

Sand Hill Lakes Mitigation Bank
Second Annual Report
December 2007



Executive Summary

The Sand Hill Lakes Mitigation Bank (SLMB) consists of approximately 2,155 acres in southern Washington Co. in the Sand Hill Lakes region of the Florida Panhandle (Figure 1). It is located just west of the intersection of SR77 and SR 279 within Township 1 North, Range 14 & 15 West. It contains approximately 850 acres of wetlands, 155 acres of natural lakes and ponds, and 1,150 acres of upland buffer communities. The FDEP permit for the SHLMB was issued September 5, 2005. This is the second annual report for the SHLMB. A synoptic listing of notable activities conducted prior to this report and those anticipated in the coming year are presented below.

Perimeter fencing with gates and signs was installed prior to March of 2005. Ongoing law enforcement has been conducted at the site since purchase of the bank property. A conservation easement was recorded for the SHLMB in February of 2006, preserving the wetland, aquatic and upland communities in perpetuity. Duncan Cairns, Tyler Macmillan and David Clayton were proposed by the NFWFMD as QMS officers for the SHLMB and approved by FDEP upon submittal. In accordance with permit requirements a mitigation fund was established for the bank. An archeological/historic survey was conducted at the SHLMB and approved by the Florida Division of Historical Resources (DHR). Construction activities were initiated in July of 2006 in accordance with all permit requirements. The majority of the restoration activities were to be initiated during 2005/2006. However, due in part to the delayed permit approvals and a lengthy archeological review and approval process by DHR, the initiation of many mitigation activities were initiated approximately a year from the proposed timeline.

All stabilization of erosion areas and re-vegetation, road fill removal, bridge and culvert replacement, dam removal, removal of pine plantation or thinning of slash pine areas, shrub reduction, fuel reduction and warm season fires have been completed. The replacement of the dam at Black pond and planting of cypress at Dykes Mill Pond, and planting of wire grass, and remaining long leaf pine will occur in January 2008.

Nearly all interim mitigation activities have been met in 2007 and remaining activities will be completed by January of 2008. The interim success criteria that have been met include: less than 2% exotic vegetation; preservation areas are maintaining or improving function; upland and wet pine flatwoods have measurably increased in herbaceous ground cover and decreasing in woody vegetative cover; targeted oaks have been reduced in number with limited re-growth; adequate numbers of pine exist within the polygons to meet permit requirements; dam has been removed in slough area, slough has drained and will be replanted with cypress in January 2008; prescribed burns have occurred in accordance with the burn plans; and all erosion areas, road removal, dam, bridge and culvert replacement has been completed.

Surveys of nuisance species (flora and fauna) have been conducted throughout the past 2 years in conjunction with the monthly site inspections. In addition a yearly fall site inspection for nuisance species occurs in conjunction with the annual monitoring as well as day to day monitoring by District and FWC staff. Several small patches of torpedo

grass (*Panicum repens*) were treated with Habitat at historic boat launch areas during August and September. No live plants were observed during the fall monitoring. Minor feral hog damage was observed at Dry and Dykes Mill Pond. Traps have been set for the hogs. Water level gages were installed and surveyed in on December of 2005 for 10 locations throughout the bank, and have been read by the FWC for the last two years and data supplied to the District.

The annual sampling for this report was conducted in November 2007. Most of the management activities that will be used to restore the wetlands and uplands were implemented or completed in 2007. It is expected that in future these polygons will achieve additional success criteria as management activities continue in 2008.

Pedestrian surveys were conducted for both wetland and uplands. The pedestrian surveys were very useful in providing detailed species lists and a greater understanding of species diversity for each community. In addition the pedestrian surveys cover far more area of the polygon that may reveal late successional and threatened or endangered species. The pedestrian surveys were also useful in identifying pockets of nuisance species and determine fuel loads. Overall, species diversity was excellent throughout the SHLMB and plants were healthy.

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Introduction

The Sand Hill Lakes Mitigation Bank (SLMB) consists of 2,155 acres in the southern portion of Washington Co. in the Sand Hill Lakes region of the Florida Panhandle (Figure 1). It is located just west of the intersection of SR77 and SR 279, and is within Township 1 North, Range 14 & 15 West. It contains approximately 850 acres of wetlands including high quality cypress sloughs and strands, degraded hydric pine flatwoods, bayheads, seepage slopes, and approximately 155 acres of natural solution ponds and shallow, gently-sloped lakes connected by streams and ditches. The remaining 1,150 acres consist of secondary growth upland buffer communities (including high quality and degraded sand hill communities as well as sand pine plantation, slash pine plantation, and mixed hardwoods) (Figure 1a).

The SHLMB occurs on the divide between the Choctawhatchee and St. Andrew Bay watersheds. The majority of the proposed Bank is in the surface headwaters of Pine Log Creek, which flows westerly and southwesterly to Pine Log State Forest and ultimately to the Choctawhatchee River and Bay. However, because of the karst nature of the Sand Hill Lakes the SHLMB is also a recharge area for Econfina Creek, which, via Deer Point Lake, is the water supply for Panama City.

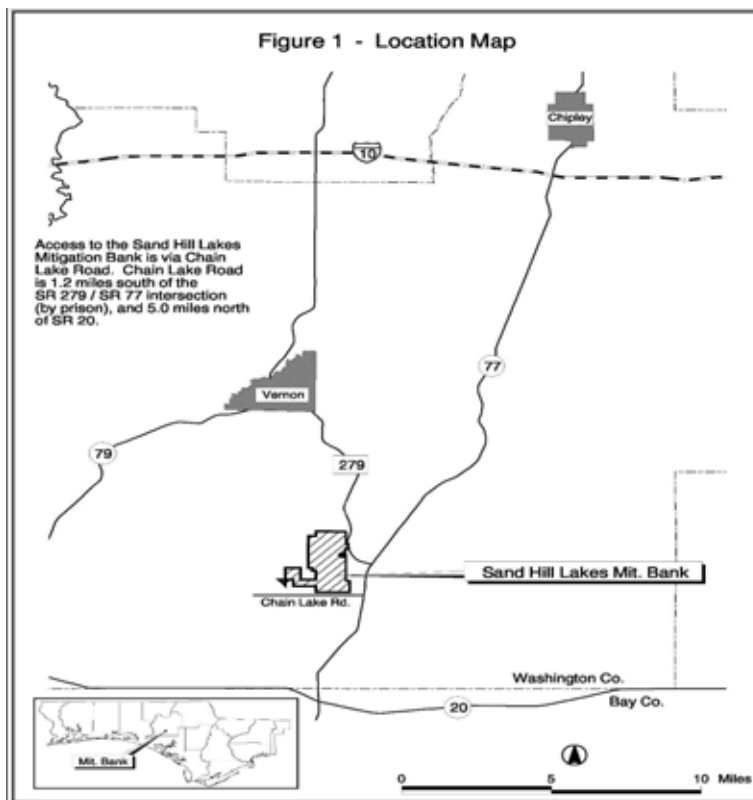
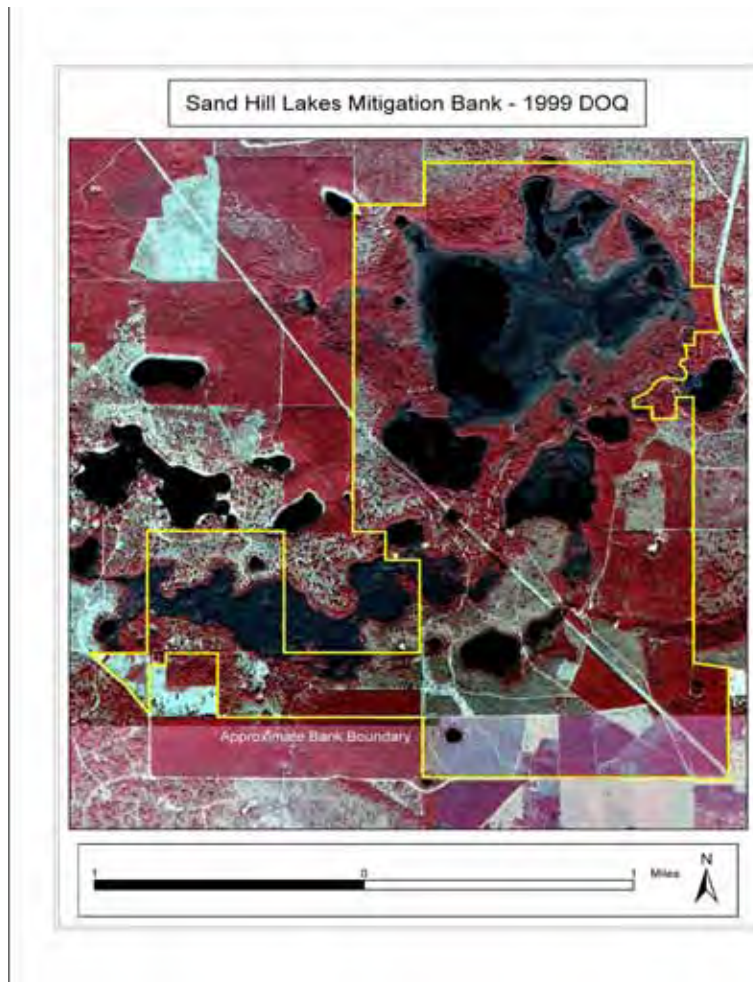


Figure 1a. SHLMB boundary map and habitats



Bank Establishment and Implementation of Permit Requirements

The permit for the Sand Hill Lakes Mitigation Bank (SHLMB) was issued by the DEP on September 5, 2005. This document represents the second annual report for the SHLMB. Perimeter fencing with gates and signs were installed prior to March of 2005. Law enforcement has been conducted at the site since the property was purchased and is ongoing at the SHLMB. A conservation easement was recorded for the SHLMB on 2/28/06, preserving the wetland, aquatic and upland communities in perpetuity. QMS officers Duncan Cairns, Tyler Macmillan and David Clayton were selected by the NFWMD and approved by the DEP. In accordance with permit requirements a mitigation fund was established for the bank. An archeological and historic survey was conducted for the SHLMB and approved by the Division of Historical Resources. Construction activities were initiated in July of 2006, in accordance with permit requirements.

Mitigation Activities

Work Schedule

According to the proposed work schedule for the SHLMB found on page 12 of the SHLMB permit, the majority of the restoration activities were to be initiated during 2005-2006. However, the restoration activities were postponed due to delays in permit issuance, recording of conservation, and additional time needed to complete and approve the archeological study. Consequently, many of the restoration activities were delayed by approximately 1 year. A revised schedule was included in the first monitoring report. In 2007, the majority of the construction and restoration activities were completed and an updated work schedule has been provided (Table 1).

Table 1. Restoration work schedule

Activity	Estimated Completion Date
Conservation easement, QMS	Completed 3/06
Fencing and signage	Completed 3/05
Site security / law enforcement / internal gating / road closures	Ongoing
Stabilization of 10 erosion sites	Completed 3/2007
Hydrologic enhancements - Replacement of Black Pond dam - Removal of Dykes Mill Pond dam - Removal of road fill at (3) sites - Construction of 2 bridges and replacement of 3 culverts	Initiated 10/07 Completed 8/06 Completed 3/07 Completed 3/07
Removal of pine plantation and thinning of slash pine	Completed 10/2007
Removal of oak overgrowth and replanting with longleaf pine	Completed: Oak removed 2005/2006 Pine planted 2005 and 12/2007
80% completion of initial growing season and fuel reduction fires in areas to be maintained as oak / pine community	Completed 12/2005
Initial thinning, roller chopping, and fuel reduction fires in hydric pine	Completed Initial burns 8/05 Completed shrub reduction 6/07 (Gyrotrack) Completed Pine thinning 10/07 Completed site prep burns 12/2007
Supplemental wiregrass seeding if necessitated by onsite conditions	2008/2009
Installation of water level gages	Completed 12/05
Baseline assessments of vegetation	Completed 2004/2005
Fire Management / Monitoring Year 1 / Annual Report	Completed 2005/2006 report
Fire Management / Monitoring Year 2/ Annual Report	Completed 2007/2008 report, Completed winter burns 12/07
Fire Management / Monitoring Year 3 / Annual Report	2009/2010 report
Fire Management / Monitoring Year 4 / Annual Report	2010/2011 report
Fire Management / Monitoring Year 5 / Annual Report	2012/2013 report
Perpetual Ecological Management	2013 +

Hydrologic Enhancements

Hydrologic enhancements include the complete removal of 3 fill-road crossings, installation of bridges at 2 crossings and 3 culverts and the removal or replacement of 2 failing water control structures, the remediation of 10 erosion areas, the stabilization of 1 boat launching site, and construction of one rain shelter (Figures 3 and 4).

The removal of the failing water control structure at Dykes Mill Pond and construction of three bridges (#1, #3, #7), and two culverts (#9, #10-A-B) was initiated in July 2006 and completed in April of 2007 in accordance with permit conditions (Figure 3). The graded areas were stabilized and seeded in early 2007 with season-appropriate, non-invasive annual grass to reduce potentially turbid runoff. Hay bales and silt fences have been left due to drought. On June 30th, the graded areas were seeded with brown-top millet. Current water levels at the bridge and culvert sites for all but Greenhead Branch are well below the replaced structures.

The removal and re-vegetation of three fill-road crossing was initiated in January of 2007 and completed in March of 2007 (Figure 3). Erosion area #6 was restored in July of 2006 as part of road enhancement project while remediation of the remaining 9 erosion sites was initiated in January and completed in April 2007. Hay bales and silt fences were installed in accordance with the permit requirements (Figure 3 and 4). The areas were planted as each site was completed. Sites were planted in accordance with the approved planting plan. Graded areas were stabilized with annual rye grass and seeded with brown-top millet on June 30, 2007. Sites were monitored during the summer and fall monitoring. Inadvertently, the contractor used Bahia grass hay to stabilize soils at the two erosion areas 1-3 (Cat Pond and the road removal at Deep Edge). The contractor was required to treat each area with herbicide until the Bahia grass was eliminated. Initial treatments occurred in May with subsequent treatments in September. No living material was observed during the fall monitoring. Supplemental wire grass and long leaf pine seedlings will be planted at these sites in 2008. In addition, poor survival was observed at the erosion sites 1, 2, 4, 5, and 10. Supplemental planting will occur in 2008 in accordance with the permit requirements.

The replacement of the water control structure at Black Pond (#2) was initiated in October 31, 2007 and is expected to be completed by the end of January 2008.

Finally, the stabilization of one boat launch area on Dry Pond was completed in September 2007. Photographic documentation for all these activities has been included in the semi-annual report.

