Hernando County Preserves Master Land Management Plan:

Adaptive Management for Fickett Hammock Preserve

Adopted by Hernando Board of County Commissioners: April 12, 2022

Introduction

This section constitutes an update to the Management Plan for the 155-acre Fickett Hammock Preserve (Fig. 4.1). The prior Management Plan was completed in March 2010. The current revised Management Plan makes use of information that was not available at the time of the earlier Plan, chiefly improved mapping of soils (i.e., a revision of the NRCS soils map to depict ground conditions more accurately), current land cover, current data on species of conservation concern, and other information.

Fickett Hammock Preserve, named for local naturalist and FWC biologist Steven Fickett, was purchased in 1994 entirely with ESL funding (i.e., the ESL fund no longer exists). This property is situated on the Brooksville Ridge and is part of the greater Annutteliga Hammock, which has been known to ecologists since the early 20th century (see below). This is the westernmost of the Hernando County preserves. The property is adjacent to the Janet Butterfield Brooks Wildlife and Environmental Area (WEA), which lies to the south and is managed by the Florida Fish and Wildlife Conservation Commission (FWC).

Fickett Hammock Preserve contains an unusual example of an upland hardwood forest natural community (though partially convergent with mesic hammock) near the southern range limit of this community type, as well as fire-excluded mesic flatwoods on the eastern side of the preserve and a couple acres of sandhill (also fire-excluded) on the southwestern corner of the preserve. Biological surveys of Fickett Hammock have been limited, but two imperiled plants and gopher tortoise have been documented on-site; additional species of conservation concern may be present. Other imperiled species have been documented nearby.

