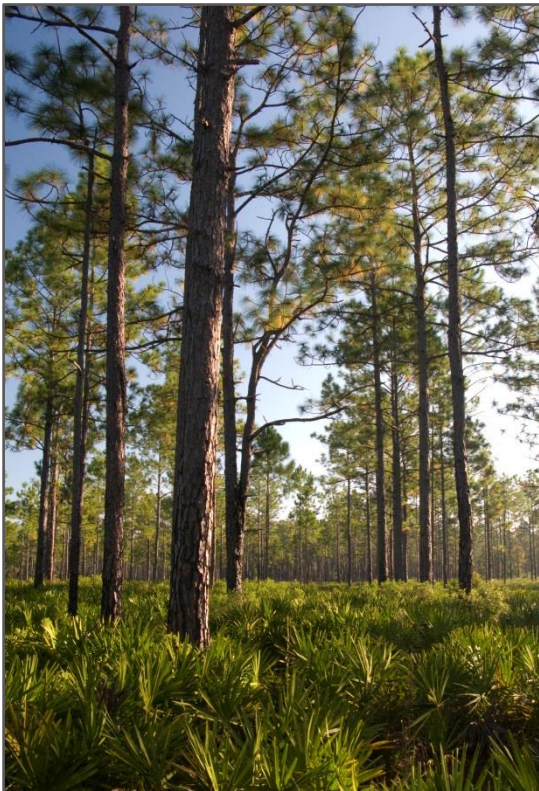# Longleaf Pine Ecosystem Geodatabase v.1 Final Report

June 2014

A cooperative project between Florida Natural Areas Inventory and the Florida Forest Service

EXECUTIVE SUMMARY

Florida Natural Areas Inventory (FNAI) partnered with Florida Forest Service (FFS) to develop the Longleaf Pine Ecosystem Geodatabase (LPEGDB), a project to design and populate a spatial database that will serve as the central repository for data on the distribution and condition of LPEs in Florida. The LPEGDB is part of a larger effort by the FFS to conduct a Longleaf Pine Forest Conservation Assessment to inform conservation, protection, management and enhancement of Longleaf Pine Ecosystems (LPE) on public and private lands in Florida. The project was divided into four major tasks: 1) Compilation of existing LPE data and identification of data gaps; 2) Collection of LPE condition field data via Rapid Assessment; 3) Integration of existing and Rapid Assessment data into LPEGDB; and 4) Summary of LPE conditions and priorities.

Potential LPE areas were identified from the Florida Cooperative Land Cover Map ([CLC]; FNAI 2010) and refined with existing field survey data from FNAI and other sources. Confidence tiers were developed to categorize knowledge gaps in both presence and condition in order to prioritize assessment needs and guide field surveys. FNAI coordinated with FFS to design a field protocol for Rapid Assessment of ecological condition and conducted one-day training seminars to instruct county foresters in use of the protocol. Rapid Assessment files were deployed to 38 county foresters who collected data from Jan. – Aug. 2013. FNAI field biologists assisted with data collection as requested by FFS. The final data submission by county foresters included 1,835,840 acres in 61 counties with 38% assessed, 46% excluded (primarily because of inaccessibility), and 6% not assessed. FNAI conducted Rapid Assessments on 354,244 acres in 29 counties. The Rapid Assessment filled significant gaps in the knowledge of LPE distribution and condition in Florida. Prior to the assessment, ecological condition data existed for about 376,000 acres of LPEs; the Rapid Assessment contributed an additional 843,000 acres of ecological condition assessments, 79% of which was on private lands. Knowledge in the distribution of LPEs also substantially improved. In deployed areas where LPE occurrence confidence was moderate or potential the Rapid Assessment confirmed the occurrence of LPEs on more than 760,000 acres and the absence on about 413,000 acres.

According to America's Longleaf 2013 Range-Wide Accomplishment Report, longleaf pine dominant ecosystems total 4.28 million acres in the U.S. This project confirmed the location of 2.2 million acres of LPEs in Florida, indicating that Florida is home to over 51% of all known longleaf pine. With integration of the rapid assessment into the LPEGDB, 53% of the known longleaf acres in Florida now have ecological condition data. Another 170,000 acres have been identified on the ground or through aerial photo interpretation for the CLC as sandhill, upland pine, or upland mixed woodland indicating likely occurrence of LPEs. Data confirmed that about 1.6 million acres initially identified as potential longleaf pine are not LPEs and can be removed from the LPEGDB. There are still 4.9 million acres where the occurrence of longleaf pine forests is uncertain. The vast majority of this, about 4 million acres, is pine plantation, a significant portion of which may not have composition or function adequate to be considered LPEs. Nevertheless some portion of this is likely to support longleaf pine and merits further assessment.

Ecological condition data were crosswalked into three management levels described in the Range-wide Conservation Plan for Longleaf Pine (America's Longleaf 2010): acres to maintain, improve and restore.   Less than half of LPE acreage is at the maintain level for these categories: presence of mature longleaf (37%), other canopy hardwoods cover (28%), herbaceous and pyrogenic grass cover (20% and 33%, respectively), fire interval (32%), and overall condition rank (44%).

To further the goal of retaining LPEs in maintenance condition and inform decisions by various conservation programs the LPEGDB condition data were synthesized into LPE Draft Protection Priorities derived from ecological condition (condition rank, pyrogenic grass cover, or hardwood cover) and size of LPE areas. This dataset should be revised with input from other longleaf experts but eventually can be used to produce statewide summaries or to inform conservation programs.

This project represents important progress in LPE data collection on private lands and consolidation of existing LPE data. Future enhancements to the LPEGDB should include information from a revised forest stands database for state forests; improved information from public conservation lands; assessment of private pine plantations; and a critical review by and collaboration with longleaf pine partners.

ACKNOWLEDGEMENTS

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LIST OF APPENDICES

INTRODUCTION

Longleaf pine (*Pinus palustris*) is an integral part of numerous natural vegetative plant communities across the southeastern U.S., collectively referred to in this document as the longleaf pine ecosystems (LPE). The importance and decline of this iconic tree and associated ecosystems have been described in many reports and publications. Oswalt et al. (2012) provide an excellent overview in a USDA Technical Report (SRS-166) entitled "History and Current Condition of Longleaf Pine in the Southern United States." The consensus is that as a result of fragmentation, unsustainable harvest, conversion to other land uses and vegetative types, and exclusion of natural fire regimes the longleaf pine ecosystem has declined from upwards of 90 million acres to less than 3 million. This remaining acreage exists as fragmented stands in varying degrees of isolation. Because these ecosystems require active and specific management including prescribed fire, much of the remaining acreage is thought by scientists, conservationists, and land managers to be in poor condition (Oswalt et al. 2012). Recently, many organizations and agencies have taken steps to prevent further loss, improve what's left, and restore the longleaf pine ecosystem where practicable. An exceptional example is outlined in the "Range-wide Conservation Plan for Longleaf Pine" prepared by America's Longleaf, 2009. This document provides a focused approach to restoration and management of longleaf pine with the goal of conserving and improving existing stands, and increasing the extent of longleaf pine forests across the south to 8 million acres within 15 years. In order to monitor progress and evaluate success toward this and other similar goals a comprehensive inventory of sites supporting the longleaf pine ecosystem is necessary.

Florida Natural Areas Inventory (FNAI) partnered with Florida Forest Service (FFS) to develop the Longleaf Pine Ecosystem Geodatabase (LPEGDB), a project to design and populate a spatial database that will serve as the central repository for data on the distribution and condition of longleaf pine ecosystems in Florida. This project derives from and fulfills objectives described in the Florida Forest Action Plan, also known as Florida Resources – 2010 Florida's Statewide Strategies (FFS 2010). A priority goal under the issue Longleaf Pine Ecosystems is reliable and accurate inventories and assessments of LPE on public and private land in accessible databases. The project objectives were to develop a database that will be accessible to Florida Forest Service county foresters and land managers, compatible with other statewide natural resource databases, compatible with regional longleaf pine ecosystem mapping efforts, and useful for developing conservation and management priorities for longleaf pine ecosystems in Florida. The LPEGDB is part of a larger effort by the Florida Forest Service to conduct a Longleaf Pine Forest Conservation Assessment to inform conservation, protection, management and enhancement of longleaf pine ecosystems on public and private lands in Florida.

METHODS

The project was divided into four major tasks conducted from March 2012 through December 2013:

1. Compilation of existing LPE data and identification of data gaps;
2. Collection of LPE condition field data via Rapid Assessment of potential LPE sites;
3. Integration of existing and Rapid Assessment data into LPEGDB; and
4. Summary of LPE conditions and priorities.

Analysis of Existing LPE Data

FNAI worked with FFS to compile existing GIS data on the distribution of longleaf pine ecosystems (LPE), both potential and known longleaf areas, and on the extent of ecological condition information. Potential LPE areas were identified using the Florida Cooperative Land Cover Map (CLC) v.2 (FNAI 2010). The CLC is a polygon-based statewide land cover that combines best available data from multiple sources, including site-specific ground-

truthed data for more than 6 million acres and ecologically-based aerial photo interpretation of seven focal natural communities, including scrubby flatwoods and sandhill, for approximately 1.5 million acres. The following classes were extracted from the CLC as potential LPE areas: Upland Coniferous, Upland Pine, Sandhill, Mesic Flatwoods, Scrubby Flatwoods, Coniferous Plantations, Wet Flatwoods, Wet Coniferous Plantations, and Cutthroat Grass Flatwoods. Only polygons within the range of longleaf pine were retained.

Longleaf pine sites also occasionally occur in other land cover classes such as Mixed Hardwood-Coniferous or Unimproved/Woodland Pasture. Polygons in other CLC classes were added based on overlap with datasets that indicated the presence (or likely presence) of longleaf pine, including rare species survey data, red-cockaded woodpecker colony data, and observations collected during the course of various site evaluations (Table 1). The initial database contained 8.5 million acres of potential LPE areas in 61 Florida counties.

Table 1. Data sources compiled at project onset to determine data gaps and identify assessment priorities for LPE distribution and condition.

Data Source	Description
FNAI Natural Community Mapping Points 2003-2012	GPS point data collected as part of natural community mapping and monitoring projects for multiple agencies; much of these data have associated ecological condition data
FNAI Element Occurrence Database	Occurrence locations for natural communities and rare species with location descriptions that may include longleaf pine and associated communities
FNAI Other Survey Data	Data from various field surveys associated with projects such as rare species inventories, Florida Forever proposal assessments, and conservation easement monitoring
Red-cockaded woodpecker colony data	FNAI compiled comprehensive data sources for cavity trees and cluster centers in 2012-2013
FFS Compiled Longleaf Stands	A polygon dataset compiled by Florida Forest Service from multiple sources including USFS stands, FFS state lands inventory, FFS private land records, Tall Timbers Research Station, SRWMD stands, and SJRWMD stands. This dataset includes only stands of longleaf pine and contains some ecological condition information.
Florida Cooperative Land Cover Map v2.0 and 2.3 (http://www.fnai.org/LandCover.cfm)	Statewide land cover data based on multiple sources, including ground-truthed natural community polygons and aerial photo interpreted polygons.

Confidence Tiers

Confidence tiers were developed to categorize knowledge gaps in both presence and condition in order to prioritize assessment needs. Potential LPE areas were assigned confidence tiers as described in Table 2. Confidence tiers are summarized by acreage on public and private lands in Table 3.

Table 2. Tiers assigned to potential LPE polygons to describe confidence in LPE occurrence based on existing data.

Tier	Description
1A	Longleaf pine was observed and condition data are available from FNAI. Detailed condition information exists; these areas do not need further assessment.
1	Longleaf pine was observed; we have high confidence that this is a longleaf pine site; existence of condition data are not confirmed.
2	Longleaf pine was observed but the observation may not reflect current conditions, or longleaf pine is assumed from red-cockaded woodpecker records but not directly observed. We have some reasonable indication of longleaf but there is some uncertainty because of the year of observation or indirect confirmation.
3	The CLC polygon is classified as sandhill, upland pine, or upland mixed woodland; longleaf pine has not been confirmed; or longleaf pine was observed but the spatial accuracy of corroborating source is low. Confidence is based solely on the natural community type. Sandhill, upland pine and upland mixed woodland are expected to have a longleaf pine canopy.
4	The CLC polygon is classified as mesic, wet or scrubby flatwoods, upland coniferous, or coniferous plantation. Confidence is based solely on the natural community type. We are uncertain of the current presence of longleaf pine in these landcover types.

Table 3. Acreage of potential LPE areas within confidence tiers on public lands managed for conservation purposes, private lands with conservation easements, and other private lands prior to rapid assessment.

Tiers	Public Conservation Lands	Conservation Easements on Private Lands	Other Private Lands	Total
1A	423,837	24,056	63,109	511,002
1	283,885	11,397	151,201	446,482
2	1,089,652	83,447	918,528	2,091,627
3	57,675	12,476	501,940	572,091
4	671,966	180,064	4,130,733	4,982,763
Total	**2,527,014**	**311,441**	**5,765,510**	**8,603,965**

Rapid Assessment Priorities

The confidence tiers were used to estimate the acreage in need of assessment as well as further guiding which areas to assess first (Fig. 1). The area in Tiers 1 – 4 (ca. 8 million acres) exceeded what could reasonably be assessed in the scope of this project. With guidance from FFS, polygons were excluded from assessment either because ecological condition data already existed or because the polygon was likely not a functioning LPE (Fig. 2). A subset of sites totaling 6,785,463 acres was excluded from field assessment based on the following filters:

1. Site was in Tier 1A and therefore had detailed ecological condition data from FNAI;
2. Site was in FFS Compiled Longleaf Stands dataset with at least some ecological condition data assumed;
3. Site was within a managed conservation land boundary where we assumed existing data might be available from the land manager;
4. CLC classification was coniferous plantation and less likely to be a longleaf pine ecosystem;
5. Polygon was below 40 acre size threshold, or part of a group of polygons within 30 m of each other that when combined totaled <40 acres.

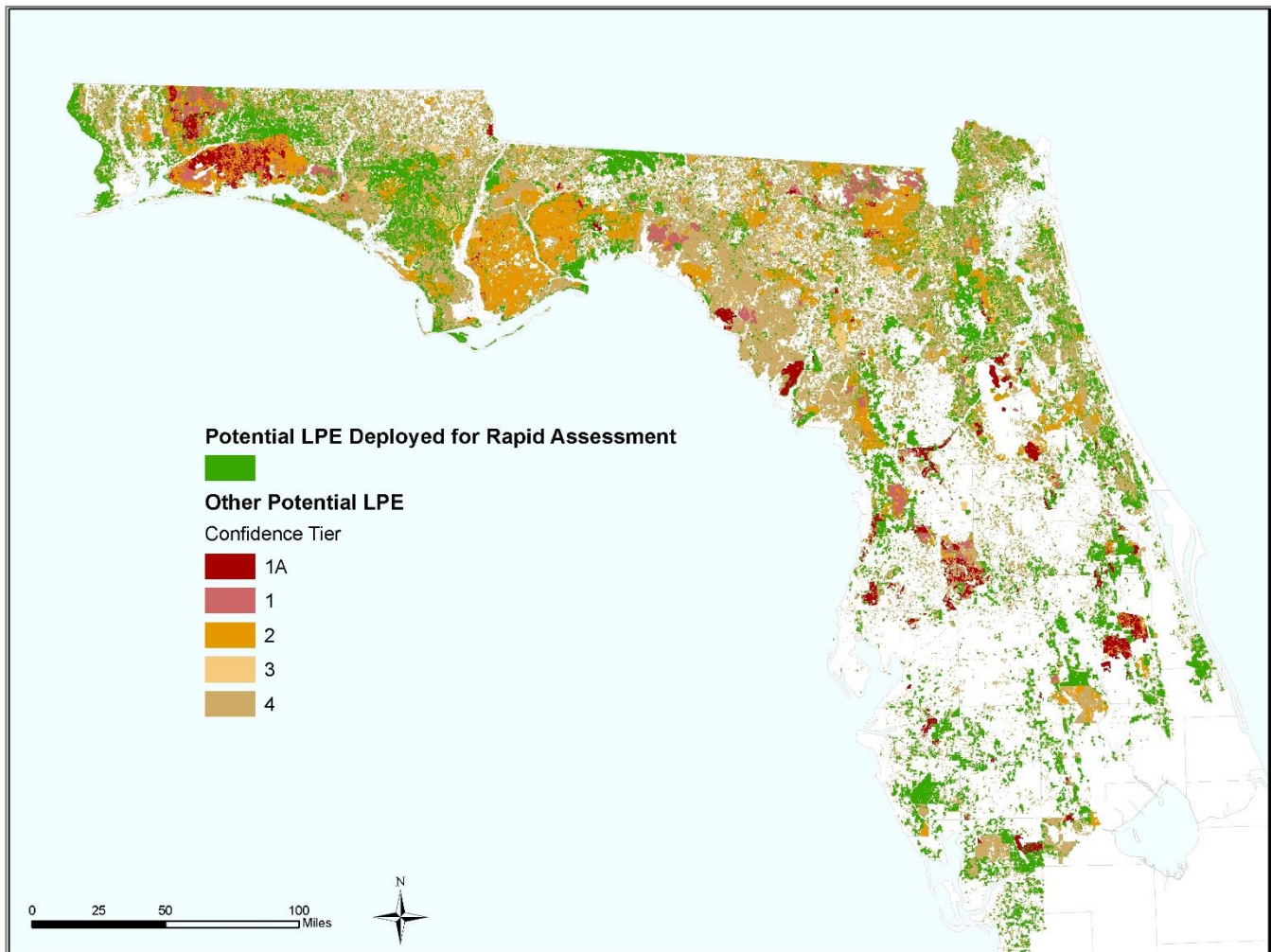The remaining polygons totaling 1,818,501 acres were included for assessment (Figs. 1 and 2).

Figure 1. Areas deployed for Rapid Assessment and confidence tiers of remaining potential LPE areas.
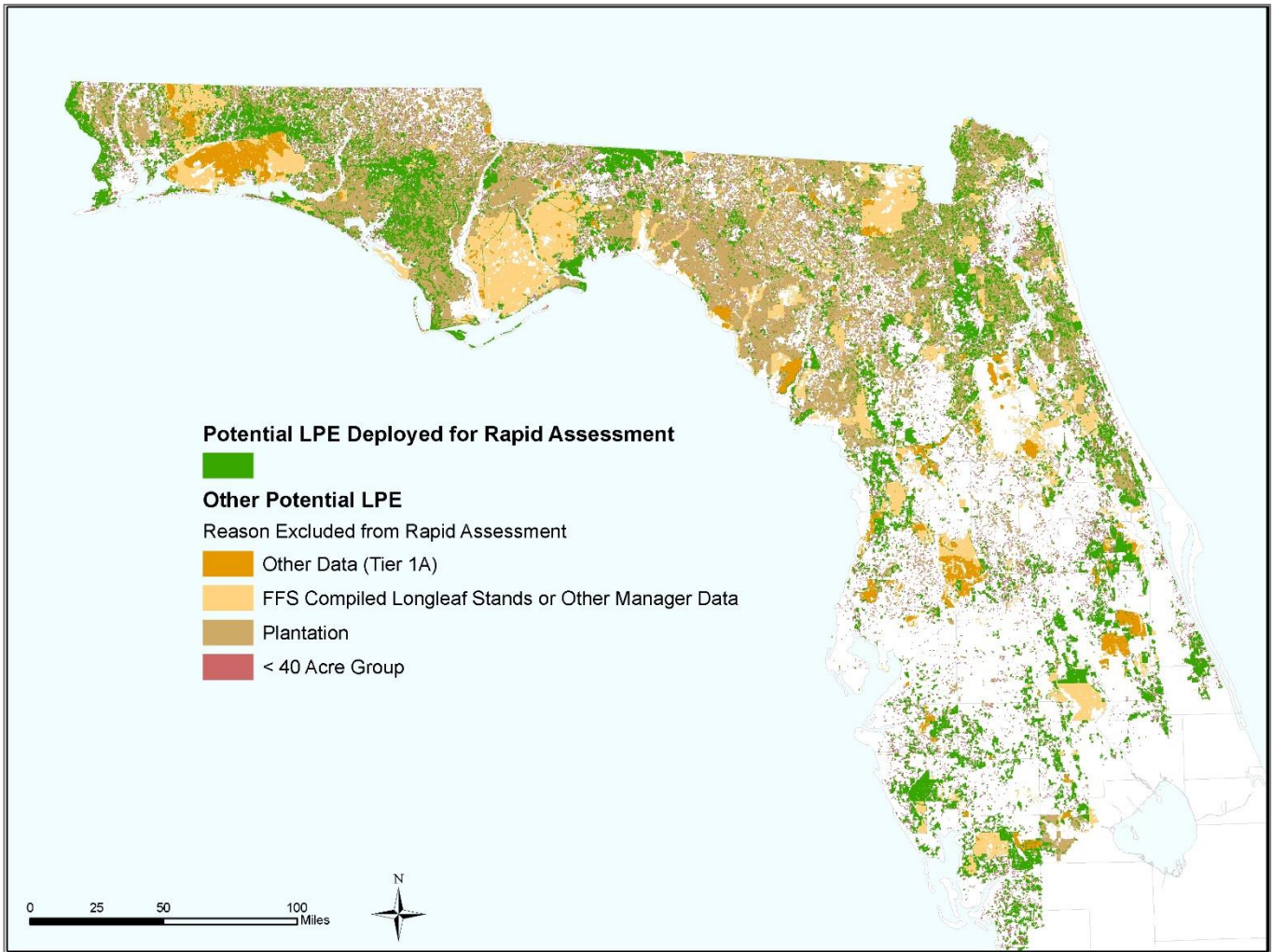
Potential LPE Deployed for Rapid Assessment
■ (green)

Other Potential LPE
Reason Excluded from Rapid Assessment
■ Other Data (Tier 1A)
■ FFS Compiled Longleaf Stands or Other Manager Data
■ Plantation
■ < 40 Acre Group

0   25   50   100 Miles

N

Figure 2. Areas deployed for Rapid Assessment and filters for excluding the remaining potential LPE from the Rapid Assessment.

Rapid Assessment of LPE Conditions

Assessment Design

FNAI coordinated with FFS to design a field protocol for Rapid Assessment of ecological condition. Existing assessment protocols from other programs such as NatureServe longleaf integrity indicator metrics developed for the USFS, and FNAI natural community mapping and ecological condition metrics were considered. A primary consideration also was the total acreage targeted for assessment (1.8 million acres) and the need for efficient data collection. Ultimately a set of concise attributes was chosen for canopy, midstory and ground layer conditions in Florida that could readily be discerned from a roadside view of the site (Table 3). See Appendix A for a detailed description of Rapid Assessment attributes.

The Rapid Assessment protocol was translated into an ESRI file geodatabase schema in ArcGIS 10 to enable disconnected editing/data collection with ArcPad 10. An identical file schema package containing assessment polygons and related data extracted for each county (or county group) was deployed to each county forester. A detailed description of the Rapid Assessment protocol including GIS file schema is provided in Appendix B.

Table 3. Ecological condition data collected for Rapid Assessment of longleaf pine ecosystems in Florida.

Field	Field Description
Longleaf Pine in Canopy	CANOPY: Presence and dominance of longleaf pine in the canopy.
Longleaf Pine Age Structure	CANOPY: Age structure of longleaf pine in the canopy.
Longleaf Pine Basal Area	CANOPY: Estimated basal area in square feet per acre of longleaf pine for the entire polygon.
Turkey Sand Post Cover	CANOPY: Percentage cover of turkey oak and sand post oak >16 feet tall.
Other Hardwood Cover	CANOPY: Percent cover of hardwood species >16 feet tall excluding turkey oak and sand post oak.
Other Pine Cover	CANOPY: Percent cover of pine species >16 feet tall other than longleaf pine.
Midstory Cover	MIDSTORY: Percent cover of midstory woody-stemmed plants (including vines and pines) from 6 to 16 feet tall.
Shrub Cover	MIDSTORY: Percent cover of woody plants less than 6 feet tall.
Pyrogenic Grass Cover	GROUND: Percent cover of native perennial graminoids that are maintained by periodic fire (see Appendix A for species list).
Herbaceous Cover	GROUND: Percent cover of all native non-woody, soft-tissued plants regardless of height, including non-woody vines, legumes, and graminoids (grasses, sedges, rushes); does not include non-native pasture grasses.
Fire Evidence	Describes the general time period since last fire as determined by visual evidence within the polygon (e.g. fire scars on trees, standing blackened shrubs).
Invasive Plant Distribution	Describes the extent and distribution of invasive exotic plants within or along the perimeter of the polygon; includes only FLPPC category I and II listed species.
Condition Rank	Ecological condition relative to a natural system (natural vegetative plant community).
Natural Community Type	Describes the dominant historic natural community type (pre-Columbian) within the site.

Assessment Training

Rapid Assessment training materials were developed by FNAI and presented in one-day training seminars for the county foresters on Oct 30, Dec 5 and Dec 12, 2012. Each seminar included lab and field instruction describing the procedures for conducting the Rapid Assessment. The various components of the LPEGDB, as well as the definitions of the data fields and attribute domains, were described and the use of handheld computers for data collection with ArcPad was demonstrated. A series of field sites was visited to discuss the choices for each of the attributes describing the polygon on the ground. This practice helped clarify field interpretation of attributes and facilitate consistent methods of data collection.

County foresters (CFs) were instructed to evaluate each polygon in their assessment file and determine whether to assess it or exclude it from the assessment. Valid reasons for exclusion were inaccessibility or determination that the site was not a functioning LPE.   The protocol required CFs to indicate if a polygon was excluded in the survey status field and give a reason in the comments field. The CFs were also instructed to add new LPE sites if not already delineated in the LPEGDB or if a site was excluded from assessment as pine plantation but still retained components of a functioning LPE. Details of the training including GIS procedures for working with the ArcPad Data Manager extension are described in Appendix B.

Field Data Collection and Submission

Rapid Assessment files were deployed to 38 county foresters in January 2013. CFs submitted interim assessment data on April 1 and June 1 with final submission on August 16, 2013. The interim submissions allowed monitoring

of overall progress but also of potential problems or inconsistencies. FFS was able to allocate staff effort where additional help was needed and provide additional guidance on data collection at these intervals.

In August 2013 FFS contracted with FNAI to help complete the assessment in a region where the county forester position was vacant, and to re-assess a subset of areas throughout the state as an audit of the CF data. From August 1 through September 10, 2013 FNAI field biologists conducted Rapid Assessments throughout the state. Because of limited time for the audit, the effort generally focused on large tracts accessible by state and county roads. In addition to re-assessing polygons that had been previously assessed by the CFs, FNAI also assessed a number of polygons that had been excluded by CFs and added some new LPE sites that were not previously included in the LPEGDB, or that had been filtered from assessment because they were pine plantation.

FNAI established a set of quality control checks and procedures for final assessment data submitted by CFs and FNAI (Appendix C). The most common spatial data problem was overlap between polygons which often occurred when polygon boundaries were edited in the field. All attributes were evaluated for completeness; then a set of additional fields was populated to indicate the status of assessment completion, LPE occurrence and site accessibility.

Integration of Rapid Assessment with Existing LPEGDB

FNAI updated the LPEGDB with the Rapid Assessment data (see Appendix C). Additional analyses were conducted to assign negative longleaf pine ecosystem status to some sites that were not deployed for Rapid Assessment, primarily confidence tier 3 and 4 sites. For example, composition data from natural community mapping points were used to exclude sites where LPE indicators were absent.

LPE Ecological Conditions Crosswalk

The main challenge with integrating Rapid Assessment and existing LPEGDB datasets is the crosswalk of ecological condition attributes which vary between data sources. Condition data from multiple sources, including the Rapid Assessment, were crosswalked into three management levels described in the Range-wide Conservation Plan for Longleaf Pine (America's Longleaf 2010): acres to maintain, acres to improve, and acres to restore. Several groups have drafted criteria for canopy, midstory, and ground layer conditions designed to represent these management levels. Because the condition data did not fit one single set of criteria, data were crosswalked based on a combination of schemes (Table 4; Appendix D) including 2013 draft criteria from the Longleaf Partnership Council (LPC), 2011 draft criteria from the Longleaf Measures Work Group (LMWG), and 2011 East Gulf Coastal Plain Joint Venture (JV) – Longleaf Woodlands Desired Future Conditions version 1.1. Where data did not fit into an existing scheme, FNAI assigned management classes based on expert knowledge. The current crosswalk should be considered a draft in progress; final target conditions should be further informed by input from longleaf partners.

In some cases the assessment class break values did not exactly correspond to the management class criteria values and a 'best fit' approach was used to crosswalk actual assessment attributes into management classes. For example, the recommended desired condition for herbaceous cover is >40% (LMWG 2011) but the closest herbaceous cover class assessment range was 36 – 45%. All areas within this range or greater (i.e. >35%) were crosswalked as acres to maintain (Appendix D).