Figure 3 - Structures

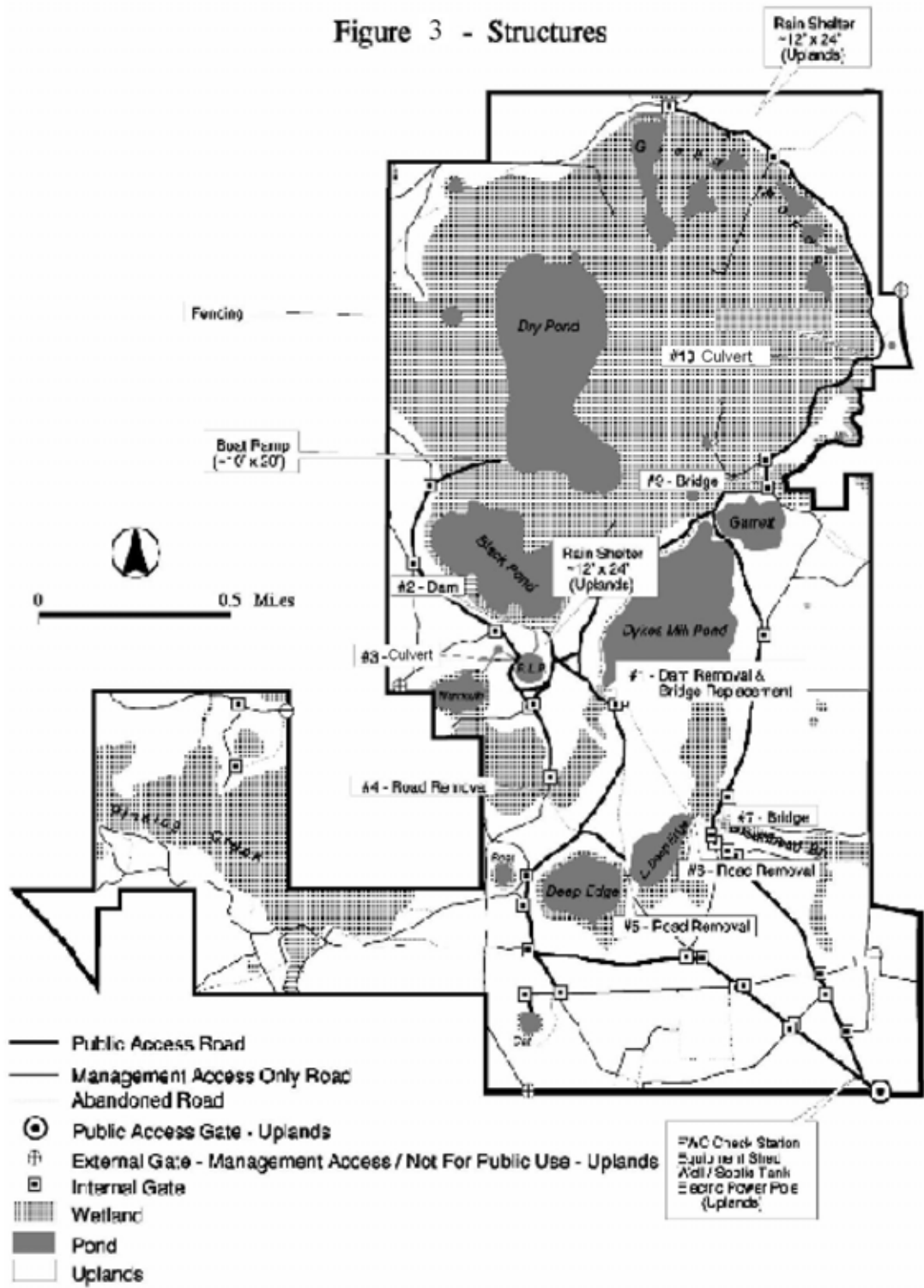
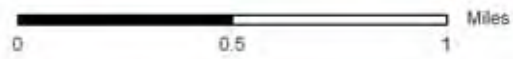
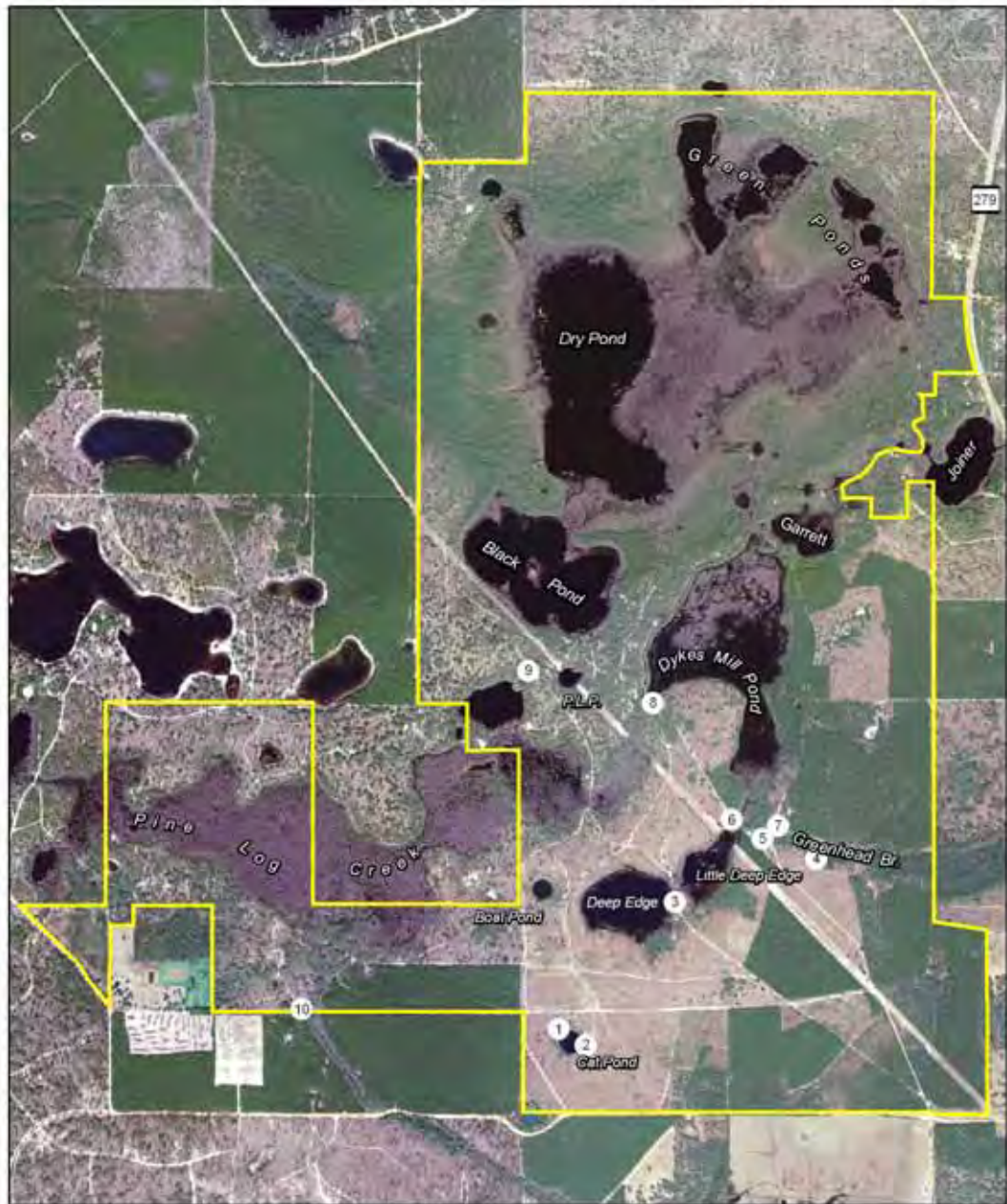


Figure 4 - Erosion Stabilization Sites



Fire Management

The bank is divided into 14 Management Units that range from 0.25 to ~580 acres. Prescribed fire is an integral component of the management, enhancement and restoration for six of the management units (Management Units 2, 3, 8, 10, 11, and 12), and will also be used to manage portions of the power line ROW (Figure 5). The remaining Management Units are wetlands or aquatic systems not typically managed with fire, although fire from adjacent Units may be allowed to burn into them when conditions allow. Prescribed burns have generally been conducted during the growing season (March through August), although initial dormant-season fuel-reduction fires have been required in some areas. Burns are planned for 1-3, 3-5 and 5-7 year cycles, although fuel levels, prevailing weather patterns and other on-site conditions may necessitate modification of burn cycles. Burn coverage of 80% or more within a polygon has been considered a successful burn. Prescribed fire is intended to inhibit establishment of woody species, promote fire-adapted species, and stimulate seed production of desirable herbs. Fire prescriptions have been written to comply with open burning laws (Florida Statutes 590) and liability considerations. Safety and protection of property will be the priority concern of the Florida Certified Prescribed Burn Manager (FCMB).

Fire was re-introduced to the SHLMB during the winter of 2004 to portions of Management Unit 11 and 12. Subsequently portions of the sand hills and hydric pine flatwoods were burned during the summer of 2005 with the remaining initial burns completed by December of 2005 in accordance with the Fire Management Plan (Figure 6). In areas with a high fuel loads such as Management Unit 2, 3, 8 and some portions of Management Unit 10 adjacent to Black pond dormant season fuel reduction fires were utilized. However in Management Unit 11 and 12 initial burns reduced fuel loads to the extent that warm season burns were conducted. Wire grass flowered in these areas following the fire and plants appeared healthy. The burns at the SHLMB have also been successful in reducing woody vegetation coverage as well as stimulating a seed bank of fire adapted species. Prior to the initiation of fire, woody goldenrod was the dominant species, but the initial fires greatly reduced the woody goldenrod cover and stimulated the wire grass.

In the 2007 monitoring, Centipede grass was not observed in areas that had hot fires. While never a large component of the vegetation, it appears that centipede grass may be removed through successive fires.

In 2007, it was anticipated that 287 acres would be burned during winter 2006/2007. However, due to the extended drought and unsafe fire conditions 69 acres were burned with 66 acres meeting the 80% requirement (Figure 7). No warm season burns were attempted due to the extended drought. During the winter 2007/2008, oak reduction, and site preparation burns are scheduled for 599 acres. The first burns were conducted on November 16, 2007. To date 314 acres have been burned in burn units 5-19 (152 acres), 5-18 (26 acres), 5-17 (6 acres), 5-16 (21 acres), 5-12 (33 acres), 5-11 (60 acres), and 5-10 (16 acres) (Figure 7a).

In addition to the prescribed burns at the SHLMB a wildfire occurred in the dry lake bottom of Dry Pond. The fire was thought to have started as the result of a lightning strike. The fire was first observed Friday (10/12/07) at about noon near the southeast corner of Dry Pond and moved north and east. DOF was contacted and arrived on site with a dozer/plow and gyrotrack. Efforts were made to extinguish the fire, but the fire continued to spot up so a containment line was established. The fire was contained to 12 acres of the lakebed and the majority of the cypress trees were saved.

