Forest Stewardship

Management Plan

Girl Scouts of Gulf Coast Florida, Inc.

S 12, T 43 S, R 25 E

06/27/08

Florida Division of Forestry
Florida Fish and Wildlife Conservation Commission
USDA Natural Resources and Conservation Service
University of Florida – Institute of Food and Agricultural Sciences
Private Natural Resource Consultants and Land Managers

LOCATION

Camp Caloosa is located on State Road 31 in northern Lee County a couple of miles south of the Lee County/Charlotte County line, and north of the Caloosahatchee River. The closest major town is Fort Myers, located about 10 miles to the southeast. Land uses surrounding the property include agriculture, residential, and small businesses. The property covers about 80 acres with approximately 65 acres of timber land comprised of pine forest, along with several lakes and buildings that comprise the Gulfcoast Girl Scout's Camp Caloosa.

The address for the tract is 19931 State Road 31, North Fort Myers 33917. The strap number for the property is 12-43-25-00-00002.0000. The tract is located within Section 12 of Township 43 South and 25 East. A final locator that is often used is latitude and longitude which for Camp Caloosa are: Lat. 26° 45' 14.88" N, Long. 81° 45' 54.27" W. See appendix 1 for a location map.

MANAGEMENT OBJECTIVES

Just as every Forest Stewardship property is different, so is each Forest Stewardship Management Plan, all along retaining the same emphasis on multiple-use management on non-industrial private forest lands. The primary objective of the property is to provide a quality recreational experience for the girl scouts, their families, and other user groups. The second objective is to improve aesthetics and provide a high quality visual experience for people using the property. The third objective is to provide resilient wildlife habitat with a concentration on the control of invasive exotic plants and diversifying habitats. The fourth objective of the property is to practice good soil and water conservation principles primarily to safeguard Owl creek that runs through the property. The final objective listed for the property is to provide a diverse forest resource that is resilient, healthy, and a strong backbone for both the recreational experience at the camp and the wildlife habitat.

The management plan that follows in this document will first discuss the general characteristics of the property's natural resources along with actions that will support the creation of a multiple-use land management ethic for the future. Multiple-use is the primary goal of any forest management plan that is written by the Florida Division of Forestry. Areas of focus in multiple-use resource management include: timber; aesthetics; soil and water conservation; wildlife; recreation; and grazing. After the objective descriptions and outlines are described, more detailed information will follow for each specific forest stand (see appendix 1 for maps) with recommendations based on on-site observations and classification according to cover types in the Florida Natural Areas Inventory classification system. The third section will discuss the forest management practices that are described in the stand specific sections. Finally, an appendix section contains everything from maps, to vendor lists, to costs of various forest practices in the state of Florida.

SUMMARY OF MANAGEMENT RECOMMENDATIONS

Recreation

The first overall objective of the property is to improve and support outdoors related recreation for user groups of the property, while also balancing resource sustainability and safety. Potential activities in the woodsy areas of the property include: canoeing, kayaking, fishing, riding

ATV's, walking the property, running, observing seasonal changes in vegetation and natural systems, wildlife watching and/or photography, and working the property for personal gratification and service work. In the Firewise/Built up area of the property, more yard orientated activities are possible such as volleyball, sitting around campfires, soccer, etc. All of these activities will only be enhanced through the management schemes outlined in the plan.

Foot traffic and bicycle traffic, especially when it is heavy, can result in rutting on trails. To counteract this, mulch can be placed on firelines/trails where the groundcover is wearing thin by placing the mulch in the center of the fireline. This will minimize erosion and the mulch can easily be hand-raked to the side before prescribed burning activity begins. Ruts that do form should be filled in with more soil as soon as possible. Attention will also need to be paid to marking tree roots as they come to the surface, as fill over tree roots can often compromise their health.

For safety and privacy reasons, it is recommended that a vegetative buffer be established on the outer perimeter of the property to screen out prying eyes from neighboring landowners and to keep the feel of a more back-woods experience. These barriers will need to be woven into the fire lines that run near the edge of the property as some of the current firelines have removed the buffer from the edge of the property. Plants that are installed should be native and drought tolerant. Ideally, the plants would have thorns, but there are few plants native to pine flatwoods that have thorns. Attempts can be made to grow Smilax vines from cuttings on the property and spread them to palmetto and other bushes on the edge. Other plants that will work on the edge include hawthorne, saw palmetto, and even tightly spaced pine trees at 4 feet between rows and 8 feet between trees with an offset planting of the rows.

Inevitably with camping, there are usually campfires. For bonfires, the fires have to be 165' from any of the Girl Scout Buildings as well as any of the neighboring property owners' buildings. A small ring of bare-dirt should be around any bonfire with water and a shovel on site to put out any small escapes.

Aesthetics

The aim of multiple-use forest management on any property is to make the property more visually pleasing for the landowner. This is achieved by rotating practices throughout the property, such as prescribed burning and timber harvesting, so that some parts of the property will be "under construction" with others looking less cluttered. Over time, well managed, diverse forest lands provide great vistas and provide a great sense of peace. Forested properties that are well managed tend to be more open and visually pleasing. Most people are not comfortable with extremely dense undergrowth of plants and shrubs, as they make walking through the forest more difficult and remind many people of the unkept "wilderness" of fairy tales and lore. However, properties that have been long unmanaged, especially in south Florida, need to undergo a period of "facelift" that can leave people put off and scared of finishing restoration activities because of the temporary mess that can be created. The thing to keep in mind with forestry activities is that the land heals rapidly, new trees grow or in-place trees shoot out more growth, and the understory jumps back green and many times with a flash of greater color as dormant flower seeds germinate and grow.

Plant/habitat diversity can be achieved through 1) a regular burn regime, 2) mechanical fuel reduction using a roller chopper or Gyrotrac® or bush-hog, or 3) chemical/herbicidal means to

reduce overgrowth of woody shrubs and to eliminate invasive exotic plants. In all likelihood, invasive exotic plants will never be eliminated from the property, but efforts must be made to reduce their presence to only an occasional occurrence. The major invasive exotic plants in each stand are included in each of the forest stand recommendation sections. More information can be found about invasive exotic plants at the Florida Exotic Pest Plant Council's website at www.fleppc.org.

Camp Caloosa has a lot of visual bonuses that center around the intact wet pine flatwoods forests and their proliferate growth of wildflowers, varying densities of south Florida slash pine trees, the presence of two large lakes, and Owl Creek running through the middle of the property. Special concerns at Camp Caloosa are to retain visual barriers that screen the property from the outside, as well as interior screening that provides more places that feel "on their own" or isolated. As such, barriers of vegetation should be established and burning/mechanical control limited in these areas, or additional planting of trees/bushes to reinforce failing buffer plantings. A buffer distance of at least 10 feet is recommended.

Soil and Water Conservation

Conservation of soil and water is a goal on any managed property, especially considering all of the concern in southwest Florida for the health of our estuaries and the need in the near future for more drinking water. The most effective practices to carry out soil and water conservation goals are those which increase ground cover densities and limit activities that excessively produce soil disturbance that cannot be mitigated through seasonal activity prohibition or altered forest practices. While 100% plant soil coverage is not realistic and will inhibit some wildlife species from using the property, there needs to be high enough ground cover density to hold soils in place during high rainfall events/seasons, with planned soil disturbance for events such as pine seed germination. Groundcover densities can be manipulated by initiating a prescribed fire regime and/or mechanical means such as the roller chopper or use of a positrac. Opening the mid-story and canopy will allow herbaceous and grassy vegetation (groundcover) to thrive, thus holding soil, and filtering water.

The Florida Department of Agriculture - Division of Forestry has worked hard with the South Florida Water Management District and Florida Department of Environmental Protection to give landowners up front information about methods to conduct forestry activities to limit sedimentation or negative impacts to water and wetland resources in the State of Florida. These methods are outlined in the Silvicultural Best Management Practices (BMP) book (copy enclosed). Forestry has an improving track record in minimizing soil erosion and impacts to wetlands but we need all landowners to be proactive. Silvicultural BMP's are a down and dirty guidebook to give easy to understand guidance to forest landowners and forestry contractors on how to avoid violating water quality standards and polluting water bodies around the state of Florida including wetlands, lakes, rivers, and streams. The use of these guidelines is considered a starting point only for soil and water quality protection. Before any management activities are started that may impact any wetlands, contact the South Florida Water Management District for any necessary permits or authorizations at (239) 338-2929. Laws and wetland definitions seem to be ever changing.

Over the life of this management plan, it is anticipated that the following sections will be used for Camp Caloosa: Special management zones for lakes and intermittent streams (page 3-6, 12);

Stream Crossings (pages 28-30); timber harvesting (page 31); site preparation and planting (page 32); pesticide and fertilizer use (pages 34-35) and waste disposal (page 36).