The basal area attribute was more problematic. The desired maintenance level condition proposed by most groups (based on standards for red-cockaded woodpecker) is basal area of 40 – 70 sq. ft. /acre. In much of Florida, however, longleaf basal area <40 is a natural occurrence. In support of FWC's Objective-Based Vegetation Management (OBVM) program, FNAI recommends a lower threshold of 10 for reference mesic flatwoods sites in central Florida. For the upper threshold we have less information. For this project we assigned a range of 10 – 70

as maintenance level based on the FNAI OBVM recommendation for the lower threshold and existing guidelines for red-cockaded woodpecker for the upper threshold. The crosswalk is complicated, however, in that the basal area choices in the rapid assessment were classes with ranges of 0-30, 31-60, 61-90 and >90. We assigned all classes except >90 as 'maintain' (Appendix D) but expect to address this issue in the next version of the LPEGDB with input from longleaf partners.

Table 4. Management class criteria assigned to LPEGDB ecological condition attributes. See Appendix D for detailed crosswalk of attribute values to management classes. The current crosswalk should be considered a draft in progress; final target conditions should be further informed by input from longleaf partners.

Attribute	Management Class			Source*
	Maintain	Improve	Restore	
Longleaf Pine Canopy	Dominant	Codominant to Occasional-Rare	Absent	LMWG, FNAI
Longleaf Pine Age Structure	Multiple (2+) age classes	One age class	Absent from canopy	LPC
Longleaf Pine Basal Area	10 - 70	<10 or >70	N/A	FNAI
Turkey Sand Post Cover	≤15%	16 - 55%	>55%	FNAI
Other Hardwood Cover	≤5%	6 - 35%	>35%	JV, FNAI
Other Pine Cover	≤15%	16 - 45%	>45%	FNAI
Midstory Cover	≤25%	26 - 75%	>75%	LPC, LMWG
Shrub Cover	≤30%	30 - 75%	>75%	LPC
Pyrogenic Grass Cover	>20%	1 - 20%	<1%	LPC, FNAI
Herbaceous Cover	>40%	10 - 40%	<10%	LMWG
Fire Evidence	≤5 years	>5 years	Not evident	FNAI
Invasive Plant Distribution	Not evident	1 to few patches or present along perimeter only	Many patches within	FNAI
Condition Rank	Excellent to good	Fair	Poor	FNAI

*Crosswalk criteria source: LPC = Longleaf Partnership Council Draft 2013; LMWG = Longleaf Measures Work Group Draft 2011; JV = East Gulf Coastal Plain Joint Venture - Longleaf Woodlands DFC v1.1

RESULTS

Rapid Assessment
The final data submission by county foresters included 1,835,840 acres in 61 counties with 38% assessed, 46% excluded, and 6% not assessed. FNAI conducted Rapid Assessments on 354,244 acres in 29 counties: audits were conducted on 243,504 acres; assessments were completed on 94,056 acres; and new lands were added and assessed on 16,684 acres. For some polygons that had been excluded by the CF, FNAI completed limited assessment information remotely based on previous field visits to Camp Blanding Military Reservation in Clay County, Osceola Pine Savannas Florida Forever Project in Osceola County, and St. Sebastian River State Park in Brevard County, and assigned condition rank for several red-cockaded woodpecker sites based on ancillary data. In areas assessed by both CFs and FNAI, data were reconciled by retaining FNAI data.

LPE Occurrence within Rapid Assessment Areas
The occurrence of longleaf pine was confirmed on 843,940 acres, 79% of which was on private lands; LPEs were absent on 496,571 acres. LPE occurrence status on 570,874 acres remains undetermined primarily because of inaccessibility but also because information was lacking or unclear on the reason for exclusion in the field.   The LPE sites confirmed by Rapid Assessment and remaining data gaps for deployed areas are shown in Fig 3.

LPE Occurrence in Rapid Assessment Areas

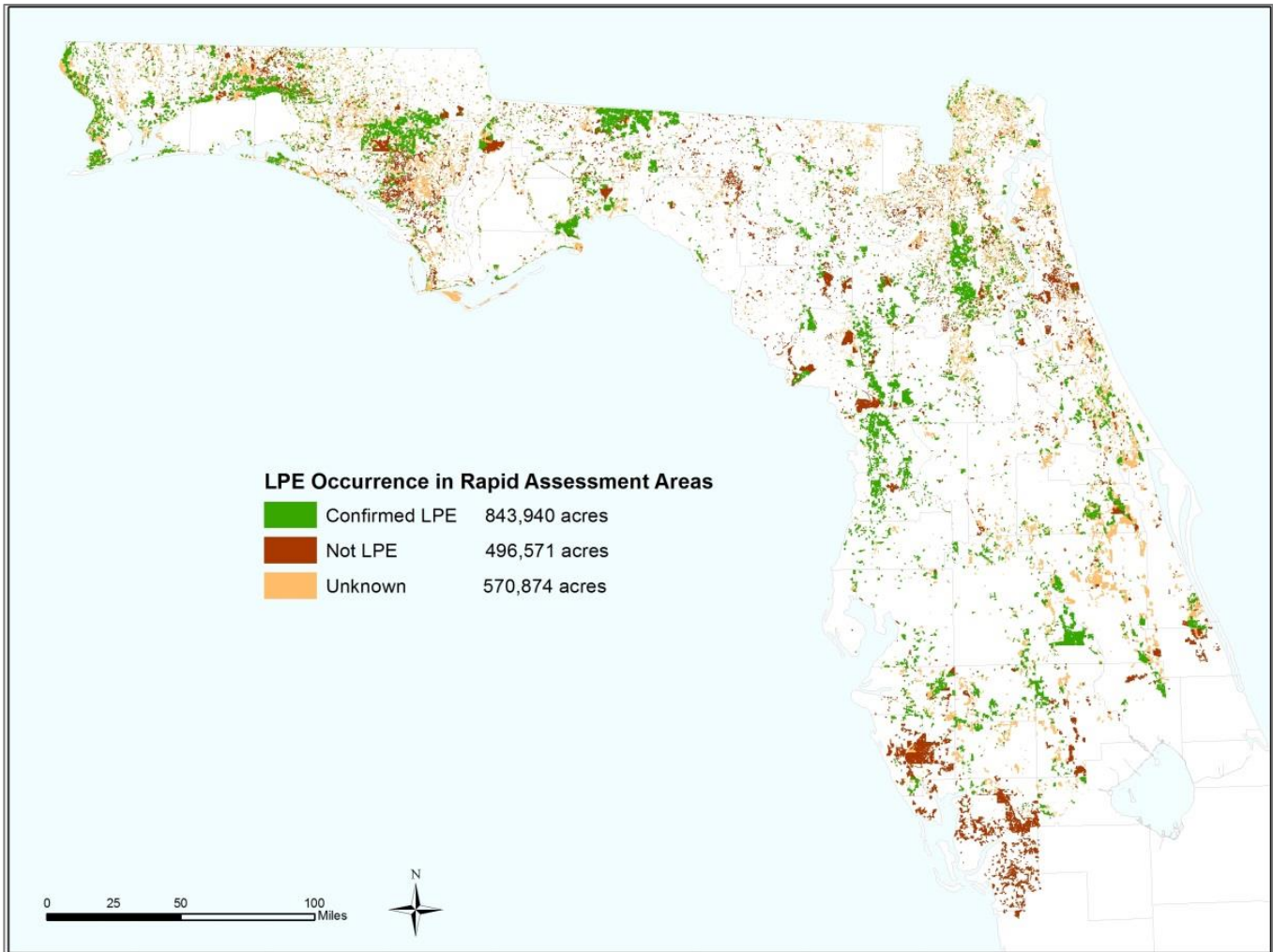|		
🟩	Confirmed LPE	843,940 acres
🟫	Not LPE	496,571 acres
🟧	Unknown	570,874 acres

Figure 3. Distribution of LPE occurrence based on Rapid Assessment results. Only the subset of lands deployed for rapid assessment is displayed.

The Rapid Assessment filled significant gaps in the knowledge of LPE distribution and condition in Florida. Prior to the assessment, ecological condition data existed for about 376,000 acres of LPEs; the Rapid Assessment contributed an additional 843,000 acres of ecological condition assessments. Knowledge in the distribution of LPEs also substantially improved. Table 5 compares knowledge of areas deployed before and after the Rapid Assessment. In areas where LPE occurrence confidence was moderate or potential the Rapid Assessment confirmed the occurrence of LPEs on more than 760,000 acres and the absence on about 413,000 acres.

Table 5. Acreage of LPE occurrence status prior to and following Rapid Assessment. Areas include only those deployed for and/or submitted by assessment; areas remaining as unknown status are not shown.

	Rapid Assessment Results	
LPE Distribution Knowledge Prior to Rapid Assessment	**Confirmed Presence of LPE**	**Confirmed Absence of LPE**
High Confidence in LPE Occurrence (Tier 1)	54,697	3,275
Moderate Confidence in LPE Occurrence (Tier 2)	286,534	34,908
Potential LPE Occurrence- not confirmed (Tiers 3 and 4)	473,950	378,251
Not Previously Identified – Added by Rapid Assessment	28,759	-
Total	843,940	416,434

LPE Ecological Condition within Rapid Assessment Areas

Ecological condition data were assessed on 843,039 acres. Polygons with at least 2 condition fields completed were considered assessed. Although most attributes had a completion rate of >97%, data for turkey oak/sand post oak cover and herbaceous cover were less complete (87% and 92%, respectively), indicating that these features were more difficult to discern from a roadside assessment.

The condition data are summarized for each of the 13 Rapid Assessment condition fields in Figs. 4 - 6. Ecological condition (condition rank) was ranked as excellent or good on 47% of sites. Also notable is that 57% of sites had <15% herbaceous cover and only 28% of sites showed evidence of fire in the last 5 years.

Figs. 7 – 9 show how condition rank, which describes overall ecological condition of the site, relates to other individual rapid assessment attributes. As expected, increasing dominance of longleaf in the canopy, number of longleaf age classes, and higher fire frequency correspond to improved ecological condition rank (Fig. 7). Condition rank diminishes with decreasing basal area; however, sites in excellent condition had a relatively even distribution of basal area classes indicating that in Florida basal area may not be a meaningful indicator of condition.

These comparisons also revealed some unexpected results. Almost 30% of acres (48,440 ac) in poor condition had at least 3 longleaf age classes in the canopy (Fig. 7). Further evaluation of these data shows most was submitted by just three counties, and more than half had very low herbaceous cover, potentially indicating that individuals assessing these counties may have used herbaceous cover as a primary indicator of condition. Also unexpected was that about 25% of acres (34,272 ac) ranked as excellent showed no evidence of fire (Fig. 7). Again, the results are concentrated in just 3 counties (although different counties from the previous example). In this case almost all of the areas had at least 2 age classes of longleaf in the canopy, and more than two-thirds had relatively low midstory cover (<25% cover) , indicating these may have been used as primary indicators of condition.

In Figs. 8 and 9 the display of condition rank vs. attribute is reversed from that in Fig. 7 for ease of interpretation. The most apparent relationships are between increasing hardwood and midstory cover and diminishing condition rank (Figs. 8 and 9). Although these charts are useful for showing patterns, results for individual cover classes are less meaningful because of low acreage represented in some categories. For example, the acreage represented by pyrogenic grass cover of 86-95% in poor condition is 1,200 acres, all of which is in a single county. Further statistical analysis is needed to explain the relationship between attributes.

Longleaf Pine in Canopy

	dominant	codomin.	occasional - rare	absent
%	34%	28%	35%	3%

Longleaf Pine Age Structure

	at least 3 age classes	2 age classes	1 age class	absent from canopy
%	47%	25%	25%	<1%

Longleaf Pine Basal Area

	0 - 30	31 - 60	61 - 90	> 90
%	68%	22%	9%	<1%

Fire Evidence

	< 2 years	2 - 5 years	> 5 years	not evident
%	14%	14%	11%	61%

Invasive Plant Distribution

	not evident	along perim. only	1 to few patches	many patches
%	75%	19%	5%	1%

Condition Rank

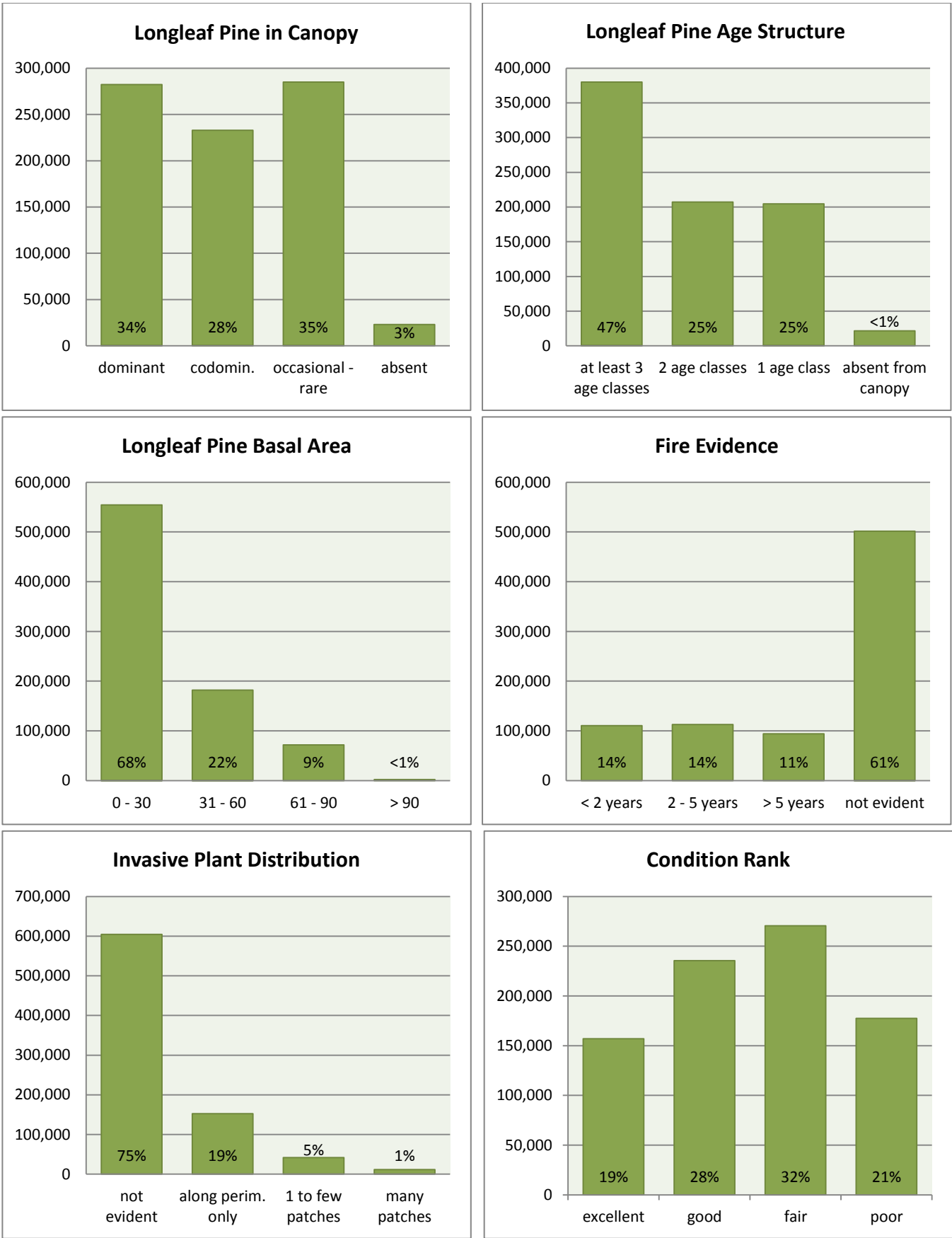|	excellent	good	fair	poor
%	19%	28%	32%	21%

Figure 4. Acreage assessed for longleaf pine canopy attributes, fire evidence, invasive plant distribution and overall ecological condition rank during 2013 Rapid Assessment. Percent of total acres assessed is shown within data bars.
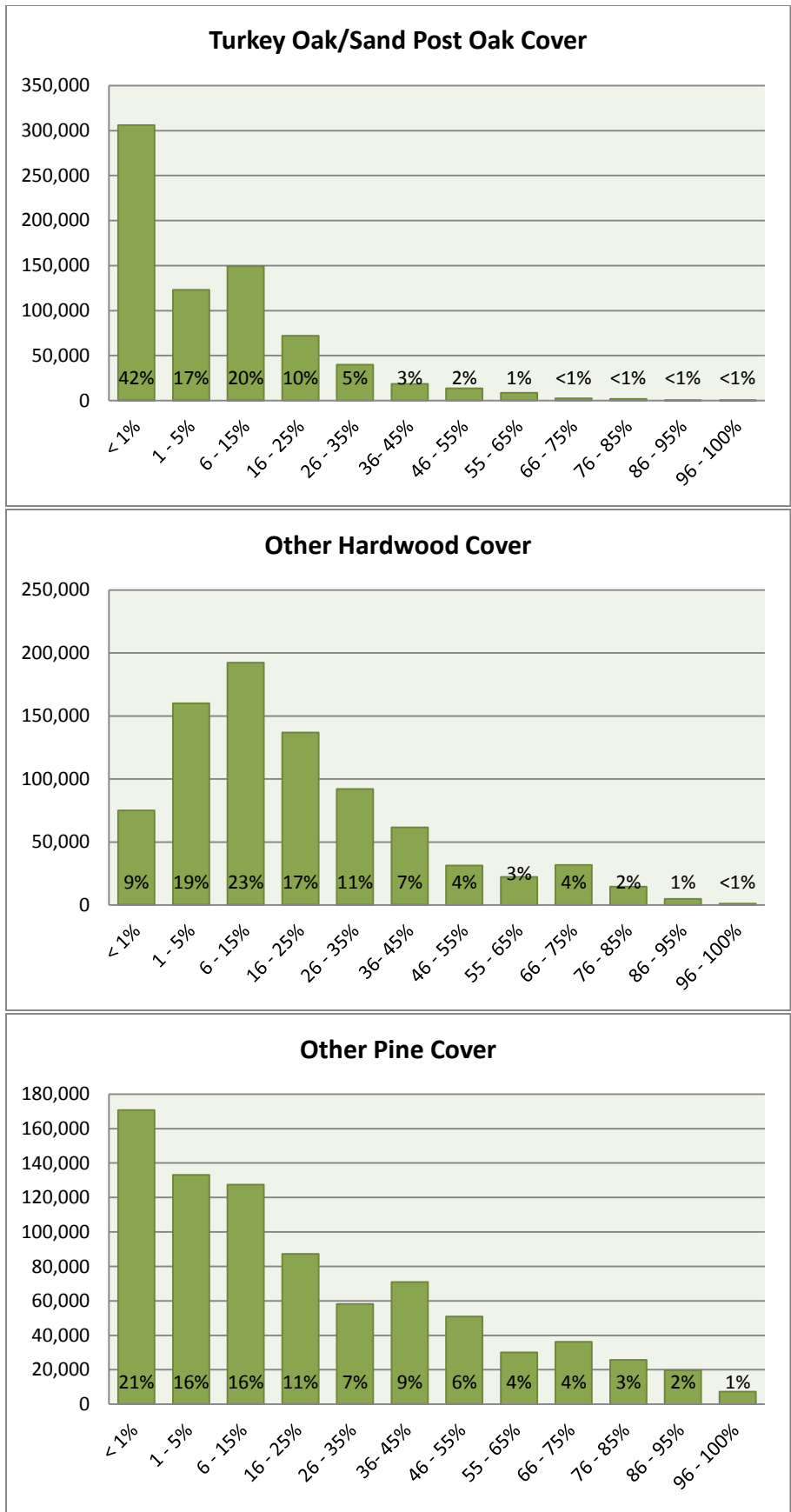
Turkey Oak/Sand Post Oak Cover

Bar chart — Acreage (vertical axis, 0 to 350,000) by canopy cover class (horizontal axis). Percent labels within bars:

Cover class	< 1%	1 - 5%	6 - 15%	16 - 25%	26 - 35%	36 - 45%	46 - 55%	55 - 65%	66 - 75%	76 - 85%	86 - 95%	96 - 100%
Percent	42%	17%	20%	10%	5%	3%	2%	1%	<1%	<1%	<1%	<1%

Other Hardwood Cover

Bar chart — Acreage (vertical axis, 0 to 250,000) by canopy cover class (horizontal axis). Percent labels within bars:

Cover class	< 1%	1 - 5%	6 - 15%	16 - 25%	26 - 35%	36 - 45%	46 - 55%	55 - 65%	66 - 75%	76 - 85%	86 - 95%	96 - 100%
Percent	9%	19%	23%	17%	11%	7%	4%	3%	4%	2%	1%	<1%

Other Pine Cover

Bar chart — Acreage (vertical axis, 0 to 180,000) by canopy cover class (horizontal axis). Percent labels within bars:

Cover class	< 1%	1 - 5%	6 - 15%	16 - 25%	26 - 35%	36 - 45%	46 - 55%	55 - 65%	66 - 75%	76 - 85%	86 - 95%	96 - 100%
Percent	21%	16%	16%	11%	7%	9%	6%	4%	4%	3%	2%	1%