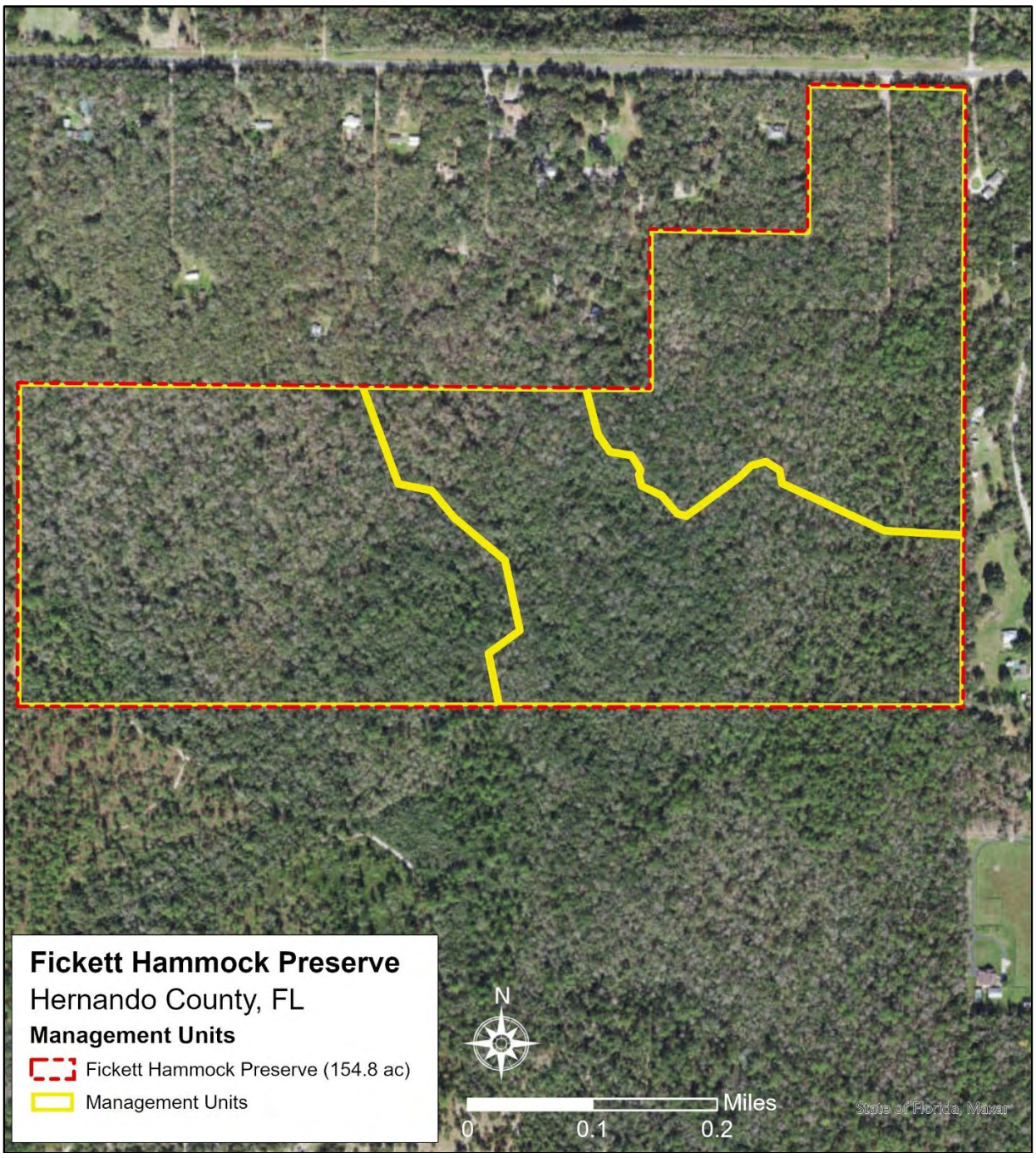

Figure 4.1. Management units of Fickett Hammock Preserve. These management units were created based on elevation contours and the location of seepage slopes and seasonal streams. Conducting management activities such as invasive plant treatments by management unit will better fit department budgets than managing the entire preserve as one unit.

Geography, geology, landform, and soils

Fickett Hammock Preserve lies on the north slope of Bailey Hill, which is part of the Brooksville Ridge (Fig. 1.4), although sometimes considered an outlier. The preserve is located 5.5 miles northwest of Brooksville and 0.75 miles east of the Suncoast Parkway (Rt. 589) in north-central Hernando County. The land slopes generally downhill from south to north and is incised with geologically young seasonal streams, which drain down the slope. Elevations above sea level range from highs of about 160 feet near the southwest corner and 135 feet near the southeast corner to a low of about 100 feet near the center of the northern boundary. Hardwood forest covers nearly all the preserve now, but the southwestern corner is fire-excluded sandhill and the eastern side is apparently fire-excluded mesic flatwoods.

The underlying geology of Fickett Hammock is Suwannee Limestone of Oligocene age covered over most of the preserve's area by a thin veneer of sediments from the Hawthorn Group of Oligocene to Miocene age (Fig. 1.3). There is limited surface expression of karst, except one small sinkhole and a possible solution hole. According to the 2010 Management Plan, no exposed limestone or chert has yet been observed on the preserve.

The most abundant soil type on Fickett Hammock Preserve is Wauchula fine sand on 0-5% slopes and with a 31 cm depth to water table (Fig. 4.2; Table 4.1). The Wauchula series consists of very deep, very poorly or poorly drained, moderately slow or slowly permeable soils. They formed in sandy and loamy marine sediments (https://soilseries.sc.egov.usda.gov/OSD_Docs/W/WAUCHULA.html).
The next most common soil type is Blichton loamy fine sand, which occurs on slopes of 2-5% in the northeastern and northwestern parts of the preserve and on slopes of 0-2% in the eastern portion of the preserve. All three areas average 15 cm depth to water table. The Blichton series consists of very deep and very poorly drained, moderately slow or slowly permeable soils on uplands in central Florida. They formed in thick beds of loamy and sandy marine sediments (https://soilseries.sc.egov.usda.gov/OSD_Docs/B/BLICHTON.html). The third relatively abundant soil type on the preserve is Flemington fine sandy loam, which occurs on slopes of 2-5% with a depth to water table of 38 cm. This type occurs in the north-central portion of the preserve and on the southeastern corner. The Flemington series consists of poorly drained, very slowly permeable soils formed in thick beds of clayey marine sediments on nearly level to strongly sloping areas. The soil is saturated in summer and early in the fall. Less abundant soil types on the preserve are Micanopy loamy fine sand (2-5% slopes and 61 cm depth to water table) in the northeastern part of the preserve and Sparr fine sand (0-5% slopes and 59 cm depth to water table) on the southwestern corner of the preserve, corresponding to the area with sandhill vegetation.