The specifics of the best management practices are as follows: the property has lakes that are over 2 acres in size and an intermittent stream. Given the soils on the site and the almost lack of slope, the Site Sensitivity Class (SSC) can be rated as A1 (the lowest risk) as shown on page 40. This means that Owl creek needs to retain a stringer (page 6) of trees with an emphasis on hardwood trees along the bank and a secondary zone of 35 feet on each side (no timber harvesting restrictions except no loading ramps or mechanical site preparation). The lakes over 2 acres need to have a primary zone of 35 feet.

Appendix 5 contains a map of the soils on the site and Appendix 6 lists the soils and their qualities as found on Camp Caloosa. Essentially, the site is a classic area for pine forests that tend to be wetter with occasional surface flowing water. An issue that has come up is the possible impairment of drainage to Owl creek to the south. Efforts must be made to correctly restore the flow pattern off of the property to naturally mimic seasonal flood patterns. The soils on the property itself create something like a plate with two ends that are slightly upturned, meaning that the center of the property is more prone to seasonal (10 – 30 days) flooding given the soils (Malabar fine sand) that are present. Lee County and the US Army Corps of Engineers should be consulted as this creek is navigable for a long ways, and there may be mechanisms that can be used to create cooperation with downstream landowners to correct past practices that have resulted in the impounding of water on the property. The berms along both sides of owl creek may in fact prevent good drainage off of the property, though this water does need someplace to go.

Additional soil and water conservation information can be obtained through the USDA Natural Resource Conservation Services office in Fort Myers at (239) 995-5678 or a Best Management Practices forester or County Forester can arrange to visit the site by calling (239) 690-3500.

Wildlife

Management recommendations within this plan will serve to further diversify existing habitats as well as promote quality wildlife habitats. Active management practices are: maintenance of exterior and interior fire lines (these will serve as travel corridors and transitional areas); prescribed burning; planting additional seedlings when natural regeneration not present; chemical vegetation control; and roller chopping/mechanical brush reduction. Passive management options include leaving snags standing and building brush piles on the property for cover. Many brush piles already exist on the property, and these will be kept to allow shelter for snakes and other animals, whereby more can be created through the activities that will reduce the amount of invasive exotic plants. Cut melalueca can be stacked in small sections to provide cover. The property has many openings, which should be enhanced as thinning takes place. Openings should be from a half acre to 1 acre and can be disced in the late winter on an annual basis to promote new grass and forage growth for wildlife to feed on. By combining all of these activities, a more diverse habitat is created which will benefit wildlife as well as encourage pine tree growth and improve the property aesthetically.

During tours of the property, many burrows of rabbits were found when walking on the property, along with various song-birds. The property possesses habitat on the east and west sides, which combined with proper management, is ideally suited for the management of gopher

tortoises, a threatened animal, as well as many snakes and songbirds. Additional animals that can be expected to use the property are black bear, bobcats, wading birds, woodpeckers, and perhaps in the future scrub jays may even use the site.

The greatest disadvantage of the property is that rural land connections are disappearing on all sides and the property will likely no longer support Florida panther. This is unfortunate as the site offers excellent habitat for these this charismatic mega-fauna. If additional wildlife are found using the property, then management advice can be obtained from the Florida Fish and Wildlife Conservation Commission through Chris Green, Biological Scientist IV, at 941-575-5784.

A list of Lee County protected species is provided in the appendix of this plan.

Timber

The focus of timber management at Camp Caloosa is to strengthen each of the forest types that are present on the property, with a primary concern focusing on the creation of an additional cohort (age class) of south Florida slash pine while simultaneously eliminating the presence of invasive exotic plants on the property. Multiple cohorts of pine will allow the landowner to sell timber every 10-15 years as the trees mature and to spread out the risk of catastrophic stress and tree mortality that may be caused by future hurricanes. Side benefits to good forest management include: severe reduction in the occurrence of invasive exotic plants; revenue generation; management of wildfire risk through the use of prescribed fire; and creation of more open forest conditions for better wildlife habitat.

Timber stands on the property can be divided into three categories: mesic pine flatwoods; degraded hydric pine flatwoods; and cabbage palm/oak hammock. There is the beginning of a slough wetland on the property in the owl creek flow-way, but the steep sides of the bank keep this forest system small, which is typical for creeks in North Fort Myers. Given the spread of the invasive exotic plants on the property, it is best to treat the whole property as degraded, but the focused areas of heaviest impact are in the center of the property.

The forests on the property will be described in greater detail later on, but they are mostly stagnant in their growth and dominant trees are around 40-60 years old, meaning it is only a matter of time before a disaster hits the pine stands without some intervention. Diameters vary from stand to stand, with the larger timber on the eastern, southern, and western sides of the property. Tree heights are normal for south Florida and range from 42 feet to 64 feet. Density varies from 30 feet squared of basal area in areas with obvious disturbance (wildfire, etc.), average 60-110 feet squared in most areas, and go all the way up to 160 in some spots. South Florida slash pine forests can safely be thinned down to 40-50 square feet of basal area (the amount of wood measured at 4.5 feet off of the ground per acre) with many people preferring to leave younger stands with a basal area up to 70 after a first thinning.

Harvests can be conducted now during drier periods of the year to avoid rutting and soil compaction. The goal of the harvests will be to improve the health of the forest, provide conditions to allow for new pine seedling growth, and to cost effectively reduce the height of the understory to allow for the quick introduction of a long term burning program on the site. Logging will need to be bid out in 20 acre or larger blocks to attract a logger. The goal of any mature tree harvest will be to grow the next stand, with some income coming to the camp from

the timber sales. Since the stand is a natural woodland, the recommendation is to thin the harvest areas down to around 30-50 feet squared basal area (the amount of wood per acre if you packed all of the trees on an acre in a corner and measured the square feet of the cross section of wood at 4.5 feet in height) and leave at least 10 trees per acre for seed disbursement. On the first thinning treatment of mature stands, clump leave trees in groups of 2-5 trees 66-100 feet apart depending on the objective of the area, with single trees left every 50-60 feet if no clusters are available. Clustering is far more important if the saw palmetto will need to be roller chopped to avoid killing more pine trees. Trees that are left should have well formed crowns to allow for more cone production, and basal wounds should be minimal if any are present at all. Tops should be scattered in the woods during the logging operations. The grouping of the trees will allow for roller chopping for wildland fuel control. Additional thinning will likely take place in 20+ years when the new stand is well established.

Newly established stands will be thinned for the first time around 15-20 years of age with a residual basal area around 70 square feet per acre. During this harvest, most of the leave trees from prior reseeding efforts are removed, unless efforts are underway to attract red cockaded woodpeckers. Depending on markets and tree health, one to two more thinning may be possible with a seed tree cut targeted at 40-60 years.

Regeneration of pine in pine forests often takes two different directions. If seed trees with crowns that have branches on all sides and in the upper half of the tree are on the site in a density of around 10 trees per acre, then natural regeneration is an option if the landowner's business model will allow for several years of burning and looking for good cone crops. Generally, pine seed can fall within 1-2 times the height of a single tree, with less seed getting out to the farthest end of the dispersion area. Seed drop occurs sometime between September and early November depending on weather conditions. Where good seed trees are not present or spaced badly, planting of seedlings will need to be done. Planting should be done to install at least 500 trees per acre, with a recommended spacing of 10 feet in between rows, and 7-8 feet in between trees. This planting spacing will allow for 544 - 622 trees per acre. Planting is done in the winter using either bare-root or containerized seedlings. January seems to be the best month to plant in south Florida, with containerized seedlings, even costing 3-4 times as much as the bare-root variety, providing the only way to successfully plant forests in south Florida. Successful regeneration is defined when over 400 seedlings per acre survive to the next fall. The rows in the stand allow for bush-hogging if needed and easy release herbicide applications. The rows will quickly disappear after the first thinning and with pine tree mortality.

Control of invasive exotic plants is always the most important precursor to good forest management in south Florida because our climate is so good at supporting excessive growth of these visiting plants that alter our forests for the worse. The control of invasive exotic plants seems to be the penalty we have to pay to enjoy our south Florida forests. Prior to any mechanical work in the rest of the property, sweeps need to be made to eradicate old world climbing fern. Other invasive exotic plants that merit control after timber harvests and were observed on property walks are: melaleuca; Brazilian pepper; earleaf acacia; guinea grass; wedelia; and java plum. All equipment that uses the site must be washed prior to entering the natural parts of the property, and preferably before coming onto the property, to avoid the spread of rhizomes and seed. Invasive contractors can and should be contracted to work on invasive control that cannot be conducted by Girl Scout staff. Many cost-share programs such as the Forest Land Enhancement Program and Landowner Incentive Program may be able to

provide some funding for these activities. Contact the Senior Forester with the Caloosahatchee Forestry Center at (239) 690-3500 Ext. 118 for more information.