Figure 5. Acreage assessed (vertical axis) by canopy cover class (horizontal axis) for turkey/sand post oak, other hardwood, and other pine species during 2013 Rapid Assessment. Percent of total acres assessed is shown within data bars.
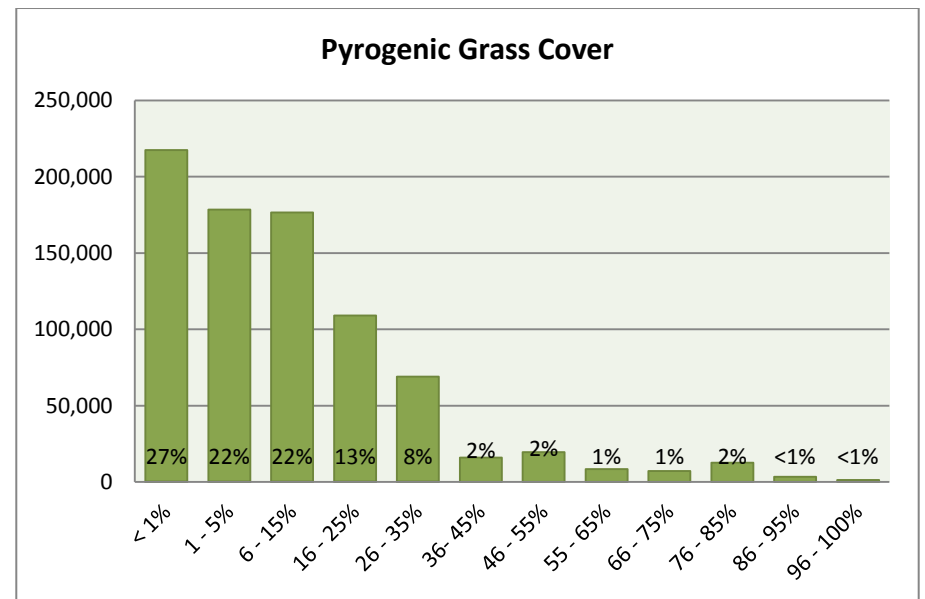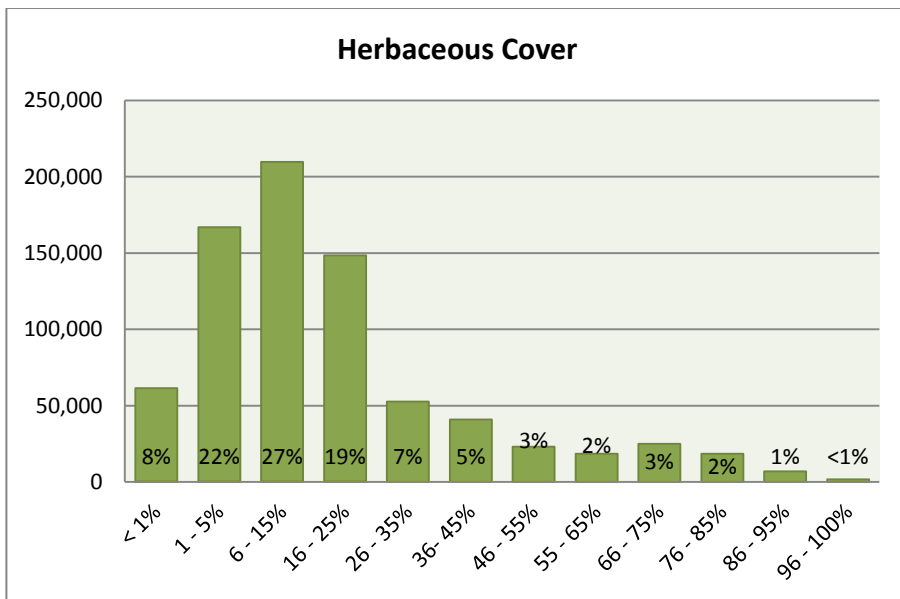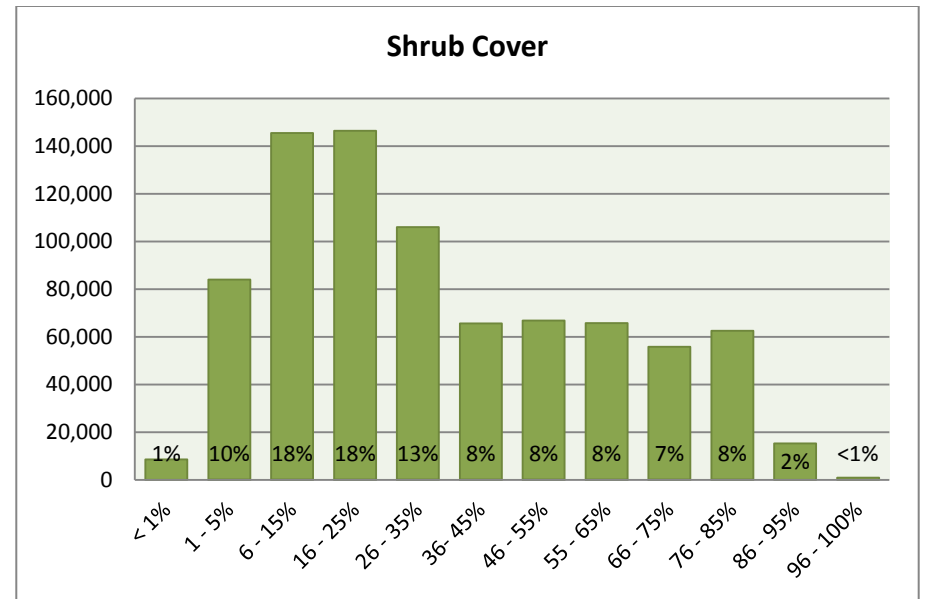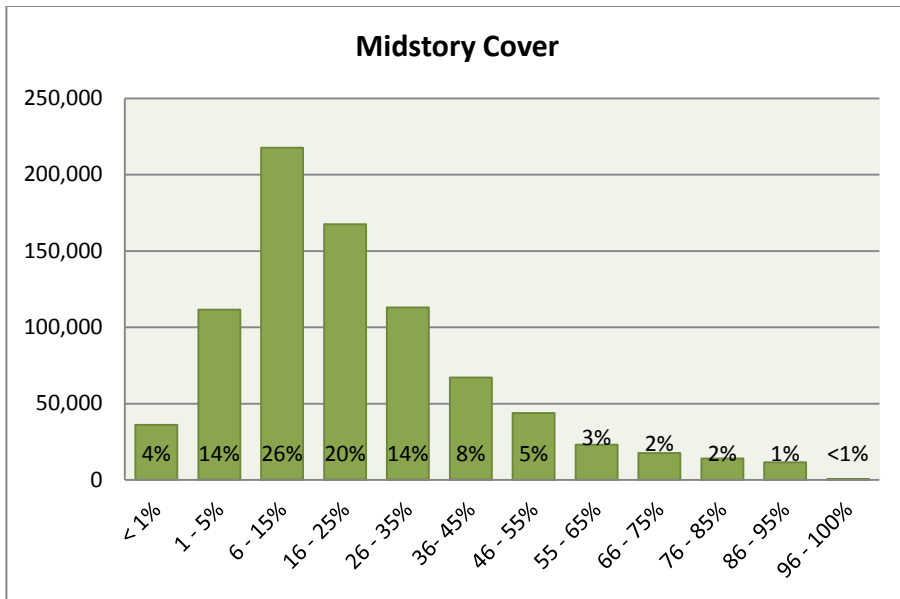
Figure 6. Acreage assessed (vertical axis) by cover class (horizontal axis) for midstory, shrub, herbaceous, and pyrogenic grass during 2013 Rapid Assessment. Percent of total acres assessed is shown within data bars.
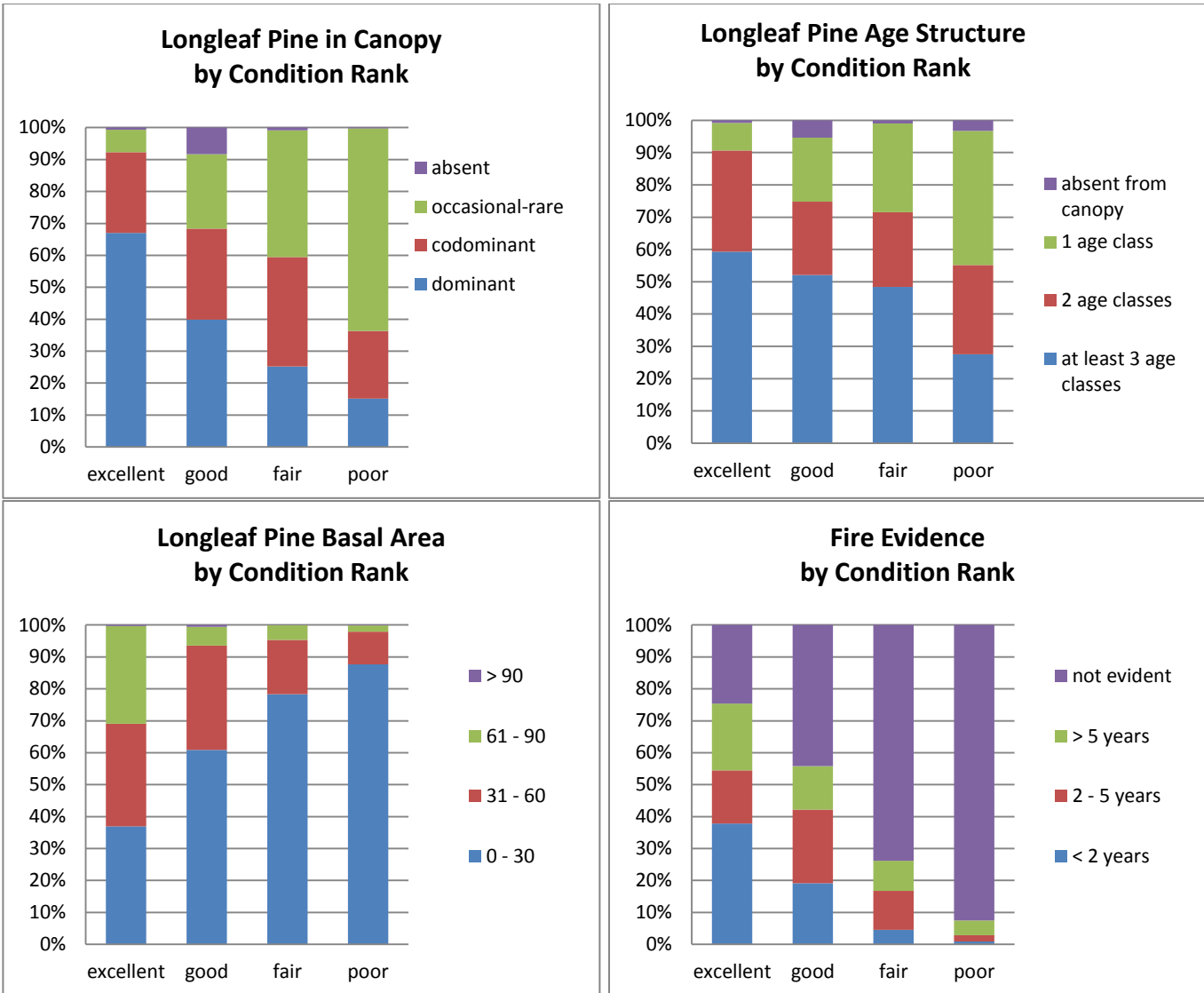
Figure 7. Percent acres of each condition rank class (excellent, good, fair, poor) that occur within longleaf pine canopy condition classes and fire evidence classes. Condition rank describes the overall ecological condition of the site based on species composition and structure characteristic of historic fire regimes. These charts generally show how individual attributes for canopy structure and fire interval relate to the assignment of condition. Only data collected during 2013 Rapid Assessment are shown.
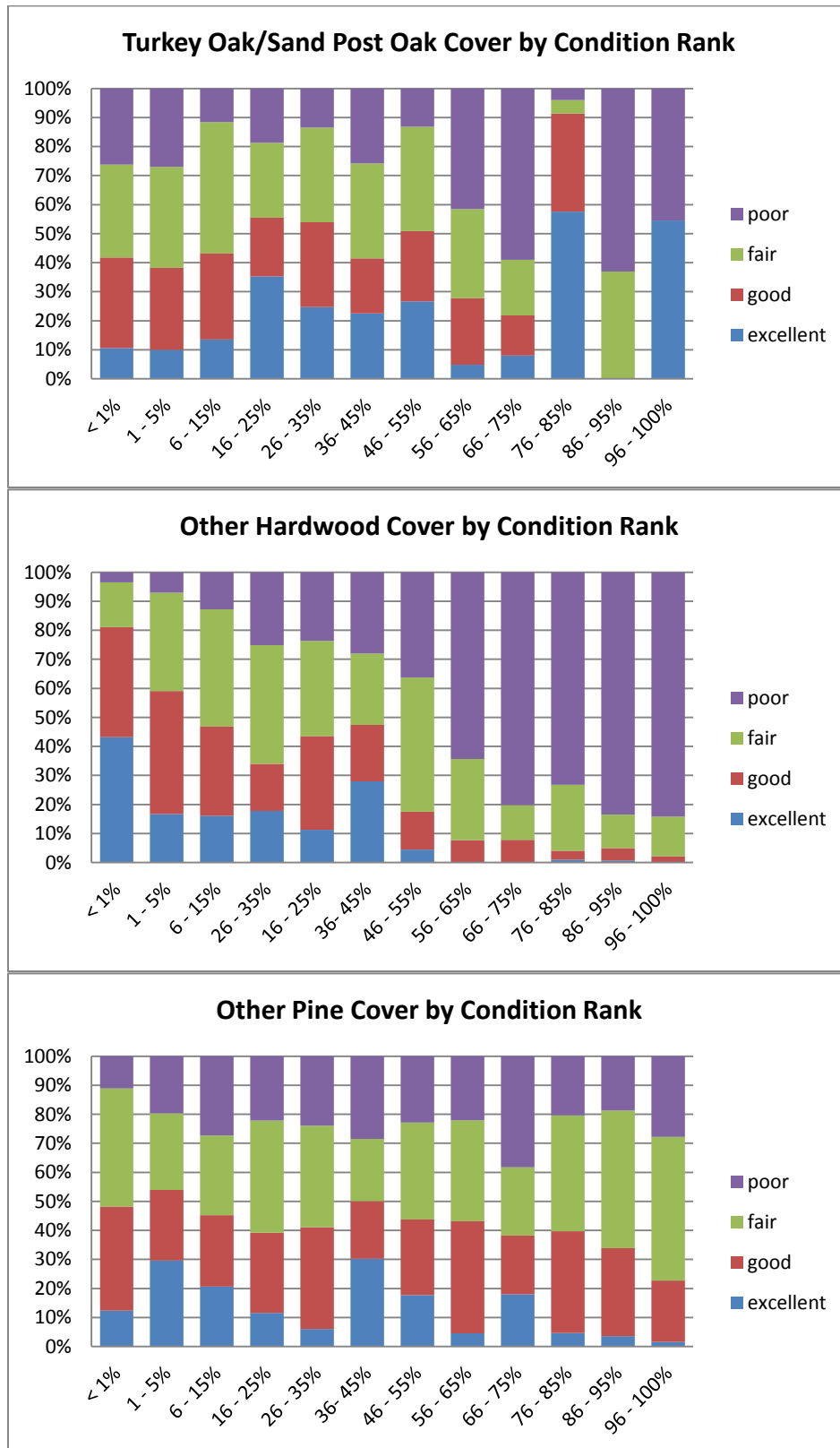
Figure 8. Percent acres (vertical axis) of each canopy condition cover class (horizontal axis) that occur within condition rank classes of excellent, good, fair or poor. Condition rank describes the overall ecological condition of the site based on species composition and structure characteristic of historic fire regimes. These charts generally show how individual attributes relate to the assignment of condition. Only data collected during 2013 Rapid Assessment are shown.
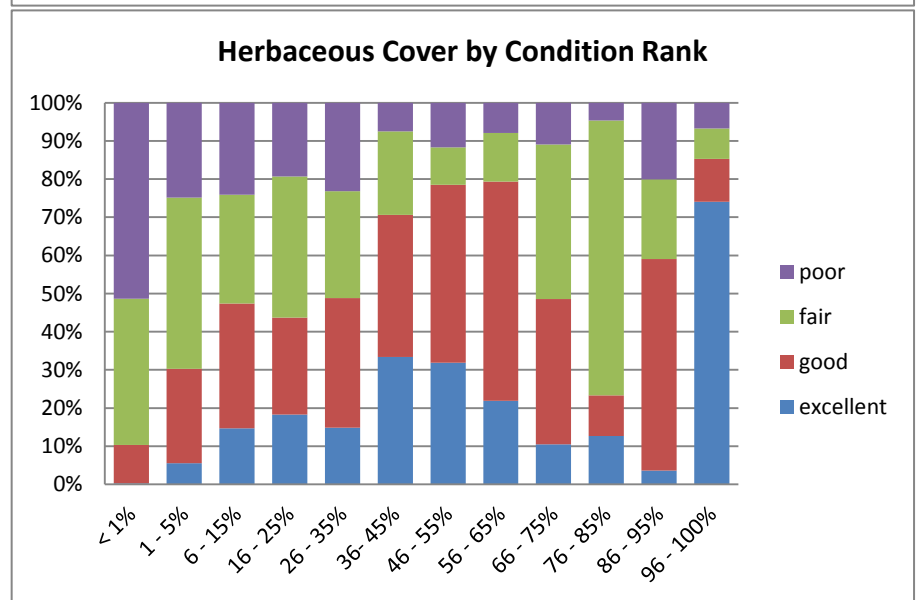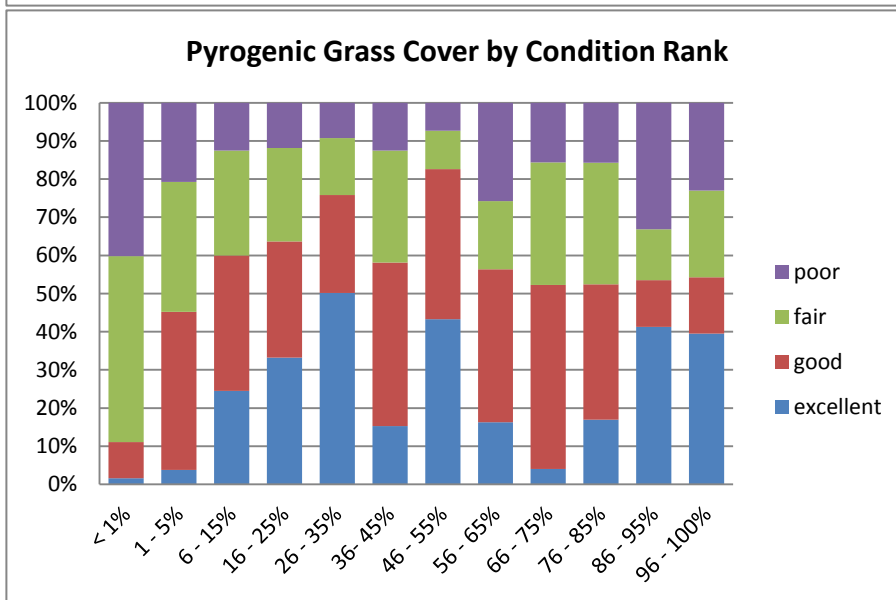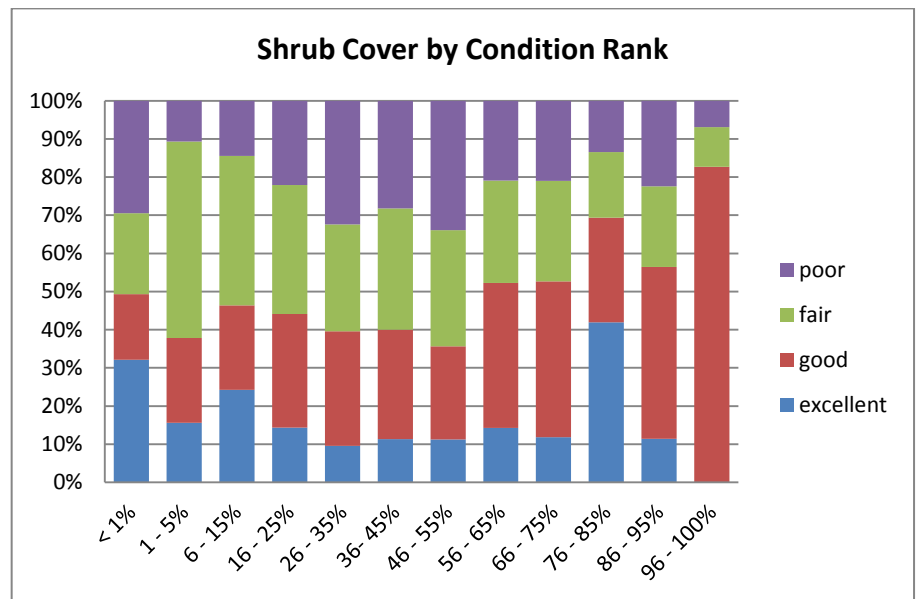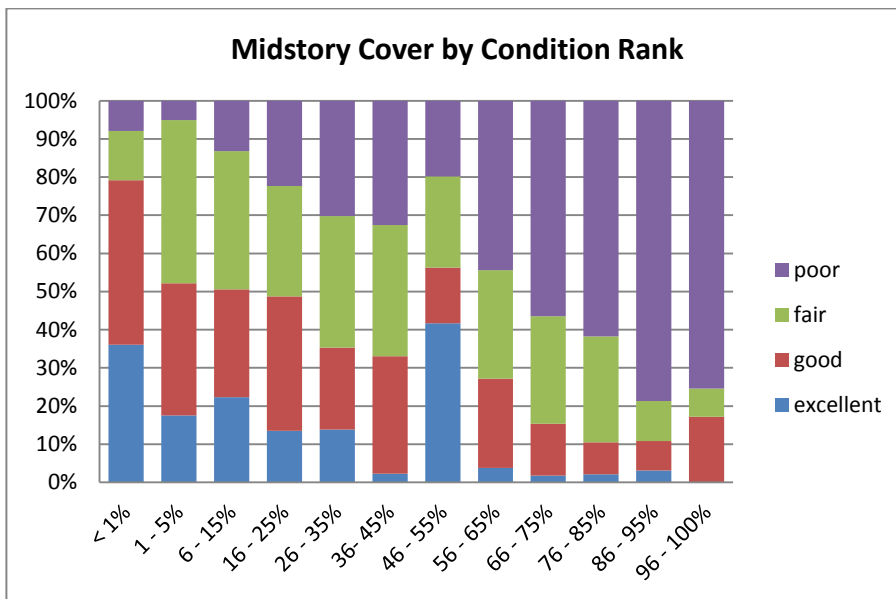
Figure 9. Percent acres (vertical axis) of each midstory and ground layer cover class (horizontal axis) that occurs within condition rank classes of excellent, good, fair or poor. Condition rank describes the overall ecological condition of the site based on species composition and structure characteristic of historic fire regimes. These charts generally show how individual attributes relate to the assignment of condition. Only data collected during 2013 Rapid Assessment are shown.

LPEGDB Version 1

Statewide LPE Occurrence and Distribution

According to America's Longleaf 2013 Range-Wide Accomplishment Report, longleaf pine dominant ecosystems total 4.28 million acres in the U.S. This project confirmed the location of approximately 2.2 million acres of longleaf pine ecosystems in Florida, indicating that Florida is home to over 51% of all known longleaf pine. With integration of the rapid assessment into the LPEGDB, 53% of the known longleaf acres in Florida now have ecological condition data (Table 6; Fig. 10). Another 170,000 acres has been identified on the ground or through aerial photo interpretation for the CLC (FNAI 2010) as sandhill, upland pine, or upland mixed woodland indicating likely occurrence of LPEs. Data confirmed that about 1.6 million acres initially identified as potential longleaf pine are not LPEs and can be removed from the LPEGDB.

There are still 4.9 million acres where the occurrence of longleaf pine forests is uncertain (Table 6; Fig. 10). The vast majority of this, about 4 million acres, is pine plantation, a significant portion of which may not have composition or function adequate to be considered LPEs. Nevertheless some portion of this is likely to support longleaf pine and merits further assessment. Another 747,000 acres has been identified as mesic, wet, or scrubby flatwoods through some field verification but primarily through various land cover sources where the classification is not as reliable as that for sandhill described above. See Appendix E for LPE acreage by county.

Table 6. Status of LPE occurrence on managed conservation lands and private lands as determined by Rapid Assessment and other data sources in the LPEGDB. The sum of yellow-highlighted values in the Total Acres column equals the rounded 2.2 million acres of LPEs confirmed by this project.

LPE Occurrence	Managed Conservation Lands	Permanent Conservation Easements	Other Private Lands	Total Acres
LPE Confirmed: ecological data available	449,426	27,951	666,985	1,144,362
LPE Confirmed: ecological condition undetermined	855,472	37,665	139,311	1,032,448
LPE Assumed: sandhill, upland pine, upland mixed woodland	35,188	2,665	132,073	169,927
LPE Unknown: mesic, wet, and scrubby flatwoods	145,926	27,009	574,430	747,364
LPE Unknown: pine plantation and other land cover classes	220,640	126,508	3,803,249	4,150,397
LPE Does Not Occur	1,146,708	13,737	426,002	1,586,446
Total	2,853,360	235,534	5,742,050	8,830,944

LPE Ecological Conditions and Prioritization

The purpose of LPE prioritization is to help inform decisions about protection, restoration, and management of longleaf pine forests in Florida. The synthesis of ecological condition data into management classes for maintain, improve and restore provides a means for establishing priorities for specific actions (Table 4; Figs. 11 and12; See Appendix D for crosswalk of ecological condition data into management classes). For example, sites with herbaceous or grass fuel cover in the 'improve' category could be targeted for prescribed burning; sites with hardwood or midstory cover in the 'restore' category but with intact groundcover could be targeted for mechanical treatment with care taken to minimize soil disturbance.

Occurrence of Longleaf Pine Ecosystems in Florida
- LPE Confirmed: ecological condition data available
- LPE Confirmed: ecological condition undetermined
- LPE Assumed: sandhill, upland pine
- LPE Unknown: mesic, wet, and scrubby flatwoods
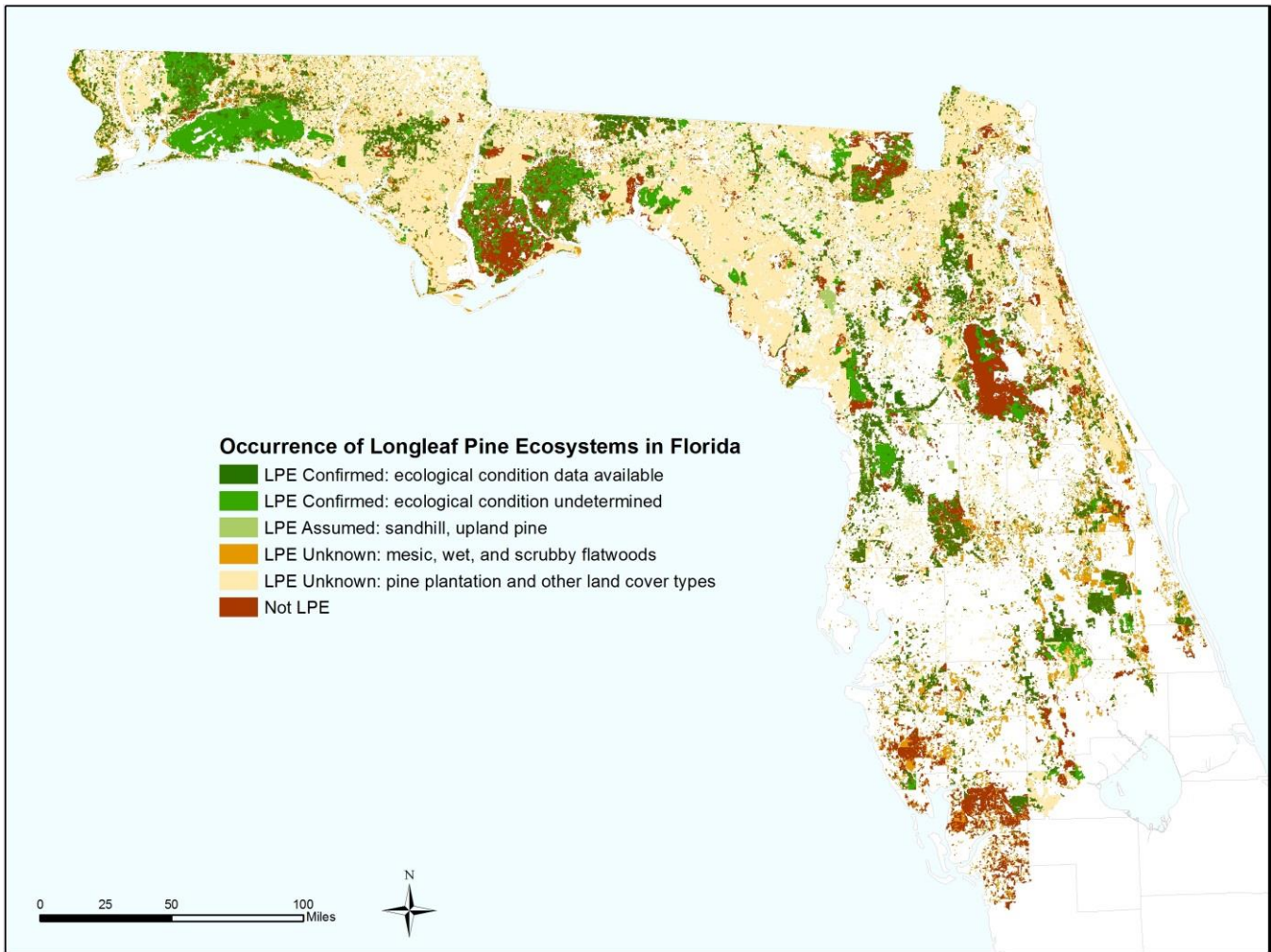- LPE Unknown: pine plantation and other land cover types
- Not LPE

Figure 10. Occurrence status of potential longleaf pine ecosystem sites in the LPEGDB.

Less than half of LPE acreage is at the maintain level for many condition categories: presence of mature longleaf in canopy (37% of acres), other hardwood in canopy (28% of acres), herbaceous cover (20% of acres), pyrogenic grass cover (33% of acres), fire interval (32% of acres), and overall condition rank (44% of acres). Assignment of management levels for some categories should be viewed with caution: because many excellent longleaf sites in Florida have low basal area, 0-30 was included in the 'maintain' class and may include sites without a longleaf canopy; no published criteria were found for turkey oak/sand post oak cover making a standard for LPE condition difficult to determine.

Management priorities may differ regionally or on public vs private lands. The LPEGDB 'condition by management class' dataset will enable managers to customize data views for a specific purpose. As an example, Fig. 13 shows a county level view of ground cover management classes that considers both herbaceous and pyrogenic grass cover.

Figure 11. Acreage (vertical axis) within canopy cover class and basal area criteria (horizontal axes) assigned to management classes of maintain, improve or restore. Percent of total acres assessed is shown within data bars. See Appendix D for crosswalk of conditions to management classes.
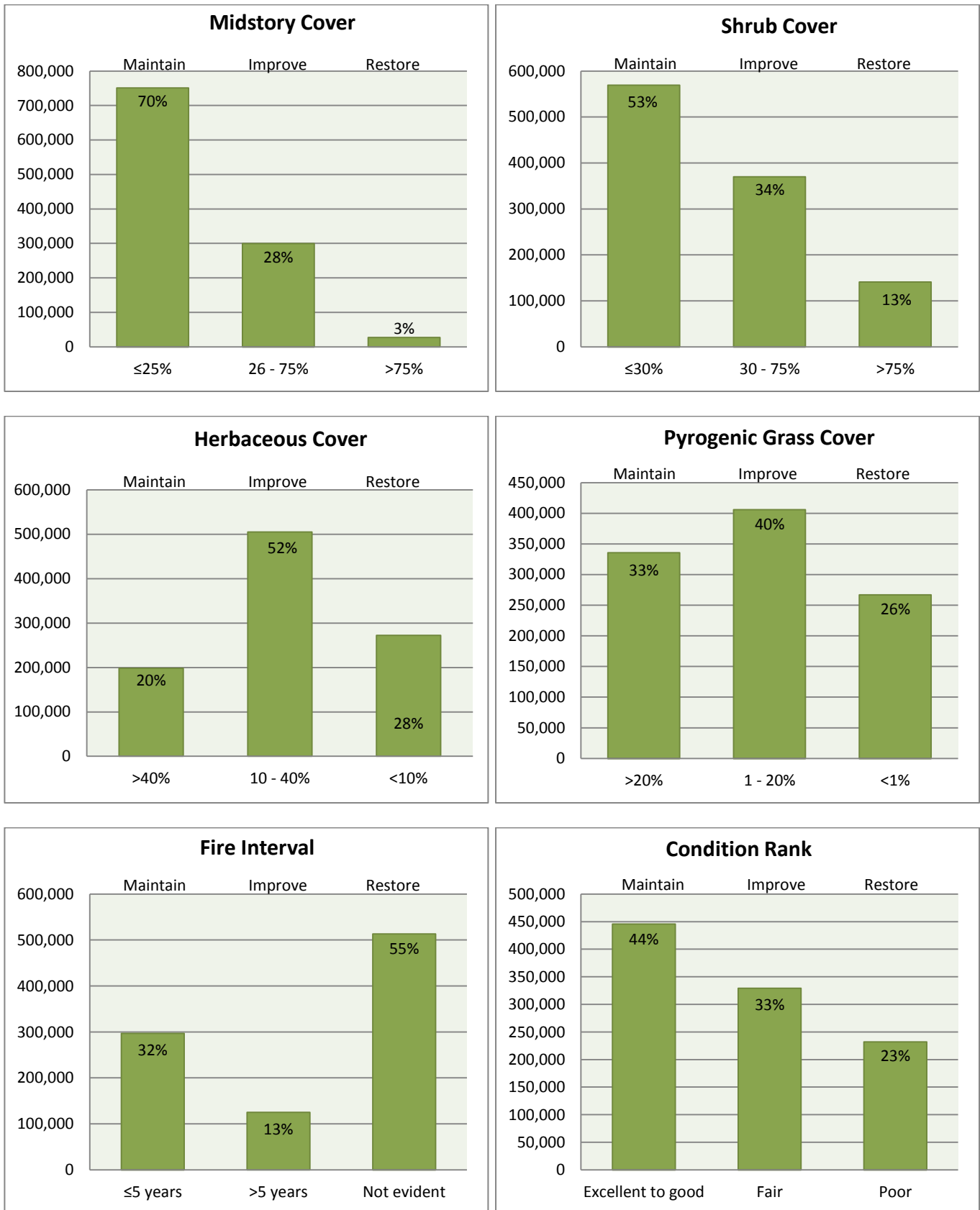
Midstory Cover

	Maintain	Improve	Restore
	70%	28%	3%
	≤25%	26 - 75%	>75%

Shrub Cover

	Maintain	Improve	Restore
	53%	34%	13%
	≤30%	30 - 75%	>75%

Herbaceous Cover

	Maintain	Improve	Restore
	20%	52%	28%
	>40%	10 - 40%	<10%

Pyrogenic Grass Cover

	Maintain	Improve	Restore
	33%	40%	26%
	>20%	1 - 20%	<1%

Fire Interval

	Maintain	Improve	Restore
	32%	13%	55%
	≤5 years	>5 years	Not evident

Condition Rank

	Maintain	Improve	Restore
	44%	33%	23%
	Excellent to good	Fair	Poor

Figure 12. Acreage (vertical axis) within midstory and ground cover classes, fire interval and condition rank criteria (horizontal axes) assigned to management classes of maintain, improve or restore. Percent of total acres assessed is shown within data bars. See Appendix D for crosswalk of conditions to management classes.
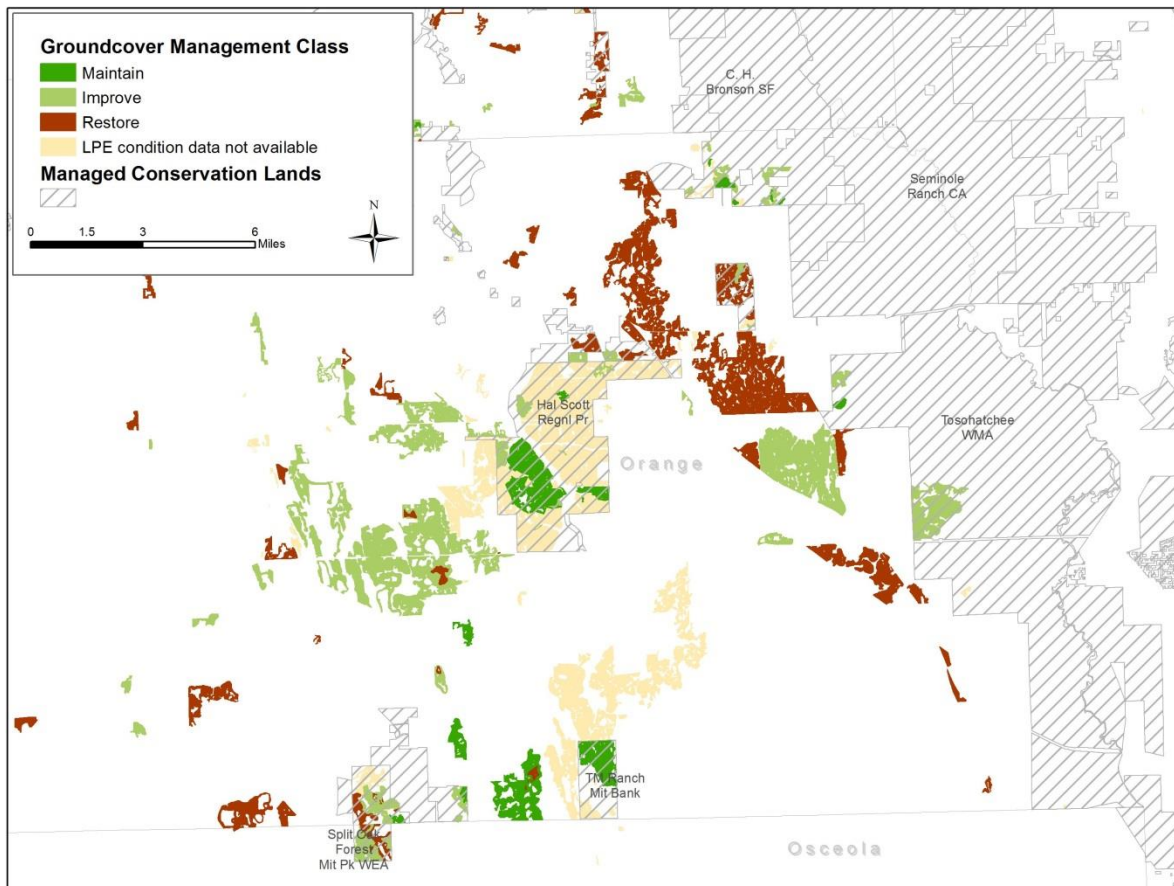
Figure 13. Example of groundcover management classes in Orange County based on ecological condition data in the LPEGDB. Groundcover condition data were not available for all known LPE sites.