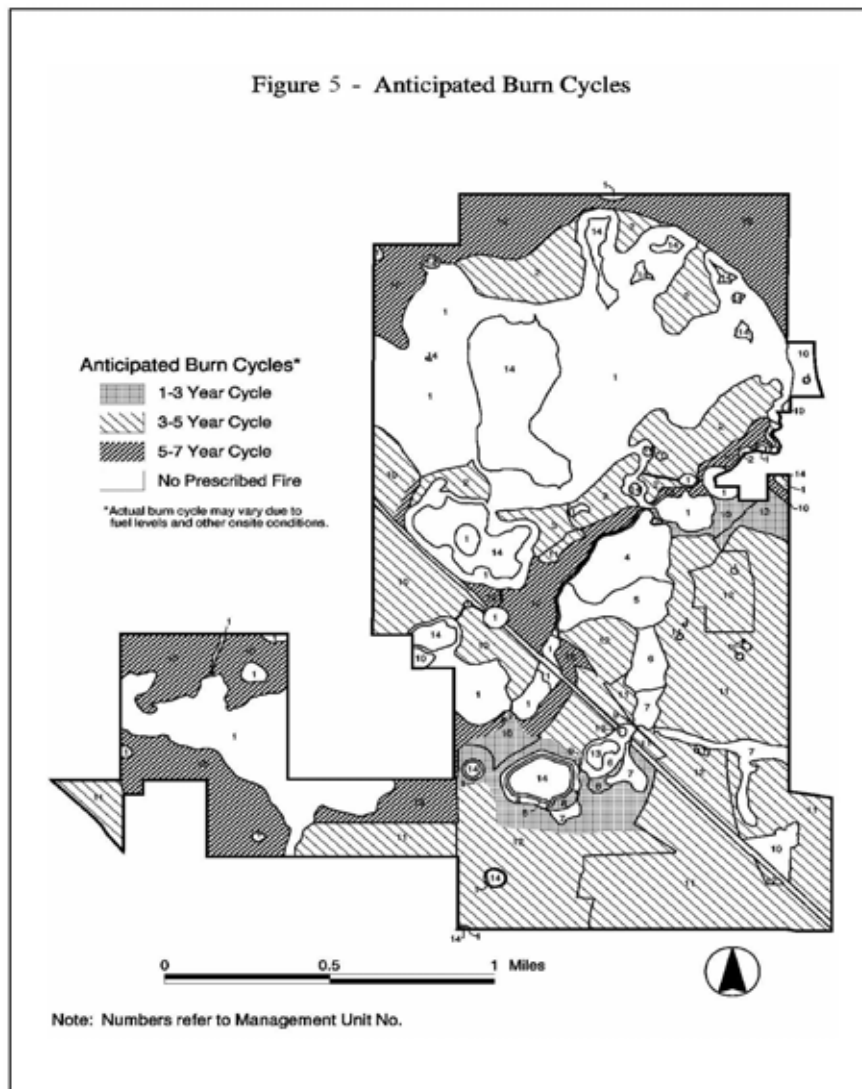


Figure 6 - Areas Burned Since Inception of Bank Through 2006

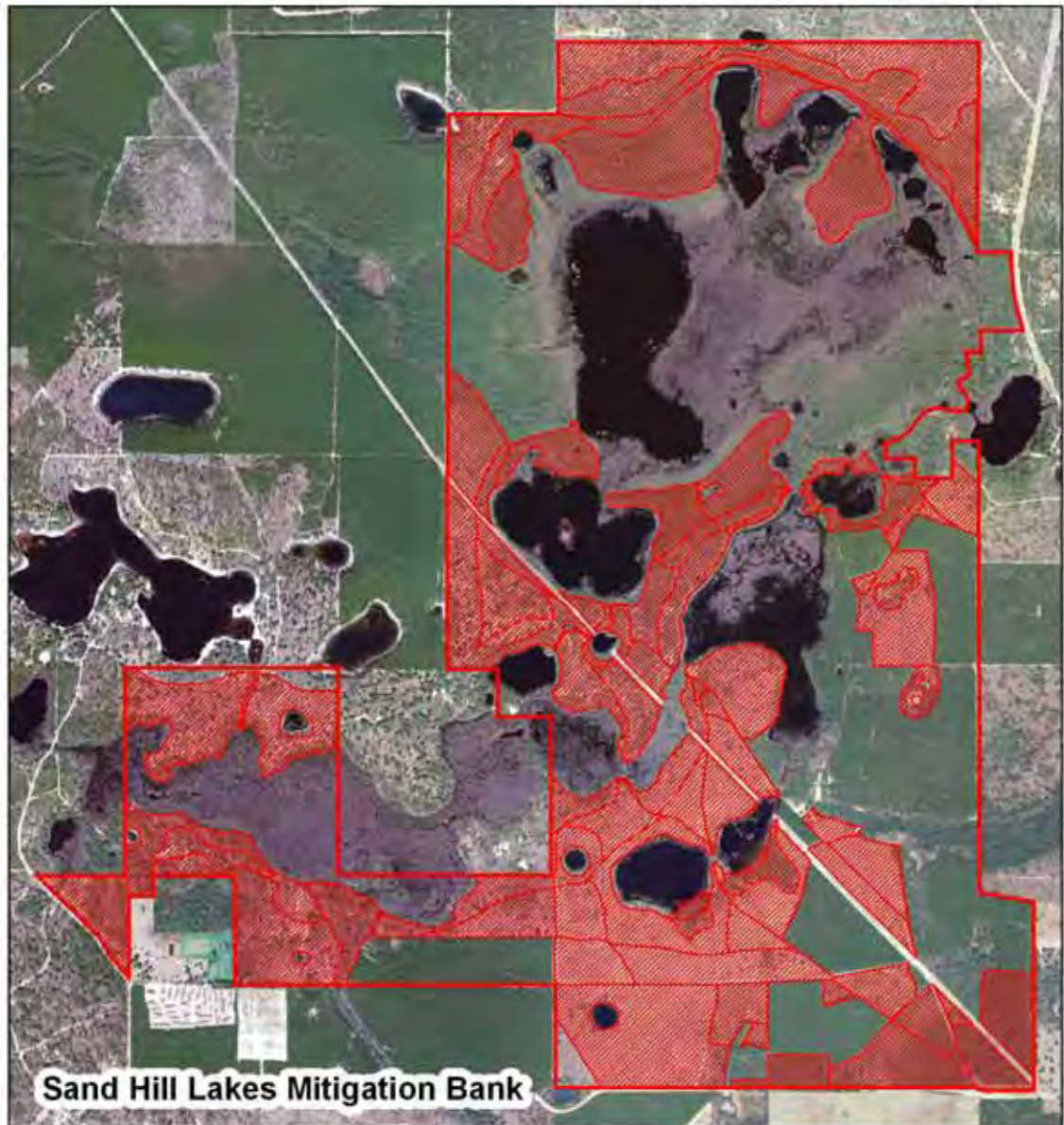


Figure 7. Winter Burns 2006/2007

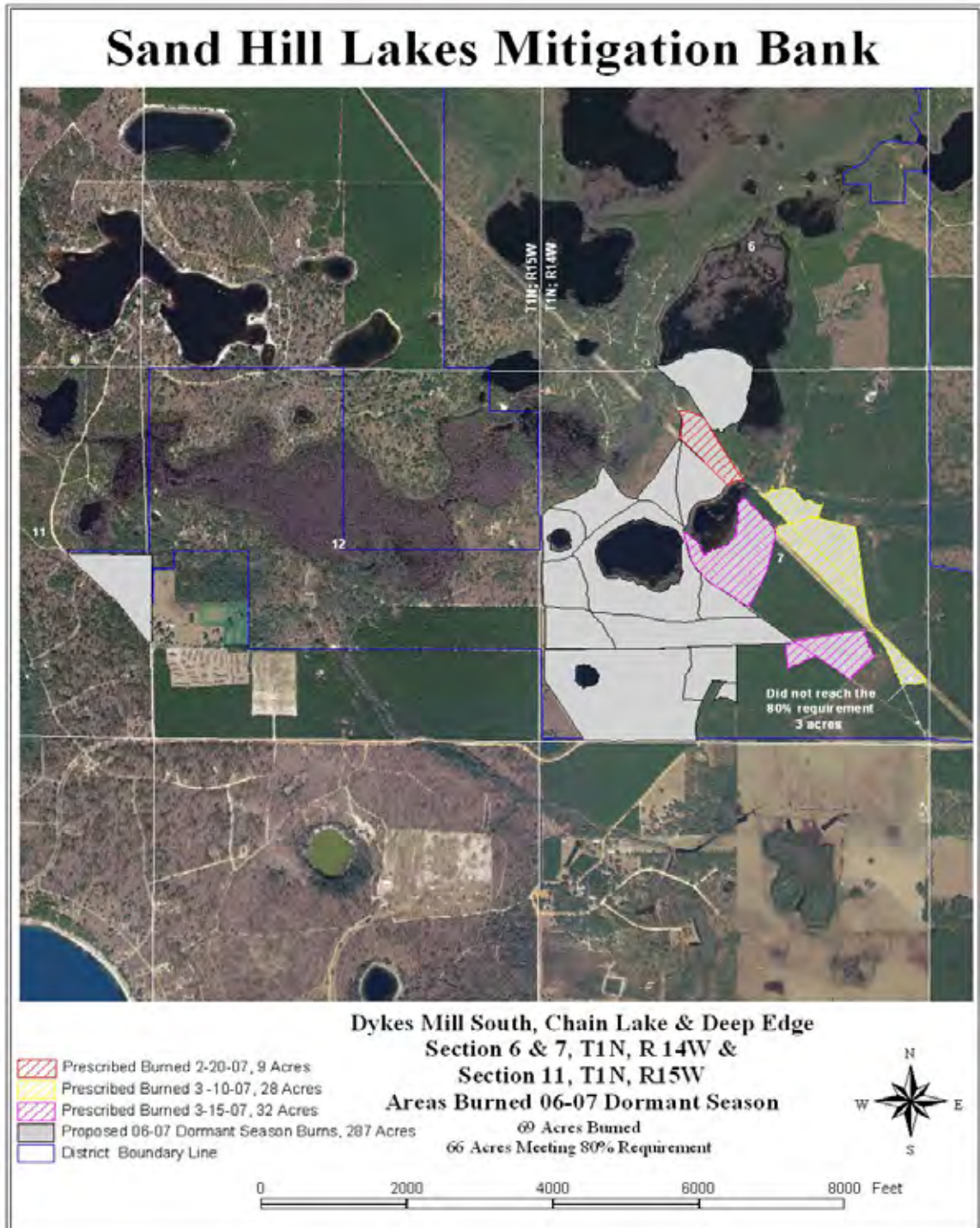


Figure 7a. 2007/2008 Winter Burns



Exotic Fauna and Vegetation

Surveys nuisance species have been conducted throughout the year in conjunction with the monthly monitoring. In 2006, one female hog was trapped and patches of torpedo grass were observed at historic boat launches. These areas were treated by the Bureau of Invasive Plant Management on July 20th 2006. In 2007, several small patches of torpedo grass were again observed at the historic boat launch areas of several ponds (Figure 8). These areas were treated twice with Habitat on July 26th and August 6, 2007. No visible living plant material was observed during subsequent site visits. Inadvertently the contractor working on the road removal and stabilization of erosion areas used inappropriate Bahia grass hay to stabilize the soils for erosion areas 1 and 2 and 3 the road removal between Deep Edge and Little Deep Edge. The contractor was required to treat these areas with herbicide until the Bahia grass was killed. Treatments occurred in May and September. No living material was observed during the fall monitoring. Supplemental planting will occur at these sites in 2008. Minor feral hog damage has been observed in scattered localities adjacent to the eastern edge of Dry Pond and western edge of Dykes Mill Pond. Traps have recently been set to trap the hogs.



Monthly Site Inspections:

Monthly inspections were conducted for the SHLMB. Copies of the monthly inspection reports are included in (Appendix 1).

Monthly Water Gage Assessments:

Water levels gauges were installed and surveyed in on December of 2005 for 10 locations throughout the bank. These locations include Black Pond, Power Line Pond, Pine Log Creek, Deep Edge Pond, Little Deep Edge Pond, Dykes Mill Pond, Ditch connecting to Pine Log Creek #7, natural channel from Joiner Lake to the Green Pond, Green Ponds, and Dry Lake (Table 2, Figure 9). The gauges were read monthly by the Florida Wildlife Conservation Commission staff and the results submitted to the NFWFMD (Table 2, Figure 9). In 2006, the water levels were above the gages until April, then from May to December then water levels were below the staff gages for all but Little Deep Edge and Dykes Mill Pond. The drought continued in 2007. Water levels were below the staff gages for all the entire year for all locations except Little Deep Edge Pond and Dykes Mill Pond, and Dry Pond.

TABLE 2: WATER LEVEL STAFF GAGE READINGS - 2007

(All Readings are in Feet)

Date	Gage 1 Black Pond	Gage 2 Power Line Pond	Gage 3 Pine Log Creek	Gage 4 Deep Edge Pond	Gage 5 Little Deep Edge Pond	Gage 6 Dykes Mill Pond	Gage 7 Joiner/Dry Ditch	Gage 8 Joiner/Green Ponds Channel	Gage 9 Green Ponds	Gage 10 Dry Pond
1/3/07	Dry	Dry	Dry	Dry	0.50	2.80	Dry	Dry	Dry	2.18
2/6/07	Dry	Dry	Dry	Dry	0.60	3.18	Dry	Dry	Dry	Inaccessible
3/5/07	Dry	Dry	Dry	Dry	0.29	3.05	Dry	Dry	Dry	2.32
4/5/07	Dry	Dry	Dry	Dry	Dry	2.5	Dry	Dry	Dry	1.80
5/3/07	Dry	Dry	Dry	Dry	Dry	2.17	Dry	Dry	Dry	1.46
6/4/07	Dry	Dry	Dry	Dry	Dry	0.9	Dry	Dry	Dry	0.58
7/5/07	Dry	Dry	Dry	Dry	Dry	0.2	Dry	Dry	Dry	Dry
8/3/07	Dry	Dry	Dry	Dry	Dry	0.25	Dry	Dry	Dry	Dry
9/22/07	Dry	Dry	Dry	Dry	Dry	0.30	Dry	Dry	Dry	0.10
10/16/07	Dry	Dry	Dry	Dry	Dry	0.30	Dry	Dry	Dry	0.55
11/1/07	Dry	Dry	Dry	Dry	Dry	No data	Dry	Dry	Dry	No data
12/26/07	Dry	Dry	Dry	Dry	Dry	0.25	Dry	Dry	Dry	0.10

<Gage = Water level was down slope of staff gage.

DRY = Site is dry.

No data – site was inaccessible or unread

Figure 9 - Water Level Staff Gage Locations



Sand Hill Restoration

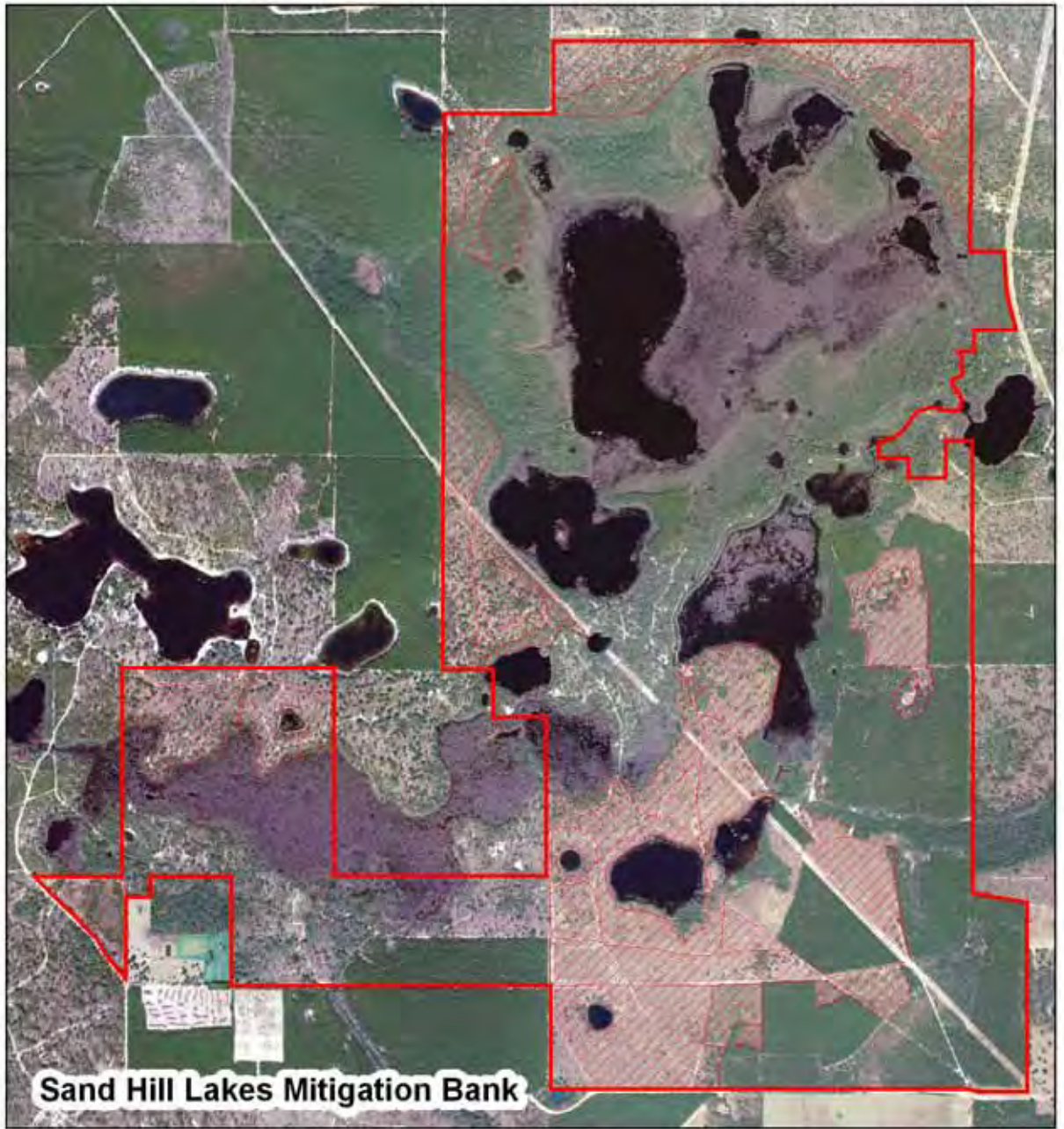
Activities: oak eradication, planting of pine


A total of 1,150 acres longleaf pine / wiregrass community, live oak forest and other buffer habitats occur on the SHLMB. The NFWMD will provide perpetual ecological management for these habitats. Oak eradication in Management Unit 12 was completed for the majority of the site in August of 2005 with a small remaining portion completed in September of 2006. Turkey and live oaks were reduced to less than 150 trees per acre and stumps were painted with an approved herbicide to reduce stump sprouts. Similarly, oak coverage was reduced for significant acreage in Management Unit 10 in September of 2006. These areas have excellent wire grass cover and a well developed understory of sand hill species. To date a total of 550 acres of sandhills have had the oaks thinned, far exceeding permit requirements (Figure 10). Most of these areas have already been burned this winter and it is expected that these areas will be treated with warm season burns during the next rotation.

Prior to permit issuance, longleaf pine seedlings were planted in portions of Management Unit 12 in the winter of 2004. However, intense winter burns in early 2007 destroyed most of the planted pines in some areas. Additional plantings of longleaf pine at a rate of 436 trees per acre will occur in Management Unit 12 and portions of Management Unit 10 during the dormant season of 2007/2008.

Restoration activities for the existing sand pine plantation (~385 acres) and slash pine plantations (11.5 acres) were initiated in 2007 (Figure 11). The sand pine and slash pine plantations harvest began on June 15 and completed in November 16, 2007. All sand pine and slash pine scheduled for removal has been completed in accordance with permit requirements. These areas will be burned in the fall of 2008 and replanted in the winter of 2008/2009 with long leaf pine and supplemental plantings of wire grass tublings if necessary.