The reduction of the fuel hazard on the property should be selective and focus on melaleuca and thick areas of palmetto. The goal should not be to eradicate all saw palmetto, but to leave pockets of taller material, along with mowing/running over a majority of the stems one time before using fire for long term maintenance to achieve a general palmetto height that will peak at about three feet prior to burning. Staging areas for equipment will be west of the eastern pond in the open grassy area. This allows for the easy loading and offloading of equipment. Many areas of the property are chalk full of great understory bushes/trees such as: red bay, cabbage palm, myrsine, marlberry, wild coffee, beauty berry, etc. These plants should be allowed to thrive and will provide both wildlife food and shade that will keep the fire danger in many areas lower than without these plants.

Additional Forest Management advice can be obtained from Michael Weston, Senior Forester of the Florida Division of Forestry, at (239) 690-3500 or by going to www.fl-dof.com and finding a consultant that works locally from the Forestry Services Vendor Database. Any timber sales should be coordinated through private natural resource consultants as prices are generally higher than working directly with a logger. A list of logging companies is found in Appendix 2.

Grazing

Grazing is not listed as an objective of the landowner, but extensive damage is currently taking place on the property from both wild hogs and neighboring domestic hogs that are rooting up huge areas of the property. The only recommended action is to contract with a fence contractor and have hog fence installed on the west side of the property to exclude access to the property by these pigs.

The property currently has native range on it that would provide limited food to cattle, especially during the dry season, and average feed to goats that would graze the property. For the health of the animals, they would either have to be kept in low numbers or rotated off the site when forage levels decrease to both protect the forage resources of the site and to allow the animals to grow as quickly as possible. Fertilization of the area to promote forage nutrient quality is recommended, especially for cattle. Supplemental feed would likely be required most of the year to offset the limited nutritional quality of the feed on-site given current conditions.

If grazing were ever considered as an option in areas with reforestation, it will need to wait until pine seedlings are 4-6 feet tall, fences would need to be mended around most of the property, and water stations would need to be set-up. Bobcat are found in the area and could prey on goats if left out nightly. For more information on grazing leases and setting up livestock-use on the property, contact the University of Florida's Lee County Extension Office at (239) 461-7512 for the Agricultural and Natural Resources Extension Agent.

Non-timber Forest Products

In the drive to produce revenue off of timber lands in the United States, small markets have emerged that collect products other than timber from forests. The most common method used on small properties is to lease a portion of the tract for use in the extraction of products, unless the landowner has the ability to set up the operation and run it themselves. The

information is too diverse to include in this plan, but contact should be made with the following entities to inquire about adding these possible revenue generating activities to the property:

- Firewood – Florida Division of Forestry – (239) 690-3500
- Bee Apiaries – Lee County UF/IFAS Extension Office (239) 461-7512
- Saw Palmetto Berries– Lee County UF/IFAS Extension Office (239) 461-7512

Table 1: List of forest community types (stands), acreage, and percent of the total area.

Stand #	Community	Acres	Percent
1	Mesic flatwoods	15.3	19.4%
2	Mesic hammock	1.9	2.4%
3	Hydric flatwoods (disturbed)	26	32.9%
4	Mesic flatwoods (flow-way)	2.2	2.8%
5	Mesic flatwoods	16.1	20.4%
6	Mesic flatwoods (burned)	2.9	3.7%
Firewise	Buildings and Yard Areas	9.5	12.0%
Lakes	Water	5.1	6.5%
Total		79*	100%

*****Acreage calculated using ArcGIS 9.2.

Cultural and Historical Resources

The landowner does not know of any historical resources that exist on the property. The Florida Department of State Division of Historical Resources should be contacted if any artifacts are found or if any ground disturbing activities will be started. They can be contacted by going to the following website: www.flheritage.com. Examples of ground disturbing activities include the installation of new facilities, including septic tanks and trenched utilities, widespread hydrologic restoration that includes dredging, and other activities where earth is moved. The past of any society is very important and key archeological finds have often only occurred because curious people called in to report news of a new site.

Specific Stand Recommendations

Appendix 4: "5 Year Table of Recommended Actions" shows in a chronological order what should happen on the property to perform good forest management on the property. ***Prior to the start of any preserve maintenance, the Lee County Division of Environmental Sciences must be notified.*** A copy of this plan will be on file with the E.S. Division for reference.

The stands are defined using categories set forth in the Florida Natural Areas Inventory criteria. Further divisions have been made based on the amount of invasive exotic competition and maintenance level in regard to fire.

Stand 1: Mesic pine flatwoods 15.3 acres

Invasive exotic competition – low
Fire Maintenance level – needs mechanical work

A great example of what can happen when invasive exotic plants don't take over a forest stand in south Florida can be found in this stand on the property. The stand starts immediately inside the front entrance gate to the left and goes south along the entire eastern frontage of the property.

The dominant tree in this forest stand is south Florida slash pine (*Pinus elliottii* var. *densa*). The stand has three general diameter spreads with large trees having a diameter at breast height (dbh) of just over 12-14 inches, middle trees at 8 inches dbh, with many smaller trees sitting at 3-4" dbh. There is a gradual continuum from north to south with the northern part of the stand sitting slightly understocked at 40 square feet per acre of basal area, and the southern and western portions sitting slightly overstocked at 80-100 square feet per acre basal area. In the heavier areas, there is significant crown competition and growth rings have significantly grown smaller over the years. Average age is 40-50 + of the south Florida slash pine making this stand elderly in it's composition, and there is no widespread regeneration in this stand that appears ready to take over growing duties once the current crop of trees become over-mature. Average tree height is 57 feet.

Understory plants in the stand include saw palmetto (*Serenoa repens*) that is generally 4-5 foot tall with the palmetto getting taller but slightly more isolated as you go south and west in the stand. The palmetto will require some mechanical management prior to burning, unless extremely slow burns are conducted with knock down of hot areas to avoid major crown scorch and tree mortality. Duff layers vary in the stand, but are extremely heavy in the southwest part of the stand. Other plants are cabbage palms (*Sabal palmetto*), American beautyberry *(Callicarpa Americana)*, winged sumac (*Rhus copallinum)*, various wildflowers, fox grape, myrsine *(Rapanea guinensis)*, rusty lionia **(***Lyonia ferruginea)*, poison ivy, scattered oaks, smilax vines, gallberry (*Ilex glabra*), wax myrtle (*Myrica cerifera)*, and widely scattered shiny leaf coffee *(Psychotria nervosa)*. Areas with more canopy cover are generally more open, though ladder fuels (vines that grow onto the trunks of trees) cover a good percentage of the trunks of trees. Invasive exotic plant pressure is not high in the stand, and mainly comes from isolated earleaf acacia trees, scattered Brazilian pepper, isolated 2" and under diameter melaleuca, and Caesar's weed.

A dormant gopher tortoise burrow is located to the south of the entrance to the camp. The ranger on-site is aware of the burrow. The area behind the burrow will not require any machine travel except for the periodic discing of a fireline that is located about 20 feet to the east of the burrow's entrance. When any equipment is working in this stand, the burrow should be marked and equipment access within 20 feet of the burrow limited. Forage plants on-site are present in sufficient number and will only increase as the prescribed burning program moves into full swing. The area that is around this burrow, and to the immediate south should be kept as open as possible and as frequently burned as possible to provide the best possible habitat for gopher tortoises.

Recommendations for management include the following:

1. Invasive exotic plants - patrol for old world climbing fern and control isolated pockets prior to any mechanical work. Similar work should also occur for Caesar weed prior to introduction of prescribed fire as Caesar weed responds very aggressively to prescribed fire. Melaleuca control is of lower priority, but should take place before stems are too large.
2. Pine tree harvesting - thin pines down to 40-60 foot basal area to allow for new seed fall and mechanical control of palmetto prior to initiation of prescribed burn routine. This can be achieved by leaving clusters of 2-4 trees about 60-80 feet apart. Trees that are left should have a crown with branches on all sides to produce good cone crops, with isolated large diameter trees left as future cavity trees. Tops should be scattered in the woods. Emphasis near the road and adjacent to camp facilities should be accessing trees for harvest from the interior side of the stand to limit any viewing of camp property from outside. Harvest activities should limit excessive rutting and be conducted outside of the rainy season.
3. Buffer - leave a 15+ foot buffer of trees and understory plants along the outside of the stand for visual and noise buffering. Isolated harvest of overly crowded trees should be allowed, but only with access from the inside of the stand. In areas without adequate pine growth, vegetative buffers can be jumpstarted by planting a double row of pine in 4' between trees and 8' between row spacing. The fireline can then be inside of these trees.
4. Prescribed burns and regeneration – there is a fireline that runs nearly on the outside of the stand, along with several interior fire lines, so no more lines will be needed. Semi-annual burns should take place in the area that is closest to the entrance and in the open area in the first part of the pine stand as it travels south. This area will be designated as prime gopher tortoise area and the camp hopes to attract more tortoises to this area. The first priority will be to finish treatment of overgrown palmetto following the timber harvest using either a positrac, bush-hog, or roller chopper depending on palmetto layout following logging operations. Walk the site and mark any gopher burrows prior to heavy equipment access. Burns will need to fire out around mature pines to ensure that feeder roots unaccustomed to fire are not overly damaged during the first burn. Firing techniques will likely include flanking and spot fires. Later burns will be much quicker and involve less strenuous firing techniques with a goal of 1-2 burns prior to waiting for new seedling recruitment. Once a good cone crop is in place and a summer burn is done to make the soil surface receptive to seed fall or seedlings are planted, wait until new trees are 8-12 feet tall prior to reinitiating burn program. After this, the return interval for fires will be every 3-4 years.