Protection and conservation of existing LPEs is a component of many statewide conservation efforts. The Florida Forever environmental land acquisition program and the Critical Land and Water Identification Project (CLIP) include sandhill, upland pine, and mesic flatwoods as priority natural communities. Florida's State Wildlife Action Plan (2012) includes natural pineland and sandhill as habitats under greatest threat. In addition, these programs and others target species dependent on LPEs in protection efforts. The retention of longleaf pine forests in maintenance condition is a priority goal of the Conservation Plan (American's Longleaf 2010).   To further this goal and inform decisions by various conservation programs the LPEGDB condition data were synthesized into LPE Draft Protection Priorities.

The LPE Draft Protection Priorities layer (Fig. 14) was derived from the site management class (condition rank, pyrogenic grass cover, or hardwood cover) and size of LPE areas. Polygons were first assigned an overall management class as shown in Table 6. Condition classes were originally assessed per natural community polygon or in some cases for portions of polygons split by managed area boundaries.   Adjacent polygons with the same management class were merged in GIS to calculate acreage for the entire ecosystem in a given condition. The condition/management and size classes were combined into 3 priority classes such that large sites in good condition received the highest priority and small sites in poor condition the lowest (Table 7; Fig. 14). Based on this analysis about 441,000 acres are high priority LPEs: of this 50% occur on existing conservation lands and 8% (37,000 acres) on unacquired portions of Florida Forever land acquisition projects. The LPE Protection Priorities should be considered a draft in progress; final priorities should be further informed by expert input on data and methods of the LPEGDB.

Table 7. Prioritization scheme for LPE Draft Protection Priorities Map.

Management Class for Condition Rank, Pyrogenic Grass Cover, or Other Hardwood Cover*	Size Class	Priority Class
Maintain	>1000 acres	High
Maintain	100-1000 acres	High
Maintain	<100 acres	Medium
Improve	>1000 acres	Medium
Improve	100-1000 acres	Medium
Improve	<100 acres	Low
Restore	>1000 acres	Medium
Restore	100-1000 acres	Low
Restore	<100 acres	Low

*For the prioritization, management class was assigned hierarchically, first according to condition rank, then for sites without condition rank data, by pyrogenic grass cover, then by hardwood cover. Management class was determined in each category as shown in Appendix D.
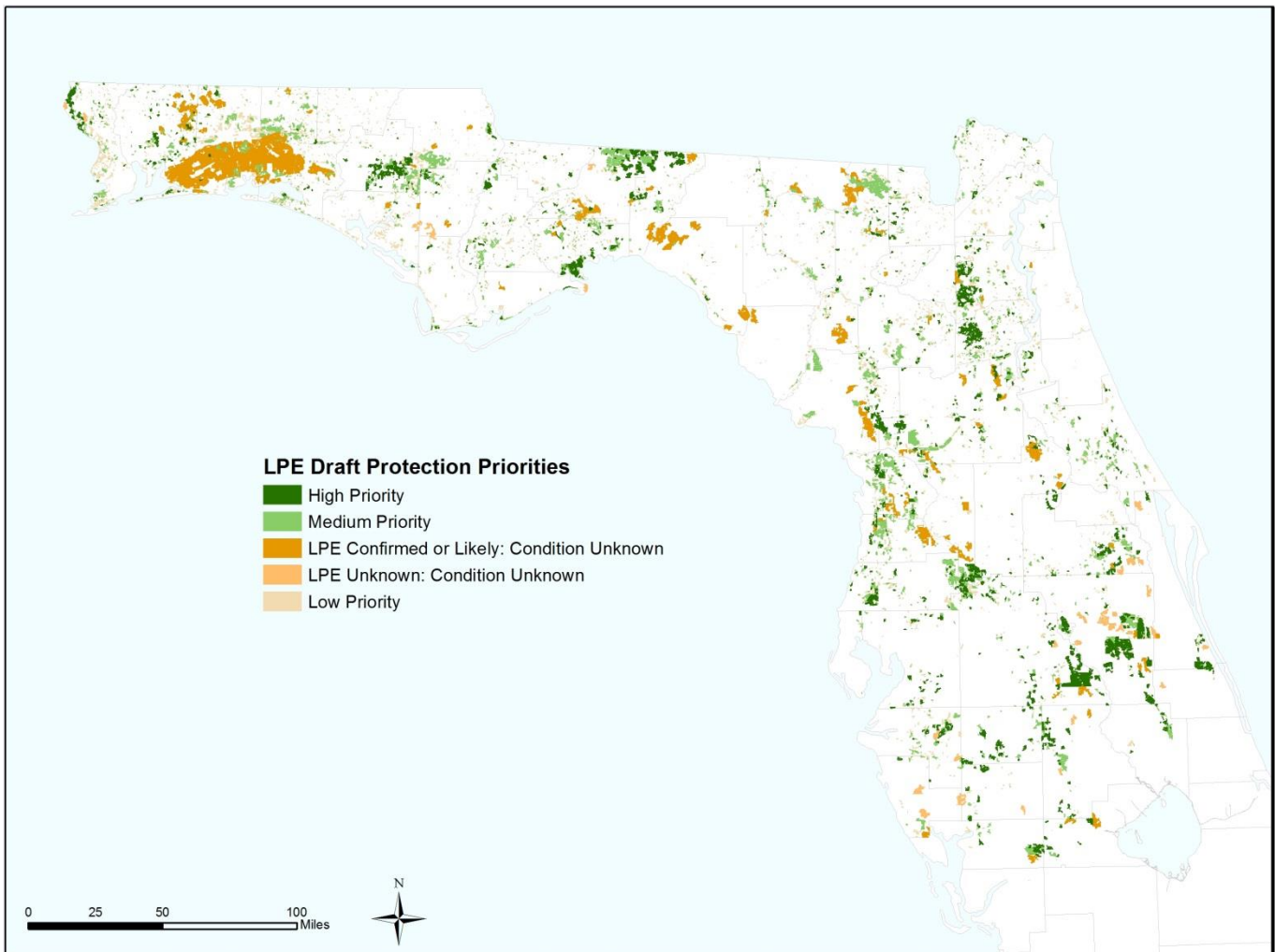
Figure 14. LPE Draft Protection Priorities. Potential LPEs on pine plantation are not displayed.

SUMMARY AND NEXT STEPS

The LPEGDB project goal to collect comprehensive information on condition and distribution of longleaf pine forests throughout Florida was ambitious and largely successful. Version 1 of the LPEGDB represents a significant increase in data on LPE location and condition, especially on private lands. There are, however, remaining data gaps and limitations to current information that should be the focus of future work.

Rapid Assessment: Lessons Learned

The Rapid Assessment design allowed for determination of LPE occurrence on more than 1.3 million acres and collection of condition data on 843,000 acres. Although successful, some improvements to the design are recommended based on review and summary of this initial effort:

1. The definition of Longleaf Pine Ecosystem for the purpose of field determination should be clarified. Sites that were not LPEs should have been excluded in the field but this determination was somewhat inconsistent. For example, in some counties sites dominated by hardwoods and without other apparent indicators of LPE were assessed and therefore included as confirmed LPEs whereas in other counties these types of sites were excluded as non-LPE. As a result acreage of LPEs in some areas may be overestimated.
2. Rather than relying on typed comments, the addition of two drop-down fields for 'Accessibility' and 'LPE Occurrence' are recommended. Although presence of longleaf pine in the canopy was captured by existing data, longleaf presence and regeneration in other strata was not.
3. Addition of a field to record presence of old growth longleaf pine trees should be considered to inform condition of the longleaf canopy. Basal area may be less informative in that 68% of sites were in the 0 – 30 square feet per acre range.
4. Additional training on the FNAI natural community classification for data collectors is needed for consistency. Data recorded for 'Natural Community Type', especially assignment of upland pine and upland mixed woodland, did not consistently follow the FNAI definition.
5. Adjusting the balance of data quantity with consistency is recommended. More than 40 individuals participated in this initial Rapid Assessment effort. Although training facilitated consistent data collection, this might be improved in future efforts by additional training or by limiting the number of individuals collecting field data.

Next Steps

This project represents important progress in LPE data collection on private lands and consolidation of existing LPE data from FNAI projects. There are, however, remaining data gaps that should be the focus of future enhancements to the LPEGDB:

1) FFS mined existing land records to create the Compiled Longleaf Stands data included in LPEGDB version 1, but this effort was considered a work in progress and used primarily to indicate areas with existing longleaf. Ecological condition data were limited and these areas were intentionally excluded from the Rapid Assessment because of the potential for other means of data collection on these sites. FFS intends to now use the Rapid Assessment protocol as county foresters work with landowner programs including Longleaf Legacy Private Landowner Incentive Program, Conservation Reserve Program, Wildlife Habitat Incentives Program, Environmental Quality Incentives Program, and Southern Pine Beetle Prevention Program. This ongoing data collection will be integrated into future versions of the LPEGDB.
2) FFS also is in process of developing the State Lands Management System (SLAMS), a database for forest stands on all state forests. The LPEGDB should be updated with this information when completed.

3) More detailed information on LPE condition for some federal and state conservation lands may be available. A focused effort is needed to coordinate with agency partners (e.g. Northwest Florida Water Management District, Eglin Air Force Base, USFS, USFWS, Apalachicola Regional Stewardship Alliance) to collect and integrate this information into a future version of the LPEGDB.

4) In order to focus the efforts of the Rapid Assessment some potential LPEs on conservation lands were excluded with the assumption that land managers might be able to provide information. There are certainly public lands, however, where additional field data collection is needed. These should be identified and targeted for future assessments and included in the LPEGDB.

5) Four million acres of pine plantation remain as data gaps. These should be prioritized for future field assessment and other means of data collection, including coordination with forest industry.

6) The LPEGDB data should be compared and possibly enhanced with LandFire data, Comprehensive Statewide Forestry Inventory Analysis, soils, or other remotely sensed data, especially for inaccessible sites. To date this has not been explored outside described use of the Cooperative Land Cover Map.

7) The LPEGDB version 1, including data collection methods and synthesis, and data distribution formats, should be reviewed and vetted with both state and regional longleaf pine partners.

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Florida Natural Areas Inventory. 2012. Florida Cooperative Land Cover Map version 2.3. http://www.fnai.org/LandCover.cfm

Oswalt, Christopher M., Jason A. Cooper, Dale G. Brockway, Horace W. Brooks, Joan L. Walker, Kristina F. Connor, Sonja N. Oswalt, and Roger C. Conner. 2012. History and Current Condition of Longleaf Pine in the Southern United States. USDA Forest Service Southern Research Station. General Technical Report SRS–166.

Appendix A. Rapid Assessment Data Field Descriptions

Field	Field Name	Field Description	Field Attributes
Survey Status	SURVEYSTAT	Indicates status of the site (polygon) assessment. 'Excluded' was used to indicate that site was not a longleaf ecosystem or that site could not be assessed due to inaccessibility.	assessed excluded not assessed
Survey Date	SURVEYDATE	Date of the field assessment	(automated)
LLP Maturity	LLP_MATURE	CANOPY: Presence and dominance of longleaf pine in the canopy	dominant codominant occasional-rare absent
LLP Age Structure	LLP_AGE	CANOPY: Age structure of longleaf pine in the canopy	at least 3 age classes 2 age classes 1 age class absent from canopy
LLP Basal Area	LLP_BA	CANOPY: Estimated basal area in square feet per acre of longleaf pine for the entire polygon	0-30 31-60 61-90 > 90
Turkey Sand Post Cover	TO_SPO_COV	CANOPY: Percentage of the ground within the polygon covered by the general extent of the canopy of turkey oak and sand post oak >16 feet tall. Spaces between leaves and stems count as cover.	<1% 1 - 5% 6 - 15% 16 - 25% 26 - 35% 36 - 45% 46 - 55% 56 - 65% 66 - 75% 76 - 85% 86 - 95% 96 - 100%

Other Hardwood Cover	OTH_HW_COV	CANOPY: Percentage of the ground within the polygon covered by the general extent of the canopy hardwood species >16 feet tall excluding turkey oak and sand post oak. Spaces between leaves and stems count as cover.	(see TO_SPO_COV above)
Other Pine Cover	OTH_PINECOV	CANOPY: Percentage of the ground within the polygon covered by the general extent of the canopy of pine species >16 feet tall excluding longleaf pine. Spaces between leaves and stems count as cover.	(see TO_SPO_COV above)
Midstory Cover	MIDST_COV	MIDSTORY: Percent cover of midstory woody-stemmed plants (including vines and pines) from 6 to 16 feet tall. Spaces between leaves and stems count as cover.	(see TO_SPO_COV above)
Shrub Cover	SHRUB_COV	MIDSTORY: Percent cover of woody plants less than 6 feet tall. Spaces between leaves and stems count as cover.	(see TO_SPO_COV above)
Pyrogenic Grass Cover	PYROGR_COV	GROUND: Percent cover of native perennial graminoids that are maintained by periodic fire; includes wiregrass (*Aristida stricta*), pineywoods, dropseed (*Sporobolus junceus*), Florida dropseed (*Sporobolus floridanus*), Chapman's beaksedge (*Rhynchospora chapmanii*), cutover muhly (*Muhlenbergia capillaris* var. *trichopodes*), toothache grass *(Ctenium aromaticum)*, little bluestem (*Schizachyrum scoparium*) and Florida toothache grass *(Ctenium floridanum)*; not switchgrass (*Panicum virgatum*).	(see TO_SPO_COV above)
Herbaceous Cover	HERB_COV	GROUND: Percent cover of all native non-woody, soft-tissued plants regardless of height, including non-woody vines, legumes, and graminoids (grasses, sedges, rushes); does not include non-native pasture grasses.	(see TO_SPO_COV above)
Fire Evidence	FIRE_EVID	Describes the general time period since last fire as determined by visual evidence within the polygon (e.g. fire scars on trees, standing blackened shrubs)	not evident < 2 years 2 - 5 years > 5 years

Invasive Plant Distribution	INVPL_DIST	Describes the extent and distribution of invasive exotic plants within or along the perimeter of the polygon; includes only FLPPC category I and II listed species.	not evident present along perimeter only 1 to few patches within many patches within
Condition Rank	COND_RANK	Ecological condition relative to a natural system (natural vegetative plant community)	excellent Community species composition/abundance and structure are characteristic of conditions prevalent under historic fire regime good Community species composition/abundance and structure are only partially characteristic of conditions previously prevalent under historic fire regime. fair Retains some components and/or structure characteristic under historic fire regime. Components of original pyrogenic groundcover are sparse or suppressed so as to be functionally irrelevant. Poor May retain little of the original community species components and/or structural characteristics. Components of original pyrogenic groundcover are not evident.
Natural Community Type	NC_TYPE	Describes the dominant historic natural community type (pre-Columbian) within the site (polygon)	mesic flatwoods sandhill scrub scrubby flatwoods upland mixed woodland upland pine wet flatwoods unknown
Comments	COMMENTS	Comments provides additional, optional information about the site (polygon)	optional text

Appendix B. Longleaf Pine Ecosystem Geodatabase Training Guide

Table of Contents

Longleaf Pine Ecosystem Geo Database – LPEGDB

Scope/Objectives/Deadlines

The project derives from and fulfills objectives described in the Florida Forest Action Plan, also known as "Forest Resources – 2010 Florida's Statewide Strategies". These objectives are described under the issue "Longleaf Pine Ecosystems". Goal 1. under this issue states: "Reliable and accurate inventories and assessments of Longleaf Pine Ecosystems (LPE) on public and private land exist in accessible databases. Objective 1.1. under this goal states: " Develop central and accessible repositories of LPE data collected with standardized methods to facilitate communication and coordination of efforts, to frame the scope of the issue, and to identify sites where land managers and landowners can observe restoration projects at various stages and interact with practitioners to develop realistic expectations for restoration efforts and site potential."

Funding for the project comes from a Competitive Resource Allocation Grant from the US Forest Service. The project is being done as a partnership between the Florida Forest Service and the Florida Natural Areas Inventory. Within the Florida Forest Service, the partnership includes the Forest Resource Planning and Support Services Bureau (Information Technology Section), the Forest Management Bureau (Cooperative Forestry Assistance Section), and the Field Operations Bureau (County Foresters. Funding for the project includes a 50% match from the Florida Forest Service.

The Summary from the project proposal that was approved by the US Forest Service states: "Develop and statewide, comprehensive Longleaf Pine Forest geospatial database and conduct priority assessments to inform conservation, protection, and enhancement efforts on public and private lands in Florida. Integrate data into state and region wide conservation planning efforts, and into state and federal landowner assistance programs. Serve as a central repository for tracking progress in restoration and conservation."

Specific objectives from the approved proposal are:
- Develop an accurate, comprehensive geo-spatial database of locations and condition of longleaf pine forests in Florida.
- Prioritize acres to assist State and Federal agency decisions on conservation, protection, and restoration on public and private lands.
- Spatially track progress in acres conserved, protected, and enhanced. Provide a model for range-wide longleaf pine mapping efforts.
- Integrate data into DOF, FWCC, DEP, Florida Water Management Districts, NRCS, USDA Forest Service and USFWS public/private land acquisition and management programs.

The Information Technology Section and the Florida Natural Areas Inventory have completed the compiling of existing data from many databases and incorporated these into shape files that can be used to located known or potential longleaf pine ecosystem occurrences so that they can be assessed by County Foresters. By the end of December, training sessions in the use of these databases and in conducting field assessments will be completed. Field data from the County Foresters is due by April 1 2013. The final report of the project is due by September 1, 2013.

Where do I get the LPE data for my county?

A compressed data package has been provided for each county. At the network location below you will find the following file: **'County_Name'_LPE_RA_Data.zip**.

\\tlhforgisdata\for_gisfield\FSP_CostShare\FY_2012_2013\Download\

Copy the.zip file from the network to a local hard drive. If you are responsible for more than one county, copy all relevant county .zip files.

To decompress the .zip file, right-click on the file and select *Extract All….*. Do this for each file you downloaded.

You should now have a folder called 'County_Name'_LPE_RA_Data with the following contents:

- LPE_RA_DATA_TO_EDIT.gdb
- LPE_REFERENCE_DATA.gdb
- LPE_RA_Workspace.mxd
- Layer Files folder
- Project documents

Use the map document (.mxd) provided until you become comfortable working with the data. Follow all process steps outlined in this document, and then submit the entire updated geodatabase on or before the final submission deadline.

How do I map a network drive?

1. Open Windows Explorer (My Documents)
2. Go to *Tools > Map network drive …*
   a. Choose a drive letter (**G:** is recommended)
   b. Enter the following path: **\\tlhforgisdata\for_gisfield**
3. Click OK

For more information refer the FFS GIS-GPS intranet page.

What if I can't see the network location using ArcCatalog?

1. In ArcCatalog, click on *File > Connect Folder*
2. Navigate to the G: drive you created in Windows Explorer.
3. Click OK

The folders will now appear in ArcCatalog just like in Windows Explorer. It will remain in ArcCatalog for future use unless you choose to remove it.

Explanation of Data Organization and Content for the Longleaf Pine Ecosystem Rapid Assessment

LPEGDB Background

The Longleaf Pine Ecosystem (LPE) Rapid Assessment (RA) will help fill gaps in the LPE statewide geodatabase. Current LPEGDB contains longleaf data from FNAI and FFS. Within this data, however, longleaf condition attributes vary, from relatively complete condition information to unknown. The Rapid Assessment is focused on filling those 'unknowns'. The LPEGDB is segmented into polygons that need to be assessed versus polygons that will not be assessed. These data will be distributed to CFs with attributes specific to the LPE rapid assessment. Rapid Assessment data collected by CFs will be used to update the LPEGDB.

Note June 2014:
LMP Data here is termed
FFS Compiled Longleaf
Stands in Final Report v.1,
June 2014
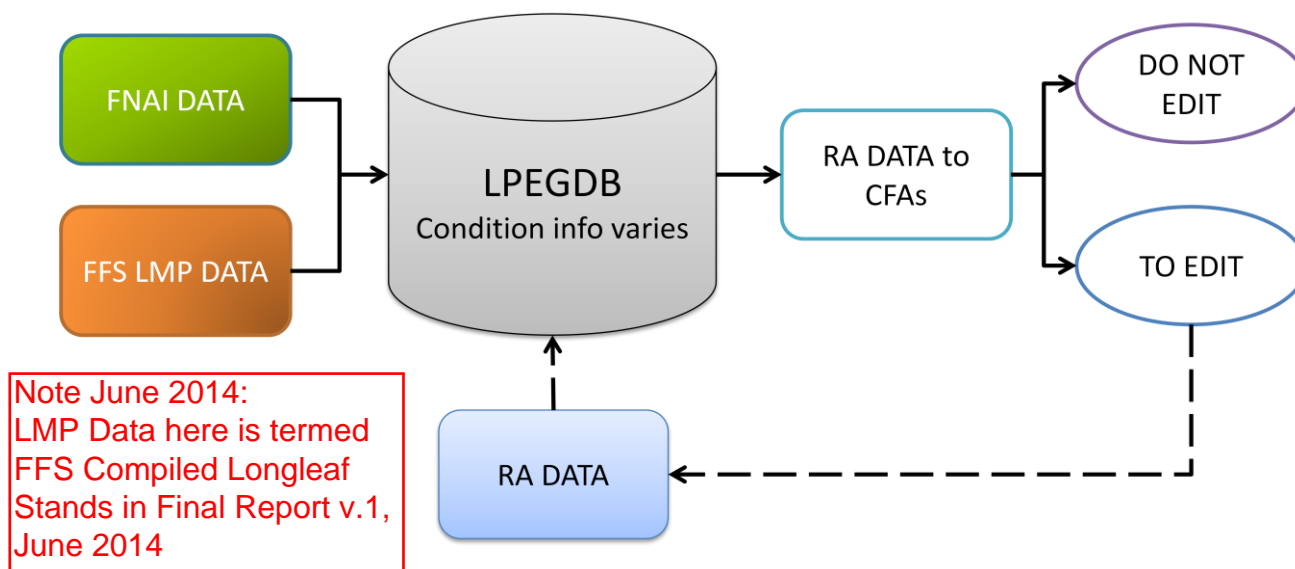
LPEGDB Contents

FNAI DATA. Most of the LPEGDB contains data developed or collected by FNAI. Those sources include the following: 1) FNAI Natural Community Mapping data from 2003 – 2012. Much of these data have associated ecological condition data; 2) FNAI element occurrence data. These are primarily rare species occurrence data but sites descriptions may include longleaf pine & associated communities; 3) Other Survey Data. These include any other types of surveys that FNAI is involved in; 4) Red-cockaded woodpecker colony data. We recently did a comprehensive data mining of RCW data; and 5)Florida Cooperative Land Cover. A recent update of land cover using best available statewide and local data sources but with no associated condition information.

Polygons within the LPEGDB Polygons within the LPEGDB have been assigned tiers indicating confidence of the condition or presence of longleaf:
- Tier 1A: Longleaf observed plus condition data available from FNAI. We already have detailed condition information. These areas do not need further assessment.
- Tier 1: Longleaf observed, high confidence in existence of longleaf; existence of condition data not confirmed.
- Tier 2: Longleaf observed but observation may not reflect current condition, or longleaf is assumed from RCW record but not directly observed. We have some reasonable indication of longleaf but there is some uncertainty because of year of observation or indirect confirmation.

- Tier 3: Natural community polygon is sandhill, upland pine, or upland mixed woodland; longleaf not confirmed OR longleaf observed but representation accuracy is low. Confidence is based solely on the natural community type. We expect sandhill, upland pine and upland mixed woodland to have longleaf canopy.
- Tier 4: Natural community polygon is mesic, wet or scrubby flatwoods, upland coniferous, or coniferous plantation. Confidence is based solely on the natural community type. We expect longleaf but are less certain of its occurrence in flatwoods, plantation, or uncertain designations such as upland coniferous.

FNAI data for longleaf pine
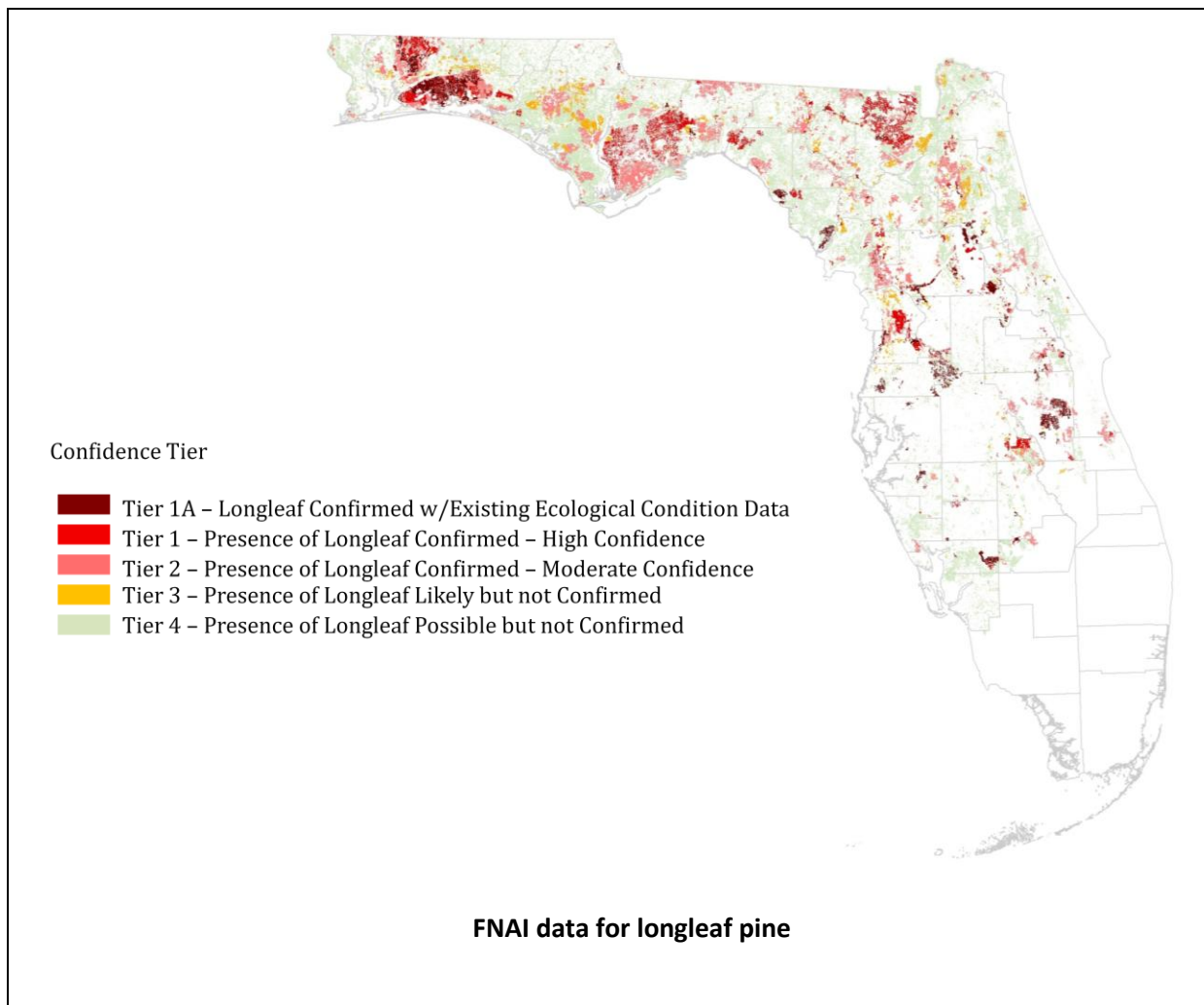
FFS LMP DATA. Another component of the LPEGDB is the FFS LMP Stands data. FFS can discuss the content of these data in more detail. There is some overlap of LMP data with FNAI data which will be reconciled.   Data collection and processing for these sites is ongoing.

