffeen Land Trust to remove all Chinese tallow present on Four Mile Village residences. This effort will greatly reduce the impact of the species encroaching upon the Preserve by eliminating a significant seed source. Chinese tallow is an aggressive species native to Asia that has invaded and greatly altered wetlands along coastal areas in the southeastern U. S., displacing desirable native vegetation. The species is often promoted by horticulturists as an attractive ornamental (leaves turn crimson-red in autumn) for residential plantings in the Southeast. Given the intrusive nature of Chinese tallow and other NNIS, ongoing eradication efforts can be expected as new infestations become apparent.

The redbay ambrosia beetle (*Xyleborus glabratus*) has been detected on the Preserve, in Units B4 and B5. The insect is a relatively recent arrival, having been first noticed at Port Wentworth

in Savannah, Georgia, in spring 2002. Native to the Orient, the beetle likely arrived with wood
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Figure 7. Torpedo Grass (*Panicum repens*) on south side of Lake Fuller

Figure 8. Chinese Tallow (*Triadica sebifera*)

packing material. The first signs of the insect's impact became clear in 2003 and 2004 when redbay trees (*Persea borbonia*) in coastal areas of Georgia and South Carolina began to wilt and die. In 2005, scientists incriminated the beetle as the carrier of a pathogenic fungus, laurel wilt, the name now given to the disease. The pathogen has, and continues to spread quickly, often killing its hosts within only a few months of the initial attack. Currently there is no method for prevention or control of laurel wilt; however, some pathologists suggest that prescribed burning may help slow the spread of the disease. Many biologists consider this disease to be one of the most ravaging ecological disasters to invade North America, having the potential to eliminate an entire family of plants, including an icon of American culture, the sassafras (*Sassafras albidum*). On the Coffeen Preserve the ambrosia beetle has affected swamp redbay (*Persea palustris*), which infected trees are easily identified by mass-browning of the leaves and by small, toothpick-like structures that protrude from the bark (Figure 9).

Some board members inquired about the probability of the oleander (*Nerium oleander*) planted along Village Road to invade the natural areas of the Preserve. Native from southern Europe to Asia, the species is widely planted in warmer regions of the U.S. as an ornamental. However, it is not known to be invasive and poses no management concern.

Figure 9. Toothpick-like projections of laurel wilt, Unit B2

Figure 10. Cogon Grass (*Imperata cylindrica*)

While not presently documented from the premises, cogon grass (*Imperata cylindrica*) (Figure 10) is known from within the vicinity of the Preserve, and should be watched for and immediately removed if found. This species has become a serious pest throughout warmer regions of the world, often encroaching upon and displacing native vegetation. The species is recognized as one of the top ten most invasive plants known worldwide. It is easily identified by its production of fluffy, white, plume-like seedheads in early spring. It also has a distinctive habit of quickly forming colonies or infestations, somewhat circular in outline. The plants vary in height, growing from 1 to 4 feet.

Monitoring and treatment of existing infestations of NNIS, and preventing the encroachment of new populations should continue as an important component of land management at the Preserve. While most residents, Board members, and resident managers are aware of the problems associated with exotic pests, effecting a proactive approach to reduce the incursion of such species may not be as readily apparent. As highlighted above reporting new sightings to resident managers is crucial toward controlling invasive plant and animals. In addition to the species discussed above, the following table highlights invasive plants that have been recorded from the Preserve in the past and should be eradicated if found.

Table 1. Non-native invasive species previously documented from the Coffeen Nature Preserve with location and last year of observation.

Common Name	Scientific Name	Location	Year of Last Observation
Japanese Climbing Fern	*Lygodium japonicum*	Along trail in Unit C1.	2007
Japanese Honeysuckle	*Lonicera japonica*	Hardwood hammock on east side of Lake Fuller.	2007
Rattlebox	*Sesbania punicea*	Interdunal swales and marshy shoreline	2006

		on east side of Lake Fuller.	