Stand 2: Mesic hammock 1.9 acres

Invasive exotic competition -moderate
Fire Maintenance level - easy

The hammock is dominated by 15-20 inch diameter live oaks with the highest concentration of cabbage palms on the property. The oaks provide the classic shady umbrella, almost cathedral like ceiling as the branches spread across the sky in iron resoluteness, complete with vine wrapped branches. Swamp bay is also present, as is shiny and dull leaf coffee, American beauty

berry, poison ivy, and many ferns. There is a large Australian pine in this stand that should be removed either during the timber harvest or in the near future on its own. Australian pine provides very good firewood and may be an option for the camp to use in the short term. There are also several bunches of bamboo that should also be removed. While bamboo can be an exciting plant, it is not native and would likely not do well with future fires and does have the potential to spread in the property.

Recommendations in this stand include:

1. Remove Australian pine and bamboo. Patrol for other invasive plants, especially old world climbing fern, Caesar weed, and guinea grass.
2. A light, surface burn that attempts for no more than 50% surface coverage should be done within 10 years. Return interval for fire will be 10-20 years.
3. Additional plantings can be done on the outside edge of this stand for privacy and can include saw palmetto, hawthorne, cocoplum, and a double row planting of pines spaced in an offset 4' by 8' planting scheme. Oaks can also be planted in a double row with 15 feet in between trees and 15 feet in between the rows.

Stand 3: Hydric flatwoods 26 acres

Invasive exotic competition - high
Fire Maintenance level – moderate work

The hydric flatwoods follow a line that is roughly west of Owl Creek to a line that goes nearly north and south just west of the far western pond. Because of the soil characteristics of this site, water should be found standing on the soil surface for 7-30 days during especially rainy parts of the year. This is natural and provides the opportunity for some groundwater recharge in the area. Stand 3 is the stand where the battle lines have to be drawn to win the peace and control of the invasive exotic plants that are on the site. The stand is divided into two management units that share the same overall plant community classification, but are on slightly different paths toward restoration.

Stand 3 - North

The north stand is the portion of stand 3 located north of the big island. This area has the highest remaining impact from invasive exotic plants and this will be the first priority for management. Pine is extremely dense and never really drops below 80 square feet per acre basal area and gets as high as 160 with trees that are 5-7 inches dbh. Trees average about 55 feet tall and are in the range of 40-50 years old. Seedling presence is poor to non-existent and seedlings that are present are extremely unhealthy at this time because of all the competition. Regeneration will be very tricky in this stand because conditions need to coincide to combine both open ground for seedling germination and rooting, along with water levels that don't overtop the pines. Bedding is likely not an option, so new trees from three gallon pots may need to be planted if regeneration fails time after time. Crown competition is intense and a thinning operation is essential in this area, after the old world climbing fern invasions are controlled.

Bark beetles are on the march in the stand, but primarily because the trees are too dense. The dominant beetle appears to be the ips engraver beetle and there were no signs of black

turpentine beetles. Ips engraver beetles are the vultures of pine trees and can zero in on very stressed trees due to drought, competition from other trees, scarring on the tree, and simple old age. The trees actually release an odor that attracts beetles from up to four miles away, and then like an army they attack the stressed tree. During the thinning, all trees that have recently died or are dying from ips engraver beetle attacks should be harvested. Future isolated tree mortality should only result in the felling of the tree if black turpentine beetles are responsible for the mortality, or if the tree threatens to fall on a structure/is near a walking path. There are many birds and other animals that depend on the presence of these trees to survive.

The understory is a huge mix of patchy saw palmetto that is 5-6 foot tall, but presents a fairly low fire danger because in between these patches are mainly grasses and wildflowers. Additional native plants that are present include wax myrtle, myrsine, gallberry, saltbush *(Baccharis halimifolia*), saw grass (*Cladium jamaicense),* and red bay trees (*Persea borbonia*). Essentially, other than pockets of invasive exotic plants, the understory is in good health in this area, and after invasive control begins, the best thing for this area will be to burn it, while leaving pockets of unburned, less fire ready plants for wildlife cover and food.

This stand has the largest remaining invasive competition that could overwhelm the stand. Large pockets of melaleuca that are less than 6" dbh and Australian pine of varying diameters are located on the site. The melaleuca is as dense as 100 square feet of basal area for a couple of areas, but not the monster trees that were present on the south side prior to treatment. The Australian pine is concentrated on the north side of the big island, and just north of the big island. These trees should be dropped with a minimal stump, and cut up to provide firewood for the campers, with the stumps painted with an appropriate herbicide. Australian pine is interesting because it will actively suppress other plants from growing by using chemicals released in the soil to suppress other plant growth. This is why the areas within the Australian pine dominated areas are so open and have a carpet of these ancient tree's needles on the ground. Other invasive exotic plants that are present are java plum, guava, and Caesar weed. Treat these plants with an appropriate herbicide with a focus on Caesar weed because of it's love for fire.

Stand 3 - South

The southern portion of this stand includes the two islands and the area that is west of the Owl Creek buffer and includes all of the areas to the west with fallen melaleuca and melaleuca regrowth. South Florida slash pine is the dominant tree in the overstory with basal area in the range of 40-70 square feet per acre. Trees are very small on the island (4-6 inches dbh) with intense crown competition, whereas the southern area of the stand is fairly wide open, with trees that range from 5-12 inches dbh, and only a few pockets would need any attention from a thinning operation to provide regeneration conditions for more pine. The southeast corner of the stand burned in wildfire in 2006 that killed most of the pine, and new seedlings are not present. Once the Australian pines are dropped and remaining melaleuca is dropped, along with a couple of cycles of prescribed fire, replanting of pine or another useful native tree may be needed.

Understory native vegetation on this site is quite healthy for a hydric pine flatwoods and in light of the intense competition present from both Australian pine and melaleuca. Melaleuca is generally scattered but is still in the slightly scary height of 4-7 feet on average as more seed production is imminent. Biological controls of melaleuca were found on the site. Additional plants that are present include wax myrtle, grape vine, smilax vines, scattered live oak, myrsine,

rusty lionia, gallberry, and in the wetter areas red bay. Understory reduction strategies should leave as many of these plants as possible.

The southern edge of this stand has no vegetative buffer. As such, it is recommended that pine trees be planted in a double row in four foot between trees and 8 foot between row planting. Once the trees are 4-5 feet tall, other vegetation can be added. Saw palmetto in this area should only be controlled to allow for the pine planting. Additional view barriers should be identified in the interior and less management should occur in them so that the whole area is not visible from one single point on the ground. The South Florida Water Management District is being asked to look into the low berm that was installed on a landowner's property to the south that may be slightly impeding water flow off of stand three.

Invasive exotic competition in the stand reflects the control work that has started. Old world climbing fern can be found in several places, and should be removed prior to any equipment coming on site. The remaining large Australian pine and melaleuca need to be dropped and stumps treated with herbicide. If trees will be left on site and mulching is not possible, cut up chunks into smaller pieces and make sure the wood is on the ground to aid in decomposition. There is also low level competition from Brazilian pepper in this stand.

Prescribed fire will be relatively easy to introduce into this stand with a few passes of a positrac on the outside edges and through some of the heavier palmetto pockets. Introduction burns on the island will take place in the summer of 2008. In areas where melaleuca dropped, heavier fuel conditions will persist for a couple of burns and burns should be conducted when these logs are hydrated to avoid excessive residual smoke issues. On the other side, the more melaleuca that can be consumed in fire, the sooner there will be no more evidence it was ever on the site.

The downed melaueca can be pile burned. The Division of Forestry has come out and looked at the open areas suitable for pile burn sites to limit additional pine mortality. In burn areas, scrape bare dirt for at least a five foot buffer around the outside of pile. Use a portable pump with ¾ inch hose for water, and burn on days with a higher relative humidity (over 50% to avoid spotting). This material must be at least 100 feet from a highways or road, and at least 300 feet from a neighboring landowner's building. There should have loader/dozer, and portable pump on-scene while doing pile burning. No exact locations needed.