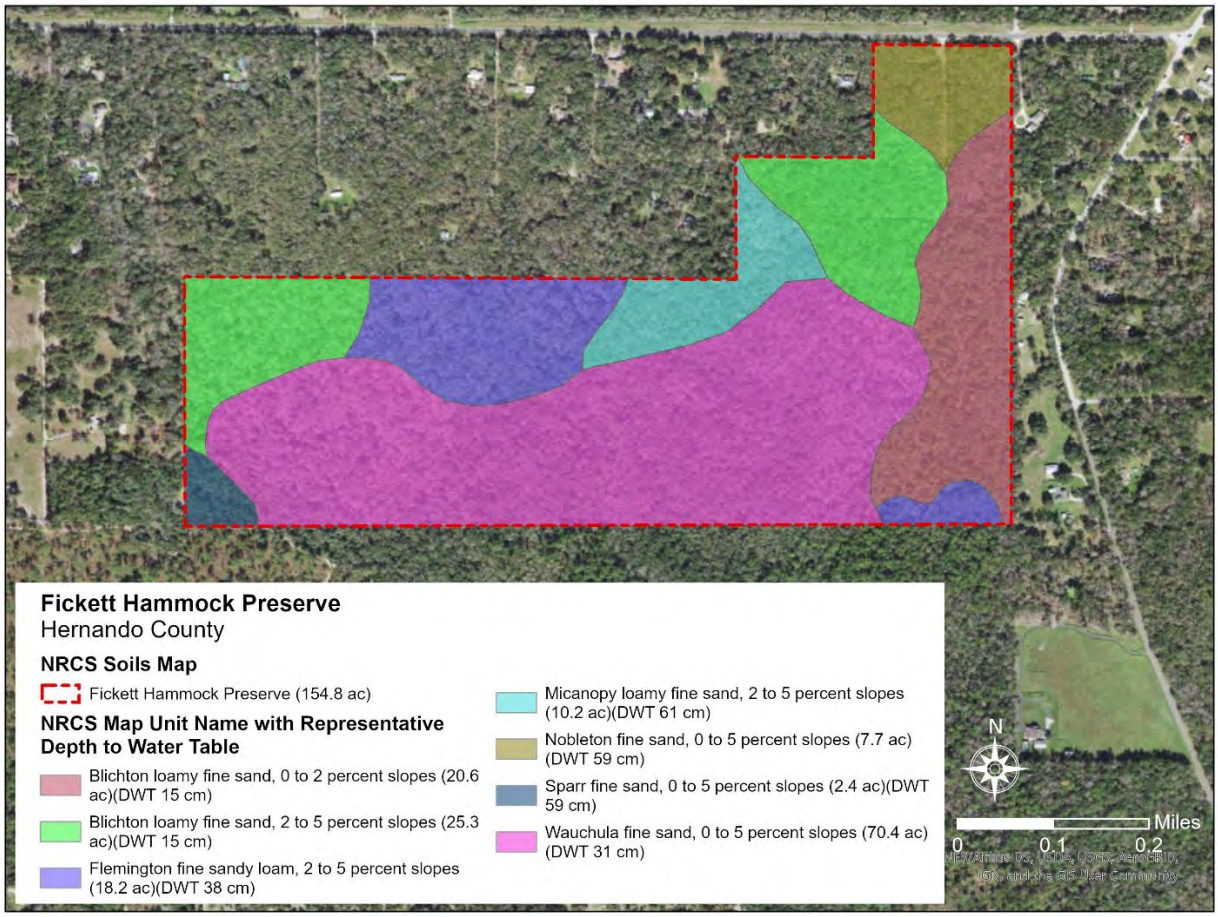

Figure 4.2. Natural Resources Conservation Service (NRCS) soil map for Fickett Hammock Preserve.