Feral and Free-Ranging Cats

The impact of domestic cats on the federally endangered Choctawhatchee beach mouse (*Peromyscus polionotus allophrys*) at the Preserve has become a significant concern. The Choctawhatchee beach mouse is one of five subspecies of old field mice living only in coastal sand dune areas along the Gulf Coast. The range of this subspecies is restricted to the Florida Gulf Coast, extending from the Choctawhatchee Bay in Okaloosa County to St. Andrews Bay in Bay County. References consulted for this report suggest cats be kept indoors to minimize the predation of beach mice. It may be advisable to remind homeowners, verbally and through written materials, on the presence of beach mice and the need to ensure their long-term protection. The following two websites provide additional information on protecting beach mice (applies to all subspecies) and are recommended for review by all homeowners and renters, specifically those living in dune habitat:

Florida Fish and Wildlife Conservation Commission (http://myfwc.com/conservation/you-conserve/wildlife/beach-mice/): Provides brief overview of species and additional information sources.

University of Florida IFAS Extension (https://edis.ifas.ufl.edu/uw173): Provides good overview with additional reference sources.

Raccoons

An increase of raccoons occupying the Preserve has brought about an unusually high incidence of homeowners becoming subjected to fleas. Although a native species and a natural component of the Preserve, like many species of native wildlife without predatory control raccoons will become more numerous, often inflicting damage to structures, destroying croplands, and potentially serving as vectors of disease detrimental to human and their own well-being. Several websites are available that offer excellent tips to dissuade raccoons from becoming a nuisance to homeowners, each recommending the same general advice. While hiring a pest control specialist will likely provide the best results for removing problematic animals, the following tips will be helpful in discouraging unwanted animals.

1) If you have outdoor pets, it is recommended to bring their food bowls indoors before nightfall, putting them out each morning.
2) Make sure garbage receptacles are securely covered.

3) Remove tree limbs around your house to discourage raccoons from jumping on the roof, and potentially gaining access inside. It is suggested that limbs be removed at a minimum distance of five feet from the roof.
4) Avoid using dogs as a deterrent against raccoons. While some dogs are specifically bred to combat raccoons (e.g., Blue Tick Coonhounds), most dogs will become severely injured (or worse) when engaged in battle. Pound for pound, a raccoon is approximately three times as powerful as a dog.

Black Bear

While not recognized as an invasive species, the black bear, at times, can become a nuisance. The Florida black bear (*Ursus americanus floridanus*), the species native to Florida, has been reported at various times in the vicinity of the managers' residence, the Castle, and the Four Mile Village residential area. These encounters incited consternation among some homeowners by dispersing garbage and destroying flower gardens, but overall caused minimal structural damage. To avoid further unwanted dispersal of trash, residents installed bear-proof garbage containers. This is a good idea. Given the rapidly growing urban interface across North America, human encounters with black bears and other wildlife in residential areas and commercial zones will steadily increase. Resident managers, Susan and Bruce Paladini have been actively involved with a Bear Stakeholder Group during the past several years, where participants meet several times each year for discussion of bear issues and to identify methods of reducing interaction between humans and bears.

LAKE FULLER

Since monitoring efforts began in 2005 Lake Fuller has experienced fluctuations of water levels correlated to periods of excessive rainfall and severe drought. Oscillations in precipitation patterns are a normal part of short-term climatic cycles, and will continue to have significant influence on lake levels in the future. Periodic increases in water levels are also important to flush saltwater from the lakes incurred during storms such as hurricanes, a process that has continually taken place since the origin of these coastal lakes. Occasionally, excessive precipitation, such as during the 2004-2005 and 2009-2010 hurricane seasons, will instigate flooding that may again impinge upon Village Road and properties nearest the lake. While periodic flooding is a natural ecological process necessary toward maintaining the integrity of the lake, extreme levels that impede access (or nearly so) to residential properties may be the result of drainage obstructions (e.g., fallen trees, logjams) associated with outflow, beyond Preserve boundaries on adjacent Topsail Hill Preserve State Park. In instances where water flow blockage is apparent on adjacent state park lands, it may be necessary for the Coffeen Land Trust to formally submit a request to park personnel to alleviate drainage flow obstacles within park boundaries. However, if water levels do not pose a serious threat to homeowners, the lake

should be allowed to rise and fall naturally. Water quality continues to remain in good condition and can be expected to last, given no effluents are discharged into the lake. In keeping with the format presented in the previous monitoring reports to furnish an annual water quality assessment, the Tenth Year Monitoring Report will also highlight comparisons of water quality (Table 2) for the past eight years. Water quality data for the three lakes highlighted in this

Table 2. Water quality measurements for Lake Fuller, Morris Lake, and Campbell Lake. [Average (and maximum) readings for monthly samples taken from 2010-2017, courtesy of the Florida Lakewatch Program.]