Recommendations:

1. Treat Invasive Exotics – see herbicide recommendations after stand descriptions. The successful treatment of this area will reduce the pressure on the rest of the property. Make sure melaleuca and Australian pine that is felled sits on the ground and is chunked up to aid in decomposition. Pile burning is possible in the stand.
2. Thinning – more need on island and in the north part of the stand. Bring basal area back down to 40-60 square feet per acre with an emphasis on trees that will produce good cone crops (well formed top that is not too branchy), and focus on bark beetle pockets. Equipment must be cleaned off prior to moving into other stands.
3. Introduce prescribed fire with care to avoid scorching pines. Use hand tools to exclude areas with lots of red bay and other bushes that provide lots of wildlife food. Fire return interval in this area is more in the 5-7 year variety, though should be kept at 3-5 years where palmetto is more dominant. Positrac or bush hog through areas of dense

melaleuca to lower flame height. The key is not to mow everything, but to reduce the overall fuel height. Future growth will be controlled by prescribed fire.

4. Consider planting cypress in designated areas to diversify forest stand.
5. Plant double row of 4' by 8' spaced south Florida slash pine on both north and south borders to act as a vegetative barrier. Once trees are around 4 feet, can plant other material around these trees. Oak trees could also be planted with a spacing of 15 feet in between trees and 15 feet in between rows.

Stand 4: Mesic Flatwoods (Owl Creek flow-way) 2.2. acres

Invasive exotic competition –moderate to high
Fire Maintenance level – N/A

Stand 4 is the most difficult to type. It is essentially a mesic flatwoods because of the presence of beautyberry and thicker saw palmetto, but then Owl creek runs right through it and with a foot or so of elevation drop, more wetland plants can be found. The creek is intermittent and has steep banks and is only three feet across in most places and varies from 1 foot deep to stagnant depending on area rainfall. The stand quickly transitions to surrounding mesic flatwoods with larger transition areas found on the north and south ends of the property.

The banks of this canal include large diameter south Florida slash pine that is generally over 10 inches in diameter with lots of room to grow. Other overstory trees include red maple, willow, and cabbage palm. Understory edge plants include wax myrtle, large red bay tees, myrsine, saw grass, salt bush, and pond apple (*Annona glabra*). One bald cypress (*Taxodium distichum* (L.) Rich. var. *distichum*) tree was found on the edge of the creek, and more of these trees could be planted on the edge provided a gap of at least 20 feet by 20 feet can be found to provide enough sunlight.

At one point, the creek enters a small pond that is within the Firewise area on the property. The banks of this canal are quite steep and will likely continue to erode unless planting and/or regarding is done. Furthermore, there is a severe lack of any littoral plantings (water's edge, both on land and in the water) and aquatic vegetation in this little pond. The camp will want to consider littoral plantings that will aid in improving the underwater life in the area and attract more wading birds to feed on fish and other creatures that live in the ponds. The Lee County Extension UF/IFAS Office has good guides available on how to properly do littoral plantings from their Agricultural and Natural Resource Extension Agent at (239) 461-7512. Also, any work that will involve changing the canal bank should be approved by the south Florida water management district at (239) 338-2929. Failure to get the proper permits and/or authorization could result in severe fines and long work stoppages.

Lee County has indicated that they will treat invasive exotics 25 feet from both sides of the stream bank and remove impediments to the flow of the creek. This treatment will be done by cutting invasive exotic plants near their base and treating with an appropriate herbicide. Old world climbing fern will be bagged and removed off property, with lower rooted portion sprayed with an appropriate herbicide. Chipping of cut material will be done if no mature berries are on Brazilian pepper plants (the mulched berries will produce seed) and mulch spread on paths on the property and used to mulch trees. One follow-up treatment will be provided by the county at which time the camp will be responsible for maintenance of the site. The recommended secondary zone in the Silvicultural BMP manual is 35 feet where no mechanical

site preparation or logging ramps should be located, which is consistent with the actions the county will conduct, provided stumps are not removed.

Prescribed fire is not really necessary in this stand nor will vegetation management proceed beyond the treatment of invasive exotic plants. This north-south corridor provides an essential visual barrier to create a sense of place in the camp and shields the western areas from viewing the eastern areas of the property.

Recommendations:

1. Work with Lee County to remove invasive exotics from the canal bank and to restore natural flow to the creek. Continue follow up treatments to keep area clean.
2. Plant cypress and additional wetland plants in wider transition areas on the north and south ends of the property. With the removal of the Brazilian pepper, there should be adequate room, but a few additional trees may need to be felled to provide open areas at least 20 feet by 20 feet for the sun loving cypress to grow in. Additional plants to consider include pond apple, pop ash, cypress, red maple, red bay, and willow.
3. Design littoral planting areas and increase the health of this zone through appropriate plantings.

Stand 5: Mesic flatwoods 16.1 acres

Invasive exotic competition - low
Fire Maintenance level - easy

This stand, with some removal of trees, represents the eventual goal of management on the rest of the property. A lightning strike in this stand will result in little more than one dead tree and a cool, beneficial fire that will likely not spread very far before it extinguishes itself. The outside of the property has been left with overgrown saw palmetto to provide visual screening. The dominant tree in this stand is south Florida slash pines that have different diameter classes: 3-6 inches further east and more westerly trees that are 7-14" dbh. The stand is very well stocked with basal areas in the stand ranges from an occasional 30 square feet per acre with normal ranges from 60-100 square feet per acre. Competition is greatest on the northwestern corner of the stand, but current shade conditions are unlikely to support recruitment of additional pine seedlings and the stand will require thinning in the near future. Several pockets of trees spaced 15-20 feet apart should be left to simulate denser forest conditions in the stand, while allowing for most of it to move towards the creation of the next stand. Some regeneration is in place in the north central part of the stand, though at only about half an acre, more is needed.

The understory is now consistent with a newly burned pine flatwoods stand. Plants coming back well after mitigation work include rusty lionia, gallberry, wildflowers, grape vine, wax myrtle, and salt bush. Saw palmetto coming back slowly, especially where fire was used quckly after positrac treatment, whereas where fire was not used, gallberry seems to be coming back stronger with less saw palmetto.

Prescribed burning will be the best management tool in this stand, and because of the work that has already been done, can be conducted very safely. Burn rotations should generally be every 3-4 years and should alternate halves of the stand burned to keep adequate food and cover on site for wildlife. The thinning operation will likely reduce the level of saw palmetto to the required height for burning in the few remaining overgrown areas, but some additional positrac

work may need to take place following the operation to get to the safe saw palmetto burn height of three feet or less.

Invasive exotic plant pressure is very low in this stand with one occurrence of old world climbing fern, and what appears to be a generally south progression of Ceasar's weed from the north in stand 6. However, with stand 5 butting up against stand 3, there is lots of seed source on the edge of these pine woods and bi-annual control using herbicide or hand pulling of new seedlings should take place. Remaining plants that can provide a seed source should be felled and the stump treated with an appropriate herbicide. Other plants that remain in the stand include Brazilian pepper, java plum, and guava.

Recommendations:

1. Bolster buffer by filling in tree gaps with a double row of pines spaced 4' between trees and 8' between rows. Leave saw palmetto less managed on the edge, except for occasional gaps to allow fence maintenance and stop the movement of a fire along the buffer with the right winds. Alternate plantings in areas with less saw palmetto can include oaks spaced 15 feet in between rows and 15 feet in between trees.
2. Continue initial burn introductions into the stand and try for natural regeneration by doing mid-summer burns prior to seed fall in a couple of years. Burns will take place every couple of years and then halt while seedlings are growing until the trees are 8-12 feet tall.
3. Thin down pines to 50-60 feet squared of basal area by leaving clumps of 2-5 trees at 66-80 feet. Leave several pockets of 10 trees to simulate more closed forest conditions.
4. Leave the eastern edge of the stand as buffer from the lake. This will involve removing invasive exotic plants and reducing the height of some of the tall saw palmetto, but a screen that is at least 10 feet thick should be left to provide a sense of place and space on the stand.

Stand 6: Mesic flatwoods (burned) 2.9 acres

Invasive exotic competition - moderate
Fire Maintenance level – moderate work

A beautiful area of pine flatwoods was destroyed when a lightning caused fire ripped through this area in early 2007. Prior to the fire, the trees needed to be thinned and the palmetto reduced in height from an average of 8-12 feet. Much of the saw palmetto is still over four feet tall and some effort to reduce this height should be done soon to reduce the fire risk down to natural levels, with the caveat that a line of palmetto should be left to provide a visual barrier from the properties to the north and west. In many areas now, palmetto is the tallest plant. Only a few isolated south Florida slash pines survived the fire, and these do not have very healthy crowns and will not provide adequate pine seed on this site for regeneration. On the plus side, there are plenty of dead snags of large diameter in this area, though these trees are starting to fall apart, but should remain upright for many more years.

The native understory is also only slowly coming back with rusty lionia leading the way along with wax myrtle. Given nearby seed sources, there should be no problem in recruiting additional plants in this stand.