Data Organization and Content for the Longleaf Pine Ecosystem Rapid Assessment

LPE_Rapid_Assessment folder

This folder contains a set of files, including 2 geodatabases with feature classes, an ArcGIS map document (mxd), several layer files (lyr), and a BACKUP folder. The details of each are discussed below.
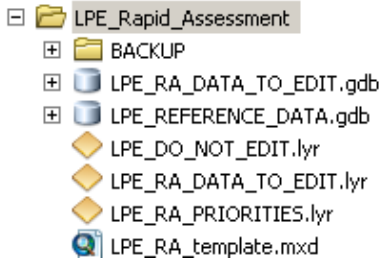
 LPE_RA_template.mxd

This is a template MXD for ArcMap 10 that contains relevant layer files for rapid assessment data preparation, check-out and check-in. You may need to add additional files such as background imagery or layers that may help to prioritize areas to be assessed (discussed more below).
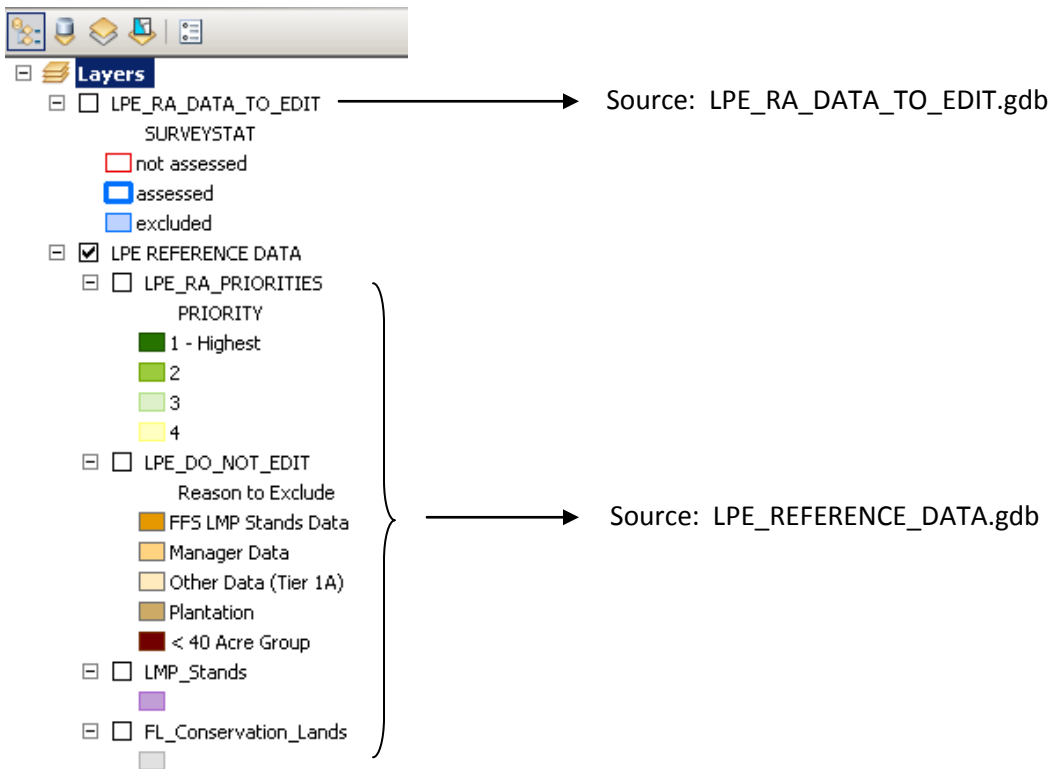
LPE_RA_DATA_TO_EDIT.gdb

This geodatabase contains a single feature class – **LPE_RA_DATA_TO_EDIT**

The **LPE_RA_DATA_TO_EDIT** feature class is the master feature class that contains polygons and attributes to be assessed/edited. You will check-out a subset of these features for use in ArcPad using the ArcPad Data Manager toolbar. After field data collection you will check-them back in to this feature class. ArcPad automatically updates the **LPE_RA_DATA_TO_EDIT** feature class with your edits during the check-in procedure.

This is the file that contains properties (e.g. symbology) of the LPE_RA_DATA_TO_EDIT file as displayed in the ArcMap Table of Contents.
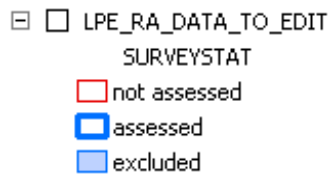
The symbols in the ArcMap layer are set to reflect the SURVEYSTAT field. The SURVEYSTAT default is 'not assessed'. As polygons are assessed and checked back in to the feature class the symbols will change to reflect their survey status.
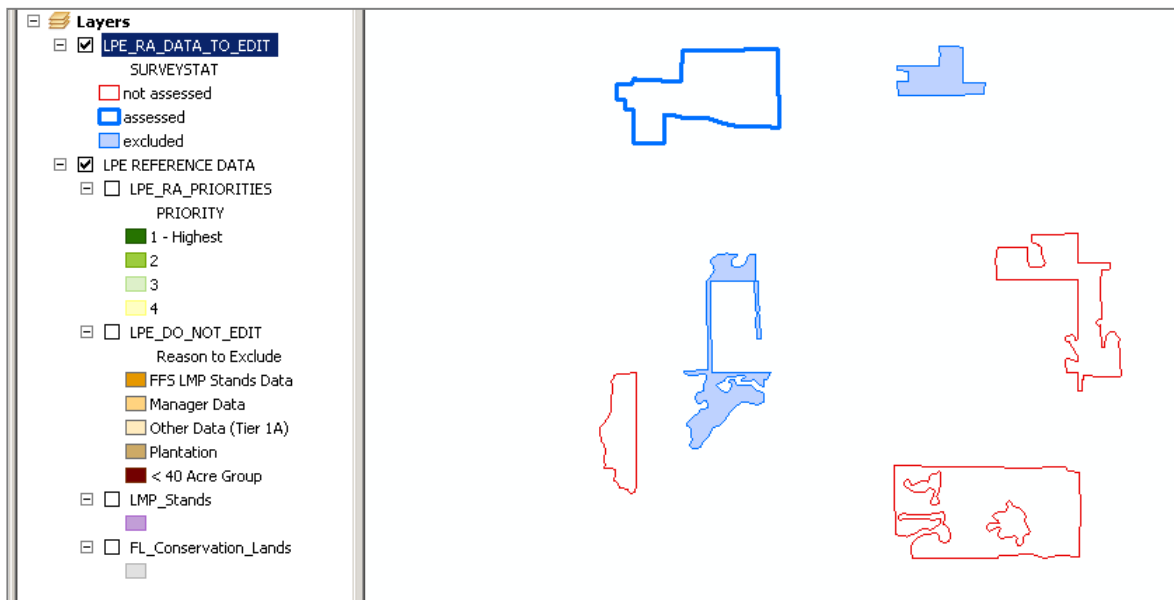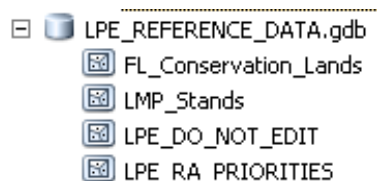
BACKUP folder

Make a backup of the LPE_RA_DATA_TO_EDIT.gdb after each field collection session.

Open ArcCatalog and copy the entire LPE_RA_DATA_TO_EDIT.gdb and paste into the BACKUP folder. Rename the gdb with the current date.
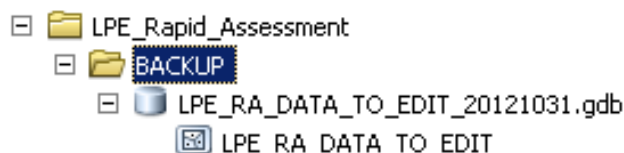
LPE_REFERENCE_DATA.gdb

This geodatabase contains four feature classes. Each will be described in more detail below.

FL_Conservation_Lands feature class

This is the statewide conservation lands data (aka Florida Managed Areas) maintained by FNAI. The dataset includes boundaries and detailed attributes for more than 2,000 federal, state, local, and private managed areas, all provided directly by the managing agencies. National parks, state forests, wildlife management areas, local and private preserves are examples of the managed areas included.

These data are provided as background information for the rapid assessment.

Most relevant fields: MANAME (Managed Area Name)

MANAGING_A (Managing Agency)

Additional details about all fields may be found in the metadata.

LMP_Stands feature class

This feature class contains existing longleaf stand-level data from Florida Forest Service. It is expected that any additional assessment data to be collected on these properties will occur outside the scope of the LPEGDB project. These lands are therefore *excluded* from the LPE_RA_DATA_TO_EDIT feature class but are *included* within the LPE_DO_NOT_EDIT feature class.

LPE_DO_NOT_EDIT feature class

This feature class contains polygons (known longleaf or potential longleaf) that are built into the LPEGDB but should not be assessed during the rapid assessment. Polygons are excluded from the rapid assessment because 1) we are focusing data collection on viable natural sites (excl. plantation, < 40 acre group) or 2) data can be or has been collected through some other means (FFS LMP Stands, Manager Data, Other Data).

Note: You may decide to include polygons from the 'Plantation' or '<40 Acre Group' category under special circumstances, e.g. plantation site with longleaf and high quality ground cover near site to be assessed. *If so, you will simply digitize a new polygon in the field in your check-out version LPE_RA_DATA_TO_EDIT feature class.*
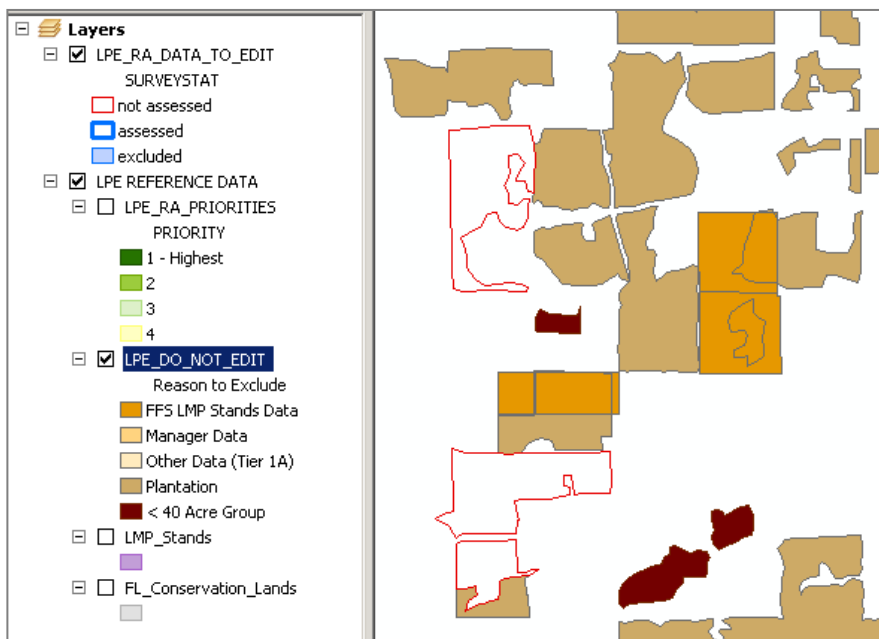
*Do not directly edit **LPE_DO_NOT_EDIT** feature class.

LPE DO NOT EDIT.lvr

This is the file that contains properties (e.g. symbology) of the LPE_DO_NOT_EDIT file as displayed in the ArcMap Table of Contents.


The symbols in the ArcMap layer are set to reflect the EX_REASON (Reason to Exclude) field.

LPE_RA_PRIORITIES feature class

This feature class contains the same initial set of polygons as LPE_RA_DATA_TO_EDIT but with a set of attributes intended to help prioritize sites for assessment.   A preliminary prioritization (1 – 4) is provided but may be modified as needed.

LPE RA PRIORITIES.lyr
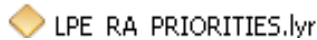
This is the file that contains properties (e.g. symbology, fields displayed) of the LPE_RA_PRIORITIES file as displayed in the ArcMap Table of Contents.

LPE_RA_PRIORITIES
PRIORITY
1 - Highest
2
3
4
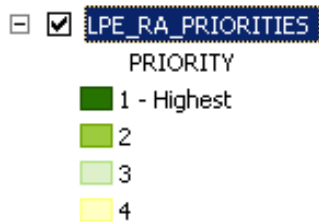
The initial prioritization is based on whether the lands are public or private ([PRIVATE] field) and the degree of confidence that longleaf pines are present (confidence tiers; [CONF_TIER] field). Private lands with confirmed longleaf are assigned the highest priority. Public lands are assigned the lowest priority because of the potential for alternative data collection. *Initial priorities may be modified based on local knowledge, regional ecology, or other criteria.*

Initial prioritization example: Assignment of Priority 1

2. Select records where Private = Yes and where CONF_TIER is either 1 or 2.

1. Field calculate PRIORITY = 1

Note that the PRIOIRTY field is formatted as text, not numeric, therefore requires double quote in expression
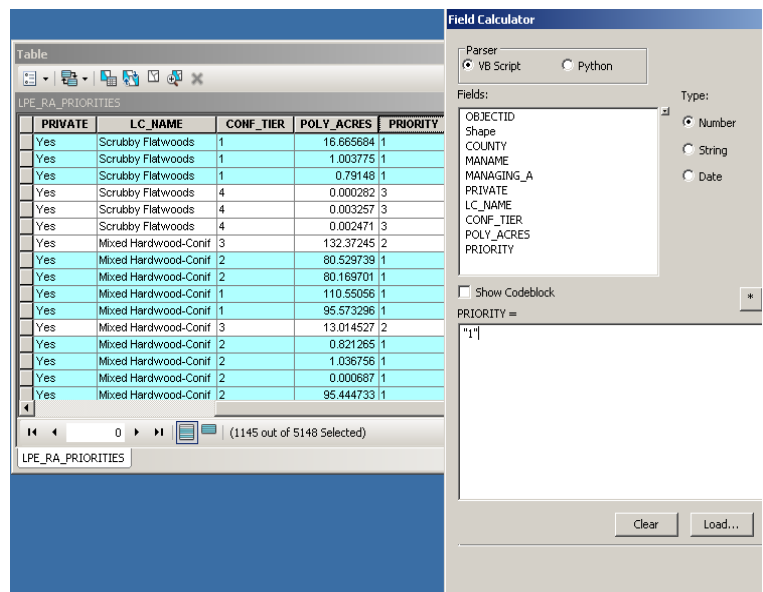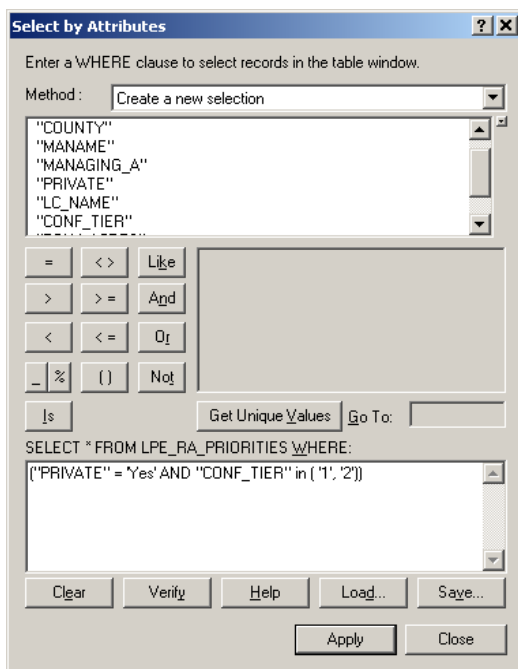
Data Fields for Modifying Priorities

PRIVATE: Indicates whether polygon is private (Yes) or public (No).   In general private lands should be a higher priority than public lands because of the potential for alterative data collection means on public lands. A county forester may, however, have reason to override this general rule.

CONF_TIER: Indicates the degree of confidence that longleaf pines are present based on existing FNAI data.

> TIER 1: Longleaf observed, assessment/condition data not confirmed

> TIER 2: Longleaf observed; slightly less confidence in data source than for Tier 1

> TIER 3: Natural community polygon is sandhill, upland pine, or upland mixed woodland; longleaf not confirmed OR longleaf observed but representation accuracy is low

> TIER 4: Natural community polygon is mesic, wet or scrubby flatwoods, upland coniferous, or coniferous plantation

> *TIER 1A: Longleaf observed plus condition data available from FNAI   (included in LPE_DO_NOT_EDIT; excluded from LPE_RA_PRIORITIES and LPE_RA_DATA_TO_EDIT)

LC_NAME: The land cover name typically describes the natural community associated with the polygon. Most of the polygons are originally from the Florida Cooperative Land Cover Map, a hybrid of several land cover datasets in Florida. A major component is the land use land cover data from the water management districts and DEP. For the most part the LC_NAME is assigned based on aerial photo interpretation. Sometimes you will see LC_NAMES that do not match an FNAI natural community type, for example 'upland coniferous' or 'hydric pine flatwoods'.

This field might be useful in prioritization if a certain land cover type in a region is more or less likely to have longleaf. For example, in the initial prioritization scheme priority 3 includes mesic flatwoods without confirmation of longleaf. The county forester might know that most flatwoods in a region of the county have longleaf and choose to assign these a higher priority for assessment.

POLY_ACRES: Acreage of polygon. This was not factored into the initial prioritization but could be used in a modified prioritization scheme. For example if the county has an extremely large number of polygons to assess, the county forester might increase efficiency by assigning higher priority to larger sites.

MANAGING_A: Managing agency. This was not factored into the initial prioritization but could be used to further refine which, if any, public lands should be assessed.   For example, locally managed lands (e.g. county, city) might be a higher priority for assessment than state and federally managed lands.

MANAME: Managed area name: This was not factored into the initial prioritization but could be used by a county forester with specific knowledge of managed areas. Note that not all managed areas are public; private conservation easements are included but are assigned 'Yes' in the [PRIVATE] field. These may also be queried using the following expression: "MANAME" LIKE '%Conservation Easement'

Public lands to be assessed are currently included in Priority 4, the lowest priority, because of the potential to collect data some other way.   But this potential might be very low for locally managed lands like county parks and

preserves. These two managed area-related fields may help to select a subset of public lands that should be high priority.

Rapid Assessment Prioritization Examples

Example 1. Initial prioritization might help focus effort. In Alachua county the initial prioritization seems to give fairly good guidance on locations to begin assessment. The areas outlined in red contain mostly Priority 1 and 2 polygons.
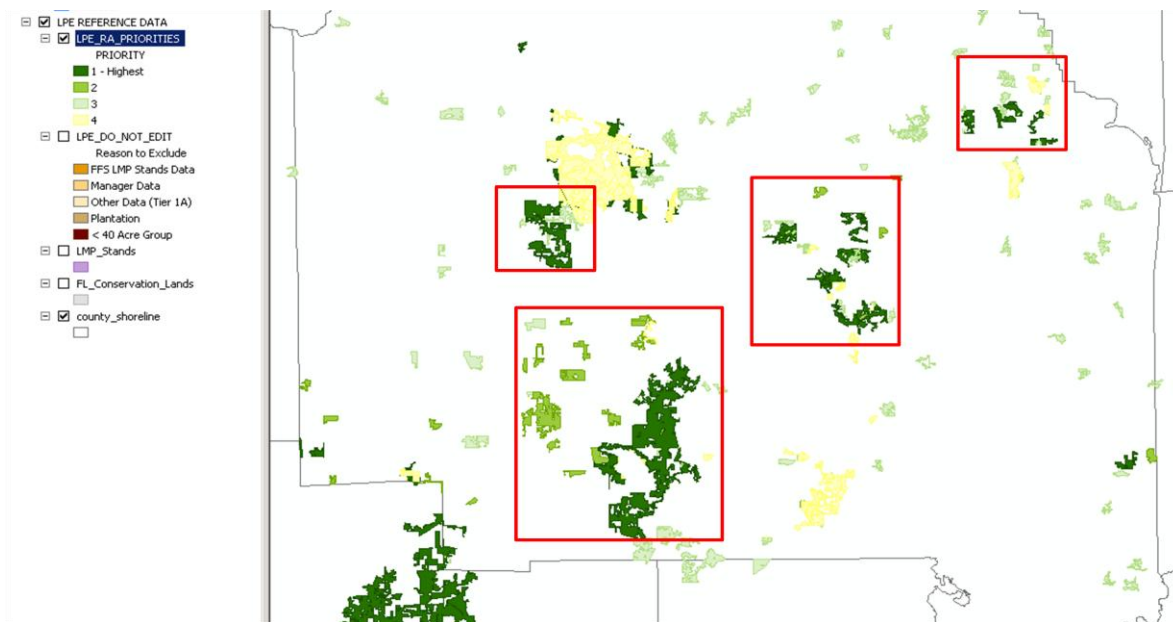
Example 2. Initial prioritization provides no discrimination. In other counties, like Holmes, the initial prioritization is not very helpful. In this case it might be feasible to visit all the polygons and no priorities are needed. But if you happen to know that the sites in the SW portion of the county are likely to be longleaf then you could go there first, or you could use polygon size as a guide, or efficiency of travel. *It is not absolutely necessary to redo the priorities in GIS.*
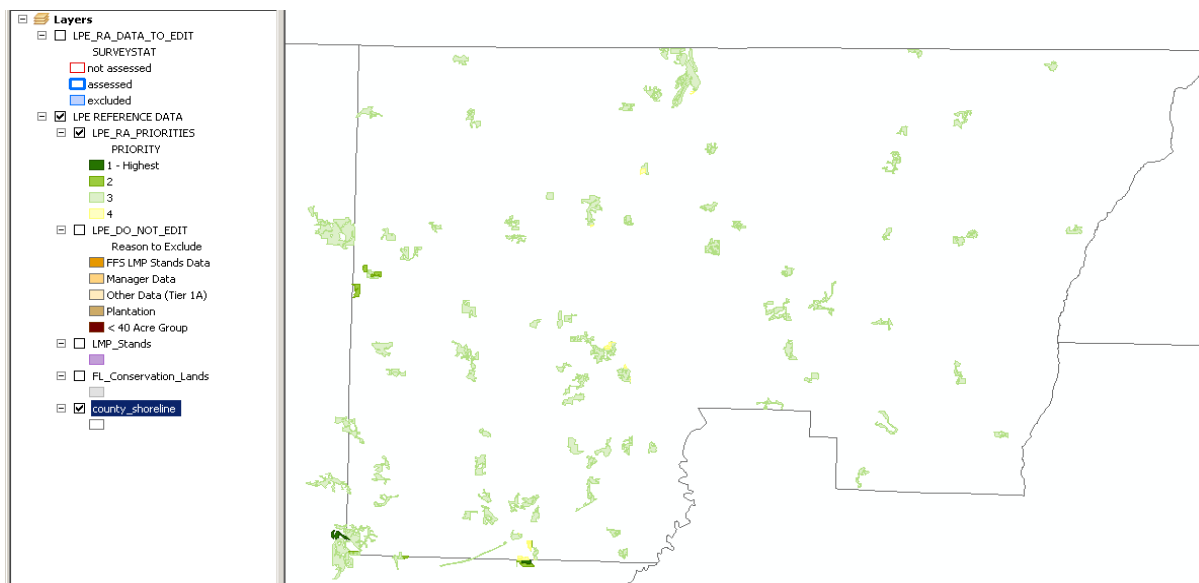
Example 3. Other fields in LPE_RA_PRIORITIES might help. You could try changing the legend to read another field. In this example the legend shows the LC_NAME. Now, depending on your knowledge of the county you might decide to focus on the 'upland coniferous category' and avoid 'hydric pine flatwoods' or 'wet flatwoods'. We would encourage to explore using other fields if initial scheme doesn't work well.
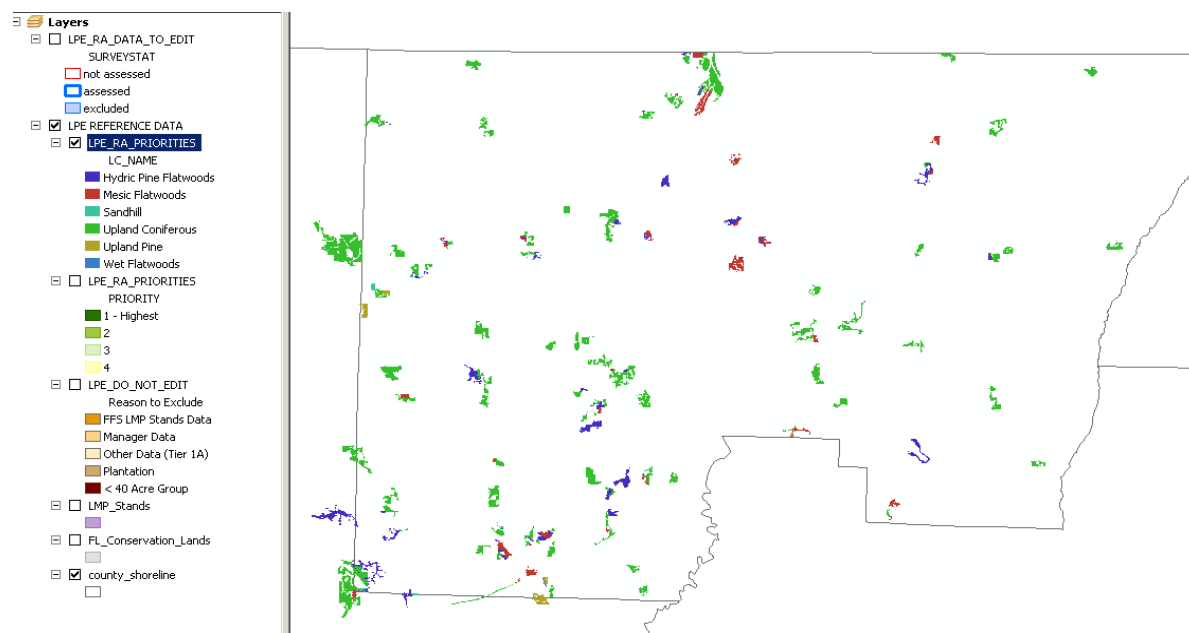
Example of LPE Rapid Assessment data layers displayed together.
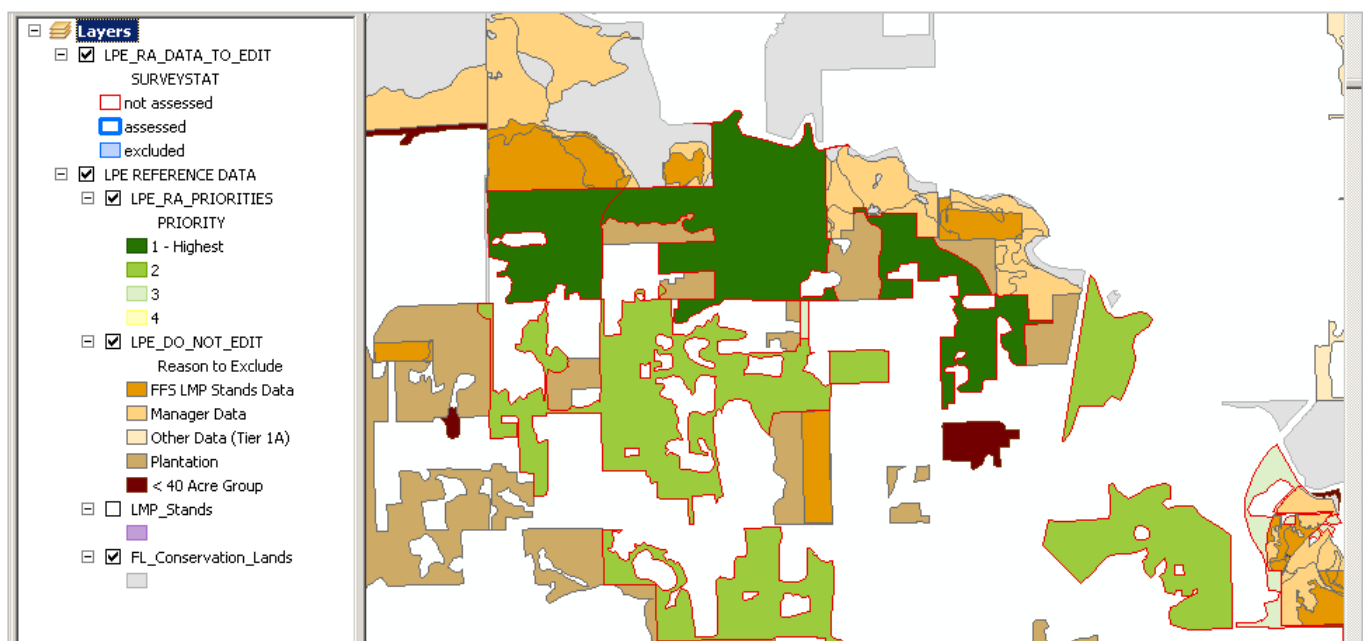
Data Check-out, Field Editing, and Check-in Process Using the ArcPad Data Manager Toolbar

Session Objectives:

1. **Check-out data from a geodatabase for editing in the field using the ArcPad Data Manager Toolbar in ArcMap**

2. **Edit data in the field using ArcPad**

3. **Check-in field data and update a geodatabase using the ArcPad Data Manager Toolbar in ArcMap**

SECTION 1 – Establishing a connection with your mobile device.