		Nitrogen (µg/L)	Phosphorus (µg/L)
Lake Fuller	2010	1019 (1267)	14 (16)
	2011	947 (1063)	13 (15)
	2012	1020 (1210)	12 (15)
	2013	1013 (1210)	13 (21)
	2014	638 (870)	12 (19)
	2015	699 (860)	15 (28)
	2016	675 (1120)	14 (24)
	2017	635 (660)	11 (21)
Morris Lake	2010	665 (810)	10 (13)
	2011	604 (837)	9 (11)
	2012	522 (650)	8 (11)
	2013	569 (683)	8 (11)
	2014	485 (700)	9 (16)
	2015	502 (700)	11 (20)
	2016	488 (940)	9 (14)
	2017	467 (500)	8 (14)
Campbell Lake	2010	481 (740)	7 (10)
	2011	373 (493)	5 (8)
	2012	315 (570)	6 (9)
	2013	518 (727)	8 (12)
	2014	427 (660)	8 (14)
	2015	341 (500)	9 (17)
	2016	344 (480)	8 (10)
	2017	318 (340)	7 (8)

report, as well as for aquatic systems throughout Florida, are available from the Florida Lakewatch Program (http://lakewatch.ifas.ufl.edu/) based in the University of Florida at Gainesville. Data for Campbell Lake are available for 1995 to present, whereas for Lakes Fuller and Morris are available for 2002 to present, and can be acquired through the Lakewatch Program. Levels of phosphorus and nitrogen were selected to be addressed in this report (and previous reports) because of their direct impact on water quality. While it is normal for

phosphorus to exist in Florida's aquatic environments, excessive concentrations contribute to a condition known as eutrophication, generating an unnatural vigorous algal growth (known as algal blooms). When aquatic systems become eutrophic, containing too much algae, their natural systems will gradually cease functioning efficiently and begin to break down. Similarly, an excess of nitrogen will cause an overstimulation of growth of algae and other aquatic plants, which, in turn, can occasionally result in fish kills and a decrease in other animal life as oxygen becomes depleted through decomposition of plant life. Lawn fertilizer is often a major contributor to water quality degradation, and should be applied sparingly (or not at all) by Four Mile Village homeowners. A pamphlet distributed to homeowners explaining the impacts of fertilizing lawns on the water quality of Lake Fuller may be helpful in this regard.

In an effort to further promote public awareness and education on the significance of Lake Fuller and Walton County's coastal dune lake system, the Live Oak Productions Group, a film and video company based in Blountstown, Florida, has produced a documentary titled "*Coastal Dune Lakes: Jewels of Florida's Emerald Coast*" that premiered on public television in 2015. A companion book of the same name was also published. The film and book are beautifully illustrated and exceptionally written that offer viewers and readers an in-depth story behind the scenery into one of the world's most unique and imperiled natural environments. Known along only coastal New Zealand, Australia, Madagascar, and a 26-mile stretch along the Gulf Coast of Bay and Walton Counties in northwest Florida, the uniqueness of these systems arises from the fact of the continual exchange of salt and fresh water. Given the hydrologic dynamics of these lakes, they have become recognized as some of the most biologically diverse aquatic systems in North America. Additional information on the film, book, and the lakes themselves is available through the company's website (www.CoastalDuneLakes.org) and Facebook page (Facebook.com/CoastalDuneLakes) where both items are available for purchase. Several board members and Four Mile Village residents were interviewed and are featured in the film.