Figure 10 - Oak Removed Through 2006

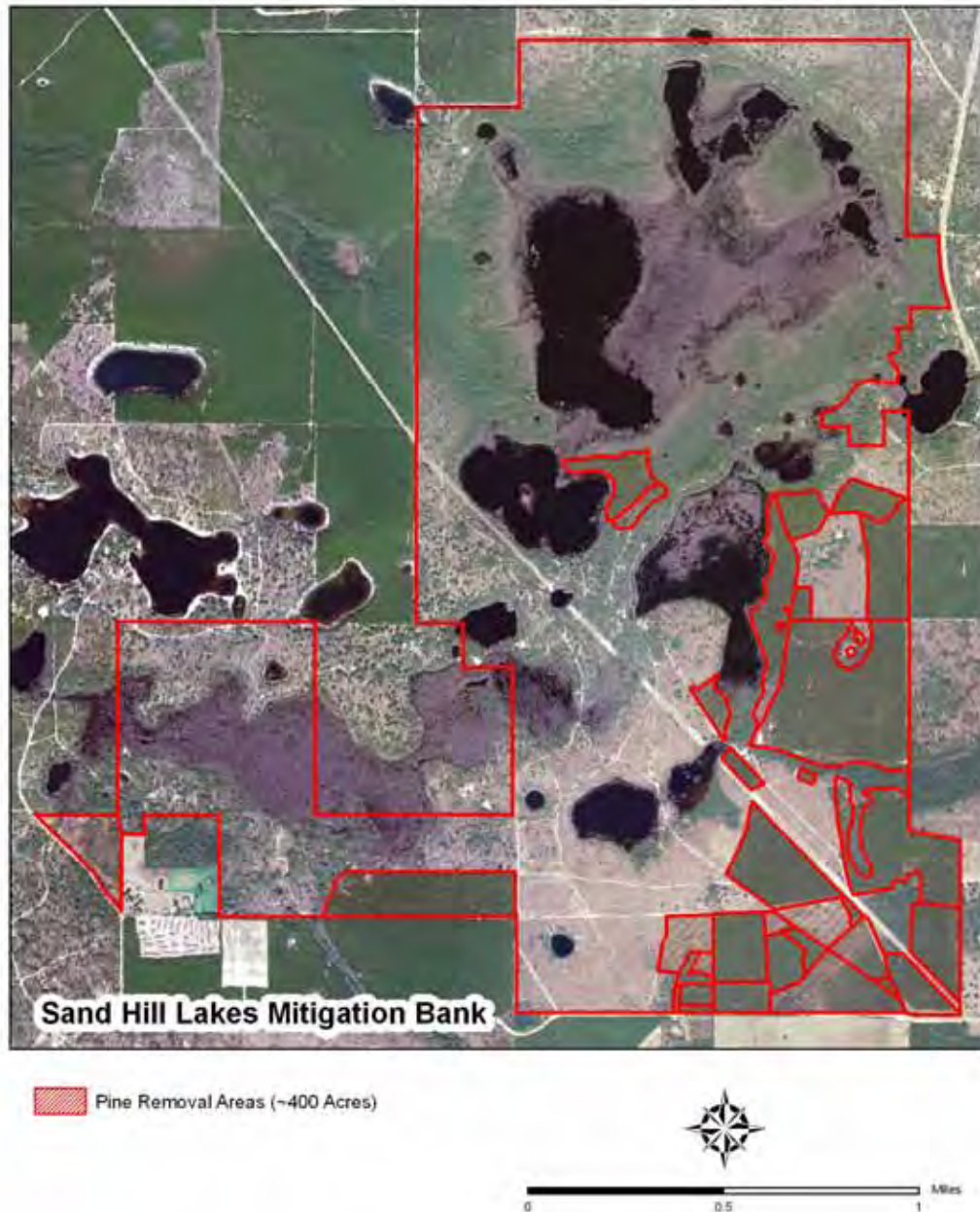


 Oak Removal Areas Through 2006 (550 Acres)



0 0.5 1 Miles

Figure 11 - Management Unit 11 Pine Removal



Wet Flatwoods Restoration

According to the permit requirements, wet flatwood areas, Management Unit 2 and 3, the standing biomass of shrubs (primarily titi, gallberry and fetterbush) shall be reduced in cover by roller chopping, gyrotrack or hydro-axe- in a manner to promote the carrying of fire and to enhance the growth of herbaceous groundcover. A

gyrotract was used in Management Unit 2 to reduce the standing biomass of shrubs (Figure 12). The gyrotack work was initiated on March 13 and was completed by June 16 2007. The black titi in these areas was extremely thick often with a dbh of 8-10". Even with the large "tree" size black titi, the gyrotrack was excellent in reducing the thick dense shrub cover to mulch. There were no noticeable track marks or ruts left by the gyrtotrack. The mulch within these areas was allowed to dry for several months prior to burning. Sites were burned in December of 2007. Shrub re-sprouts were observed in all areas. During the remainder of the growing season the shrub re-sprouts reached a height of about 3 foot in height. However shrub densities were greatly reduced, open ground was observed, and herbaceous species re-sprouted from the seedbank.

In Management Unit 3, the shrub layer was limited due to the dense overstory of planted pine. Wet flatwood herbaceous species were more common in these areas after the initial warm season burn (2006) and recent slash pine thinning (2007). The initial fire in this area reduced most of the shrubs to coppice sprouts. It was determined that the shrubs in this area could be managed through successive warm season fires. The second warm season fire is planned for Management Unit 3 in 2008.

Figure 12 - Management Unit 2 Brush Reduction



Annual Monitoring

In accordance with Specific Condition 26, all sampling locations have been identified (Figure 13). Fall monitoring methods as well as data analysis are described below. Sampling for the annual report was conducted on November 6-9, 15 and 16 2007. Raw data sheet, computational analysis, pedestrian surveys and photographic documentation are included in Appendix 2, 3 and 4. Oblique aerals were taken for the SHLMB on October 30, 2007 and have been included in Appendix 5.

The 2005-2006 Annual report by the Florida Fish and Conservation Commission was completed in October and can be found in Appendix 6 in accordance with Specific Condition 25f.

Quantitative Monitoring

Materials and Methods

Quantitative monitoring has been conducted in accordance with the methods described in Attachment H – Monitoring Plan. Quantitative vegetation monitoring occurred at the end of the growing season. This is the second annual monitoring report for the SHLMB.

The percent vegetation cover was monitored at transect locations shown in Figure 13. One-meter square quadrats were established along 600' transects at 20' intervals. In addition, each transect contained a permanently established photographic documentation stations, where qualitative quadrat (north, east, south, and west) observations were recorded (Appendix 4). Transect termini will be marked using iron rebar surrounded by PVC pipe.

Vegetation species coverage statistics were developed from the recorded coverage of each species (or bare ground or open water) within a given quadrat. The percent coverage for each species (and bare ground or open water) was generated by adding all quadrat observations together, and dividing the total coverage by the cover of each species within each transect. This represents a modified Daubenmire cover scale where vegetation species statistics are used to determine the percent cover by bare ground, water, individual species and groups, such as wetland species, invasive exotic and nuisance species, and present.

Tree density was monitored using the “line strip” (belt transect) technique. Transects were co-located with each vegetation transect. The belt transects will be 600± feet in length and 30± feet in width. Within each belt transect, the height and condition of each planted tree will be recorded.

Photographic Stations:

Panoramic photographs were taken from the permanently established stations at each transect (Appendix 4). **Please note: photographic station 12 was abandoned as it was not placed in the correct habitat. The photographic station was inadvertently placed in a mesic hammock on the edge of management unit 2. To remedy this, a new photopoint 12b was established in the in management unit 2 to the south of the original photo point (Figure 13).**

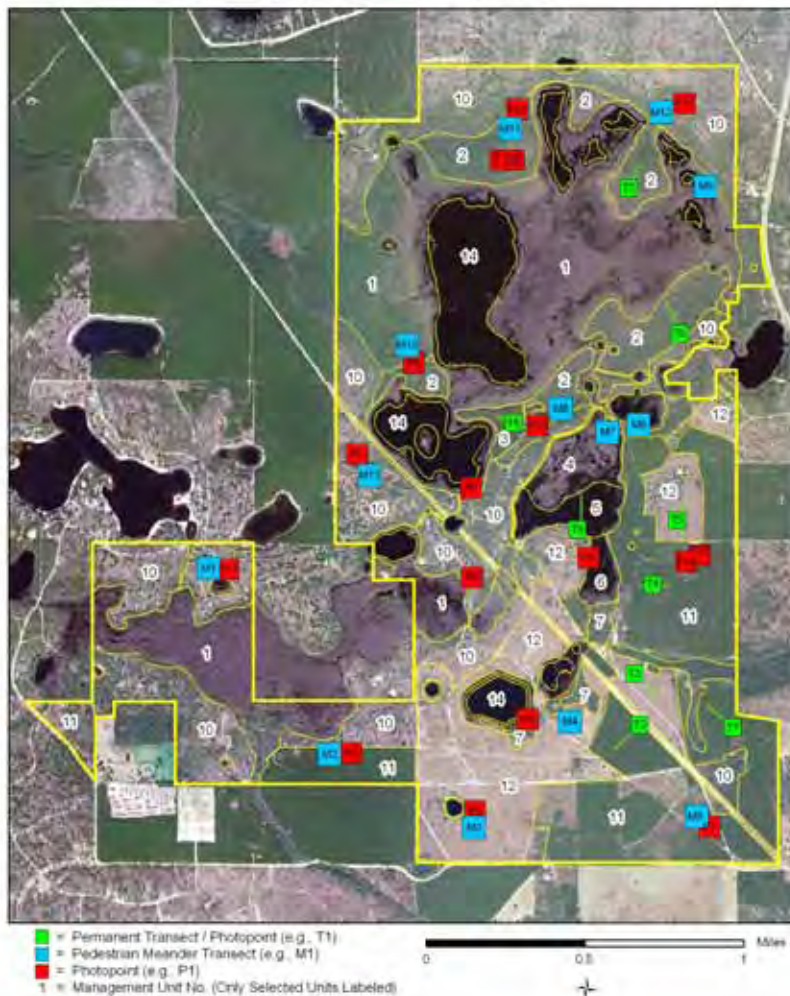
Wildlife Utilization:

During the vegetation monitoring described above, wildlife observations will be recorded in each community. These observations will consist of direct sightings, scat, tracks, or vocalizations.

Fuel loads and prescribed fires within wet flatwood and sandhill communities:

Semi-annual status reports will detail the condition of the communities relative to the need and potential for a burn, the conditions required for the next desirable burn, and the anticipated timeframe for the next burn. This data was included for each pedestrian survey transect (Appendix 4).

Figure 13 - Monitoring Locations



Results and Discussion

UMAM Polygon II, Management Unit 11- Sand Pine Plantation

UMAM Polygon II, Management Unit 11, consists of 383.484 acres of planted sand pine plantation that will be converted to long leaf pine and sand hill habitat. Baseline conditions indicated a sand pine canopy with nearly 100 percent canopy closure and an average of 446 sand pine trees per acre occur in the sand pine plantations. Removal of the sand pine was completed in November 2007. Three transects (transect #1, #2 and #4) were located within UMAM Polygon II, Management Unit 11.

In 2006, a total of 12 species were observed in transect 1, 9 species in transect 2, and 21 in transect 4. In general, species observed were common to sand hill communities. Wire grass was observed only in transect 2 with 5.5% cover and was the dominant species

occurring in that transect. The dominant cover class for all transects was bare ground with a range of 81% bare ground (transect 4) to 96% bare ground (transect 2). The exotic species Bahia grass (*Paspalum notatum*) was observed in transects 1 (0.1% cover) and transect 4 (1.5% cover) and may be due to the previous conversion of this area to pasture prior to conversion to a sand pine plantation. Similarly centipede grass (10.6% cover) was observed in transect 4 and was the dominant species within that transect.

In 2007, the pine canopy was harvested drastically increasing light levels reaching the ground layer. A total of 4 species were observed in transect 1, 15 in transect 2 and 22 in transect 4 (Tables 3-5, Figures 14-16). The reduction in the number of species observed in Transect 1 may be due to a combination of mechanical removal and recent pine harvest whereas other transect were harvested months earlier and had longer to re-vegetate. Wire grass was again only observed along Transect 2, but with 2.6% cover was the dominant species within that transect. The cover is reduced from the 5.5% cover observed in 2006, but this may be due to allot of mechanical damage that occurred during the pine harvest. The dominant cover class was again bare ground ranging from 68.5 to 99.29%. The reduction in bare ground from transect 4, may be due to the pines being removed earlier allowing longer for the sandhill community to recover. Bahia grass and centipede grass were observed in Transect 4 in 2007, but centipede grass was observed in Transects 1 and 4 in 2006. Similarly the cover of Bahia grass was slightly reduced in 2007, while the cover of centipede grass increased by about 5%. This may be due to increased light reaching the herbaceous layer. It is expected that the cover of centipede grass will be reduced during the site preparation burns. No wildlife or tracks were observed within these transects, probably due to the lack of vegetation.

Interim Success Criteria:

The sand pine plantation was harvested in 2007. Site preparation burns will occur during 2008 and the site will be re-planted in the winter of 2008/2009. Many of the management activities that will be used to restore UMAM II, Management Unit 11 will be implemented in 2008/2009.

Table 3. Transect 1 Species cover and occurrence (Former Sand Pine Plantation)

Date: 11/7/2007	Transect 1	Polygon: 11
Canopy Closure 0%	Overstory: None	
Scientific Name	Common Name	Percent Cover
<i>Callicarpa americana</i>	Beauty berry	0.1
<i>Desmodium sp.</i>	Tick trefoil	0.1
<i>Ilex vomitoria</i>	Yaupon	0.01
<i>Quercus hemisphaerica</i>	Diamond oak	0.5
	Bare ground	99.29

Figure 14. Transect 1. Percent Cover and occurrence (Sand Pine Plantation)

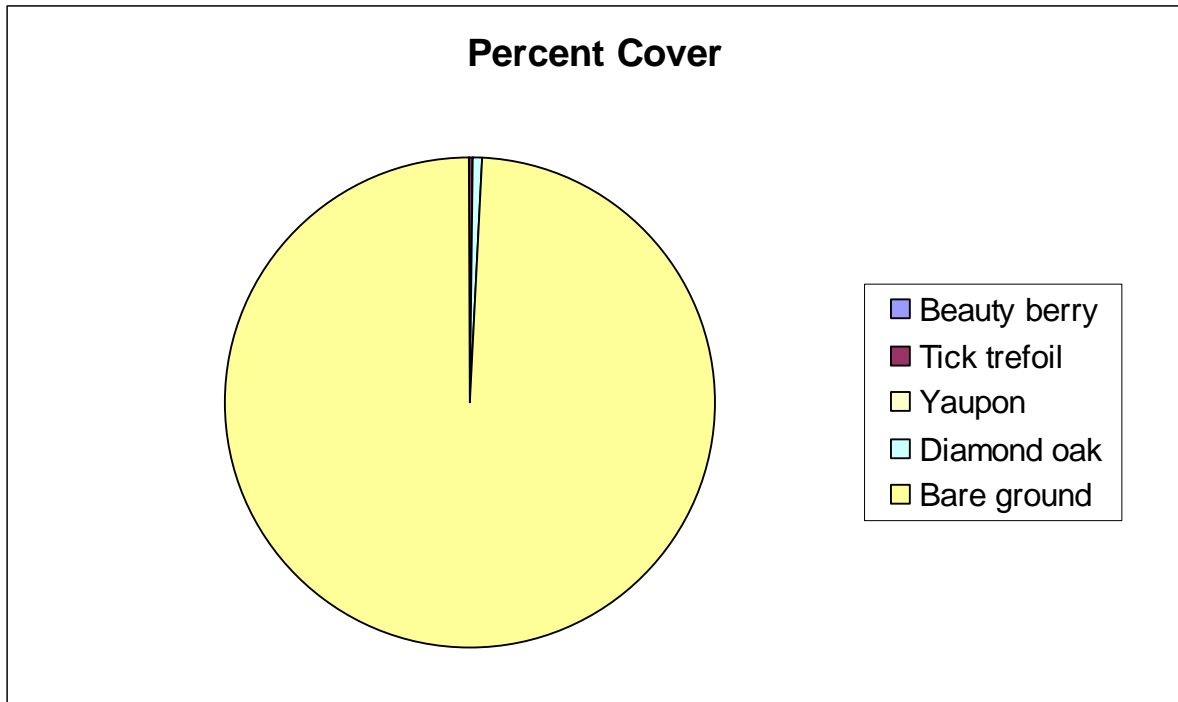


Table 4. Transect 2. Species cover and occurrence (Sand Pine Plantation)