When you plug in your field unit (datalogger) to your computer the Windows Mobile Device Center program should open. This program replaces ActiveSync for previous versions of Windows. If Windows Mobile Device Center does not open reboot your field unit.

Click "Connect without setting up your device"
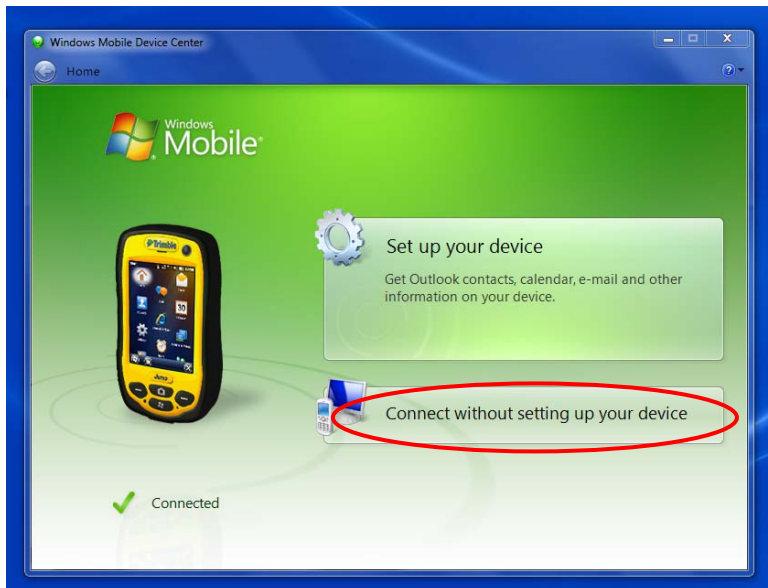
That is all that is necessary for the transfer of files to and from the datalogger.

If you want to browse for files on your field unit, click "browse the contents of your device" under File Management. We will revisit File Management later.
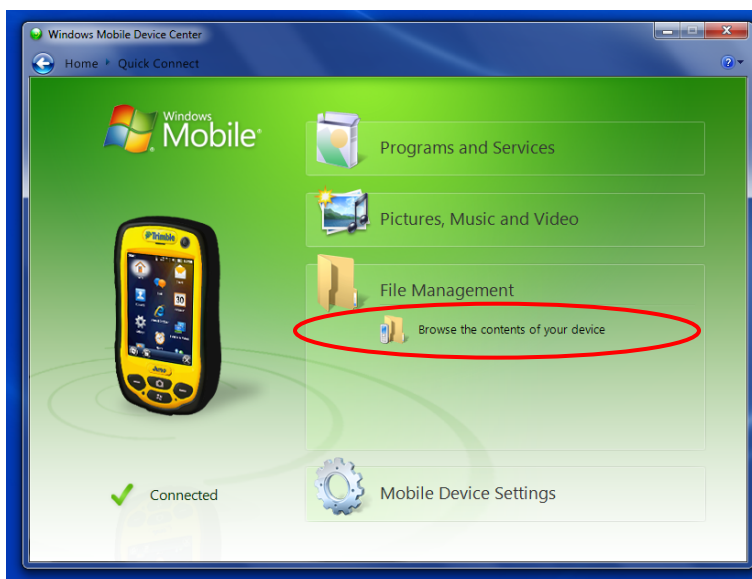
Section 2 – Preparing Data for Check-out

Open your LPE_RA_Template ArcMap project
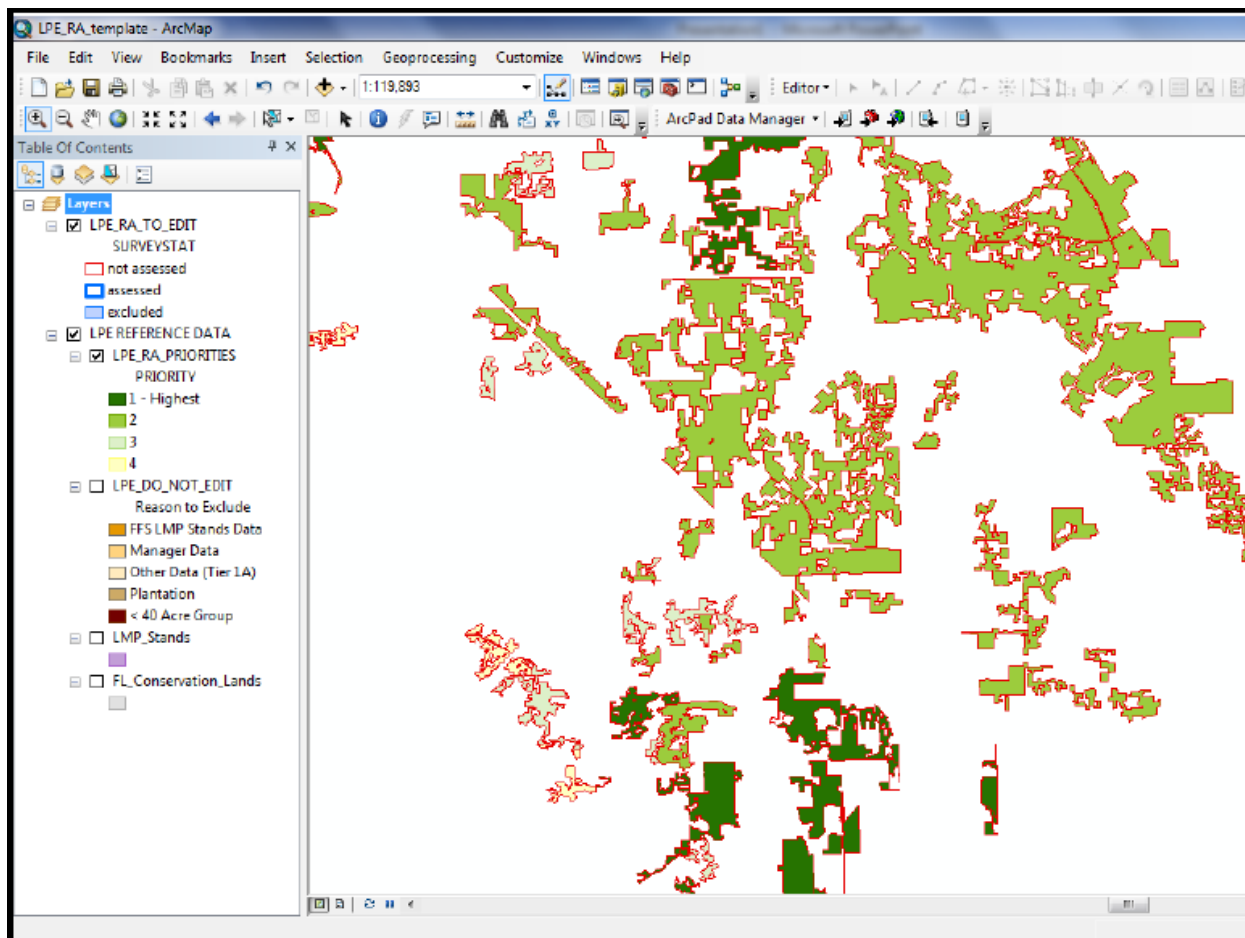
Optional: Edit files or change your symbology and priorities as needed or desired. These procedures are covered elsewhere in your training.

Section 3 – Using the ArcPad Data Manager Toobar to Check-out Data

Add the ArcPad Data Manager toolbar to your Arc Map project by clicking the "Customize" tab and select Toolbars then ArcPad Data Manger.
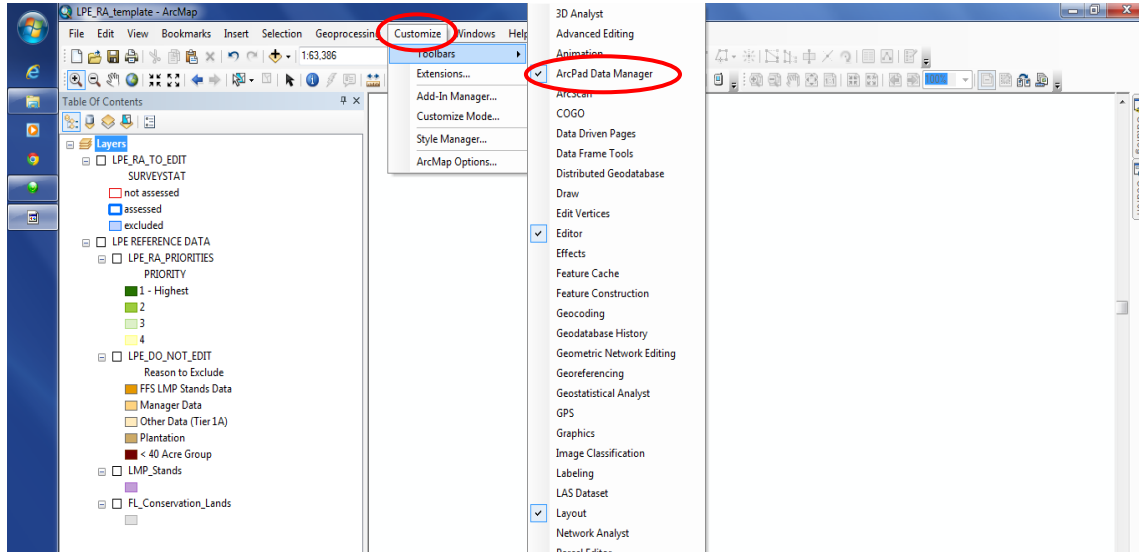
Click on the get Data for Arc Pad button.

Select an Action for each file you intend to export.

For the LPE_RA_TO_EDIT file, select Check Out for disconnected editing in ArcPad, then Data based on defined extent.
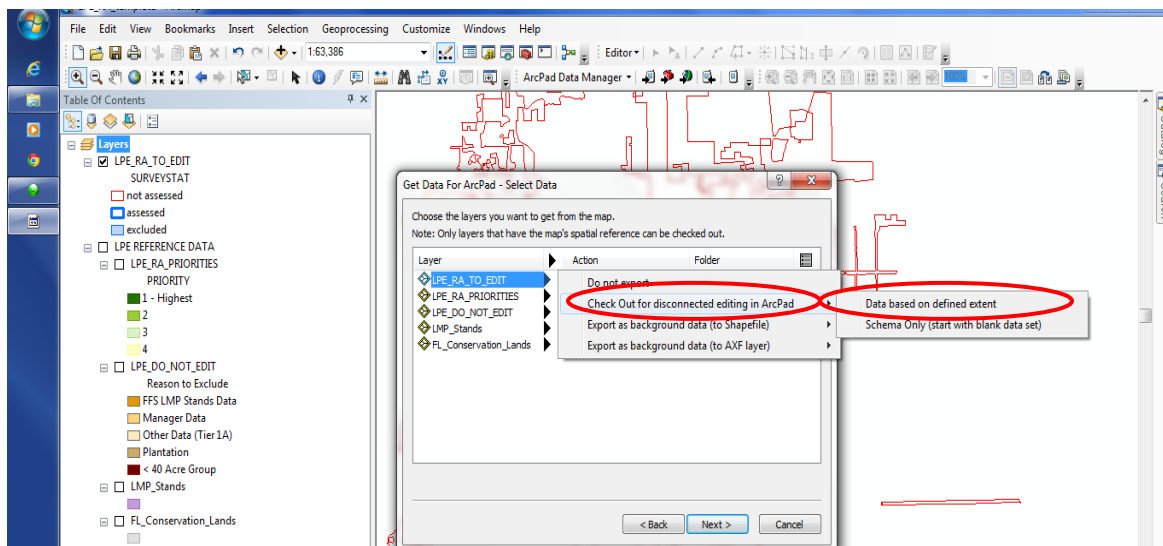
For files that are not to be edited select "Export as background data (to Shapefile)" and "Make Read Only"
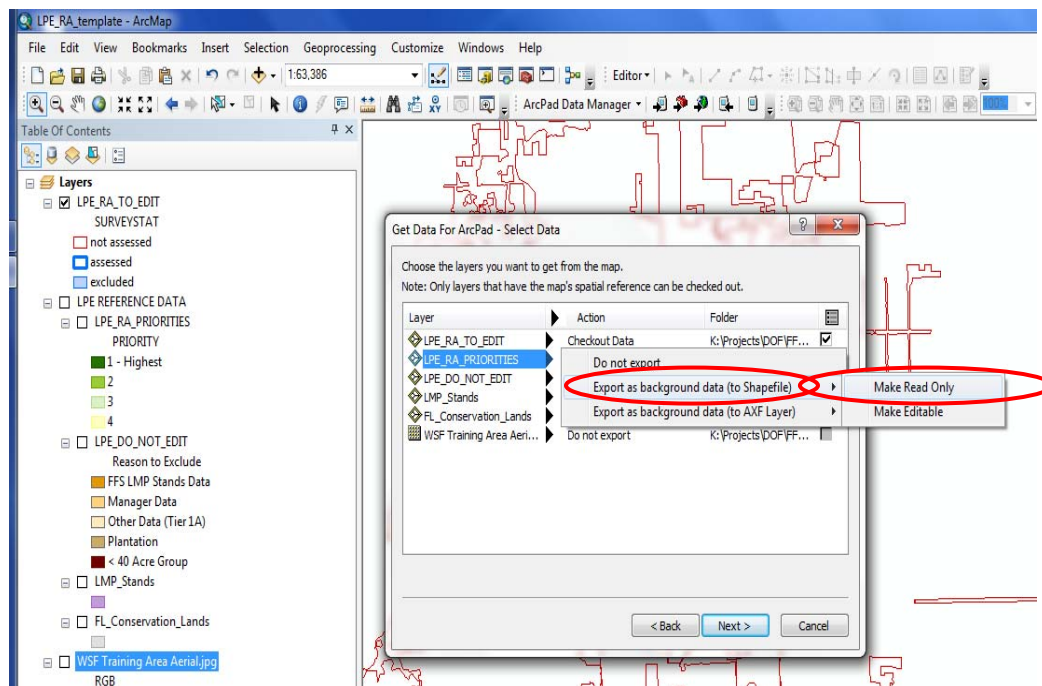
For bacground imagery select "Export as background JPEG2000"
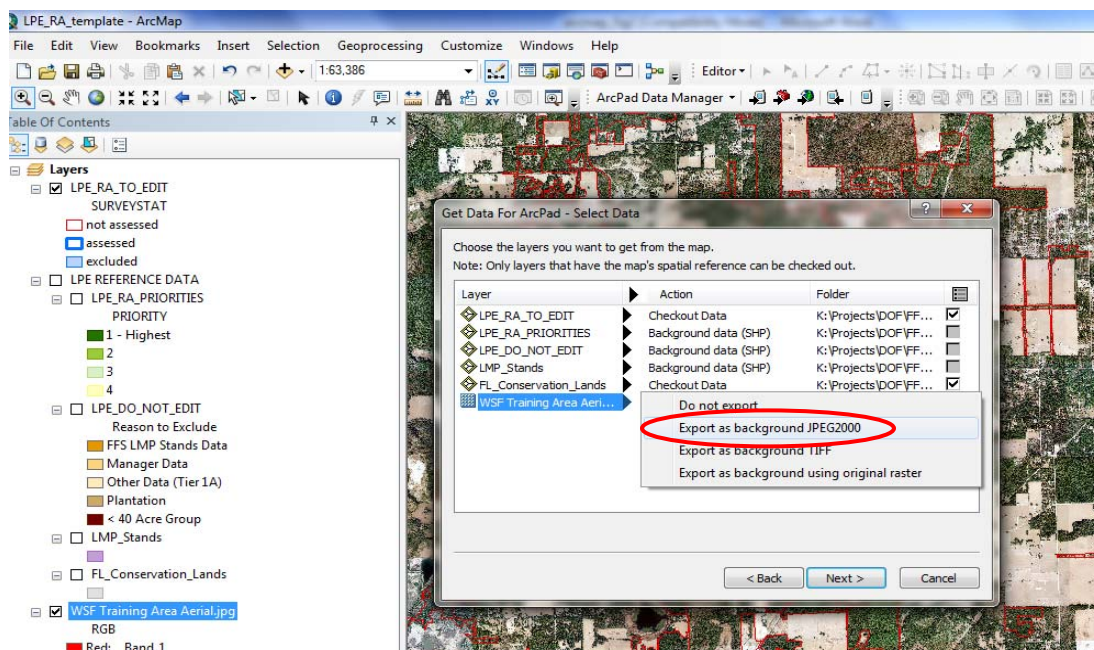
Click "Next" when finished selecting layers for check-out

Select "Next" at the next screen; field photos are not required for this project
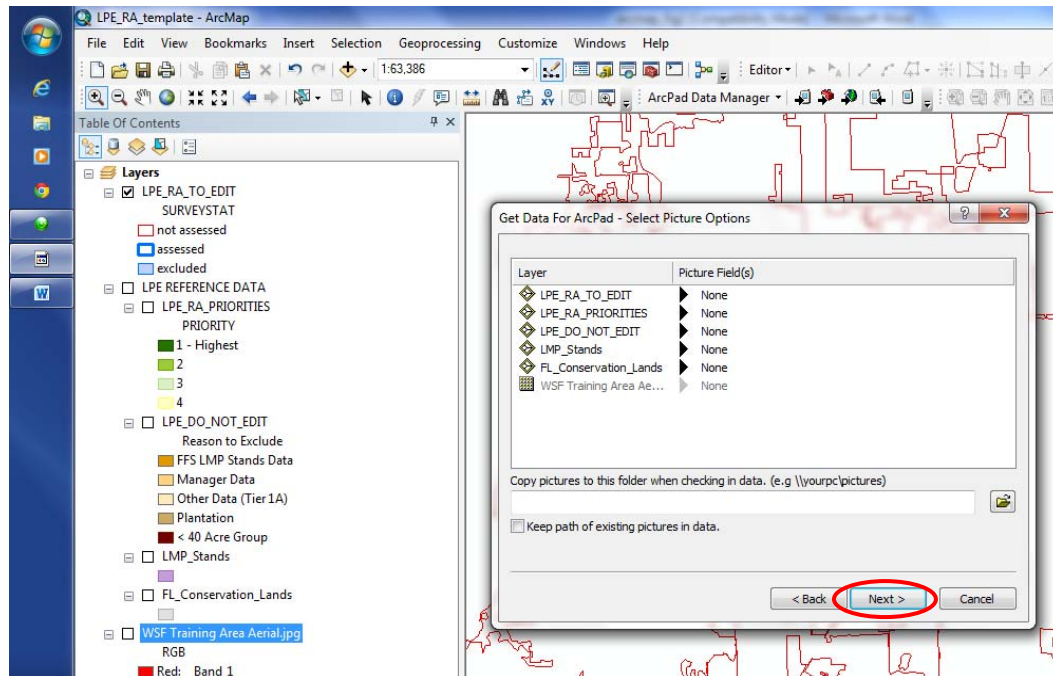
In the following window, ensure that all boxes are checked as below. This will be the default setting until you change them. Specify a name for the folder for this check-out session; use the following naming convention *initials_county_yyyymmdd*

Choose a location to store the folder containing your check-out data and ArcPad project; this may be prescribed in another portion of your training. Remember this file name and location for the check-in procedure. Name the ArcPad map the same as the folder.
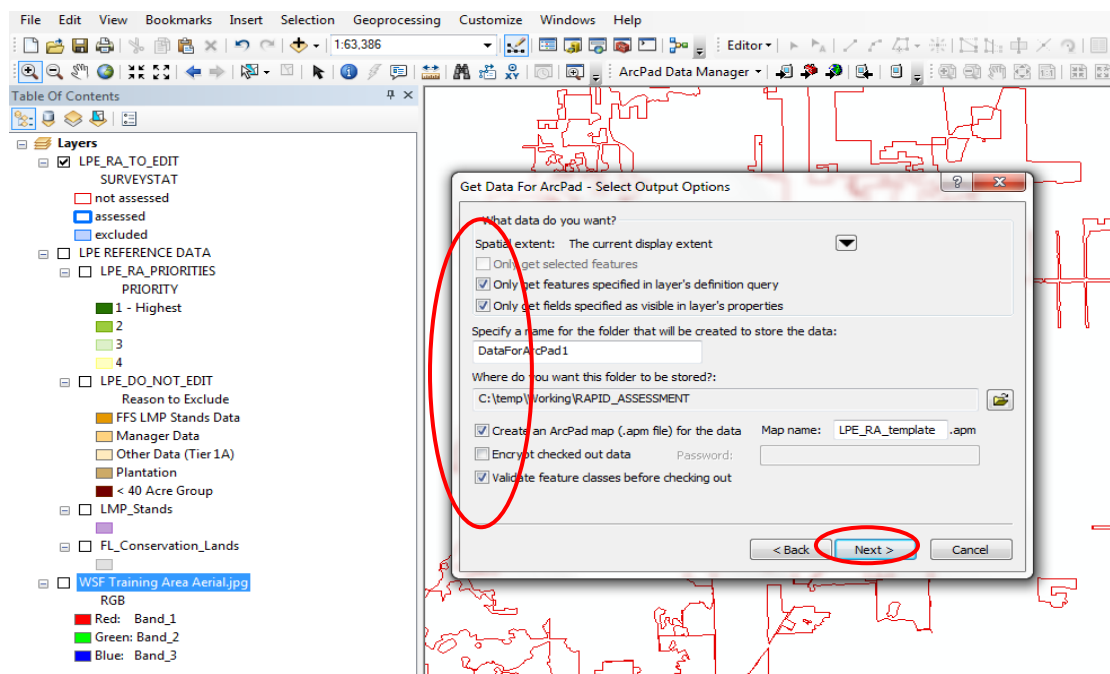
Under deployment options, check the "Create ready to deploy .CAB file…" and select "Create the ArcPad data on this computer now", then finish.

You must create a new .CAB file after modifying the RA data in ArcGIS. Only one file can be used to update the database following field data collection (two people can't work on two separate field files to update the master RA data file.
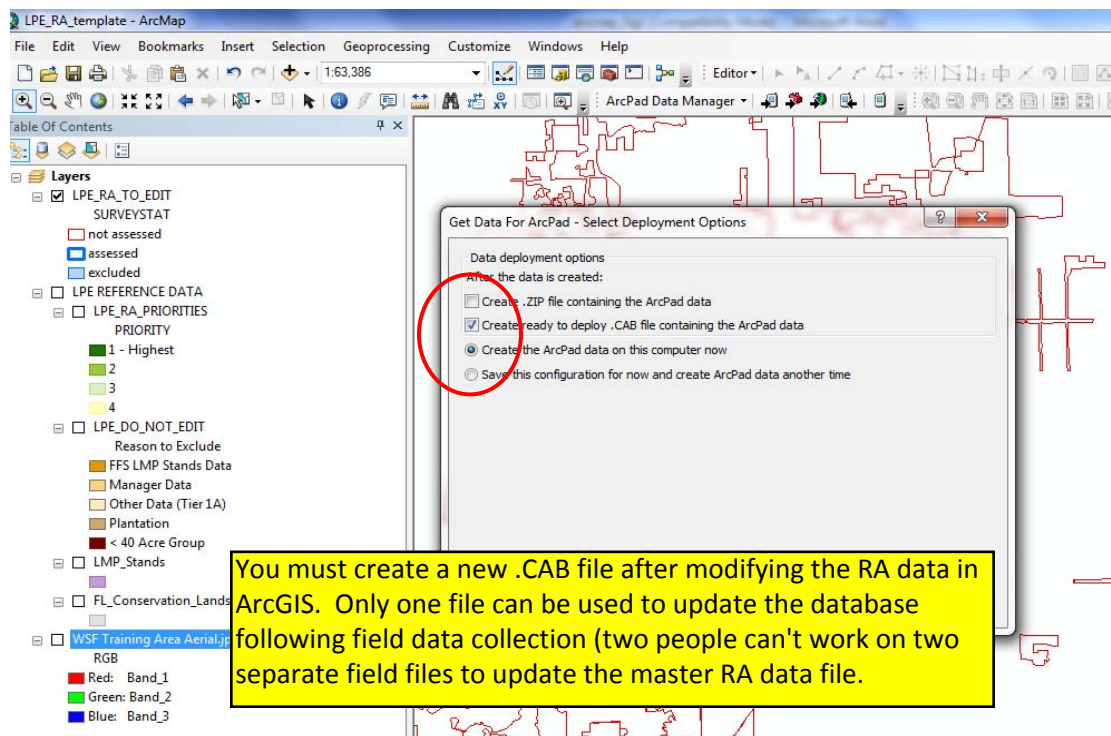
You should then receive and "operation successful" message

If you receive an error you may have exceeded the 50 MB file size for background imagery. Zoom into a smaller area or do not include imagery in the check-out.
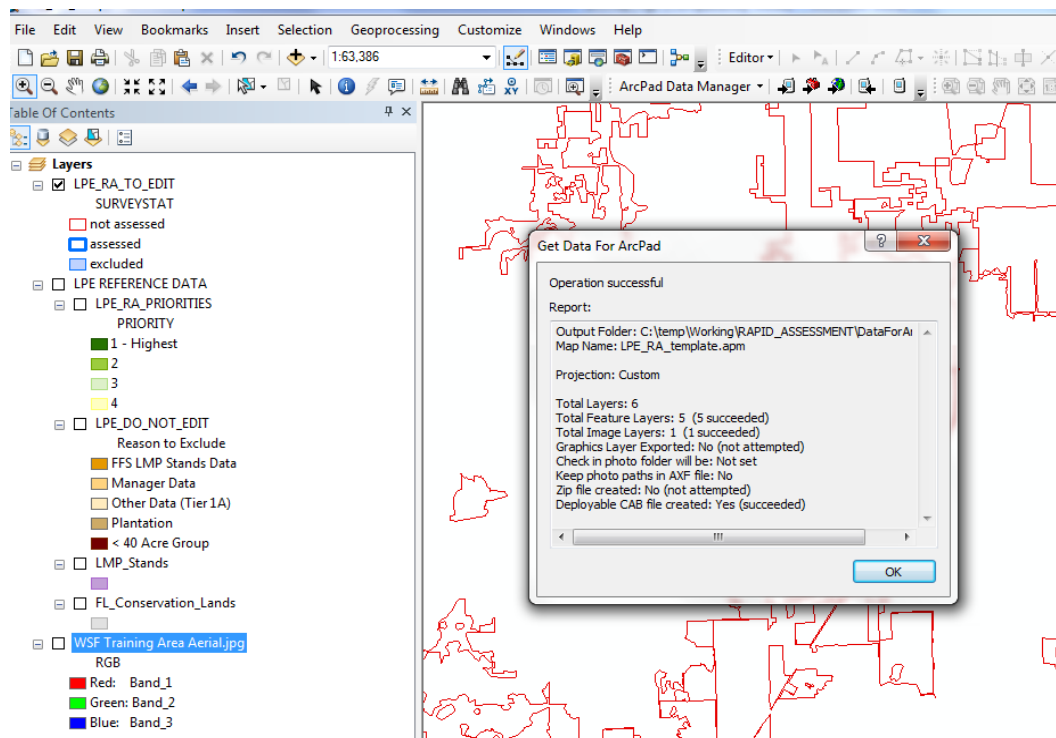
Deploy the data to your field unit (GPS Datalogger)
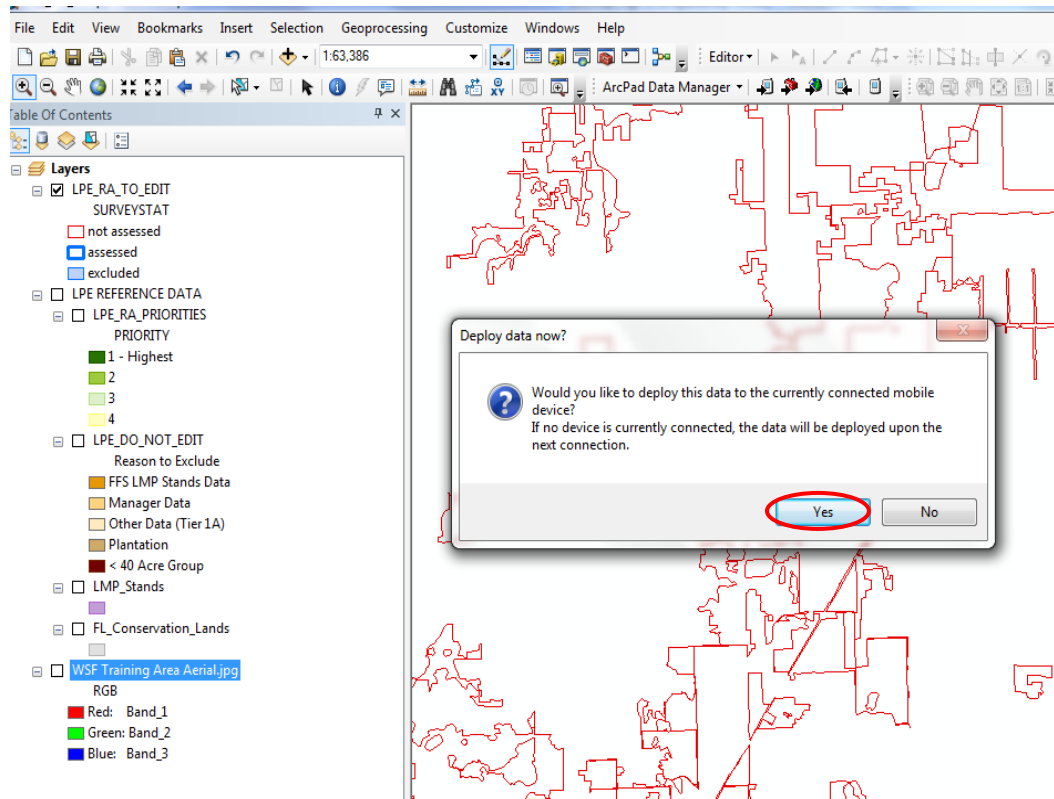
The deploy process will take a minute or so; follow any on screen prompts on your field unit. It may state that the CAB file has been installed (click OK in the bottom right of the screen). Or, it may ask if you want to install the CAB file (replacing a former file) click yes. Your checked out data is now on your field unit and ready for editing/updating. Caution: If you have deployed data during a previous session, make sure you are editing the latest version of the data. It is a good practice to delete the old files on your field unit following the Check-in procedure (see below)

SECTION 4 – Manual Copying of ArcPad Project Folder

If you have a problem deploying the files to your field unit you may manually copy the files using File Management in the Windows Mobile Device Center.