Aquatic vegetation continues to be a minor concern among some residents because of its interference with fishing and/or boating activities, particularly in vicinity of the boat dock. An herbicidal treatment has been applied to the environs of the boat dock and some of the residences in past years as an effort to remove water lilies and other plant life to enhance recreational pursuits. These aquatic species, primarily consisting of water lily (*Nymphaea odorata*), yellow pond lily (*Nuphar advena*), and water shield (*Brasenia schreberi*) serve as a major food source for several species of waterfowl and aquatic organisms and should left undisturbed as much as possible. In addition to serving as a food source, aquatic and shoreline vegetation also provides shelter and breeding areas for a diverse array of wildlife, act as a natural filtering system having the capacity to absorb and break down polluting chemicals, improve and maintain water clarity by preventing the resuspension of bottom sediments that cause algal blooms, and prevent shoreline erosion. Torpedograss (*Panicum repens*) a highly invasive species has also become well established along the southern margin of the lake and will need to be eradicated as soon as time and resources allow. The grass is an exotic species of

an obscure origin (many authorities suggest Asia and Africa), having the ability to quickly colonize coastal aquatic systems along the Gulf and lower Atlantic coasts. John Byrd and Victor Maddox in their publication (citation following this section) entitled "Torpedograss (*Panicum repens*)" assert that this species is one of the most aggressive invasive plants known, occurring throughout warmer regions of the world. While herbicide application such as glyphosate (Roundup, etc.) is likely the most efficient and economical means of controlling this invasive weed, caution is advised regarding its use. Users should be fully aware of potential adverse impacts associated with the use of specific brands, applying only those herbicides known not to cause injury to fish, alligators, and other animal life. Application is best accomplished with a spray dispenser, conducted only on windless days to reduce residual herbicide from affecting desirable species. Several applications will likely be necessary to maintain control and gradually eliminate this species. Selective use of herbicide to remove native species such as waterlilies is highly encouraged by limiting applications to only where plant life interferes with human activities, and by applying the least amount needed to eradicate problematic occurrences. In addition to serving as an attractive component to the lake, aquatic plant life is critical in maintaining the intricate web of animal life and the overall ecological integrity of Lake Fuller and the biological richness that has come to make the Coffeen Preserve a unique gem within Florida's landscape.

Online References for Torpedograss

Byrd, J.D. and V. Maddox. Torpedograss (*Panicum repens* L.). Bulletin available through the Mississippi State University Extension Service.

Florida Center for Aquatic and Invasive Plants (http://plants.ifas.ufl.edu/plant-directory/panicum-repens/): Provides good overview of species, particularly in reference to Florida.

Smithsonian Marine Station in Fort Pierce, Florida (http://www.sms.si.edu/IRLSpec/Panicum_repens.htm): Website is slightly dated but offers an excellent summary of species description and biological attributes, as well as a good selection of references.

Texas A&M AgriLife Extension (http://aquaplant.tamu.edu/management-options/torpedograss/): Provides good summary of management options for torpedograss and other invasive species.

EDUCATION AND RESEARCH

The resident managers continue to accommodate a good representation of environmental education activities and research interests for the Preserve from 2014 to 2017, having been a forceful component in promoting the rich and diverse cultural and natural history of the sanctuary since the Coffeen Land Trust was established 2003. Primarily organized and conducted by Susan Paladini, programs entail either interpretive walks, illustrated talks, or a

combination of both that are catered to varied age groups with diverse backgrounds on and off site. Participation in many programs are long-standing traditions, going back to the earliest days of the Land Trust, if not before. During the past three years Susan Paladini once again partnered with the Topsail Hill Preserve State Park in organizing and participating with several programs, including presentations for Veteran's Day, in dedication of a butterfly garden in honor of Marian and Richard Ludlam (former Four Mile Village residents and activists involved with creation of Topsail Hill Preserve State Park) and "Dirty Fridays" as an effort to maintain the garden, and in assisting the State Park to prevent (and having succeeded) a local homeowners association from placing a walkway within the park for beach access. Of the many tours and presentations given, from 2014-2016 she participated in an ecotour program sponsored by Walton County in teaching classes on the history of the Preserve; the program received the "People's Choice" award by the "Perfect in South Walton" visitors' guide in 2015. Nonie's Ark Animal Encounters, an environmental education specialist based in Fort Walton Beach, visited the Preserve in 2015, bringing a series of live animals designed for kids to interact with and learn. Also in 2015 Susan hosted the 53rd Wing, a group of military personnel located on Eglin Air Force Base, where more than 80 individuals embarked on a tour of the Preserve, learning of its role in the military (Figure 11). Examples of additional activities include presentations for the Cub Scouts, for the management of the neighboring Tops'L resort, and for the E.O. Wilson Biophilia Center, an environmental education center near Freeport, Florida, all in 2014. As in past years, the South Walton Turtle Watch continues to conduct an annual census of nesting activity for the various species of sea turtles (Leatherback, Loggerhead, Kemp's Ridley, and Green) indigenous to the Gulf. In 2015, the Turtle Watch captured turtles from further west and released them on the Preserve. Extending from May to September, under the direction of the Florida Fish and Wildlife Services, the Turtle Watch (http://www.southwaltonturtlewatch.org) is a group of volunteers dedicated to locating threatened and endangered sea turtle nests along the Gulf coast of northwest Florida, ensuring their protection during the crucial nesting and hatching seasons. To afford further protection to turtles, the Preserve imposed lighting restrictions during the nesting season where night-lighting was not permitted after sunset. The impact of night lights on hatchlings in finding the sea is well documented and researched, having demonstrated that the animals are vulnerable to disorientation by artificial lighting