The invasive plants that are a problem in other areas of the property are simply not an issue in this stand. The reason is that the understory was so closed prior to the fire, that there was little sunlight available for new plants to establish. Unfortunately, Ceasar's weed was able to gain a foothold in this stand, and as it normally does following a fire, it is now taking over the site. Control of this invasive is a priority. Also present on the north east side is a green groundcover called *Wedelia trilobota*. This yellow flowered groundcover is usually a pest near firelines and in yards. Control is done through repeated applications of glyphosate and waiting for resprouting to occur. Any fireline plowing or discing that occurs should include cleaning off of equipment prior to leaving the infested area as this plant will spread by tiny root particles if allowed. Some scattered melaleuca also exists.

Buffering will need to be done to screen the views from off the property and of surrounding homes. Firelines should be kept inside of the property line and a double row 4' by 8' of pines planted. It may also be possible to plant a buffer with oak trees with alternating 15 foot spacing between trees and 15 feet in between rows. Once trees are established, vegetation native to pine flatwoods previously mentioned in this plan can be installed.

Recommendations:

1. Gain control of Caesar's weed and wedelia to prevent the stand from getting over-run.
2. Select reduction in height of saw palmetto, keeping in mind the need to keep visual screening from neighbors.
3. Start burning the stand to prep for new pines.
4. Plant pines in several years time if burning fails to recruit adequate seedlings.

Lakes and Canoe Trail 5.1 acres

The lakes and canoe trail on the property are vital to the success of recreational activities at the camp. Water activities include fishing, paddling canoes and kayaks, and occasional swimming.

The eastern lake is surrounded by mowed grass, and if any fertilizer is applied, it should be done according to the new Fertilizer Best Management Practices that have been adopted by Lee County. Essentially, no fertilizer should be applied between June through August on turf grass, and throughout the rest of the year, fertilizer should be tailored to the nutrient needs to the site and if any nitrogen is added, it should be in a slow release formulation. Nutrient run-off is the number one cause of harmful aquatic vegetation growth in south Florida.

All of the lakes have banks that will continue to slowly erode if no work is done. While regrading may or may not be possible, plantings can be done to stabilize the bank. The banks of this canoe trail attached to the western lake are quite steep and will likely continue to erode unless planting and/or regarding is done. Some native vegetation already exists and can be supplemented with additional plantings of red maple (*Acer rubrum*), wax myrtle, myrsine, and marlberry. This vegetation could also then serve to provide a visual barrier for the island to create a smaller sense of space and wildness. The other benefit to these stream and lakeside plantings will be to provide shade over the water. This will help to moderate temperature fluctuations in the water.

In all of the lakes and on the canoe trail, there is a severe lack of any littoral plantings (water's edge, both on land and in the water) and aquatic vegetation in this little pond. The camp will want to consider littoral plantings that will aid in improving the underwater life in the area and

attract more wading birds to feed on fish and other creatures that live in the ponds. The Lee County Extension UF/IFAS Office has good guides available on how to properly do littoral plantings from their Agricultural and Natural Resource Extension Agent at (239) 461-7512. Also, any work that will involve changing the canal bank should be approved by the south Florida water management district at (239) 338-2929. Failure to get the proper permits and/or authorization could result in severe fines.

Recommendations

1. Increase littoral plantings and screening at the lake and canal edges.
2. Increase appropriate aquatic plant presence through planting or other appropriate practices.

Special Notes on Specific Practices

Firewise Areas 9.5 acres

Each property has a "wow" factor that sets it apart from every other forested property. At Camp Caloosa it is the cabin and meeting facilities that are on the property, all built in close proximity to the forest and lake areas, that give the camp a feel of back-woods so close to Fort Myers. The Florida Division of Forestry is tasked with managing all wildland-urban interface risks, where houses and other structures are built in close proximity to forest plants that burn. Camp maintenance should continue to observe and maintain Firewise principles including the establishment of at least 30 feet of defensible space, application of good forest management for a distance of 100-200 feet from houses to include pine tree thinning and prescribed burning, removal of pine needles from building roofs before and during the fire season, keeping branches trimmed at least 10 feet off the ground and 10 feet from buildings, and making sure all structures have intact roofs. For more information, go to www.firewise.org or contact the wildfire mitigation specialist for the Caloosahatchee Forestry Center at (239) 690-3500.

The Firewise areas also represent areas where more urban forestry can be practiced, and along this vein there are several practices that should be instituted.

1. Plant additional young trees to protect structures from hurricane winds. Trees that are planted in groups of at least five trees and with good rooting space not only help to support each other during tropical storm events, they also buffer man-made structures from dangerous winds. Only trees that are Florida grade #1 or better should be planted and used on-site because these trees come from the nursery with good structure already established and are easier to prune and healthier. Lower quality trees only save money up front, especially if they are anywhere near buildings or other structures that can be damaged by falling limbs or failing trees.

2. Diversify species. In urban forests, one tree species should not make up more than 25% of the forest canopy in case an insect or disease should come through. Overdependence on certain tree species is a major problem worldwide in urban forests. Other trees that can be planted include sycamore, red maple, south Florida slash pine, laurel oak, an occasional American elm, pop ash, and sugarberry.

3. Create a tree inventory. Attempts should be made to make an inventory of the trees over time on site that notes their condition, species, size (diameter and height), and any repair work or visual defects that are seen.

4. Prune all trees as budgets allow. Really, all trees with the exception of pines, need some pruning work every few years when they are older. However, a real key is that trees are pruned from when they are young to establish proper structure. Proper pruning is especially important with trees and limbs that are near buildings and power lines. If branches are within 10 feet of power lines, contact the utility to come out and prune the trees.

5. Mulch all trees as widely as possible. Camp Caloosa does not have an irrigation system nor is the sod especially thick. These are both great things for established trees, but the addition of a layer of mulch 2-3 inches thick at the most will help to conserve soil moisture and restart the decomposition process that is present in all forest soils across the world. Recommendations indicate for each inch of trunk diameter two feet diameter of mulch is needed. The decomposition of organic matter is how many trees gather most of their nutrients. An additional side benefit of mulch is that the exclusion of turf grass around tree roots often results in trees adding more fibrous roots making them more drought tolerant and healthier. Turf grass is a great competitor for water and nutrients.

6. Maintain view barriers. Heavy pockets of fuel need to be moved out from the structures to a distance of at least 30 feet. Walls of palmetto beyond this mark, however, can be managed in a more selective manner to provide visual buffering both inside the viewscape of the developed area and to provide screening against seeing the buildings from surrounding stands. The key is to create small strips of tall palmetto that will not produce large amounts of heat, and are preferably isolated from surrounding wildland areas by a disced fireline to prevent fires from easily moving into this taller vegetation. Occasional removal of dead saw palmetto fronds will provide some additional reduction in fire danger, but it should always be remembered that green saw palmetto lows to burn.

Prescribed Fire

Prescribed fire is necessary to maintain all of the pine forest and hammock areas on the property. If the property were not burned with purpose, then a wildfire will eventually burn the property without purpose and destroy many of the qualities that make it so valuable to the landowner. This is evident in stand 6 in the northwest corner of the property.

Pine flatwoods (pine forests) and hammocks (oak/cabbage palm) forest types are dependent on the continued use of prescribed fire to maintain nutrient cycling, keep fire risk low, allow for the highest quality wildlife habitat possible, and create conditions for pine regeneration. Pine forests do best with more frequent and middle intensity fires in a 3-5 year fire return interval. The cabbage palm/oak hammock forest types do best with infrequent, light intensity fires with a fire return interval of 10-20 years following some rain. Scattered melalueca should be felled prior to burning to limit spotting and to prevent spread of seed following burns. Dense areas of melaleuca should not be burned through, though these areas are now very few on Camp Caloosa. The goal of any burn, with the exception of a site preparation burn, is to burn across the landscape leaving areas of unburned ground to provide continued cover and food for wildlife.

Firelines should be established and maintained yearly around areas to be burned. Current interior lines have divided most of the stands into blocks less than 10 acres, and no more should be established. A width of greater than 12 feet is recommended to allow for the passage of brush trucks, and to slow down any future wildfires. Using the guidelines from the latest version of the Silvicultural Best Management Practices Guide, available from the Florida Division of Forestry for free, the following guidelines can be generalized: keep plow depth to a minimum; do not connect plow lines directly to water bodies/streams; do not allow firelines to act as conduits for water drainage from wetland areas. Once established, it may only be necessary to disc most fire lines once a year, although firelines established in areas dominated by saw palmetto may require multiple plow trips to completely establish the line. Fireline maintenance by discing promotes the growth of different plant species depending on the time of year of the soil disturbance. Winter discing is the most beneficial as it promotes the growth of native plant species such as partridge pea.

The time of year to burn depends on many factors, but the heaviest factor is always, "Has this area been burned before? Winter burns will be used to complete site preparation activities for tree planting as a follow-up to roller chopping or other forms of mechanical fuel reduction (use of a positrac, etc.) in stands that are going through their first burns. Winter burns tend to promote the growth of shrubs at the expense of grasses. Summer burns will be the eventual goal on the whole property are encouraged and will promote the growth of nutritious and diverse wildlife forage. Summer burns are best used to prep soil for the reception of pine seed. All burns should be patchy with a goal of at least 50 % ground coverage, and no more than 10% pine mortality. The goal should be to burn ¼ to 1/3 of the property each year that it is feasible given restraints such as seedling regrowth, improper weather, unavailability of burn teams, etc.