Paste the entire folder created in Section 3 (page 6 of this procedure) into the My Documents folder on your field unit.
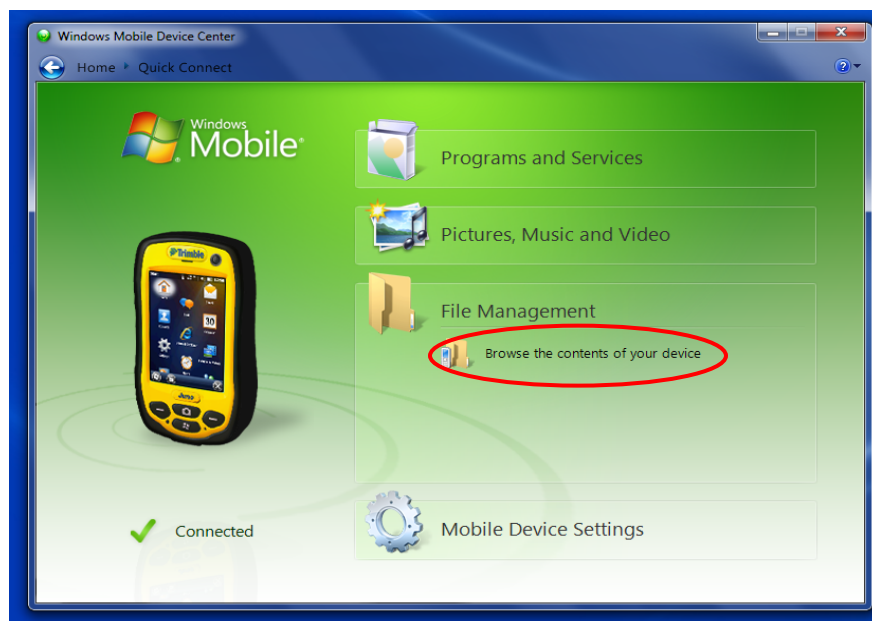
SECTION 5 – Opening the Project on your field unit and data collection

Open ArcPad on your field unit.

Select "Choose a map to open" in the Welcome to ArcPad menu.

If the Welcome to ArcPad menu does not open automatically, click on the "Main Tools" icon that looks like a closed file folder at the top left. Then click the "open map" icon directly underneath it as depicted below.

Then chose the ArcMap file created for this field session
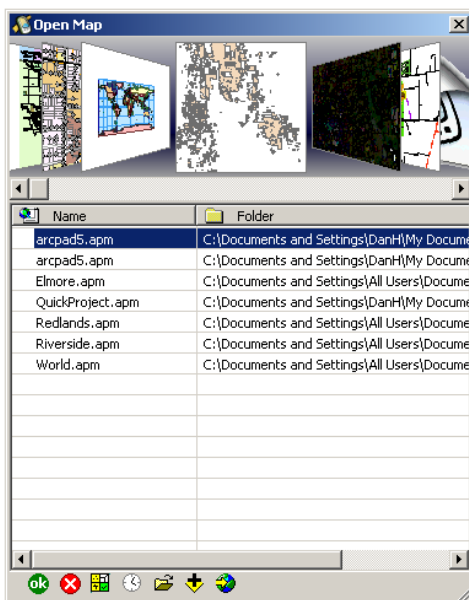
Activate your GPS (if not already activated) by clicking the dropdown menu under the satellite icon and select "activate GPS". You will find this under the main menu (folder icon)
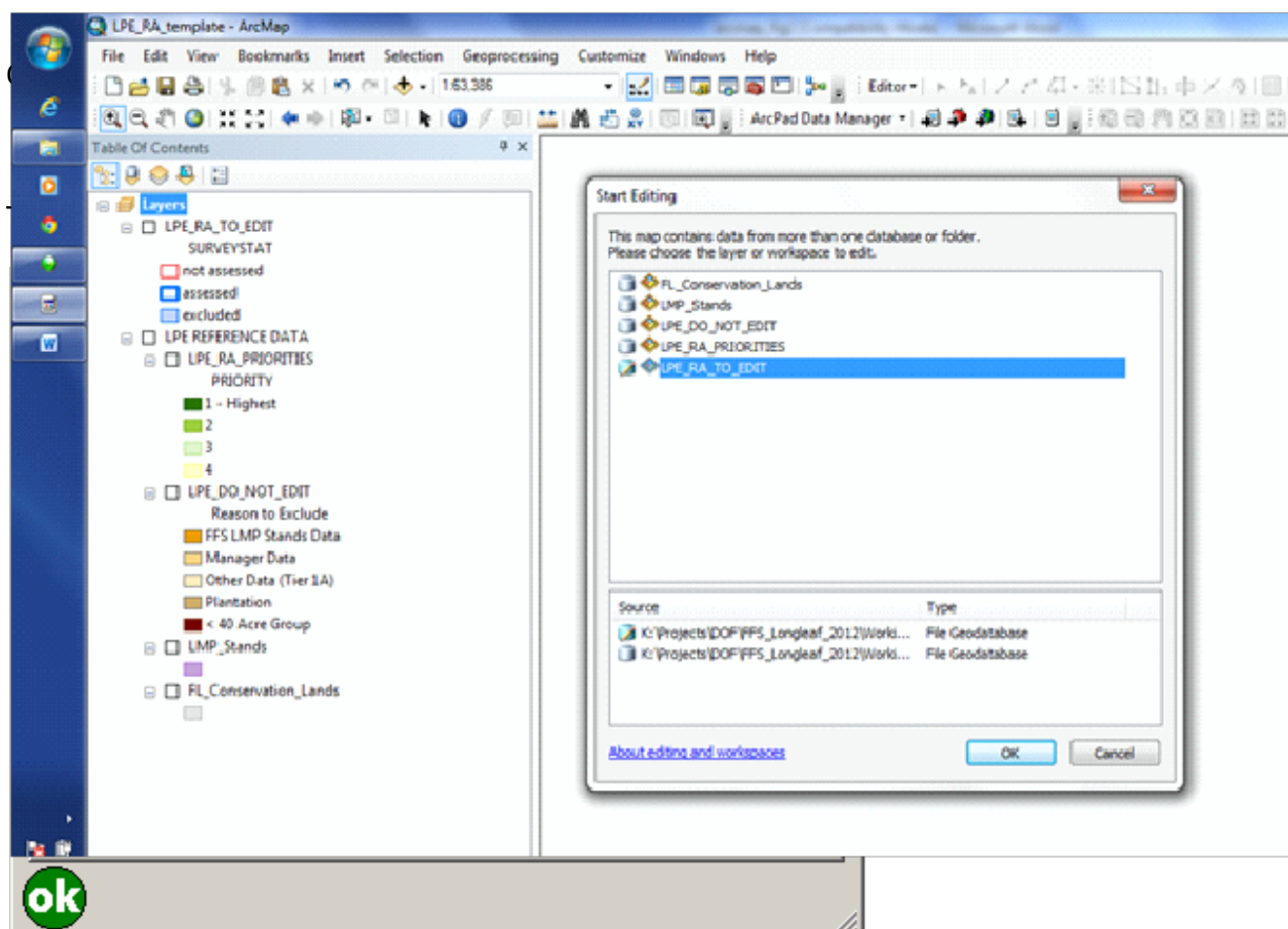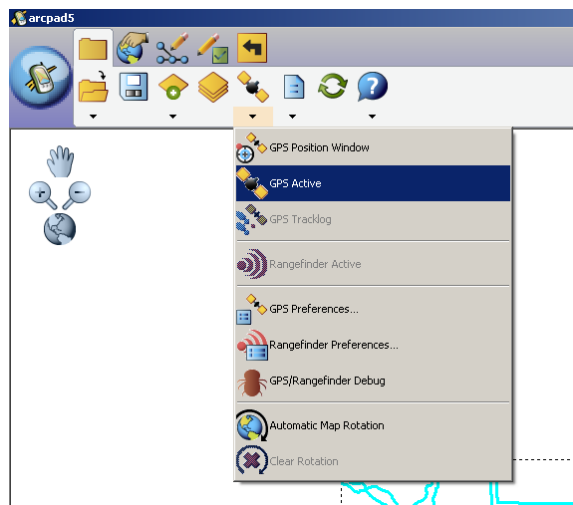
Then click OK

Click drawing tools then click polygon and you will be able to select existing or add new polygons representing the extend of the area you are going to describe with data.
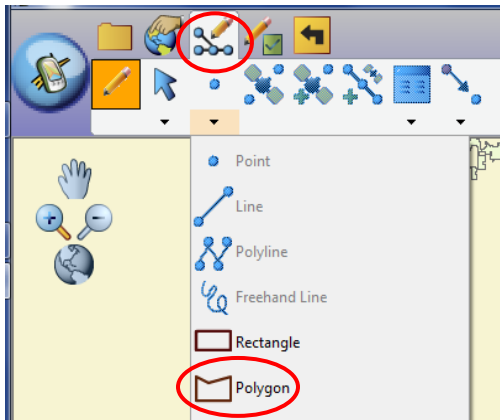
If you need to add additional layers such as imagery, click the add layers button to browse to the location. You may want to store large imagery files on a micro SD card (located behind the battery on your Flint)
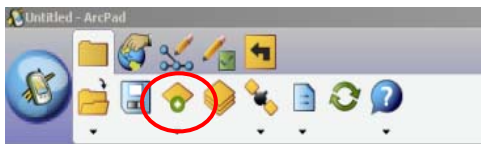
If the polygon on the map screen for your selected site is accurate select the polygon with the select tool and click the feature properties button to edit/collect the data.
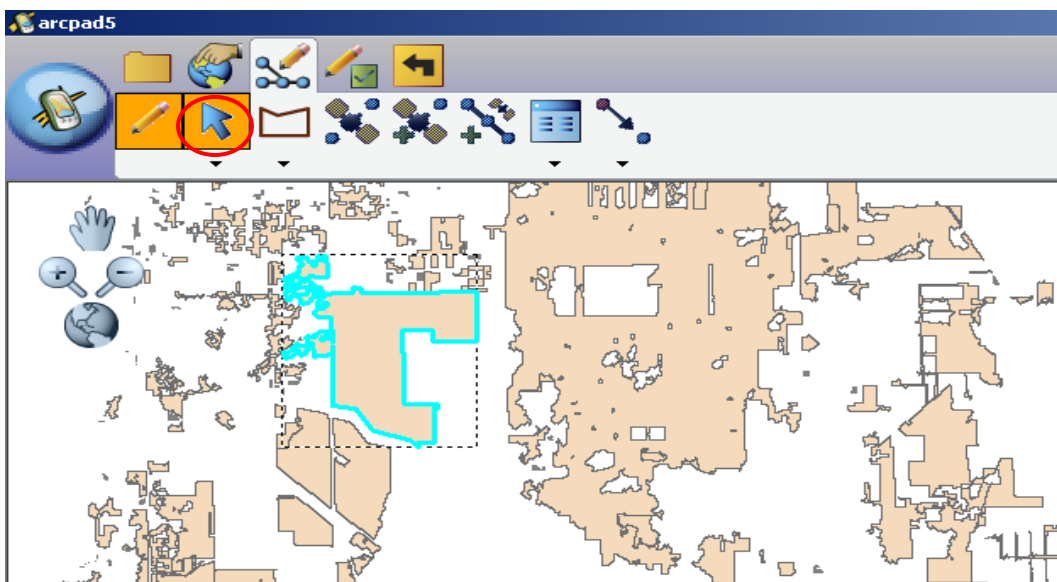
If the polygon does not reflect the extent of the site for which data will be collected, add a new polygon to the file covering the extent of site and add data. The new polygon can overlap the existing polygons.

For technical assistance contact:
Cory Campbell, 850-488-5661
Karen Cummins, 850-414-0868
Scott Taylor, 850-487-3015
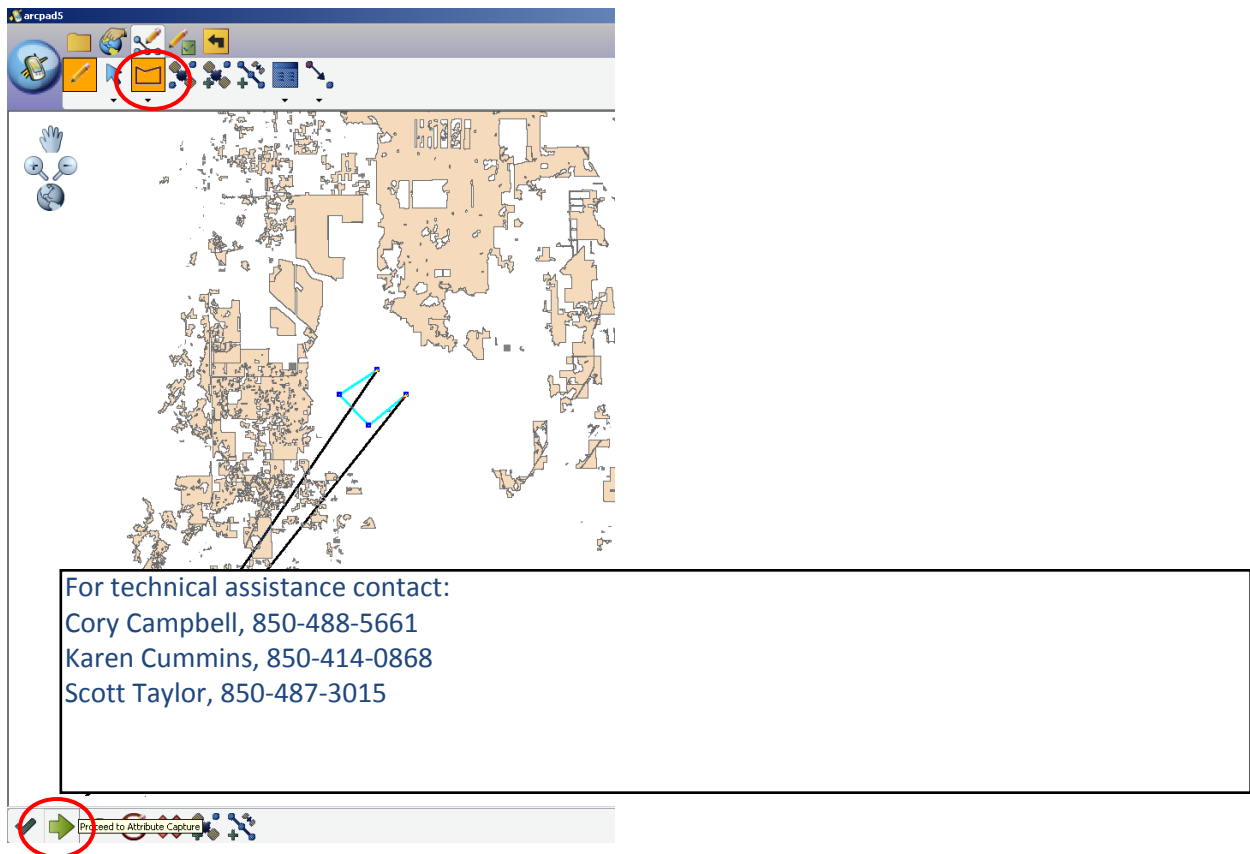
Click on the polygon icon then click the map screen to add vertices; **click the green arrow at the bottom of the page to close the polygon and proceed to the data entry form**.
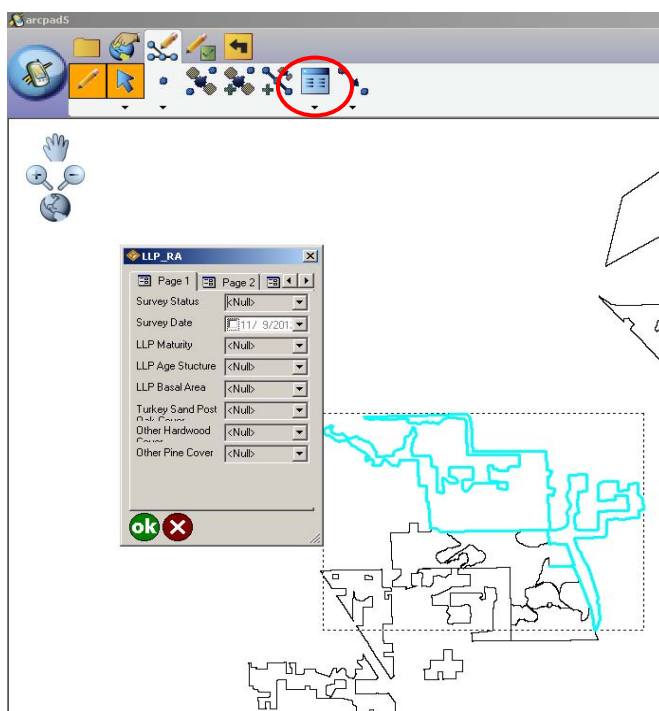
Complete each page of the form and click OK to store the data. If you need to edit the data select the polygon then click the feature properties icon under the drawing tools menu to re-open the form.

When the field session is complete close ArcPad and follow the Check-in procedures to update your RA geodatabase.

Rapid Assessment Data Field Descriptions

Interpretive Guide		Geodatabase Guide	
Class	**Field Definition**	**Field Name**	**Field Attributes**
Survey Status:	Indicates status of the site (polygon) assessment	SURVEYSTAT	assessed excluded not assessed
Survey Date:	Date of the field assessment	SURVEYDATE	(automated)
LLP Maturity:	Indicates the presence and dominance of LLP in the **canopy**	LLP_MATURE	dominant codominant occasional-rare absent
LLP Age Structure:	Indicates the age structure of LLP in the **canopy**	LLP_AGE	at least 3 age classes 2 age classes 1 age class absent from canopy
LLP Basal Area:	Estimated basal area in square feet per acre of LLP for the entire polygon	LLP_BA	0-30 31-60 61-90 > 90
Turkey Sand Post Cover:	Percentage of the ground within the polygon covered by the general extent of the canopy of turkey oak and sand post oak; **Spaces between leaves and stems count as cover.** Canopy is defined as any stem greater than 16 feet tall. values:	TO_SPO_COV	**Code** **Description** 1 < 1% 3 1 - 5% 10 6 - 15% 20 16 - 25% 30 26 - 35% 40 36- 45% 50 46 - 55% 60 55 - 65% 70 66 - 75% 80 76 - 85% 90 86 - 95% 98 96 - 100%

Other Hardwood Cover:	Percentage of the ground within the polygon covered by the general extent of the canopy of hardwood species excluding turkey oak and sand post oak; **Spaces between leaves and stems count as cover.** Canopy is defined as any stem greater than 16 feet tall.	OTH_HW_COV	(see TO_SPO_COV above)
Other Pine Cover:	Percentage of the ground within the polygon covered by the general extent of the canopy of pine species other than LLP; **Spaces between leaves and stems count as cover.** Canopy is defined as any stem greater than 16 feet tall. values: see TO_SPO_COV	OTH_PINECOV	(see TO_SPO_COV above)
Midstory Cover:	Percentage of the ground within the plot covered by the general extent of midstory plants; **Spaces between leaves and stems count as cover.** Midstory Cover includes any woody stem (including vines and pines) from 6 to 16 feet tall. values: see TO_SPO_COV	MIDST_COV	(see TO_SPO_COV above)
Shrub Cover:	Percentage of the ground within the plot covered by the general extent of woody plants less than 6 feet tall; **Spaces between leaves and stems count as cover.** values: see TO_SPO_COV	SHRUB_COV	(see TO_SPO_COV above)
Pyrogenic Grass Cover:	Percent cover of native perennial graminoids that are maintained by periodic fire; includes wiregrass (*Aristida stricta*), pineywoods dropseed (*Sporobolus junceus*), Florida dropseed (Sporobolus floridanus)*,* Chapman's beaksedge (*Rhynchospora chapmanii*), cutover muhly (*Muhlenbergia capillaris* var. *trichopodes*), toothache grass *(Ctenium aromaticum*), little bluestem (*Schizachyrum scoparium*) and Florida toothache grass *(Ctenium floridanum*), not switchgrass (*Panicum virgatum*)*.* values: see TO_SPO_COV	PYROGR_COV	(see TO_SPO_COV above)
Herbaceous Cover:	Percent cover of all native non-woody, soft-tissued plants regardless of height, including non-woody vines, legumes, and graminoids (grasses, sedges, rushes); does not include non-native pasture grasses. values: see TO_SPO_COV	HERB_COV	(see TO_SPO_COV above)
Fire Evidence:	Describes the general time period since last fire as determined by visual evidence within the polygon (e.g. fire scars on trees, standing blackened shrubs).	FIRE_EVID	not evident < 2 years 2 - 5 years > 5 years
Invasive Plant Distribution:	Describes the extent and distribution of invasive exotic plants within or along the perimeter of the polygon; includes only FLPPC category I and II listed species.	INVPL_DIST	not evident present along perimeter only 1 to few patches within many patches within

Condition Rank:	describes the ecological condition relative to a natural system (natural vegetative plant community) values:	COND_RANK	**Code**	**Description**
			excellent	Community species composition/abundance and structure are characteristic of conditions prevalent under historic fire regime.
			good	Community species composition/abundance and structure are only partially characteristic of conditions previously prevalent under historic fire regime.
			fair	Retains some components and/or structure characteristic under historic fire regime. Components of original pyrogenic groundcover are sparse or suppressed so as to be functionally irrelevant.
			poor	May retain little of the original community species components and/or structural characteristics. Components of original pyrogenic groundcover are not evident.
Natural Community Type:	describes the dominant historic natural community type (pre-Columbian) within the site (polygon)	NC_TYPE	mesic flatwoods sandhill scrub scrubby flatwoods upland mixed woodland upland pine wet flatwoods unknown	
Comments:	Comments provides additional, optional information about the site (polygon)	COMMENTS		

How do I submit my updates to Tallahassee?

You must be mapped to the network location to which you will submit your updates.

G:\ Longleaf_Pine_Ecosystems_Project\Upload\'County_Name'

1. Open ArcCatalog (It is recommended that you submit your geodatabase using ArcCatalog, not Windows Explorer (My Computer)).
2. Copy only the LPE_RA_DATA_TO_EDIT.gdb to its designated county upload folder. If you are working with multiple counties, place each county

   Note: <u>When you submit your updates you will submit your entire geodatabase file</u>. Folders have been created for this purpose, and are organized by county.

How do I map a network drive?

1. Open Windows Explorer (My Documents)
2. Go to *Tools > Map network drive …*
   a. Choose a drive letter (**G:** is recommended)
   b. Enter the following path: **\\tlhforgisdata\for_gisfield**
3. Click OK

For more information refer the FFS <u>GIS-GPS intranet page</u>.

What if I can't see the network location using ArcCatalog?

1. In ArcCatalog, click on *File > Connect Folder*
2. Navigate to the G: drive you created in Windows Explorer.
3. Click OK

The folders will now appear in ArcCatalog just like in Windows Explorer. It will remain in ArcCatalog for future use unless you choose to remove it.

Appendix C. LPEGDB Version 1 Operations Guide

This guide is a procedures overview for the maintenance, use and update of the Longleaf Pine Ecosystems Geodatabase version 1 developed by FNAI in cooperation with FFS and published December 2013.

Section 1. Database Maintenance

Platform	ESRI ArcGIS 10.0 File Geodatabase
Coordinate System (of all feature classes contained within)	NAD 1983 HARN Florida GDL Albers (Meters); WKID: 3087
Versions	Version 1.0 published Dec 2013 contains datasets suitable for public distribution with metadata Decimal versions (e.g. 1.1, 1.2, 1.21, etc) should be used for internal interim working updates. If another versioning convention is used it must be described in the metadata. Version 2.0 will be reserved for the next major update for public distribution.
Domains	The LPEGDB contains domains as described in the schema section below. Best practice for maintaining integrity of domains when distributing datasets is to copy the entire GDB then manage datasets within as needed.

Section 2. Database Schema

Contents and Organization

- LPEGDB_v1rev.gdb
  - LPE_Condition
    - Condition_by_Mgmt_Class
    - FNAI_LPE_Condition_Data
    - LPE_FNAI_Condition_Joined
    - LPE_Rapid_Assessed
  - LPE_Occurrence
    - LPE_Occurrence
  - LPE_Priorities
    - LPE_Draft_Protection_Priorities
  - RA_Templates
    - Rapid_Assessment_Field_Template
    - Rapid_Assessment_QC_Template
  - Cond_to_MgmtCls_FNAI_Tbl
  - Cond_to_MgmtCls_RA_Tbl
  - CrossTab_CLC_LCNAME
  - Crosstab_FLMA
  - LPE_Tools
  - LPEGDB_archive_fields_tbl
  - LPEGDB_QC_RA_DOM_DESC_tbl
  - LPEGDB_QC_RA_FIELDS_tbl
  - LPEGDB_RAM_DOM_DESC_tbl
  - LPEGDB_RAM_DOMAINS_tbl
  - LPEGDB_RAM_FIELDS_tbl

LPEGDB Contents

Feature Datasets	Description
Feature Classes	
LPE_Condition	Contains feature classes that contain ecological condition data
Condition_by_Mgmt_Class	Merged condition data from LPE_Rapid_Assessed and LPE_FNAI_Condition_Joined, crosswalked into management classes. Key Field: LPEGDB_ID
FNAI_LPE_Condition_Data	Point data compiled from multiple FNAI sources with condition data crosswalked to Rapid Assessment fields. Key Field: LPE_ID
LPE_FNAI_Condition_Joined	Condition data from FNAI_LPE_Condition_Data spatially joined to LPEGDB polygons. Join process was one-to-one, merge rule FIRST, where join features had been permanent sorted descending based on completion rate of condition fields. Key Fields: LPE_ID, LPEGDB_ID
LPE_Rapid_Assessed	Condition data from 2013 Rapid Assessment. Key Field: LPEGDB_ID
LPE_Occurrence	Contains feature class containing distribution and occurrence summary of LPEs
LPE_Occurrence	All potential LPE polygons with attributes indicating status of occurrence and condition information. Key Field: LPEGDB_ID
LPE_Priorities	Contains feature classes where ecological condition or other attributes have been synthesized into priority classes
LPE_Draft_Protection_Priorities	Prioritization derived from ecol. condition (condition rank, pyrogenic grass cover, or hardwood cover) and size of LPE areas
RA_Templates	Contains feature classes with standardized fields to be used as templates for merging populated feature classes
Rapid_Assessment_Field_Template	This is an empty feature class to be used as a merge template for new rapid assessment polygon deployment. By merging with this template domains are automatically linked to fields.
Rapid_Assessment_QC_Template	This is a feature class to be used as a merge template with submitted rapid assessment data. It adds several fields for use in the QC process.
Tables	
Cond_to_MgmtCls_FNAI_Tbl	Table for crosswalking FNAI condition data to Management Class. See Tool: 2_MgmtClass_to_FNAIJoin
Cond_to_MgmtCls_RA_Tbl	Table for crosswalking rapid assessment condition data to Management Class. See Tool: 1_MgmtClass_to_RAJoin
CrossTab_CLC_LCNAME	Cross tabulation table of LPEGDB polygons to land cover names in Cooperative Land Cover v2.3. Key Field: LPEGDB_ID (one-to-many relationship)
CrossTab_FLMA	Cross tabulation table of LPEGDB polygons to Florida Conservation Lands (FLMA). Key Field: LPEGDB_ID (one-to-many relationship)
LPEGDB_archive_fields_tbl	Table of archival fields associated with GDB prior to rapid assessment; should not be used for analysis. Key Field: LPEGDB_ID
LPEGDB_QC_RA_DOM_DESC_tbl	Table of domains assigned to LPEGDB for use in QC
LPEGDB_QC_RA_FIELDS_tbl	Fields and associated domains for use in QC
LPEGDB_ RAM_DOM_DESC_tbl	Table of Rapid Assessment domain codes and descriptions assigned to LPEGDB. Note: Descriptions here are strictly informative. Use the LPEGDB_RAM_DOMAINS _tbl for creating new domains in GDB.
LPEGDB_ RAM_DOMAINS_tbl	Table of Rapid Assessment domain codes assigned to LPEGDB.
LPEGDB_ RAM_FIELDS_tbl	Rapid Assessment fields and associated domains
Model Builder Tools: LPE_Tools.tbx	
1_MgmtClass_to_RAJoin	1st step in 2 part process for combining Rapid Assessment and FNAI condition data, and crosswalking to management classes.
2_MgmtClass_to_FNAIJoin	2nd step in 2 part process for combining Rapid Assessment and FNAI condition data, and crosswalking to management classes.
QC1 – Number of Condition Fields With	Tool for QC of data completion.
QC2 – Delete Chk Fields	Tool to remove extra fields after QC1 step is complete.