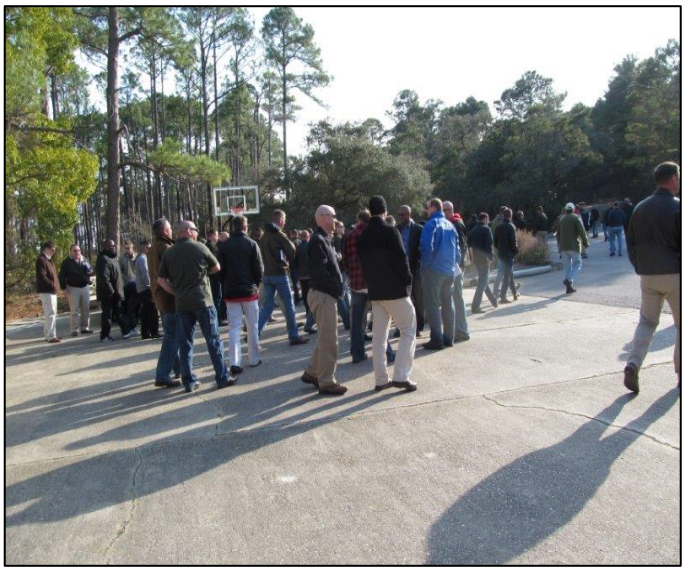

Figure 11. 53rd Wing from Eglin Air Force Base visiting Coffeen Nature Preserve in 2015.

leading them to head in the wrong direction possibly toward roads and into the path of predators. As a result of financial settlements associated with the British Petroleum (BP) oil spill, grants have now become available, with the first condo in neighboring Sandestin having received funding to retrofit their building with turtle-friendly lights.

Susan Paladini continues to work closely with the Coastal Dune Lakes Advisory Board, whose mission is the protection, health and environmental integrity of the county's globally rare and imperiled coastal dune lakes and to provide sound recommendations to the Walton County Board of Commissioners. Susan made the recommendation not to remove the current Coastal Dune Lake Management Plan adopted in 2008 from the county's planning documents that are presently under revision. This is a good idea. Removal from such plans will often make it more difficult to establish and maintain the conservation actions necessary for long-term protection. The Coastal Dune Lakes Management Plan is also being updated, which will impart further protection for Lake Fuller in following the recommendations outlined in the Coffeen Nature Preserve Management Plan.

Emphasized in earlier reports, the diverse cultural history and exceptional biodiversity of the Coffeen Nature Preserve presents itself with an excellent choice for environmental education and research opportunities. The continued success of prescribed burns, integrated with their role upon the landscape and how they are related to maintaining the integrity of the region's natural environments and the viability of its respective plant and animal species, will continue to serve as a paramount theme. Instituting prescribed fire also presents excellent opportunities to endorse research opportunities that empower scientists to acquire a greater understanding of the Preserve's biological richness. Inventories tailored to recently burned units will likely reveal species of plants and animals previously undocumented from the property, further confirming the necessity of fire and the importance of the Preserve toward safeguarding Florida's rich natural heritage. The recent burns during February 2017 in Units B1 and B2 are good examples, showing a suite of plant life that was not apparent since monitoring reports began in 2005. Biological surveys can be accomplished free or with minimal cost through various natural history organizations (e.g., Audubon, native plant societies), universities, and consultants, and should be pursued as resources allow. The Preserve's exceptional natural history is matched by its cultural significance, much of which has been, and continues to be, archived by the resident managers. Promoting the importance of the Preserve's natural and cultural resources should not only serve as the responsibilities of the resident managers, but also of the Board Members and Four Mile Village homeowners as their schedules allow. The Village Newsletter, a quarterly publication of the homeowners, offers a good forum to highlight educational activities, management issues, wildlife sightings, and other events associated with the Preserve. A section of the Newsletter could be devoted to this purpose. Advocating the importance of the Preserve and inspiring research and education will also encourage additional financial resources from donors to assist with management and protection of the site. Board

members and residents are also encouraged to participate in environmental education and research activities, such as manning booths at events and collecting scientific data.