As with any forested property in Florida, smoke management is important to think about before conducting a prescribed burn. State Road 31 looms to the east, and eventually the Town of Babcock may also pop up in this direction. Winds for burns will need to have an easterly component, or if this is not possible, be limited to only a few acres on the western portion of the property. Smoke signs will need to be placed along State Road 31, and residents around the property should be notified prior to the burn taking place to seek safety if they have smoke issues. Fortunately, besides State Road 31, smoke sensitive features in the area are limited to a school that is several miles to the south. To reduce the chances of wildfires and potential litigation, consider burning using a Certified Prescribed Burn Manager to conduct any prescribed burns on the property. The Florida Division of Forestry can provide complete burn work cheaper than any form of vegetation management.

Mechanical Wildland Fuel Reduction

If a timber harvest is not possible, roller chopping or the use of a machine similar to a positrac has much more pronounced effects than the singular use of fire on plant density and canopy cover of saw palmetto, especially if applied at the right time of year. During the dry season it is recommended that a double pass of the roller chopper pulled by a bulldozer should be done to reduce saw palmetto density in especially dense areas (heights over 4-5 feet), with the second pass at a right angle to the first, if no fire can be used. Roller chopping during the wet season may not require a double pass, but may present difficulties with using heavy equipment in wet areas because of loss of traction and rutting, and severe damage to remaining pine trees. The

roller chopper itself should be kept at least 20 feet from trees that the landowner wishes to keep on the property to avoid massive root damage. A positrac or gyrotrac, because they have low ground pressure treads, can really be used anytime of the year, but when sites are severely flooded, this equipment should not allowed to work in the stands because sharp turns can result in a lot of surface ground disturbance.

The use of a tractor pulled bush-hog should be done only when severe rutting is not an issue. Care should also be taken to avoid indiscriminately mowing down every native shrub in sight with concentration placed on palmetto that is higher than 3-4 feet in areas larger than 10 feet by 10 feet.

With few exceptions, small pockets of undergrowth and hardwood trees should be left to provide for wildlife cover and food in areas that are mechanically reduced. Visual barriers should also be maintained throughout the property. The goal should be to see a landscape where playing hide and seek would not be too hard, but where large groups of people could still walk together easily.

Herbicide Application

Herbicides are a necessary tool to use to win control over many of the plants that we find in our woods that aren't native, and will eventually take over an area making the site less useful to wildlife and less appropriate as a native habitat. To control these plants, a combination of prescribed fire, mechanical control, and herbicide application will be used. Herbicide application is done best in the mid-spring to mid-summer months as plants are most active during these times and most likely to fully absorb the chemical. As with any southwest Florida forest property, herbicide application needs to be done safely. Herbicide applicators need to follow all safety requirements and mixing rates as labeled on the pesticide bottle. Always dispose of pesticide trash responsibly. Areas in which pesticide application is done should be clearly marked to limit visitor's ability to wander into these areas. A marker dye can be used with the applications to delineate where applications have taken place, but this is not necessary. Treatment methods will include hand-pulling, foliage spraying, cut stump, frill and girdle, and basal bark painting, depending on the size and type of plant.

Camp Caloosa has a myriad of plants that will require herbicide application for eradication. Suggested application methodology is as follows:

1. Brazilian pepper – fell tree and treat stump with Garlon 3A (mix in water) at 50%; fell tree and treat stump or apply to stem of tree/bush Garlon 4 at 10 % rate (mix in carrier oil, eg "JLB oil" http://www.brewerint.com/psl-improved_jlb_oil_plus.htm , Diluent Blue http://www.prosourceone.com/img/public/pdf/other/Diluent%20Blue%20Label.pdf , or others).

2. Melaleuca – use same treatment as Brazilian pepper, except to treat the tree without cutting it down, the fluffy bark must be removed to expose a section at least 4 inches wide of inner bark for herbicide to reach the cambial tissue of the plant.

3. Old World Climbing Fern – watch out for frilly looking plants as these are the spore producing parts of this plant. Contact with the frilly leaves should be avoided, or after contact, do not enter other areas of forest that are not infested. On dense

infestations, cut our bottom 3 feet leaving about 1 foot worth of foliage to spray, and bag cut material for garbage collection. Foliar application - Glyphosate 2% *OR* Escort 2 oz of product per 100 gal (0.6 g/gal).

4. Ceasar's weed – apply herbicide to leaves prior to seed set and avoid prescribed fire in stands with infestation as this plant grows back aggressively following fire. Herbicide recommendations are as follows: Foliar application – 2-5% Roundup in water or Foliar applications – 2,4-D, sprayed on young plants.

5. Australian pine - Basal bark application – 10% Garlon 4 – *on large/older trees, it maybe necessary to slough off old loose bark to increase penetration.* For trees that are cut down apply to the stump – 50% Garlon 3A, *OR* 10% Garlon 4.

Other invasive plants such as guava and earleaf acacia can be found on the property, and should be treated as Brazilian pepper and melaleuca are labeled above. It is very important to watch out for old world climbing fern and stop it's spread once spotted in new areas on the property and prior to new work occurring that could spread the plant. Annual monitoring should take place with appropriate treatment for new invasive plant areas.

In the early stages of invasive exotic removal, it may be necessary to pile and burn the vegetation that builds up, primarily to reduce residual smoke concerns after prescribed fires. There are no plans at this time to mulch material on site, but if this does occur, no lygodium or Brazilian pepper with berries will be mulched. Mulched may either be left in place or installed along walking trails. There is not really a fine line for the amount of material that is needed to make a pile, but there are specific criteria that must be met to pile burn safely.

1. Pile must be located at least 300 feet from non-owner owned structures and 100 feet from a highway or road.
2. A five foot bare dirt area can be created around the edge of the pile using hand tools or a surface scrape from a loader or bulldozer.
3. Water must be on the site to be able to extinguish the pile once it is lit. This can be done through the use of a portable pump with at least a ¾ inch hose.
4. Piles should be located in open areas at least 50 feet across to limit pine mortality, or if no such space exists, choose pines that have damage to their stems or have poor structure (very small crown, forked tops, broken tops, etc.)
5. On-site inspections should be coordinated through the Bayshore Fire Department prior to burning, and on the day of the burn, call the Division of Forestrty-Caloosahatchee Forestry Center for an authorization. Fires can be started no earlier than 9 am and must be dead out prior to 1 hour before sunset. Other limitations will be communicated when calling in for the authorization.

Appendix 1 – see map file sent in other email

Appendix 2

South Florida Timber Buying Companies

South Florida Timber	863-990-1039	jbyrd@desoto.net
Bodaca Timber Inc.	863-559-0078	Bodaca494@aol.com
Buckhead Timber Services	863-698-1660	pinelogger@earthlink.net
Lee Timber Company	239-707-8934	leewood98@aol.com
Atlantic Land & Timber	772-571-9140	AtlanticTimber1@bellsouth.net
Cooper Timber Harvesting, Inc.	863-494-0240	CooperTimberHar@yahoo.com
Great South Timber and Lumber, Inc.	386-755-3046	russhannon@bellsouth.net
	386-303-2135	
Flatwoods Forest Products	352-267-9058	flatwoodsforest@aol.com
	352-787-2410 (fax)	
Georgia Pacific	863-528-0035	rodluthe@gapac.com
Alva Kiln Dried Hardwoods (small mill)	239-728-2484	
Keri Logging, Inc.	863-284-3721	
Golden Gate Timber (small mill)	239-455-1968	
Forestry Resources (small mill)	239-332-3966	

Always contact multiple companies to bid on any sales of timber. The Florida Division of Forestry provides the above list as a service only and listing does not endorse any of the above companies above any others. The listed companies have provided their information for inclusion on the list or were added through other searches.