Table 4.1. Soil types and seasonal high depth to water table on Fickett Hammock Preserve. AOI is +/- ac.

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
11	Blichton loamy fine sand, 0 to 2 percent slopes	15	20.6	13.3%
12	Blichton loamy fine sand, 2 to 5 percent slopes	15	25.3	16.3%
21	Flemington fine sandy loam, 2 to 5 percent slopes	38	18.2	11.8%
34	Micanopy loamy fine sand, 2 to 5 percent slopes	61	10.2	6.6%
36	Nobleton fine sand, 0 to 5 percent slopes	59	7.7	5.0%
47	Sparr fine sand, 0 to 5 percent slopes	59	2.4	1.6%
52	Wauchula fine sand, 0 to 5 percent slopes	31	70.5	45.5%
Totals for Area of Interest			**154.8**	**100.0%**

Landscape context

Fickett Hammock Preserve is contiguous with FWC's 319-acre Janet Butterfield Brooks Wildlife and Environmental Area, which lies immediately to the south and is primarily sandhill (although much of it degraded by fire exclusion). About one mile to the east is the 19,875-acre Florida Forever BOT Project, Annutteliga Hammock, which in turn is contiguous with the southern unit of FWC's Chinsegut Wildlife and Environmental Area and Chinsegut Hill. Therefore, Fickett Hammock has reasonably good habitat connectivity. The preserve could potentially increase its conservation value through additional habitat conservation efforts on adjacent lands and is discussed further in Chapter 7 management protocols, best management practices, and performance measures.

Properties along the half mile eastern boundary are large lot residential and agricultural/residential in usage, with vegetation dominated by pasture along the southern half and mostly yards with large trees along the northern part. The mile-long northern boundary includes about 660 feet of frontage on Centralia Road with the remainder occupied by large lot residential properties mostly covered in hardwood and mixed pine and hardwood forest. The western boundary is adjoined by large lot agricultural/residential uses and is mostly in yard or pasture with mixed pine and hardwood forest along the boundary.

Hydrology

The soils near the top of Bailey Hill, on the north slope of which Fickett Hammock is located, are porous, allowing rain water to soak in until it reaches underlying clay layers, where it is stored, seeping out on the hillsides to form springs and seeps. These form small intermittent streams, which in some areas of the preserve are somewhat deeply incised (Fig. 4.3). The preserve includes a significant part of the headwaters of the Dry Creek drainage, which extends more than a mile to the west and disappears in the sandhills to recharge the Floridan Aquifer, probably in the Chassahowitzka Springs recharge basin.

Figure 4.3. An incised seasonal stream in Fickett Hammock. Photo by Reed Noss.

Vegetation and natural communities

The vegetation of Fickett Hammock (Fig. 4.4) is both interesting and somewhat puzzling. The 2010 Management Plan assumed that the preserve was originally all longleaf pine sandhill and flatwoods, which were invaded by hardwood trees in the absence of fire to create a mesic hammock. For example, the Management Plan states: "Without fire, the long leaf pine forest and its related plant community began an inevitable transition to oak hammock. That evolutionary process is well advanced at Fickett Hammock with a few remaining bits of long leaf pine forest. The forest has been shaped by the absence of fire."

The transition (state change) from longleaf and other open pine communities to hardwood communities after fire exclusion is an extremely common phenomenon in Florida (Noss 2018). Fire-excluded sandhill exists in a small area (ca. 2.3 acres) on the southwestern corner of the preserve, while fire-excluded flatwoods occupy the far eastern side of the preserve. The history of these areas can be seen in the tall remnant longleaf pine trees emerging about the surrounding hardwoods (fig. 4.5). For these limited areas of the preserve, the interpretation of a type conversion from longleaf pine to oak-dominated hammock is accurate.