New directional signs and interpretive markers (Figures 12 & 13) have been replaced throughout the Preserve, affording good visibility to homeowners, beach goers, and trail users. The signs replace the former wooden markers that were becoming damaged and worn by general exposure to weather.

Figure 12. New sign in coastal dunes.

Figure 13. New directional sign.

OTHER ISSUES

Contributions

The collective creativity and conviction of board members and Four Mile Village residents continue to foster a compassionate relationship among the Coffeen Land Trust, residents, and Topsail Hill Preserve State Park toward a common cause: to honor the vision of Dorothy Coffeen in conserving and preserving the natural beauty and characteristics of the Coffeen Nature Preserve for educational, conservation, and scientific purposes. Annually, an information packet and accompanying letter highlighting the respective year's achievements are distributed to Four Mile Village owners to solicit donations in support of Preserve functions. The packet is very nicely done and appears largely successful in fundraising efforts; this is a good idea and should continue. The dedication of outreach by board members, home owners,

and the resident managers continues to foster support and monetary contributions for various aspects of the Preserve's management. Notable examples include an annual donation of $25,000 made by a Four Mile Village owner from 2015 to 2017 to be used at the Land Trust's discretion. The funds were partially allocated toward the purchase of a Polaris all-terrain vehicle (Figure 14) and hand radios to facilitate prescribed burning efforts. This funding was also used to refurbish the boat dock, rebuild the stairway between the resident managers' quarters and maintenance area, and replace interpretive and directional signage. The endowment continues to grow with more than 90% of Four Mile Village owners having made donations annually to be used for Preserve expenditures. Given the budgetary constraints confronting many parks and nature preserves, endowments have demonstrated to be an effective means of procuring supplemental funds. Overall, financial support from Land Trust members has been generous, with the Four Mile Village residents through their Home Owners Association having provided a significant financial support for the Trust's operations.

Figure 14. Newly acquired Polaris

Pignut Hickory

The introduction of pignut hickory (*Carya glabra*) has been undertaken in various sections of the Preserve, specifically along Village Road and within the yards of some residences. The species is a widespread and common inhabitant of rich forests throughout eastern North America, becoming relatively uncommon in Florida where it is restricted to moist forested slopes and hardwood hammocks having developed on shell middens. Survival rate of saplings planted on the Preserve will likely be negligible, as the species is not a natural component of the highly porous sandy and very acidic soils inherent to most of the Preserve. To increase chances for survival, saplings will require constant moisture (not saturated) and protection from fire. If there is an interest of having a hickory for ornamental purposes, the Florida hickory (*Carya floridana*) will likely be a better alternative. The species purportedly has colorful fall foliage. While not native to the Florida Panhandle, the species is able to withstand the deep sandy soils occupied by the majority of Four Mile Village residences. Because the species is not native, introduction within the Preserve proper should be discouraged. An example of native pignut hickory currently exists on the east side of Lake Fuller, at the furthest distance in which

visitors can walk the nature trails. The site contains a mix of hardwoods (classified as a mesic hammock by the Florida Natural Areas Inventory), most notably live oak (*Quercus virginiana*), sugarberry (*Celtis laevigata*), and pignut hickory that inhabits fertile soils originating from the disintegration of shells. This habitat type is maintained by high moisture (which limits the incursion of fire) that is induced by heavy shading of the ground layer and an accumulation of litter. The Native Americans sought such sites for coolness and shade, serving as residential areas and retreats from the summer sun. Coastal tribes appear to have used the hammock in the Preserve, as witnessed by the numerous shells at the site.