Domains and Data Dictionary

LPEGDB Rapid Assessment Fields. Applies to these files: LPE_Rapid_Assessed; Rapid_Assessment_Field_Template

Field Description	Field Name	Field Alias	Field Type	Split Value	Domain Name
Status of field survey as assessed, not assessed, or excluded	**SURVEYSTAT**	Survey Status	Text	Duplicate	**SURVEYSTAT_cbo**
Date of survey	**SURVEYDATE**	Survey Date	Date	Duplicate	n/a
Canopy: Longleaf pine maturity	**LLP_MATURE**	LLP Maturity	Text	Duplicate	**LLP_MATURE_cbo**
Canopy: Longleaf pine age structure	**LLP_AGE**	LLP Age Structure	Text	Duplicate	**LLP_AGE_cbo**
Canopy: Longleaf pine basal area	**LLP_BA**	LLP Basal Area	Text	Duplicate	**LLP_BA_cbo**
Canopy: Cover of turkey and sand post oak >16'	**TO_SPO_COV**	Turkey Sand Post Cover	Integer	Duplicate	**COV_cbo**
Canopy: Cover of other hardwood species >16'	**OTH_HW_COV**	Other Hardwood Cover	Integer	Duplicate	**COV_cbo**
Canopy: Cover of pines other than longleaf >16'	**OTHPINECOV**	Other Pine Cover	Integer	Duplicate	**COV_cbo**
Midstory: Cover of woody species 6 - 16'	**MIDST_COV**	Midstory Cover	Integer	Duplicate	**COV_cbo**
Shrub: Cover of woody species <6'	**SHRUB_COV**	Shrub Cover	Integer	Duplicate	**COV_cbo**
Ground Cover: Cover of native pyrogenic grasses and sedges	**PYROGR_COV**	Pyrogenic Grass Cover	Integer	Duplicate	**COV_cbo**
Ground Cover: Cover of herbaceous species	**HERB_COV**	Herbaceous Cover	Integer	Duplicate	**COV_cbo**
Evidence of fire	**FIRE_EVID**	Fire Evidence	Text	Duplicate	**FIRE_EVID_cbo**
Distribution of invasive non-native plants	**INVPL_DIST**	Invasive Plant Distribution	Text	Duplicate	**INVPL_DIST_cbo**
Ecological condition rank	**COND_RANK**	Condition Rank	Text	Duplicate	**COND_RANK_cbo**
Natural community type	**NC_TYPE**	Natural Community Type	Text	Duplicate	**NC_TYPE_cbo**
Comments	**COMMENTS**	Comments	Text		n/a

LPEGDB LPE_Occurrence Fields. Applies to these files: LPE_Occurrence

Unique identifier for each feature	**LPEGDB_ID**	LPEGDB_ID	Text	Duplicate	n/a
Occurrence status of LPE	**LPE_Occurrence**	LPE_Occurrence	Text	Duplicate	**Yes_No_Unknown_cbo**
Confidence Tier	**CONF_TIER**	Confidence Tier	Text	Duplicate	**CONF_TIER_cbo**
Reason for assignment of LPE occurrence status as unknown	**UNK_Type**	Unknown Type	Text	Duplicate	n/a
Primary source of data	**DATA_SRC**	Data Source	Text	Duplicate	n/a
County	**COUNTY**	County	Date	Duplicate	n/a
Poly_Acres	**POLY_ACRES**	Poly_Acres	Float	Duplicate	n/a

LPEGDB Rapid Assessment QC Fields. Applies to these files: Rapid_Assessment_QC_Template

QC of Assessment Status	**QC_AssessStat**	QC_AssessStat	Text	Duplicate	**AssessStat_cbo**
QC of site access, determined from	**QC_Access**	QC_Access	Text	Duplicate	**Yes_No_Unknown_cbo**
Occurrence status of Longleaf Pine Ecosystem as Yes, No or Unknow	**LPE_Occurrence**	LPE_Occurrence	Text	Duplicate	**Yes_No_Unknown_cbo**

LPEGDB Archive Fields*. Applies to these files: LPEGDB_partial_fields_tbl

Land Cover	**LC_NAME**	Land Cover	Text	Duplicate	n/a
Managed Area Name	**MANAME**	Managed Area Name	Text	Duplicate	**n/a**
Managing Agency	**MANAGING_A**	Managing Agency	Text	Duplicate	**n/a**
FortyAcre Group	**FORTYACGRP**	FortyAcre Group	Text	Duplicate	n/a
Reason excluded from polygons to be assessed	**EX_REASON**	Exclusion Reason	Text	Duplicate	n/a

*Should not be used for analysis. Fields preserved only for database record purposes.

Domains and Data Dictionary

LPEGDB Rapid Assessment Domain Descriptions

SURVEYSTAT_code	SURVEYSTAT_desc
assessed	Assessed: Data form completed
excluded	Excluded: Not a LLP site
not assessed*	Not Assessed: No site visit

LLP_AGE_code	LLP_AGE_desc
at least 3 age classes	Uneven aged canopy with at least 3 age classes of LLP
2 age classes	2 age classes of LLP in canopy
1 age class	1 age class of LLP in canopy
absent from canopy	LLP absent from canopy

LLP_MATURE_code	LLP_MATURE_desc
dominant	Mature, cone producing longleaf pine dominant in the canopy
codominant	Mature, cone producing longleaf pine codominant in the canopy
occasional-rare	Mature, cone producing longleaf pine occasional or rare in the canopy
absent	Mature, cone producing longleaf pine absent in the canopy

LLP_BA_code	LLP_BA_desc
0 - 30	0 - 30 sq feet per acre
31 - 60	31 - 60 sq feet per acre
61 - 90	61 - 90 sq feet per acre
> 90	> 90 sq feet per acre

COV_code	COV_desc
1	< 1%
3	1 - 5%
10	6 - 15%
20	16 - 25%
30	26 - 35%
40	36- 45%
50	46 - 55%
60	55 - 65%
70	66 - 75%
80	76 - 85%
90	86 - 95%
98	96 - 100%

FIRE_EVID_code	FIRE_EVID_desc
not evident	no evidence of fire
< 2 years	burned within last 2 years
2 - 5 years	burned 2 - 5 years ago
> 5 years	burned more than 5 years ago

INVPL_DIST_code	INVPL_DIST_desc
not evident	invasive plants not evident
present along perimeter only	invasive plants present along perimeter only
1 to few patches within	1 to few patches of invasive plants within the site
many patches within	many patches of invasive plants within the site

LPEGDB Rapid Assessment Domain Descriptions (continued)

COND_RANK_code	COND_RANK_desc
excellent	Community species composition/abundance and structure are characteristic of conditions prevalent under historic fire regime.
good	Community species composition/abundance and structure are only partially characteristic of conditions previously prevalent under historic fire regime. Retains some components and/or structure characteristic under historic fire regime. Components of original pyrogenic groundcover are sparse or suppressed so as to be functionally irrelevant.
fair	May retain little of the original community species components and/or structural characteristics. Components of original pyrogenic groundcover are not evident.
poor	

NC_TYPE_code	NC_TYPE_desc
mesic flatwoods	mesic flatwoods
sandhill	sandhill
scrub	scrub
scrubby flatwoods	scrubby flatwoods
upland mixed woodland	upland mixed woodland
upland pine	upland pine
wet flatwoods	wet flatwoods
unknown	unknown

Section 3. Updates

The LPEGDB v.1 contains two primary sources of data: data developed through the Rapid Assessment protocol and data from other sources (aka Existing Data). The following section recommends update practices for each type.

Rapid Assessment (RA) Data

1. Deployment for Data Collection
   a. Follow guidelines in the LPEGDB and Rapid Assessment Training Material (Appendix B of the LPEGDB Final Report) for file organization. Create new GDB for deployment by copying schema of existing LPEGDB.
   b. Merge polygons to be assessed with Rapid_Assessemnt_Field_Template

2. Data Submission: Follow guidelines in the LPEGDB and Rapid Assessment Training Material (Appendix B of the LPEGDB Final Report) for data submission.   Protocol not covered will be determined by FFS.

3. Quality Control
   a. Geometry
      i. Create QC Feature Dataset. Run Multipart to Singlepart tool on RA data with output to QC feature dataset.
      ii. Establish consistent file naming convention to track QCd version of data.
      iii. Create Topology with Rule: Must not Overlap and correct errors.
      iv. Run repair geometry. Repeat after any additional spatial geoprocessing (merge, intersect, etc)
      v. Minimum mapping unit: Select polygons <0.5 acres (SQ M Area < 2025) and run Eliminate tool to merge into neighbor with longest perimeter.
   b. Attributes
      i. Merge RA data after geometry QC with merge template: Rapid_Assessment_QC_Template.
      ii. Check fields for completion. Run Tool: QC1 – Number of Condition Fields Without Null Values
      iii. Populate QC_AssessStat field (domain controlled)
      iv. Populate fields for Conf_Tier (per domain), and Data_Source.

Existing Data

1. File Storage: Create feature dataset or separate GDB named 'original sources' to store data in its original format
2. Geometry: Create versions of new data sources with LPEGDB coordinate system, 0.5 ac minimum mapping unit, and geometry QC described above. Store in feature dataset indicating processed source data. Date should be included in filename or metadata.
3. Attributes: New source data should be attributed with minimum data: LPE_Occurrence (per domain), Conf_Tier (per domain), and Data_Source.

Integration of Multiple Sources

1. Data are fully integrated in the LPE_Occurrence feature class and linked to sources by LPEGDB_ID. The next full integration with new sources is envisioned at LPEGDB v.2

2. Geometry: Prior to integration additional topology checks should be run to ensure no overlap between features in different source feature classes. A series of geoprocessing operations such as update, erase, union may be necessary to evaluate and eliminate known problems prior to topology QC.
   Final dataset should be checked for minimum mapping unit adherence.
3. Attributes: At a minimum the next version of LPE_Occurrence should have complete attributes for LPE_Occurrence (per domain) and Conf_Tier (per domain), and Data_Source.

Ecological Condition Data

For Ecological Condition Data to be most useful some crosswalk to like categories may be necessary. Crosswalk guides for condition data to management classes are provided as Appendix D of the LPEGDB Final Report and as tables in the LPEGDB: Cond_to_MgmtCls_FNAI_Tbl and Cond_to_MgmtCls_RA_Tbl

Additional details on development of the LPEGDB may be obtained from Florida Natural Areas Inventory.

Appendix D. Crosswalk of LPEGDB Condition Classes into Management Classes

Rapid Assessment Attributes

LLP_MATURE_ra	MC	SOURCE
dominant	M	LMWG
codominant	I	LMWG
occasional-rare	I	LMWG
absent	R	LMWG

LLP_AGE_ra	MC	SOURCE
at least 3 age classes	M	LPC
2 age classes	M	LPC
1 age class	I	LPC
absent from canopy	R	LPC

LLP_BA_ra	MC	SOURCE
0 - 30	M	FNAI
31 - 60	M	FNAI
61 - 90	M	FNAI
> 90	I	FNAI

TO_SPO_COV_ra	MC	SOURCE
<1%	M	FNAI
1 - 5%	M	FNAI
6 - 15%	M	FNAI
16 - 25%	I	FNAI
26 - 35%	I	FNAI
36 - 45%	I	FNAI
46 - 55%	I	FNAI
56 - 65%	R	FNAI
66 - 75%	R	FNAI
76 - 85%	R	FNAI
86 - 95%	R	FNAI
96 - 100%	R	FNAI

OTH_HW_COV_ra	MC	SOURCE
<1%	M	JV
1 - 5%	M	JV
6 - 15%	I	FNAI
16 - 25%	I	FNAI
26 - 35%	I	FNAI
36 - 45%	R	FNAI
46 - 55%	R	FNAI
56 - 65%	R	FNAI
66 - 75%	R	FNAI
76 - 85%	R	FNAI
86 - 95%	R	FNAI
96 - 100%	R	FNAI

OTHPINECOV_ra	MC	SOURCE
<1%	M	FNAI
1 - 5%	M	FNAI
6 - 15%	M	FNAI
16 - 25%	I	FNAI
26 - 35%	I	FNAI
36 - 45%	I	FNAI
46 - 55%	R	FNAI
56 - 65%	R	FNAI
66 - 75%	R	FNAI
76 - 85%	R	FNAI
86 - 95%	R	FNAI
96 - 100%	R	FNAI

MIDST_COV_ra	MC	SOURCE
<1%	M	LPC
1 - 5%	M	LPC
6 - 15%	M	LPC
16 - 25%	M	LPC
26 - 35%	I	LMWG
36 - 45%	I	LMWG
46 - 55%	I	LMWG
56 - 65%	I	LMWG
66 - 75%	I	LMWG
76 - 85%	R	LMWG
86 - 95%	R	LMWG
96 - 100%	R	LMWG

SHRUB_COV_ra	MC	SOURCE
<1%	M	LPC
1 - 5%	M	LPC
6 - 15%	M	LPC
16 - 25%	M	LPC
26 - 35%	M	LPC
36 - 45%	I	FNAI
46 - 55%	I	FNAI
56 - 65%	I	FNAI
66 - 75%	I	FNAI
76 - 85%	R	FNAI
86 - 95%	R	FNAI
96 - 100%	R	FNAI

KEY
_ra = Rapid Assessment category; **_fnai** = FNAI category
MC = management class; **M** = Maintain, **I** = Improve, **R** = Restore
Crosswalk criteria source: **LPC** = Longleaf Partnership Council Draft 2013;
LMWG = Longleaf Measures Work Group Draft 2011;
JV = East Gulf Coastal Plain Joint Venture - Longleaf Woodlands DFC v1.1

Rapid Assessment Attributes (continued)

PYROGR_COV_ra	MC	SOURCE
<1%	R	FNAI
1 - 5%	I	LPC
6 - 15%	I	LPC
16 - 25%	M	LPC
26 - 35%	M	LPC
36 - 45%	M	LPC
46 - 55%	M	LPC
56 - 65%	M	LPC
66 - 75%	M	LPC
76 - 85%	M	LPC
86 - 95%	M	LPC
96 - 100%	M	LPC

FIRE_EVID_ra	MC	SOURCE
< 2 years	M	FNAI
2 - 5 years	M	FNAI
> 5 years	I	FNAI
not evident	R	FNAI

INVPL_DIST_ra	MC	SOURCE
not evident	M	FNAI
present along perim. only	I	FNAI
1 to few patches within	I	FNAI
many patches within	R	FNAI

COND_RANK_ra	MC	SOURCE
excellent	M	FNAI
good	M	FNAI
fair	I	FNAI
poor	R	FNAI

HERB_COV_ra	MC	SOURCE
<1%	R	LMWG
1 - 5%	R	LMWG
6 - 15%	I	LMWG
16 - 25%	I	LMWG
26 - 35%	I	LMWG
36 - 45%	M	LMWG
46 - 55%	M	LMWG
56 - 65%	M	LMWG
66 - 75%	M	LMWG
76 - 85%	M	LMWG
86 - 95%	M	LMWG
96 - 100%	M	LMWG

FNAI Attributes - multiple projects

LLP_MATURE_fnai	MC	SOURCE
LL dom	M	LMWG
LL co-dom	I	LMWG
LL occas	I	LMWG
LL absent	R	LMWG
LL in cnpy	unknown	n/a
LL unk	unknown	n/a

LLP_AGE_fnai	MC	SOURCE
Multi	M	LPC
insufficient data for other categories		

OTH_HW_COV_fnai*	MC	SOURCE
<1%	M	JV
1-5%	M	JV
5-25%	I	FNAI
6-15%	I	FNAI
16-25%	I	FNAI
26-35%	I	FNAI
36-45%	R	FNAI
46-55%	R	FNAI
56-65%	R	FNAI
66-75%	R	FNAI
75-95%	R	FNAI
76-85%	R	FNAI
86-95%	R	FNAI
96-100%	R	FNAI

KEY
_ra = Rapid Assessment category; **_fnai** = FNAI category
MC = management class; **M** = Maintain, **I** = Improve, **R** = Restore
Crosswalk criteria source: **LPC** = Longleaf Partnership Council Draft 2013;
LMWG = Longleaf Measures Work Group Draft 2011;
JV = East Gulf Coastal Plain Joint Venture - Longleaf Woodlands DFC v1.1

*classes are compiled from multiple projects with differing attributes and may overlap

FNAI Attributes - multiple projects (continued)

LLP_BA_fnai	MC	SOURCE
0	I	FNAI
10	M	FNAI
20	M	FNAI
30	M	FNAI
40	M	FNAI
49	M	FNAI
50	M	FNAI
60	M	FNAI
70	M	FNAI
80	I	FNAI
90	I	FNAI
100	I	FNAI
110	I	FNAI
120	I	FNAI
130	I	FNAI
140	I	FNAI
150	I	FNAI

OTHPINECOV_fnai*	MC	SOURCE
<1%	M	FNAI
1-5%	M	FNAI
5-25%	M	FNAI
6-15%	M	FNAI
16-25%	I	FNAI
25-50%	I	FNAI
26-35%	I	FNAI
36-45%	I	FNAI
46-55%	R	FNAI
56-65%	R	FNAI
66-75%	R	FNAI
75-95%	R	FNAI
76-85%	R	FNAI
86-95%	R	FNAI

TO_SPO_COV_fnai*	MC	SOURCE
<1%	M	FNAI
1-5%	M	FNAI
5-25%	M	FNAI
6-15%	M	FNAI
16-25%	I	FNAI
26-35%	I	FNAI
36-45%	I	FNAI
46-55%	I	FNAI
66-75%	R	FNAI
76-85%	R	FNAI
86 - 95%	R	FNAI
96 - 100%	R	FNAI

SHRUB_COV_fnai*	MC	SOURCE
none	M	LPC
<1%	M	LPC
1-5%	M	LPC
5-25%	M	LPC
6-15%	M	LPC
6-25%	M	LPC
16-25%	M	LPC
25-50%	M	LPC
26-35%	M	LPC
26-50%	I	FNAI
36-45%	I	FNAI
46-55%	I	FNAI
50-75%	I	FNAI
51-75%	I	FNAI
56-65%	I	FNAI
66-75%	I	FNAI
76-85%	R	FNAI
75-95%	R	FNAI
76-100%	R	FNAI
86-95%	R	FNAI
95-100%	R	FNAI
96-100%	R	FNAI

FIRE_EVID_fnai*	MC	SOURCE
<6 mos	M	FNAI
6 mos - 2 yrs	M	FNAI
<2 yrs	M	FNAI
<2yr	M	FNAI
>2 - 5 yrs	I	FNAI
2-5 yrs	I	FNAI
>5 - 20 yrs	I	FNAI
>5-20 yrs	I	FNAI
>20 yrs	R	FNAI
>15-50 yrs	R	FNAI
unknown	unknown	n/a

KEY
_ra = Rapid Assessment category; **_fnai** = FNAI category
MC = management class; **M** = Maintain, **I** = Improve, **R** = Restore
Crosswalk criteria source: **LPC** = Longleaf Partnership Council Draft 2013;
LMWG = Longleaf Measures Work Group Draft 2011;
JV = East Gulf Coastal Plain Joint Venture - Longleaf Woodlands DFC v1.1

*classes are compiled from multiple projects with differing attributes and may overlap

FNAI Attributes - multiple projects (continued)

MIDST_COV_fnai*	MC	SOURCE
none	M	LPC
<1%	M	LPC
1-5%	M	LPC
5-25%	M	LPC
6-15%	M	LPC
6-25%	M	LPC
16-25%	M	LPC
25-50%	I	LMWG
26-35%	I	LMWG
26-50%	I	LMWG
36-45%	I	LMWG
46-55%	I	LMWG
50-75%	I	LMWG
51-75%	I	LMWG
56-65%	I	LMWG
66-75%	I	LMWG
76-85%	R	LMWG
75-95%	R	LMWG
76-100%	R	LMWG
86-95%	R	LMWG
95-100%	R	LMWG
96-100%	R	LMWG
86 - 95%	R	LMWG
96 - 100%	R	LMWG

PYROGR_COV_fnai*	MC	SOURCE
none	R	FNAI
<1%	R	LPC
1-5%	I	LPC
5-25%	I	LPC
6-15%	I	LPC
6-25%	I	LPC
16-25%	M	LPC
25-50%	M	LPC
26-35%	M	LPC
26-50%	M	LPC
36-45%	M	LPC
46-55%	M	LPC
50-75%	M	LPC
51-75%	M	LPC
56-65%	M	LPC
66-75%	M	LPC
76-85%	M	LPC
76-100%	M	LPC
86-95%	M	LPC
96-100%	M	LPC

HERB_COV_fnai*	MC	SOURCE
none	R	LMWG
<1%	R	LMWG
1-5%	R	LMWG
5-25%	I	LMWG
6-15%	I	LMWG
6-25%	I	LMWG
16-25%	I	LMWG
25-50%	I	LMWG
26-35%	I	LMWG
26-50%	I	LMWG
36-45%	M	LMWG
46-55%	M	LMWG
50-75%	M	LMWG
51-75%	M	LMWG
56-65%	M	LMWG
66-75%	M	LMWG
76-85%	M	LMWG
75-95%	M	LMWG
76-100%	M	LMWG
86-95%	M	LMWG
96-100%	M	LMWG

INVPL_DIST_fnai*	MC	SOURCE
none	M	FNAI
<1%	I	FNAI
1-5%	I	FNAI
5-25%	R	FNAI
6-15%	R	FNAI
16-25%	R	FNAI
25-50%	R	FNAI
26-35%	R	FNAI
36-45%	R	FNAI
46-55%	R	FNAI
56-65%	R	FNAI
66-75%	R	FNAI
75-95%	R	FNAI
76-85%	R	FNAI
86-95%	R	FNAI
96-100%	R	FNAI

COND_RANK_fnai*	MC	SOURCE
A- Excellent	M	FNAI
B- Good	M	FNAI
C- Fair	I	FNAI
D- Poor	R	FNAI
Excellent	M	FNAI
excellent/good	M	FNAI
Fair	I	FNAI
Good	M	FNAI
Poor	R	FNAI
very poor	R	FNAI
I	M	FNAI
2	I	FNAI
3	R	FNAI
2/3	I	FNAI

KEY
_ra = Rapid Assessment category; **_fnai** = FNAI category
MC = management class; **M** = Maintain, **I** = Improve, **R** = Restore
Crosswalk criteria source: **LPC** = Longleaf Partnership Council Draft
2013; **LMWG** = Longleaf Measures Work Group Draft 2011;
JV = East Gulf Coastal Plain Joint Venture - Longleaf Woodlands DFC v1.1

*classes are compiled from multiple projects with differing attributes
and may overlap

Appendix E. Longleaf Pine Ecosystem Acreage by County within Florida Forest Service Regions

	LPE Confirmed: ecological data available	LPE Confirmed: ecological condition undetermined	LPE Assumed: sandhill, upland pine, upland mixed woodland	LPE Unknown: mesic, wet, and scrubby flatwoods	LPE Unknown: pine plantation and other land cover classes	LPE Does Not Occur	Total
FFS Region 1							
BAY	22,841	4,500	7,319	20,135	233,316	19,443	307,553
CALHOUN	7,724	708	5,988	21,227	188,009	6,941	230,597
ESCAMBIA	37,398	3,005	2,358	26,575	81,143	2,655	153,133
FRANKLIN	4,624	20,296	32	6,939	32,285	146,541	210,717
GADSDEN	6,563	2,848	5,825	6,444	96,373	10,416	128,469
GULF	6,113	151	221	11,282	182,363	7,884	208,014
HOLMES	4,134	474	2,171	11,014	74,742	24	92,558
JACKSON	21,503	3,705	8,948	8,122	133,154	6,149	181,582
JEFFERSON	32,520	13,402	2,522	8,034	70,694	17,581	144,753
LEON	46,768	45,330	4,112	13,209	51,209	42,929	203,558
LIBERTY	17,724	44,833	3,323	3,934	89,982	118,185	277,981
OKALOOSA	47,673	195,211	14,610	21,828	58,441	17,756	355,519
SANTA ROSA	42,474	129,269	4,601	15,813	116,757	30,595	339,510
WAKULLA	30,611	38,418	1,761	10,504	38,954	69,016	189,264
WALTON	44,096	126,444	15,354	29,763	137,182	18,262	371,101
WASHINGTON	32,378	3,556	6,934	18,160	115,779	17,993	194,800
Region 1 Total	405,145	632,150	86,079	232,983	1,700,383	532,368	3,589,107
FFS Region 2							
ALACHUA	23,828	5,984	2,486	6,622	109,318	40,030	188,268
BAKER	7,444	19,502	1,198	7,979	107,262	65,738	209,122
BRADFORD	1,360	79	233	7,092	70,017	2,362	81,143
CLAY	42,428	15,558	2,577	14,320	83,455	27,158	185,496
COLUMBIA	12,914	24,927	953	10,142	128,215	48,826	225,978
DIXIE	2,572	3,460	167	1,927	172,012	7,879	188,017
DUVAL	9,551	2,661	1,371	25,962	61,593	13,359	114,497
GILCHRIST	7,187	3,890	16,541	503	53,404	13,437	94,961
HAMILTON	5,852	18,220	1,363	4,712	102,352	7,837	140,335
LAFAYETTE	2,129	2,602	788	3,478	118,028	9,270	136,296
LEVY	33,760	35,444	3,120	4,814	156,482	34,071	267,691
MADISON	4,040	8,925	3,673	3,624	126,772	13,014	160,048
MARION	58,023	33,054	10,351	13,601	58,238	214,660	387,927
NASSAU	10,507	3,052	1,000	20,345	158,340	9,483	202,729
PUTNAM	46,430	8,834	8,059	12,758	80,646	42,363	199,090
SUWANNEE	13,091	13,198	1,952	2,953	128,434	2,834	162,462
TAYLOR	7,533	32,151	997	7,930	237,838	11,284	297,734
UNION	1,707	613	1,770	1,343	69,723	4,238	79,394
Region 2 Total	290,355	232,154	58,601	150,106	2,022,129	567,843	3,321,188

	LPE Confirmed: ecological data available	LPE Confirmed: ecological condition undetermined	LPE Assumed: sandhill, upland pine, upland mixed woodland	LPE Unknown: mesic, wet, and scrubby flatwoods	LPE Unknown: pine plantation and other land cover classes	LPE Does Not Occur	Total
FFS Region 3							
BREVARD	11,185	1,613		25,887	5,691	4,659	49,035
CITRUS	37,846	44,077	2,937	1,328	8,037	9,487	103,711
FLAGLER	215	898	122	11,256	85,540	16,437	114,468
HERNANDO	32,997	15,391	3,891	1,427	8,095	10,544	72,346
HILLSBOROUGH	12,615	897	37	4,864	7,441	3,162	29,016
LAKE	13,024	21,999	1,172	12,195	20,535	54,200	123,125
ORANGE	29,043	6,585	926	37,849	10,045	14,904	99,353
OSCEOLA	64,572	16,943	416	48,020	11,537	5,750	147,238
PASCO	29,031	1,467	2,040	4,182	19,552	11,525	67,796
PINELLAS	1,325	-	4	1,283	385	178	3,175
POLK	70,132	19,862	829	33,868	23,634	11,255	159,580
SEMINOLE	2,426	684	222	5,193	660	2,063	11,248
ST. JOHNS	3,059	625	3,305	13,623	92,021	28,665	141,299
SUMTER	17,783	4,318	8,211	2,576	7,431	16,634	56,953
VOLUSIA	27,405	8,914	382	34,354	64,325	36,307	171,687
Region 3 Total	352,657	144,275	24,492	237,906	364,931	225,770	1,350,031
FFS Region 4		0					
CHARLOTTE	17,399	973	64	11,323	692	88,861	119,312
COLLIER		-		38		2,519	2,558
DESOTO	7,146	103		14,994	792	830	23,866
GLADES	5,845	7,753	13	4,845	40,463	10,691	69,609
HARDEE	16,691	797		14,391	980	2,674	35,532
HENDRY		-		6	1	177	184
HIGHLANDS	17,228	8,201	481	24,003	10,702	22,492	83,107
INDIAN RIVER	501	184	50	8,688	803	12,161	22,388
LEE	23	139	80	9,576	136	54,757	64,711
MANATEE	18,507	546	33	17,478	7,489	13,489	57,541
OKEECHOBEE	7,517	-	32	3,573	488	3,640	15,250
SARASOTA	5,347	5,173	3	17,455	407	48,175	76,561
Region 4 Total	96,204	23,869	754	126,370	62,955	260,466	570,618
Statewide Total	**1,144,362**	**1,032,448**	**169,927**	**747,364**	**4,150,397**	**1,586,446**	**8,830,944**