Scientific Name	Common Name	Percent Cover
<i>Andropogon virginicus L. var. glaucus</i>	Chalky bluestem	0.2
<i>Aristida beyrichiana</i>	Wire grass	2.6
<i>Desmodium sp.</i>	Ticktrefoil	0.19
<i>Dichanthelium sp.</i>	Witch grass	0.2
<i>Diospyros virginiana</i>	Persimmon	0.2
<i>Euphorbia floridana</i>	Greater Florida spurge	0.01
<i>Galactia sp.</i>	Milk pea	0.2
<i>Ilex vomitoria</i>	Yaupon	2
<i>Lespedeza sp.</i>	Lespedeza	0.06
<i>Liatris gracilis</i>	Slender gayfeather	0.07
<i>Pteridium aquilinum</i>	Bracken	1
<i>Quercus laevis</i>	Turkey oak	2.2
<i>Quercus virginiana</i>	Live oak	0.1
<i>Scerlia sp.</i>	Nutrush	0.07
<i>Stylisma patens</i>	Coastalplain dawn flower	0.2
	Bare ground	90.7

Figure 15. Transect 2: Species Cover and Occurrence (Sand Pine Plantation)

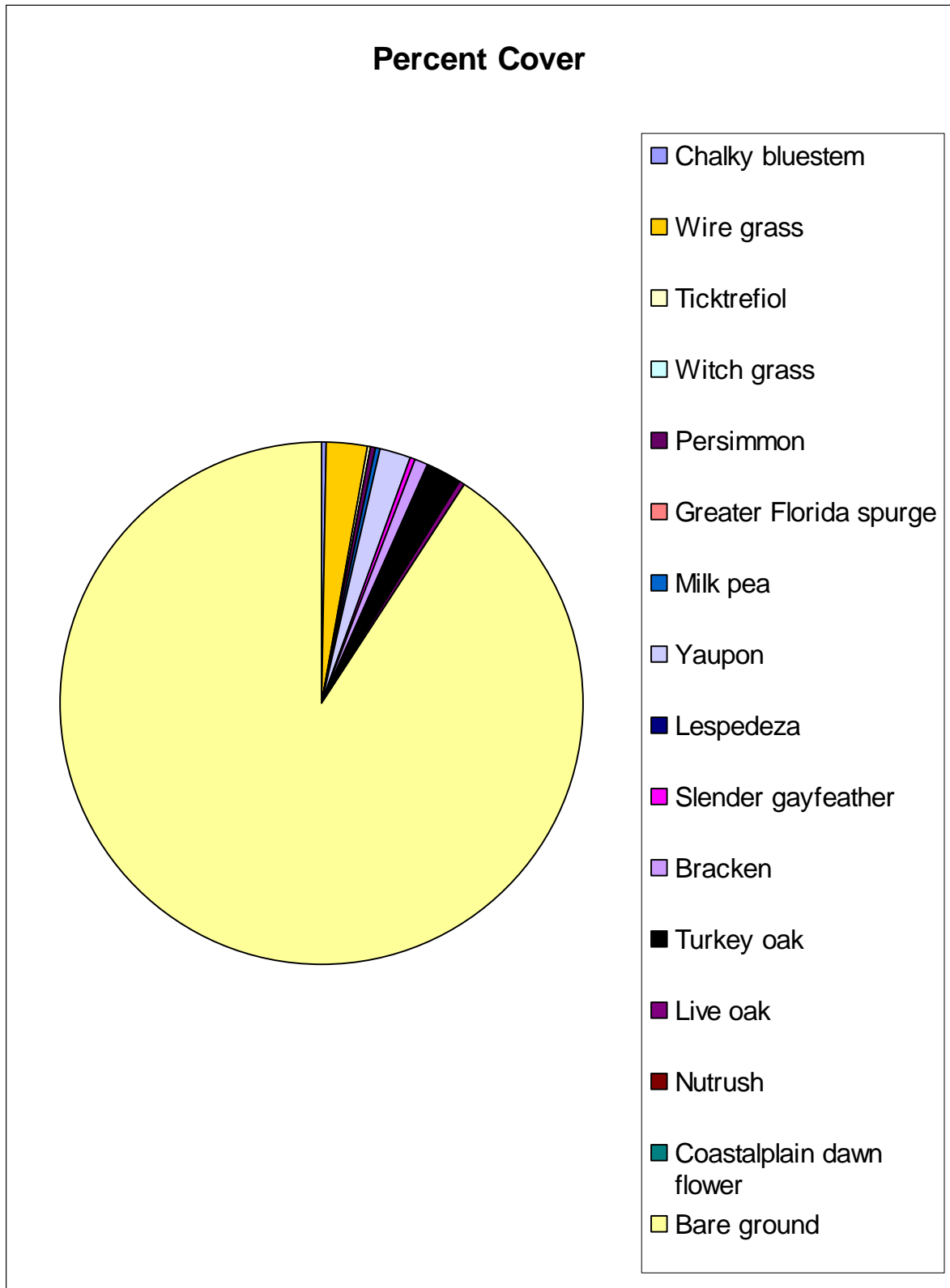
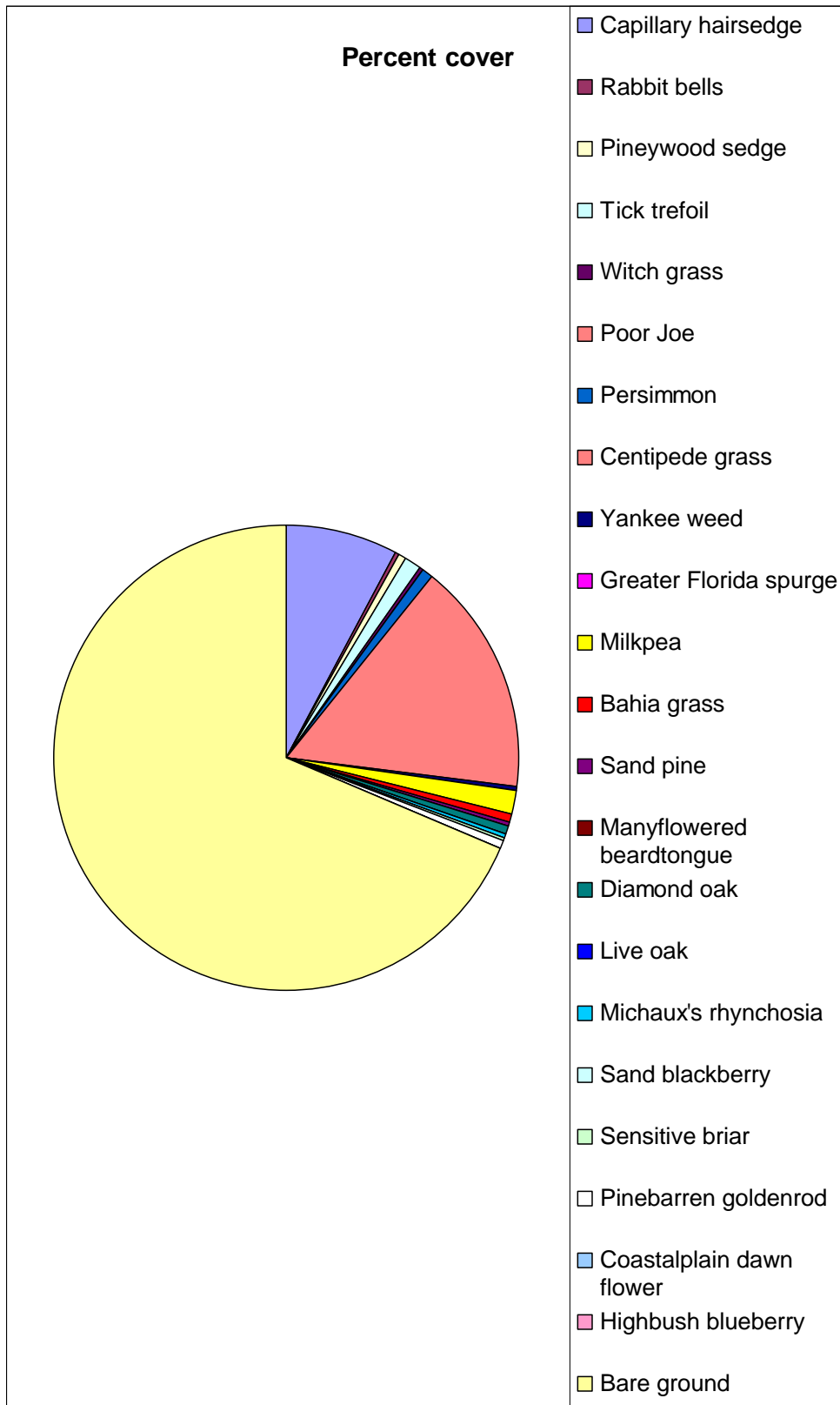


Table 5. Transect 4. Species cover and occurrence (Sand Pine Plantation)

Date: 11/7/2007	Transect 4	Polygon: 11
Overstory 0%	Canopy closure 0%	
Scientific Name	Common Name	Percent Cover
<i>Bulbostylis ciliatifolia</i>	Capillary hairsedge	7.8
<i>Crotalaria rotundifolia</i>	Rabbit bells	0.17
<i>Cyperus retrorsus</i>	Pineywood sedge	0.63
<i>Desmodium</i>	Tick trefoil	1.1
<i>Dichantherium sp.</i>	Witch grass	0.17
<i>Diodia teres</i>	Poor Joe	0.1
<i>Diospyros virginiana</i>	Persimmon	0.88
<i>Eremochloa ophiuroides</i>	Centipede grass	16
<i>Eupatorium compositifolium</i>	Yankee weed	0.3
<i>Euphorbia floridana</i>	Greater Florida spurge	0.2
<i>Galactia sp.</i>	Milkpea	1.4
<i>Paspalum notatum</i>	Bahia grass	0.7
<i>Pinus clausa</i>	Sand pine	0.17
<i>Penstemon multiflorus</i>	Manyflowered beardtongue	0.17
<i>Quercus hemisphaerica</i>	Diamond oak	0.4
<i>Quercus virginiana</i>	Live oak	0.06
<i>Rhynchosia michauxii</i>	Michaux's rhynchosia	0.17
<i>Rubus cuneifolius</i>	Sand blackberry	0.23
<i>Schrankia microphylla</i>	Sensitive briar	0.1
<i>Solidago fistulosa</i>	Pinebarren goldenrod	0.5
<i>Stylisma patens</i>	Coastalplain dawn flower	0.18
<i>Vaccinium corymbosum</i>	Highbush blueberry	0.07
	Bare ground	68.5

Figure 16. Transect 4: Species Cover and Occurrence (Sand Pine Plantation)



UMAM Polygon I, Management Unit 12- Sand Hill

UMAM Polygon I, Management Unit 12, consists of 263.52 acres. This polygon is dominated by a sand hill community with an overstory dominated by turkey and live oaks with scattered remnant longleaf pine and an understory dominated by wire grass and a wide variety of herbaceous species. Reclamation activities within this upland community include re-introduction of fire, thinning of oaks to less than 150 trees per acre and planting of long leaf pine seedlings at a density not to exceed 200 trees per acre at final release. Fire was re-introduced to this area during the winter of 2004. A winter burn scheduled for the areas that had oak reduction. Prior to the re-introduction of fire, the dominant understory species was woody goldenrod. Oaks were thinned for the majority of Management Unit 12 in August of 2005. However, the portion of Management Unit 12 which contains Transect 5 was thinned in September of 2006. The re-introduction of fire and thinning of the turkey and live oaks have led to significant changes in the species composition. Two transects (transect #3 and #5) were located within UMAM Polygon I, Management Unit 12, and reflect baseline conditions (Table 6, 7 and Figure 16, 17).

In 2006, a total of 23 species were observed in transect 3 and 31 species in transect 5. A diverse understory of plants typical of sand hill vegetation was observed within each transect. No nuisance or exotic species cover occurred within these transects. The greatest cover class for each transect was bare ground with 47.5% (transect 3) and 68.5% for transect 5. Wire grass was the dominant vegetative species for both transects with 27.2 % cover for transect 3 and 22.2% cover for transect 5. A total of 12 species, Elliot's bluestem, wiregrass, Coastalplain honeycombhead, woody goldenrod, silver croton, witch grass, persimmon, pineland spurge, milk pea, pineweed, gopher apple and bracken fern were common to both transects.

In 2007, a total of 27 species were observed in transect 3 and 32 species in transect 5 slightly higher than last year. A diverse understory of sand hill vegetation was observed again this year and no nuisance or exotic species were observed (Table 6, 7, Figure 16 and 17). The greatest cover class again was bareground with 36.1% cover for transect 3 and 37% for transect 5. The amount of bareground for each transect was greatly reduced and may be due to the re-introduction of fire. Wire grass was again the dominant vegetative species for both transects with 23% for transect 3 and 35.6% cover for transect 5. Wire grass cover was slightly less for transect 3 but cover was significantly increased for transect 5. A total of 18 species were common to both transects and included bushy blue stem, broomsedge, wire grass, woody goldenrod, witch grass, persimmon, buckwheat, milkpea, slender shooting star, few flowered shooting star, panicum, shiners, bracken fern, bluejack oak, turkey oak, queens delight and shiny blueberry.

Longleaf pines were planted in portions of UMAM polygon I, Management Unit 12 in the winter of 2004. However, longleaf pines were only observed in Transect 3 in 2006. A belt transects 600' feet in length and 30' feet in width was co-located with the vegetation transect. The number, height and condition of each planted tree were recorded. A total of 36 trees were observed or an average of 871 trees per acre. However, the winter burn in 2006 was extremely intense and killed nearly all planted

pinus. A total of 2 seedling pines were observed in 2007 both close to the ground and in the grass stage. These areas will be planted with less than 300 trees per acre during the winter of 2008. Wildlife observed included a wren, cardinal and chipping sparrow.

Interim success Criteria:

The interim success criteria have been met for UMAM I polygon I. Fire was re-introduced to the site, turkey and live oaks were thinned to less than 150 trees per acre. No nuisance or exotic species occurred were observed within the transects, fire adapted species average nearly 70% cover, woody shrubs average less than 20% cover, and long leaf pine has been planted for most of the area.