Frequency of Monitoring Reports

The frequency of monitoring natural resource management for the Preserve and the preparation of accompanying reports has been under discussion by the Coffeen Land Trust. The regularity of monitoring the management of a given conservation area is directly related to goals and objectives, and will vary considerably among sites, but are most often conducted on three-year cycles. The rationale underlying many monitoring programs is that additional information will be beneficial, specifically directed toward three components of an informed decision-making process, which are: 1) to assist with decision-making that enables land managers to decide on the appropriate course of action for specific management scenarios; 2) to evaluate the effectiveness of management actions; and 3) to apply "adaptive management" protocol, if necessary, where land managers revise management decisions based on the outcome of previous management actions. Given the scope of annual activities (e.g., prescribed burning, general maintenance, education and research) conducted at the Preserve, three-year rotations are recommended. Instituting a monitoring regimen at three-year intervals will be sufficient to identify and accommodate changes necessary to best accomplish long-term management of the Preserve.

1000 Friends of Florida

The Coffeen Land Trust joined membership with the 1000 Friends of Florida (website: http://www.1000friendsofflorida.org/), an organization dedicated to protecting the state's natural areas that cleanse and store fresh water resources needed for ensuring a healthy environment while sustaining responsible economic growth. The Land Trust decided to join the organization in response to litigation proposed by Walton County that would reduce protection afforded coastal dune lakes to encourage greater development opportunities. The 1000 Friends of Florida was successful in preventing the county's proposal from becoming reality and a settlement reached which the County agreed to have lakes tested where development appeared highest to assess environmental impacts. Part of the settlement also specified that new septic tank systems were no longer allowed around lakes.

Alligators

A 6-7 foot alligator had to be removed from Lake Fuller and euthanized because the animal gradually become imprinted on people. A small number of renters began feeding the alligator

to where it became habitualized to certain sounds (such as opening and closing of screen doors) that it associated with food, often swimming from afar. In concern for the safety of homeowners and renters, the animal was removed. Educational pamphlets are currently distributed to new homeowners and renters that detail the dangers of feeding wildlife, and forbid them from doing so. If the problem persists, more stringent penalties may be in order, such as imposing fines or relinquishing rental privileges, or both. Several parks, municipalities, and other landowners have levied harsh penalties for individuals unwilling to refrain from feeding or otherwise harassing wildlife. However, it is important to note that even the harshest punishment will not deter all people.

SUMMARY

The Coffeen Land Trust continues to address many of the recommendations outlined in the Plan and previous monitoring reports, working to restore and maintain the ecological integrity of the Coffeen Nature Preserve and in promoting the biological and historical significance through educational programs and research. The success of these accomplishments would not have been possible without the concerted efforts of all individuals, each contributing in their own special way. Essential to the success and prosperity of any entity is outreach, specifically a frame work that fosters public participation. As cited in earlier reports, public involvement affects the strength of Florida's laws, the actions of private landowners to conserve our natural heritage, and the ability of government agencies, charged with protecting nature, to follow through. Moreover, citizen involvement often swings the pendulum of decision-making toward a conservation solution. Improved government effort on behalf of conservation is dependent on the active role of private citizens.

Ongoing collaboration with Topsail Hill Preserve State Park is highly encouraged to maintain a working partnership where the preserve and park can exchange resources (personnel, equipment, etc.) to achieve like-minded goals in land management and environmental education. A working partnership is not only critical to accomplish management goals, but is also essential for maintaining a large undeveloped corridor for the movement wildlife, specifically transient species such as the black bear.

While the majority of residents understand and appreciate the mission of the Preserve, new homeowners and renters should continually be apprised on its overall purpose in an effort to foster a greater awareness and admiration relative to the cultural and natural heritage of the site and elsewhere in the region. Ongoing dissemination of the brochure and other educational materials will be beneficial in this effort.

Despite the varied interests and backgrounds among Board members and the Four Mile Village residents, the Preserve continues to garner unanimous support by everyone involved. Bearing witness to this support is an annual increase of monetary donations that have enabled the Preserve to more effectively accomplish management needs and promote educational efforts. The Preserve's endowment continues to grow. Such favorable support in conjunction with the

tireless efforts of the resident managers is a testament that the Preserve will remain as a tribute to the vision of Dorothy Coffeen and will serve as a top destination for present and future generations to know and enjoy along the Gulf Coast.