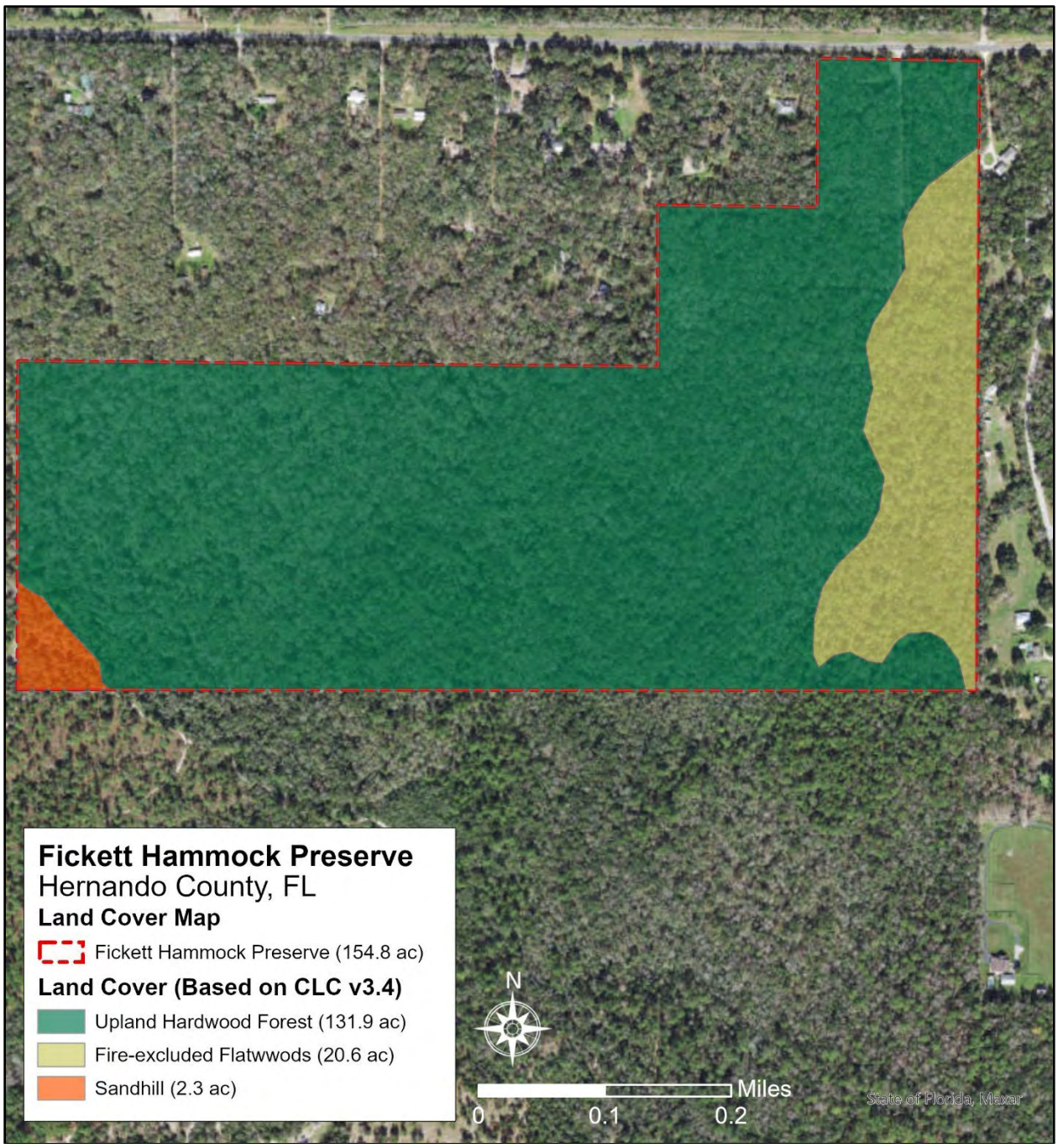

Figure 4.4. Land cover (vegetation) of Fickett Hammock Preserve.