Table 6. Transect 3. Species cover and occurrence (Sand Hill)

Date: 11/7/2007		Transect 3	Polygon: 12
Overstory: Native Sandhill with Oak Removal			
Scientific Name	Common Name	Percent Cover	
<i>Andropogon glomeratus var. glaucus</i>	Chalky blue stem	1.1	
<i>Andropogon virginicus</i>	Broom sedge	0.6	
<i>Aristida beyrichiana</i>	Wire grass	23	
<i>Bulbostylis ciliatifolia</i>	Capillary hairsedge	1.5	
<i>Chrysoma pauciflosculosa</i>	Woody goldenron	12.3	
<i>Commelina erecta</i>	Day-flower	0.04	
<i>Dichantheium sp.</i>	Witch grass	2.4	
<i>Diospyros virginiana</i>	Persimmon	0.6	
<i>Eriogonium tomentosum</i>	Wild buckwheat	0.3	
<i>Galactia sp.</i>	Milkpea	0.1	
<i>Gelsemium sempervirens</i>	Yellow jasmine	0.1	
<i>Liatris gracilis</i>	Slender gayfeather	1.4	
<i>Liatris pauciflora</i>	Few flowered gayfeather	1.5	
<i>Panicum dichotomiflorum</i>	Fall panic grass	1.8	
<i>Pinus paulstris</i>	Long leaf pine	0.2	
<i>Pityopsis graminifolia</i>	Shinners	0.1	
<i>Pteridium aquilinum</i>	Braken fern	1.2	
<i>Quercus hemisphaerica</i>	Diamond oak	0.04	
<i>Quercus inopina</i>	Blue jack oak	0.3	
<i>Quercus laevis</i>	Turkey oak	6	
<i>Quercus margaretta</i>	Post oak	1.6	
<i>Serenoa repens</i>	Saw palmetto	0.12	
<i>Sporobolus junceus</i>	Pineywood dropseed	1.6	
<i>Stillingia sylvatica</i>	Queen's delight	1	
<i>Stylisma patens</i>	Coastalplain dawn flower	1	
<i>Vaccinium arboreum</i>	Farkleberry	1	
<i>Vaccinium myrsinities</i>	Dwarf blueberry	3	
	Bare ground	36.1	

Figure 17. Transect 3: Species Cover and Occurrence (Sand Hill)

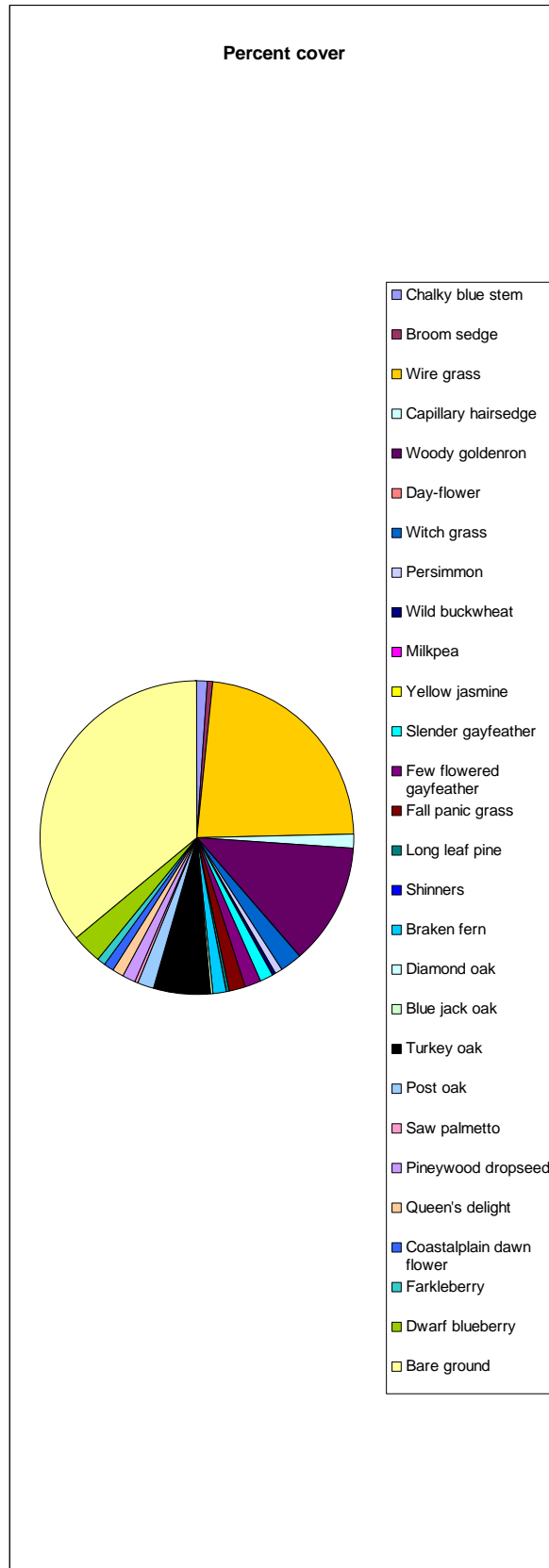
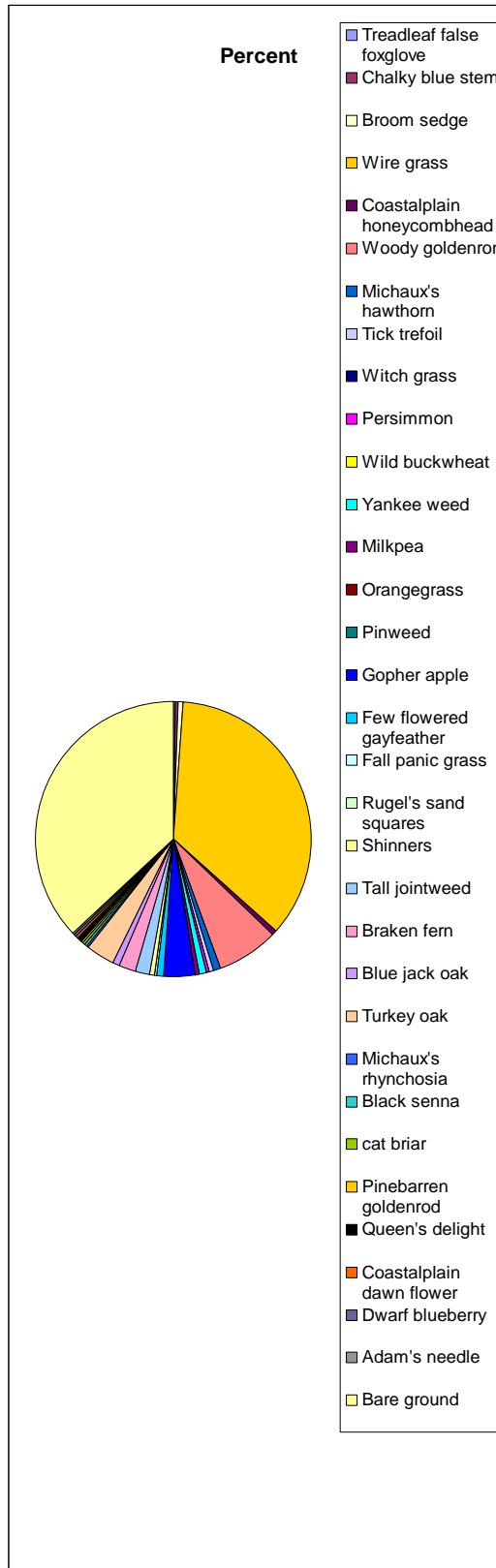


Table 7. Transect 5 Species and Occurrence (Sand Hill)

Date: 11/6/2007		Transect 5	Polygon: 12
Overstory: Sandhill with oaks cut...pines to be planted this winter			
Scientific Name	Common Name	Percent Cover	
<i>Agalinis setacea</i>	Treadleaf false foxglove	0.3	
<i>Andropogon glomeratus var. glaucus</i>	Chalky blue stem	0.3	
<i>Andropogon virginicus</i>	Broom sedge	0.5	
<i>Aristida beyrichiana</i>	Wire grass	35.6	
	Coastalplain		
<i>Balduina angustifolia</i>	honeycombhead	0.6	
<i>Chrysoma pauciflosculosa</i>	Woody goldenron	7.22	
<i>Crataegus michauxii</i>	Michaux's hawthorn	0.8	
<i>Desmodium sp.</i>	Tick trefoil	0.5	
<i>Dichantheium sp.</i>	Witch grass	0.1	
<i>Diospyros virginiana</i>	Persimon	0.2	
<i>Eriogonium tomentosum</i>	Wild buckwheat	0.1	
<i>Eupatorium compositifolium</i>	Yankee weed	0.6	
<i>Galactia sp.</i>	Milkpea	0.6	
<i>Hypericum gentianoides</i>	Orangegrass	0.03	
<i>Lechea minor</i>	Pinweed	0.03	
<i>Licania michauxii</i>	Gopher apple	3.5	
<i>Liatris pauciflora</i>	Few flowered gayfeather	0.9	
<i>Panicum dichotomiflorum</i>	Fall panic grass	0.3	
<i>Paronychia rugelii</i>	Rugel's sand squares	0.03	
<i>Pityopsis graminifolia</i>	Shinners	0.5	
<i>Polygonella gracilis</i>	Tall jointweed	1.8	
<i>Pteridium aquilinum</i>	Braken fern	2	
<i>Quercus inopina</i>	Blue jack oak	0.6	
<i>Quercus laevis</i>	Turkey oak	3.5	
<i>Rhynchosia michauxii</i>	Michaux's rhynchosia	0.1	
<i>Seymeria cassioides</i>	Black senna	0.3	
<i>Smilax sp.</i>	cat briar	0.4	
<i>Solidago fistulosa</i>	Pinebarren goldenrod	0.3	
<i>Stillingia sylvatica</i>	Queen's delight	0.6	
<i>Stylisma patens</i>	Coastalplain dawn flower	0.06	
<i>Vaccinium myrsinities</i>	Dwarf blueberry	0.3	
<i>Yucca filamentosa</i>	Adam's needle	0.33	
	Bare ground	37	

Figure 18. Transect 5: Species Cover and Occurrence (Sand Hill)



UMAM Polygon(s): VII, Management Unit 3- Planted Slash Pine Plantation

UMAM Polygon VII, Management Unit 3, consists of 11.5 acres of bedded planted slash pine that will be restored to a hydric pine flatwood. The overstory was dominated by planted slash pine. The shrub and understory was largely been shaded out by the near complete canopy closure of the slash pine. Pines were thinned to 225 trees per acre in 2007. Following the initial burn in the summer of 2005, it was determined that the shrubs could be kept to coppice sprouts with successive warm season burns. In winter 2008, wire grass tublings will be planted on 3' centers throughout the polygon.

In 2006, a total of 17 species were observed. The majority of the species were common to wet flatwoods. No nuisance or exotic species were observed. The greatest cover class observed was bare ground at 80.5%. The dominant vegetation was black ti ti with 6.5 percent coverage. The total shrub coverage was approximately 12%. No wire grass was observed within this polygon.

In 2007, a total of 18 species were observed, similar to baseline observations. The majority of the species were common to wet flatwoods. No nuisance or exotic species cover was observed. The greatest cover class was again bare ground with 77.3 percent cover. The slight increase in vegetative cover may be due to increased light reaching the understory since the dense pine canopy has been thinned. Swamp dog hobble had the greatest percent vegetative, each with 5 percent. Black titi cover was reduced from 6.5 % to 3.7%. This represents a reduction in black titi cover from the baseline observations. Overall shrub coverage within this polygon slightly increased from 12% in 2006 to 13.4% in 2007 and herbaceous cover has increased from last year. Wildlife observations included a blue jay, towhee, and cardinal.

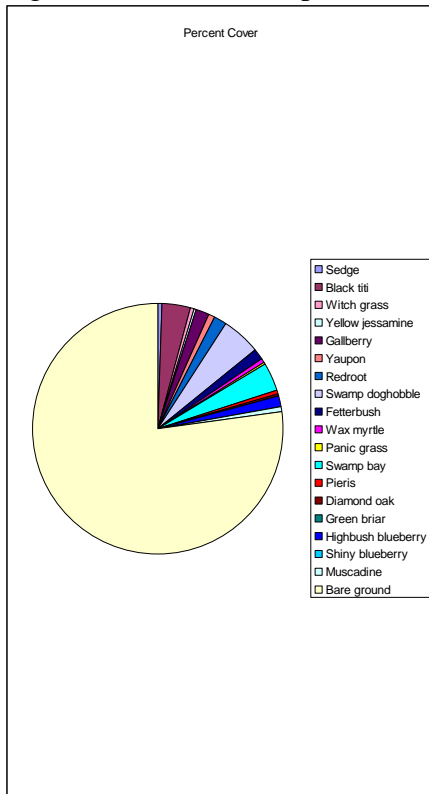
Interim success Criteria:

Many of the management activities that will be used to restore UMAM VII, Management Unit 3 have been implemented and interim management activities completed or initiated. A warm season burn was introduced in 2006, and the slash pines were reduced in density. An additional warm season fire is planned for 2008 along with the planting of wire grass plugs.

Table 8. Transect 8. Species and Occurrence (Hydric Pine)

Scientific Name	Common Name	Percent Cover
Carex sp.	Sedge	0.5
<i>Cliftonia monophylla</i>	Black titi	3.7
<i>Dichantheium sp.</i>	Witch grass	0.53
<i>Gelsemium sempervirens</i>	Yellow jessamine	0.3
<i>Ilex glabra</i>	Gallberry	1.5
<i>Ilex vomitoria</i>	Yaupon	1
<i>Lachnanthes caroliana</i>	Redroot	1.6
<i>Leucothoe racemosa</i>	Swamp doghobble	5
<i>Lyonia lucida</i>	Fetterbush	1.3
<i>Myrica cerifera</i>	Wax myrtle	0.7
<i>Panicum sp.</i>	Panic grass	0.3
<i>Persea palustris</i>	Swamp bay	3.7
<i>Pieris phyllyreifolia</i>	Pieris	0.5
<i>Quercus hemisphaerica</i>	Diamond oak	0.2
<i>Smilax laurifolia</i>	Green briar	0.07
<i>Vaccinium corymbosum</i>	Highbush blueberry	1.2
<i>Vaccinium myrsinites</i>	Shiny blueberry	0.2
<i>Vitis rotundifolia</i>	Muscadine	0.4
	Bare ground	77.3

Figure 19. Transect 8 Species and Occurrence



UMAM Polygon V, Management Unit 2, Hydric Pine Flatwoods

UMAM Polygon V, Management Unit 2 consists of 146.678 acres of fire suppressed, shrub dominated hydric pine that will be restored to a hydric pine flatwood. The overstory is dominated by a near impenetrable shrub layer with a largely lacking tree canopy and herbaceous layer. Reclamation activities within this polygon include re-introduction of fire, planting of longleaf and slash pine trees at a rate of 436 trees per acre, reduction of shrub layer (primarily titi, gallberry and fetterbush) by roller chopping, planting of wiregrass (either tubelings on 3' centers or seeding at 2-5 lbs. per acre), direct seeding or planting of wet flatwood and wet prairie species if cover is less than 40%, and annual vegetation monitoring, including monitoring for nuisance / exotic plant species.

Fire was re-introduced into this polygon during the summer of 2005. Two transects, 6 and 7 were established in different portions of the hydric pine flatwoods. The warm season burn was effective in reducing the overstory of shrubs in transect 7, however, by the time of the initial sampling event, the majority of the shrubs had sprouted from the roots and already formed an extremely dense shrub layer approximately 3-4' in height. The fire was less effective in the area surrounding transect 6. Many of the black ti ti within this transect did not burn.

In 2006, a total of 14 species were observed within the transect 6 and 16 in transect 7. Seven species were common to both sites, and all were shrubs. Both sites were dominated by shrubs with little overstory and little to no understory species due to the extremely thick shrub layer. No exotic species were observed. The greatest cover class observed for both transects was black ti ti with 69.87 % cover in transect 6 and 31.77 percent cover in transect 7. No wire grass was observed within this polygon. One other shrub species Fetterbush (15.3%) had significant cover within transect 6, myrtle leaved holly (15.4%) had significant cover in transect 7. Little bare ground was observed in transect 6 (3.7%) while 11.5% bare ground was observed in transect 7.