Appendix 3:

5 Year Table of Recommended Actions

Year	Practice	Stand	Description
Summer 2008	Burn on fuel reduced areas	3 and 5	Burn off remainder not burned in 2007.
Winter 2008	Maintain Firelines	All	Disc firelines to protect property
Winter/Spring 2009	Timber Harvest	All	Selective Harvests
Spring/Summer 2009	Invasive control	Focus 3	Move to monitoring level
Winter 2009	Disc firelines	All	Yearly maintenance of firelines
Summer 2010	Prescribed Burn	All	Prep for seed fall
Summer 2010	Invasive control	All	Spray invasive plants
Winter 2010	Disc firelines	All	Yearly maintenance of firelines
Winter 2010	Plant	All	Plant pine where natural regeneration has failed.
Summer 2011	Invasive Control	All	Spray Invasive Plants
Winter 2011	Disc firelines	All	Yearly maintenance of firelines
Summer 2012	Scout invasive plants	All	Scout for and spray invasive plants
Summer 2012	Prescribed Burn	Non-planted	Burn non-planted stands/mature areas
Winter 2012	Disc firelines	All	Yearly maintenance of firelines
Summer 2013	Scout Invasive plants	All	Scout and spray invasive plants – move to biannual monitoring.
Winter 2013	Disc firelines	All	Yearly maintenance of firelines
Summer 2013	Rewrite plan	All	Contact DOF for re-write

Appendix 4:

Table of Rates for Florida*

Machine planting only, conventional farm tractor	$36 per acre
Hand planting or machine planting with a V-blade only.	$76 per acre
Loblolly, Slash, and South Florida Slash pine	$70 per 1,000 seedlings
Longleaf pine (containerized), or hardwoods.	$160 per 1,000 seedlings
Longleaf pine (bareroot),	$76 per 1,000 seedlings
Prescribed burning	$12.00 per acre
Mowing, scalping, light-duty harrowing subsoiling, or whole tree chipping	$15 per acre
Rome-type harrow, single-drum chopping or bedding	$66 per acre
Tandem-drum chopping	$83.00 per acre
Shear and Rake	$234 per acre
Rake	$70 per acre
Herbicidal control of woody vegetation	$120 per acre
Herbicidal control of herbaceous vegetation	$50 per acre
Mechanical Mowing with Gyrotrac, Positrac, or equivalent	$200.00 per acre
Pre-commercial thinning	$48.00 per acre
Prescribed burning	$12.00 per acre

*rates represent an average across Florida and may be higher for certain localities. Multiple quotes will help best to determine the best price possible for a particular practice.

Appendix 5:

Soils Type	Community	Slope	Drainage	Site Index *
34- Malabar	Flatwoods and sloughs	< 0-1 %	Poor – shallow water often covers for 7-30 days.	South Florida slash pine – 45; longleaf pine – 70
33-Oldsmar Sand	Flatwoods	< 0-2 %	Poor – bedding recommended	South Florida slash pine – 40; longleaf pine - 65

Soil types and associated plant communities and soil characteristics.

* Site index is the average height of the dominant and co-dominant trees within an even-aged planted stand of the selected species at age 50 years (25 years for south Florida slash pine). All information taken from the Soil Survey of Lee County reference guide. Site index numbers may be inaccurate due to the age of the source; actual productivity may be higher than stated here. Site index is a good "tool" to use when considering what species of pine to plant. Not applicable indicates that information was not available at the time of the Soil Survey of Lee County. However, the final decision should take into consideration all of the landowner's objectives for the stand along with on-site variables that will move a soil more in line with other nearby soils that are producing more identical results.

Appendix 6:
Lee County Threatened and Endangered Plants and Animals
(copied from Lee County Website)

FLUCCS	COMMON NAME	*SCIENTIFIC NAME*
191	Burrowing owl Least tern	*Athene cunicularia floridana* *Sterna antillarum*
192	Burrowing owl	*Athene cunicularia floridana*
211	Florida sandhill crane** Florida panther***	*Grus canadensis pratensis* *Felis concolor coryi*
212	Florida sandhill crane** Florida panther	*Grus canadensis pratensis* *Felis concolor coryi*
261	Least tern	*Sterna antillarum*
310	Burrowing owl Florida sandhill crane	*Athene cunicularia floridana* *Grus canadensis pratensis*
320 Series	Eastern indigo snake Gopher tortoise Gopher frog Curtis milkweed Fakahatchee burmannia Florida coontie	*Drymarchon corais couperi* *Gopherus polyphemus* *Rana areolata* *Asclepias curtissii* *Burmannia flava* *Zamia floridana*

FLUCCS	COMMON NAME	*SCIENTIFIC NAME*
321	Southeastern American kestrel Florida sandhill crane Audobon's crested caracara Florida black bear Beautiful paw-paw	*Falco sparverius paulus* *Grus canadensis pratensis* *Polyborus plancus audubonii* *Ursus americanus floridanus* *Deeringothamnus pulchellus*
322	Iguana hackberry Spiny hackberry Prickly-apple Golden creeper Joewood	*Celtis iguanaea* *Celtis pallida* *Cereus gracillis* *Erondia littoralis* *Jacquina keyensis*
411	Eastern indigo snake Gopher tortoise Gopher frog Southestern American kestrel Red-cockaded woodpecker Florida panther Big Cypress fox squirrel Florida black bear Fakahatchee burmannia Satinleaf Beautiful paw-paw Florida coontie	*Drymarchon corais couperi* *Gopherus polyphemus* *Rana areolata* *Falco sparverius paulus* *Picoides borealis* *Felis concolor coryi* *Sciurus niger avicennia* *Ursus americanus floridanus* *Burmannia flava* *Chrysophyllum olivaeforme* *Deeringothamnus pulchellus* *Zamia floridana*

FLUCCS	COMMON NAME	*SCIENTIFIC NAME*
412	Eastern indigo snake Gopher tortoise* Gopher frog Florida scrub jay Fakahatchee burmannia Florida coontie	*Drymarchon corais couperi* *Gopherus polyphemus* *Rana areolata* *Aphelocoma coerulescens coerulescens* *Burmannia flava* *Zamia floridana*
414	Eastern indigo snake Florida panther Florida black bear	*Drymarchon corais couperi* *Felis concolor coryi* *Ursus americanus floridanus*
421	Eastern indigo snake Gopher tortoise Gopher frog Florida scrub jay Florida coontie	*Drymarchon corais couperi* *Gopherus polyphemus* *Rana areolata* *Aphelocoma coerulescens coerulescens* *Zamia floridana*
425	Eastern indigo snake Florida panther Florida black bear	*Drymarchon corais couperi* *Felis concolor coryi* *Ursus americanus floridanus*

FLUCCS	COMMON NAME	*SCIENTIFIC NAME*
426	Eastern indigo snake Gopher tortoise Gopher frog Iguana hackberry Spiny hackberry Prickly-apple Satinleaf Joewood Twisted air plant Florida coontie	*Drymarchon corais couperi* *Gopherus polyphemus* *Rana areolata* *Celtis iguanaea* *Celtis pallida* *Cereus gracillis* *Chrysophyllum olivaeforme* *Jacquina keyensis* *Tillandsia flexuosa* *Zamia floridana*
427	Eastern indigo snake Gopher tortoise Florida panther Florida black bear Simpon's stopper Hand adder's tongue fern Twisted air plant	*Drymarchon corais couperi* *Gopherus polyphemus* *Felis concolor coryi* *Ursus americanus floridanus* *Myrcianthes fragrans var. simpsonii* *Ophioglossum palmatum* *Tillandsia flexuosa*
428	Eastern indigo snake Audobon's crested caracara Florida panther Florida black bear Simpon's stopper	*Drymarchon corais couperi* *Polyborus plancus audubonii* *Felis concolor coryi* *Ursus americanus floridanus* *Myrcianthes fragrans var. simpsonii*

FLUCCS	COMMON NAME	*SCIENTIFIC NAME*
432	Gopher tortoise Florida scrub jay	*Gopherus polyphemus* *Aphelocoma coerulescens coerulescens*
434	Florida panther	*Felis concolor coryi*
435	Southeastern American kestrel	*Falco sparverius paulus*
438	Florida black bear	*Ursus americanus floridanus*
500 Series	American alligator Roseate spoonbill Limpkin Little blue heron Reddish egret Snowy egret Tricolored heron Everglades mink	*Alligator mississipiensis* *Ajaia ajaja* *Aramus guarauna* *Egretta caerulea* *Egretta rufescens* *Egretta thula* *Egretta tricolor* *Mustela vison evergladensis*
520	Snail kite	*Rostrhamus sociabilis*
560	Gopher frog Wood stork	*Rana areolata* *Mycteria americana*
600 Series	Little blue heron Snowy egret Tricolored heron	*Egretta caerulea* *Egretta thula* *Egretta tricolor*

FLUCCS	COMMON NAME	*SCIENTIFIC NAME*
610	American alligator Reddish egret Wood stork Big Cypress fox squirrel Twisted air plant	*Alligator mississipiensis* *Egretta rufescens* *Mycteria americana* *Sciurus niger avicennia* *Tillandsia flexuosa*
611	Wild cotton	*Gossypium hirsutum*
612	Roseate spoonbill Brown pelican Florida black bear Prickly-apple	*Ajaia ajaja* *Pelecanus occidentalis* *Ursus americanus floridanus* *Cereus gracillis*
617	Limpkin Florida panther Florida black bear	*Aramus guarauna* *Felis concolor coryi* *Ursus americanus floridanus*
620	Gopher frog Arctic peregrine falcon Everglades mink Big Cypress fox squirrel	*Rana areolata* *Falco peregrinus tundrius* *Mustela vison evergladensis* *Sciurus niger avicennia*