In 2007, a total of 12 species were observed within transect 6 and 9 in transect 7. Transect 6 had a similar species composition to the baseline while transect 7 had significantly fewer species observed probably due to the gyrotrack. Seven species were common to both sites, and all were shrubs. Both sites were dominated by 3-3.5' shrubs though each had an herbaceous component. While this did not represent significant cover in transect 6, 3.7% cover in transect 7 was red root, and early colonizing wetland species. The greatest cover class for both transects was bare ground with 40.8% for transect 6 and 48.2% cover for transect 7. This represents a significant shift in cover from black titi to bare ground due to the gyrotrack. Black titi cover was also greatly reduced from nearly 70% to 14% in transect 6 and from 31.77% to 28.1% cover in transect 7. The relative minor decrease in black titi cover in transect 7 may be the result of the intense warm season fire in 2006. Fetterbush was the dominant species by cover in transect 6 while black titi remained the

dominant plant species by cover in transect 7. Continued management activities will further reduce shrub coverage.

Interim Success Criteria:

Most of the management activities were completed by 2007 for of the UMAM V, Management Unit 2. Fire was introduced in 2005 and a second site prep burn occurred in December of 2007. A gyrotrack was employed (April-June) to reduce the shrub cover to basal sprouts. Wire grass tublings and long leaf pine seedlings will be planted in late December/January 2008. No exotic vegetation has been observed at anytime in this polygon.

Table 9. Transect 6 Species and Occurrence (Hydric Pine Flatwoods)

Date: 11/6/2007		Transect 6	Polygon: 2	
Overstory: gyrotracked shrub (black titi area)				
Scientific Name	Common Name	Percent Cover	# species	
<i>Clethra alnifolia</i>	Sweet pepperbush	1	1	
<i>Cliftonia monophylla</i>	Black titi	14	2	
<i>Ilex coriacea</i>	Large gallberry	2.8	3	
<i>Ilex glabra</i>	Gallberry	1.2	4	
<i>Ilex myrtifolia</i>	Myrtle-leaf holly	8	5	
<i>Leucothoe racemosa</i>	Swamp doghobble	3.7	6	
<i>Lyonia lucida</i>	Fetterbush	18.7	7	
<i>Magnolia virginiana</i>	Silver bay	1	8	
<i>Osmanthus americanus</i>	Wild Olive	0.16	9	
<i>Persea palustris</i>	Swamp bay	6.7	10	
<i>Rhynchospora</i> sp.	Beakrush	0.3	11	
<i>Vaccinium corymbosum</i>	Highbush blueberry	1.64	12	
	Bare ground	40.8		

Figure 20. Transect 6: Species Cover and Occurrence (Hydric Pine Flatwoods)

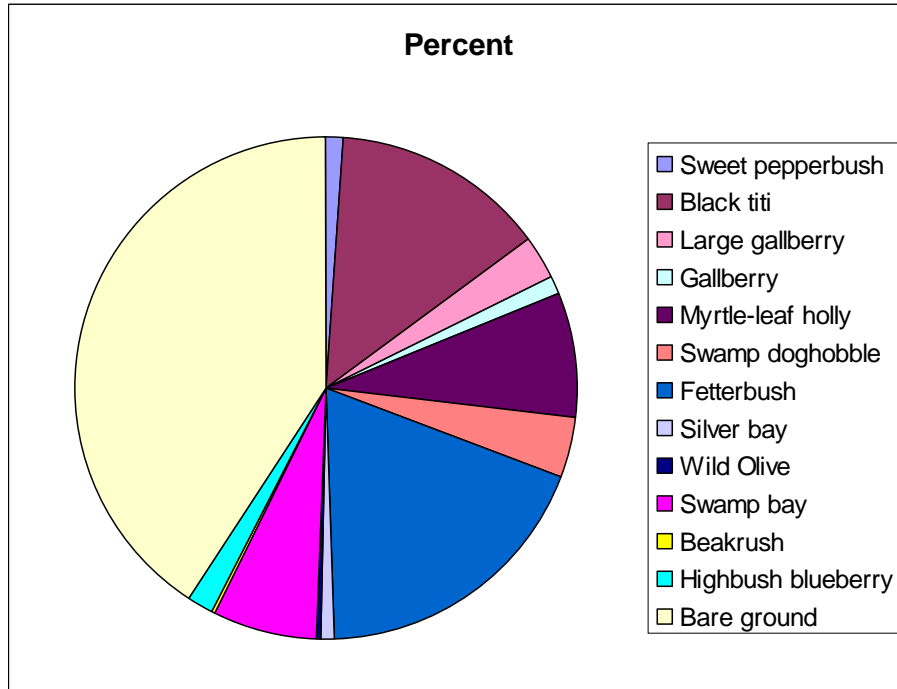


Table 10. Transect 7. Species and Occurrence (Hydric Pine Flatwoods)

Date: 11/6/2007

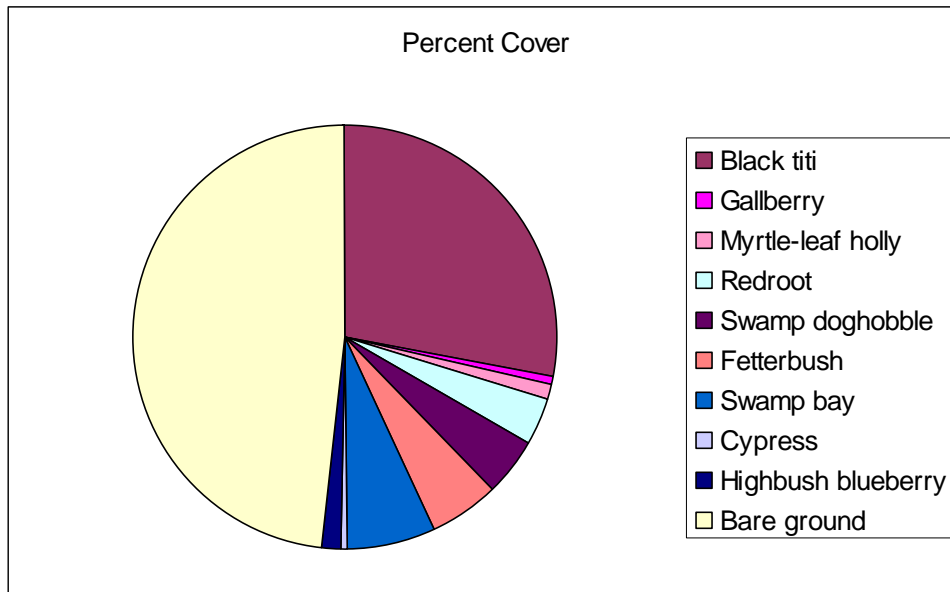
Transect 7

Polygon: 2

Overstory: gyrotracked shrub (black titi area)

Scientific Name	Common Name	Percent Cover	# species
<i>Cliftonia monophylla</i>	Black titi	28.1	1
<i>Ilex glabra</i>	Gallberry	0.5	2
<i>Ilex myrtifolia</i>	Myrtle-leaf holly	1	3
<i>Lachnanthes caroliana</i>	Redroot	3.7	4
<i>Leucothoe racemosa</i>	Swamp doghobble	4.6	5
<i>Lyonia lucida</i>	Fetterbush	5.1	6
<i>Persea palustris</i>	Swamp bay	6.7	7
<i>Taxodium ascendens</i>	Cypress	0.5	8
<i>Vaccinium corymbosum</i>	Highbush blueberry	1.6	9
	Bare ground	48.2	

Figure 21. Transect 7. Species and Occurrence (Hydric Pine Flatwoods)



UMAM Polygon V1, Management Unit 5, Inland Ponds and Sloughs

UMAM Polygon V1, Management Unit 5 consists of 24,880 acres of a dammed slough (Dykes Mill Pond) that will be restored to slough/marsh. The overstory for most of the area is absent though a fringe of cypress remains along the ponds edge. The majority of the area is dominated by water lilies and other aquatic submerged vegetation. Reclamation activities within this polygon include the removal of Dykes Mill Pond dam, and spanning the gap with railcar bridge, planting of cypress and black gum saplings and planting the area with herbaceous and shrub species, if after 2 years, the native wetland understory is < 50%. Dykes Mill Pond was removed in August of 2006 and bridge construction completed in April 2007. With the removal of the dam there have been great changes to the pond. By September 2007 most of the pond had evaporated leaving only small flooded areas. Wet prairie vegetation has greatly spread across the newly exposed sediments and a braided stream channel has emerged across most of the previously flooded area. Sampling last year occurred from a canoe while this year I was able to walk across the entire pond.

In 2006, a total of 7 species were observed within transect 9. The species were common to freshwater marshes within the region. No exotic species were observed. The dominant species observed was fragrant water lily with 45 % cover. Florida yellow bladderwort was also common with 19.2 % cover. Open water was common with 34% cover, indicating that much of the transect occurs in what is currently a pond. Wildlife was observed included wood ducks and a great egret.

In 2007, a total of 11 species were observed within transect 9. Species were common to wet prairies with some minor freshwater marsh species. This represents a major

shift in species composition and reflects the shift from an aquatic to wet prairie. No exotic species were observed. Fragrant water lily cover was greatly reduced from 45% in 2006 to 3.23% cover in 2007. Florida yellow bladderwort was not observed within the transect and open water was also greatly reduced from 34% cover to 2.2 % cover. Another significant occurrence was the cover of bare ground which did not exist in 2006, but represented 41% of the cover in 2007. The two dominant plant species were horned beaksedge with 30% cover and a beaksedge that was not in flower with 12% cover, both species common to wet soils and not tolerant of aquatic systems. A species of note, *Drosera intermedia* (Water Sundew) a state threatened species was commonly observed. Wildlife observations included a pair of sandhill cranes (State Threatened species), fresh hog tracks, little blue heron, great egret, and chipping sparrows.

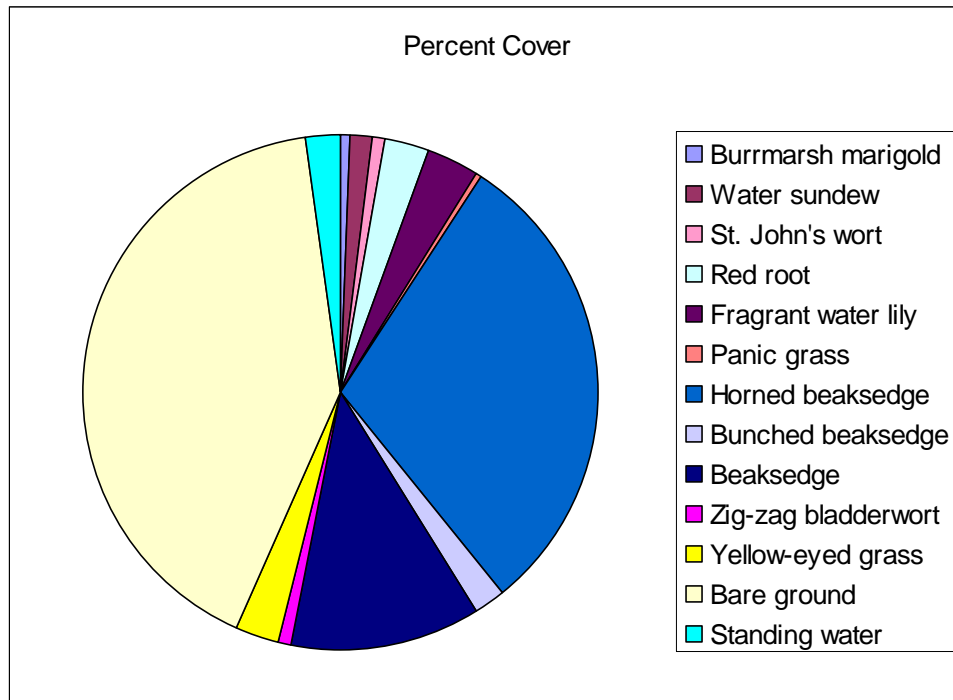
Interim Success Criteria:

Most of the management activities used to restore UMAM VI, Management Unit 5 have been completed. The archeological study was completed and the dam removed in August of 2006. The new bridge was completed in April of 2007. Since the removal of the dam the pond continues to drain. To date a shallow pond remains with the majority of the system returning to a wet prairie. Cypress trees will be planted along the edges of this system in the winter of 2007/2008.

Table 11. Transect 9. Species and Occurrence (Slough / Marsh)

Date: 11/8/2007		Transect 9	Polygon: 5
Overstory: None: Dykes Mill Pond			
Scientific Name	Common Name	Percent Cover	
Bidens mitis	Burrmarsh marigold	0.61	
Drosera intermedia	Water sundew	1.43	
Hypericum fasciculatum	St. John's wort	0.8	
Lachnanthes caroliniana	Red root	2.7	
Nymphaea odorata	Fragrant water lily	3.23	
Panicum sp.	Panic grass	0.33	
Rhynchospora inundata	Horned beaksedge	30	
Rhynchospora microcephala	Bunched beaksedge	2	
Rhynchospora sp.	Beaksedge	12	
Utricularia subulata	Zig-zag bladderwort	0.7	
Xyris sp	Yellow-eyed grass	3	
	Bare ground	41	
	Standing water	2.2	

Figure 22. Transect 9. Species and Occurrence



Qualitative Monitoring

Materials and Methods

Qualitative vegetation monitoring will include assessment of the vegetation, both ground cover and planted trees, wildlife use observations, and general habitat health. Pedestrian surveys increase site coverage and include a 30+ minute meandering walk-path intended to provide information useful in management and to determination the success of management activities. A walk path traversed as much habitat as possible. The pedestrian walk-path continued as long as species were being added, however, once additional species were not recorded for 3 minutes the survey was complete. Representative photos and a community description and health were provided for each walk-path. Fuel load for each habitat was determined and the presence of any threatened or endangered species were recorded. Plants were listed in the data sheet in the following categories (tree, shrub, vine or herbaceous) to give a better understanding of composition of the habitat. Wildlife observations were also recorded for each walk-path (Figure 13) provides the location and coverage of transects and the data sheets can be found in (Appendix 4).

Results and Discussion

A total of 13 pedestrian transects were located at the SHLMB (Figure 13) Three pedestrian surveys were located in Management Unit 1, portions of UMAM Polygon IV,

one in Management Unit 2, UMAM Polygon V, one in Management Unit 4, portions of UMAM Polygon IV, four in Management Unit 10, Polygon III, three in Management Unit 12, UMAM Polygon I, and one in Management Unit 14, portions of UMAM Polygon IV (Appendix 7).

Management Unit 1, UMAM Polygon IV, Preserved High Quality Forested and Herbaceous Wetlands

Management Unit 1, UMAM Polygon IV consists of 574.839 acres of a wide variety of preserved wetland habitats including approximately FLUCCS: 621 – Cypress, 617 – Mixed Wetland Hardwoods, 644 – Emergent Aquatic Wetlands, 611 – Bay Swamps, 641 – Freshwater Marshes, 616 – Inland Ponds and Sloughs, 640 – Vegetated Non-Forested Wetlands and 643 – Wet Prairies. The management goal for this polygon is the preservation of the existing high quality wetlands. Two of the pedestrian survey paths (M8 and M9) in Management Unit I, UMAM Polygon IV, were located in cypress dominated wetlands, while the third pedestrian survey path (M10) was located in an overgrown hydric pine flatwoods. However it is suggested that this transect be kept but the designation and analysis changed to the more appropriate Management Unit 2, UMAM Polygon V.

In 2006, a total of 38 species were observed in M8, while 32 species were observed in M9). Twenty nine of the species were common to both transects. Five tree species were observed in M8 while 3 tree species were observed for M9. Eight and nine shrub species were observed in M9 and M8 respectively, though cover of shrubs was not significant. Twenty one herbaceous species were observed in M8, while 19 herbaceous species were observed in M9. No nuisance or exotic species were found in M8, though a small patch of torpedo grass was observed in M9. Fuel load was low for each area and no threatened or endangered species were observed. Water levels in both areas were extremely low due to the drought and many of the herbaceous species such as pickerel weed, duck potato (*Sagittaria latifolia*) and fragrant water lily (*Nymphaea odorata*) had browned or appeared dead. Cypress seedlings were numerous in both areas. Wildlife was abundant.

In 2007, a total of 39 species were observed for M8 similar in number to last year (Appendix 4). Four new species, bushy bluestem, beauty berry, sweet pepperbush, and pale meadow beauty were observed. These were observed in the normal pool area and germinated due to the prolonged drought that has left the lake beds dry. Three species previously observed, water shield, bog buttons, and bladderwort were not observed, primarily due to the absence of an aquatic habitat. Along M9, a total of 31 species were observed, again similar in number to last year. However 8 species were not observed this year and include water shield, clustered sedge, Virginia willow, silver bay, pickerel weed, duck potato, bladderwort and yellow eyed grass. These are primarily aquatic species and were not found on the dry lake beds. Nine additional species were observed including bushy bluestem, sedge, black titi, witch grass, yaupon, sweet gum, savannah meadow beauty and American cupscale. The new species with the exception of the American cupscale are facultative wet species that have invaded the dry lake beds. Shrub cover for both transects was very low. No nuisance or exotic species were observed. Fuel load

was low for each area and no threatened or endangered species were observed. Water levels in both areas were extremely low due to the drought and many of the herbaceous species aquatic species were absent. A wildfire occurred within this polygon and destroyed approximately 12 acres of cypress by burning the roots and occasionally the trunk of the cypress. Details on the wildfire have been recorded in the Fire Management section. Aside from the continued drought this polygon is very similar to last year.

Interim Success Criteria:

Interim success criteria have been met and include exotic vegetation cover < 2% per acre, nuisance vegetation cover < 5% per acre, and maintaining or improving in ecological function. The systems are healthy and reacting normally to the droughts within the region.

Management Unit 2, UMAM Polygon V, Hydric Pine Flatwoods

Management Unit 2, UMAM Polygon V consists of 146.678 acres of FLUCCS 635 hydric pine flatwoods. The management goal for this polygon includes the enhancement and restoration of the degraded hydric pine flatwoods. Two pedestrian transects (M10 and M11) were located in Management Unit 2, UMAM Polygon V. Both of these areas are overgrown, degraded hydric pine flatwoods dominated by a variety of tree and shrub species. Both areas were burned during the summer of 2005, though fuel loads in both areas are moderate and additional fires are warranted. Dominant species cover along M10 was black ti ti with some silver bay and slash pine, while M11 was moved slightly in 2007 to better reflect the wet flatwoods. The previous transect was located in a mixed bayhead. Wire grass was present in M11, but absent in M10.

In 2006, a total of 32 species (8 trees, 17 shrubs, 4 vines and 3 herbaceous species) were observed along M10.

In 2007, shrub reduction was completed in both areas using a gyrotrack. Shrubs were thinned in June and the areas were burned in December 2007. A total of 40 species were observed in along M10 while 16 species were observed in M11 (Appendix 4). No nuisance exotic species were observed in either area. The increase in species along M10 may be due to increased access to the area due to the gyrotrack and the fact that the site is more of a mixture of wet flatwoods with species from an adjacent bayhead. Successive fires should remove the bayhead species. The lower number of species found in M11 is more reflective of wet flatwood species and an area overgrown by shrubs and the shrub layer reduced by the gyrotrack. Wildlife observed included robin, kingfisher, black vulture, phoebe, anole and cardinal.

Interim Success Criteria:

Interim success criteria include exotic vegetation cover < 2% per acre, nuisance native vegetation cover < 5% per acre, increasing herbaceous groundcover, decreasing density of woody shrub layer, planted pines are surviving and healthy and prescribed burns have been conducted in accordance with fire management plan. The interim success criteria

have been met for this polygon. No nuisance exotic or nuisance native species cover has been observed, and the prescribed burns have been conducted in accordance with the fire management plan. Shrubs were reduced to ground level in both areas using a gyrotrack and both areas while herbaceous vegetation was again observed within the polygon. These sites were burned in December 2007. Due to the numbers of existing pine trees this area will not need supplemental tree planting.

Management Unit 10, UMAM Polygon III, Xeric and Live Oak

Management Unit 10, UMAM Polygon III consists of 493.852 of FLUCCS 421 – Xeric Oak and 427 – Live Oak. Management goals include the preservation and the re-introduction of fire to upland sandhill communities dominated by oaks. Management activities include the introduction of fire using dormant season burns, and the eventual introduction of growing-season burns (anticipated 3 to 5-year and 5 to 7-year burn cycles), and the reduction of oak in portions of management unit as selected by QMS (Qualified Mitigation Supervisor), and monitoring for nuisance / exotic plant species. Other management activities may include the supplemental planting of longleaf pine (436 trees per acre) and wiregrass (6' centers or direct seeding as 2-5 pounds per acre as determined by the QMS. Live and turkey oaks were selectively harvested from portions of Management Unit 10, UMAM Polygon III in September of 2006. As a result the fuel load is high for most of these areas and a prescribed burn is scheduled for a dormant season burn in the winter of 2008/2009. Good coverage of wire grass was observed throughout Management Unit 10 so no additional planting will be required. Initial burns for portions of Management Unit 10 were conducted during the growing season. Wire grass was observed in flower for these areas. Continued warm season burns should ensure an increasing cover of wire grass throughout the polygon. Four transects were located within Polygon 10, M1, M2, M12 and M13).

In 2006, two transects M1 with 44 species (9 trees, 5 shrubs, 3 vines and 27 herbs) and M13 with 54 species (9 trees, 6 shrubs, 2 vines and 37 herbs) were species rich, while M2 with 29 species (6 trees, 6 shrubs, 3 vines and 14 herbs) and M12 with 26 species (12 trees, 3 shrubs, 3 vines and 8 herbs) were generally lacking a diverse herbaceous cover. This may be due to the shading of the understory by overstory oaks. However, all of the transects had between 19 and 35 species in common. Scattered diamond oak and sand pine may also be reflective of a historic lack of fire. No nuisance exotic coverage was observed, though a small patch of Bahia grass was found at the gate adjacent to the road for the transect M1. In the transect M1, a Florida threatened species Gulf coast lupine (*Lupinus westianus*) was located throughout the sand hill upland while smooth barked St. John's wort, a Florida Endangered species, was located adjacent to the solution pond 1. Gopher tortoise burrows were observed along pedestrian transects M12 and M13.

In 2007, two transects, M1 was observed with 67 species (10 trees, 16 shrubs, 3 vines and 38 herbaceous species) while, along M13 62 species (9 trees, 7 shrubs, 3 vines and 43 herbaceous species) was observed (Appendix 4). Along M2 38 species (8 trees, 5 shrubs, 2 vines and 23 herbaceous species) were observed and 34 species were observed along transect M12 (13 trees, 4 shrubs, 3 vines and 14 herbaceous species) (Appendix 4). M1

had 5 newly observed species and 3 species were not observed in 2007 and were sky blue lupine, bladderwort and yellow eyed grass. Ten new species were observed along M13 and two species, dwarf huckleberry and bracken fern were not observed. Along M2 13 additional species were observed while, 4 species Florida jasmine, red chokeberry, pale meadow beauty and lopsided Indian grass were not observed. Finally, M12 also had 13 additional species observed while 5 species were not observed and included American holly, gopher apple, sand pine, shiny blueberry, and Adam's needle. The observation of additional species may be due to increased scrutiny of the polygon and habitat improvement due to successive fires. Aside from a small patch of Bahia grass at the entrance to M1 no nuisance or exotic species were observed. Gulf coast lupine was observed at two transects, M1 and M13. Sand pine and Florida jasmine may have been removed by earlier fires. The habitat all appears healthy and vigorous. These areas were burned during the winter burns in December of 2007. Wildlife observed included a downy woodpecker, pileated woodpecker, raccoon tracks, otter tracks, gopher tortoise, deer tracks, turkey tracks, cardinal, towhee, titmouse and mockingbird.

Interim Success Criteria:

Several interim success criteria have already been met, the exotic species cover (Bahia grass) is a small patch and well below the 2% per acre, and no nuisance native vegetation was observed. Several of these transects are already quite diverse and continued fire within these areas will ensure a diverse sand hill community. Wire grass cover is good to excellent and oaks have been thinned for much of this polygon and these areas were again burned in December 2007. Existing numbers of pine trees meet the permit condition of less than 200 trees per acre.

Management Unit 11, UMAM Polygon II, Upland Slash or Sand Pine Plantations

Management Unit 11, UMAM Polygon II consists of 383.484 acres of FLUCCS 411 Longleaf Pine / Wiregrass restored from slash or sand pine plantations. The restoration goal for this area is to restore the sites to a sand hill community from a sand or slash pine plantation. Management activities will include the re-introduction of growing season burns, removal of planted pines, re-planting with 436 long leaf pine seedlings per acre and if needed the addition of wire grass tublings or seeding. Initial fire was introduced to the slash pine areas in 2005, while site prep burns will take place in the winter of 2008 for the previous sand pine areas. Trees were harvested from April to November 2007. One transect (M5) was located within Management Unit 11, UMAM Polygon II. This area had already undergone a warm season burn that greatly reduced the shrub cover. Overstory was removed in April 2007. Much of the understory was in fairly good condition with good diversity typical of the sand hills.

In 2006, a total of 50 species (6 trees, 7 shrubs, 2 vines, and 35 herbaceous species) were observed. Wire grass was the dominant grass species within the area. However, the emerging shrub layer was dominated by diamond oak.

In 2007, a total of 49 species were observed (7 trees, 8 shrubs, 2 vines and 32 herbaceous species) (Appendix 4). Nine new species were observed while 10 species initially present

were not observed. The changes in species composition may be due to the tree harvest which greatly disturbed the understory. Species were common to the sandhill community. Wire grass was common and appeared to be the dominant species. Much of the shrub layer was reduced to sprouts and much of the diamond and live oak was destroyed during the tree harvest. A site prep burn is planned for winter 2008.

Interim Success Criteria:

The interim success criteria have been met within this transect. No nuisance or exotic species were observed. Wire grass is the dominant species. The ground cover is very diverse and typical of a sandhill. The slash pine was harvested in April of this year and a site prep burn will occur during the winter of 2008.

Management Unit 12, UMAM Polygon 1, Sand Hill

Management Unit 12, UMAM Polygon 1 consists of 263.52 acres of FLUCCS: 411 – Longleaf Pine / Wiregrass (Mesic Pine Flatwoods) restored from 421 –Xeric Oak habitat. The goal for this polygon is to restore a diverse sand hill. Restoration activities include the re-introduction of growing season burns, removal of oak \leq 12 inches DBH and herbicide treatment of stumps, planting of longleaf pine (436 trees per acre), and monitoring for nuisance / exotic plant species. Oak eradication was conducted for Management Unit 12, UMAM Polygon 1 during the summer of 2005. . Fire was re-introduced in 2004 to the polygon and cover of the once dominant shrub woody goldenrod has been greatly reduced. Since the initial fire, two additional fires, the most recent in December of 2007, further reduced shrub and woody goldenrod cover. Wire grass has flowered for two consecutive years in most of this habitat. Wire grass is again the dominant herbaceous species within this polygon. The sand hill habitat within this polygon is very diverse and considered high quality with an excellent herbaceous species composition. The majority of the polygon was planted with longleaf pines in 2004, however, several areas on the north side of Green Head Branch will be re-planted with in 2008. Two transects (M3 and M4) were located within this polygon.

In 2006, a total of 35 species (7 trees, 2 shrubs, 2 vines, and 24 herbs) were observed along pedestrian transect M3, while 68 species (8 trees, 9 shrubs, 2 vines and 49 herbs) were observed within M4. The species were typical of the sand hill though in wetter areas of M4 adjacent to Little Deep Edge Pond, more pine flatwood vegetation occurred. Small patches of centipede grass were observed along the pedestrian transect M3.

In 2007, a total of 42 species (8 trees, 7 shrubs, 2 vines and 25 herbs) were observed along M3 (Appendix 4). The additional, shrub species observed may be due to expanding the path further to the west and up an old ridgeline. Shrubs were typical of the sandhill and high in wildlife value. Twelve new species were observed within this transect and may again be due to expanding the pedestrian survey. Five species, Southern magnolia, golden aster, bracken fern, Carolina milkweed and pinewoods milkweed were not observed in this years sampling. This may be due to the later sampling when some of these species are less noticeable following flowering and fruiting. Along the pedestrian transect M4 a total of 69 species (8 trees, 11 shrubs, 2

vines and 48 herbaceous) species were observed. A total of 17 new species were seen this year and 13 species previously observed were not seen this year. The area surrounding this pedestrian meander was burned during the winter of 2007 and the fire was particularly hot killing some turkey and live oaks and also may have removed some of the less fire tolerant species. Centipede grass which was observed as a minor component in the polygon was completely absent following the fire. Another species apparently removed by the fire was the slender crab grass. Other new species may have emerged from the seedbank once the fire exposed bare ground. Wildlife observed within this polygon included rabbit and raccoon tracks, and an active gopher tortoise burrow. In addition several threatened and endangered species were observed including southern crab apple, smooth barked St. John's wort and Gulf Coast lupine.

Interim Success Criteria:

This polygon has reached many of the restoration goals set forth in the interim success criteria. The three controlled burns within this polygon have greatly reduced the cover of woody golden rod and stimulated the cover of wire grass and other grasses and forbs. Oaks have been reduced to less than 150 trees per acre and the herbaceous vegetation is dominated by wire grass. Longleaf pines have been planted throughout most of the polygon with the remaining areas to be planted in January 2008.

Management Unit 14, portions of UMAM Polygon IV, Lakes

Management Unit 14, portions of UMAM Polygon IV consists of 164.958 acres of FLUCCS 520, lakes. The goal for this polygon is the preservation of the lake and aquatic habitat. One pedestrian transect (M6) was placed within the polygon around Garret Pond. The water levels at Garret pond were very low due to the summer drought. Much of the lake bottom was exposed and had been colonized by a variety of wetland grasses and sedges. Two small pools remained.

In 2006, a total of 36 species (5 trees, 7 shrubs, 1 vine and 23 herbs) were observed. Vegetation was typical of a diverse pond within the region. A small patch of torpedo grass was observed at the boat ramp to the pond. A zone of Smooth barked St. John's wort and seedlings was observed just below the shrub layer surrounding the pond. Some species such as pickerel weed appear to have been set back by the drought and most of the leaves and stem have browned.

In 2007, a total of 24 species were observed (5 trees, 7 shrubs, 1 vine and 11 herbs) (Appendix 4). Due to the extended drought, this pond has been dry for approximately a year. The reduction in herbaceous species is due to the lack of water. Most of the absent species were aquatic or required wet conditions to thrive. The small patch of torpedo grass at the old boat launch had been sprayed during the summer and none was observed during the fall sampling. Dog fennel has continued to invade the site and many of the aquatic species were absent.

Interim Success Criteria:

Exotic vegetation cover is < 2% per acre and no nuisance native vegetation cover was observed. The site appears to be maintaining normal ecological functions during a prolonged drought.