Fig. 4.5. Former longleaf pine mesic flatwoods near the eastern boundary of Fickett Hammock. Exclusion of fire for a long period allowed mesic hardwood trees to invade, but remnant old longleaf pines are mostly emergent above the hardwood canopy. Photo by Reed Noss.

Nevertheless, the vast majority of Fickett Hammock Preserve is native upland hardwood forest, some of it well over 100 years old, perhaps approaching 200 years (i.e., no trees have been cored for aging, so their exact ages are unclear) and shows no indications of being former longleaf pine flatwoods or sandhill. There are no remnant longleaf pines, no remnant patches of wiregrass, and low abundance of the more opportunistic and fast-growing mesic oak species (such as sand laurel oak, *Quercus hemisphaerica*) or scrub species that typically invade fire-excluded pine savannas.

Extensive old-growth hammocks on the Brooksville Ridge in this part of the county (the ca. 200 square mile "Hernando Hammock Belt") were documented in the early 20th century (Harper 1921) and were known much earlier by settlers (Ellis et al. 2021), which suggests that hammock vegetation is entirely natural here. Harper (1921) noted that the vegetation of the Hernando Hammock Belt can be distinguished from that of the Middle Florida Hammock Belt by the absence of southern red oak (*Q. falcata*) and "decidedly less tropical" vegetation than areas further east at the same latitude.

Moreover, the presence of more northern-distributed deciduous hardwood species, in particular swamp chestnut oak (*Q. michauxii*) (Fig. 4.6), which is an indicator species for upland

hardwood forest, suggests that this community is more accurately classified as upland hardwood forest than mesic hammock. Fickett Hammock contains some cabbage palms (*Sabal palmetto*), however, which are more typical of mesic hammock (Fig. 4.7). As noted in FNAI (2010), "Upland hardwood forest located in Central Florida, at the southern end of its range (particularly along the Brooksville Ridge), is often difficult to distinguish from mesic hammock as there is a greater overlap of species in this geographic area."

Intensive vegetation surveys are needed to further resolve the classification of this community, but for now upland hardwood forest appears to be the most accurate classification for this vegetation. This is not a fire-adapted community. Although fires sometimes creep into upland hardwood forests from edges with surrounding fire-prone vegetation such as sandhill or flatwoods, such fires only rarely burn through the understory and even more rarely lead to crown fires (FNAI 2010, Noss 2018). Therefore, the statement in the 2010 Management Plan that "the entire preserve would benefit from the periodic application of prescribed fire" is not correct and appears to be based on false assumptions about its vegetation history.

It remains puzzling, however, how an upland hardwood forest could develop in this location in the absence of any obvious natural fire breaks in the surrounding landscape. With Florida's high lightning activity, hammocks usually develop only in areas, such as islands, peninsulas, and steep ravines, that are topographically protected from fire (Harper 1911). Harper, one of the earliest fire ecologists, offered no explanation for the existence of the Hernando Hammock Belt in the absence of obvious fire breaks, except to note that the fine sandy loam (or loamy sand) soils are "above the central Florida average in fertility" (Harper 1921). It is possible that the abundance of exposed limestone within the Hernando Hammock Belt (especially the Annutteliga Hammock) prior to mining would have hampered the natural spread of fire across the landscape.

Figure 4.6. Two views of old-growth swamp chestnut oak (*Quercus michauxii*), a characteristic tree of upland hardwood forest (FNAI 2010), at Fickett Hammock. Photos by Reed Noss.

Figure 4.7. Young and mature cabbage palms (*Sabal palmetto*) in the upland hardwood forest at Fickett Hammock. This species is generally more characteristic of mesic hammock (FNAI 2010). Photo by Reed Noss.

Dooris et al. (1999) underscored the significance of the Hernando Hammock area, which can be further divided into a northern cluster of hammocks – the Annutteliga Hammock – and a southern cluster – Chocohatti Hammock – which extends into Pasco County:

> Hernando Hammock includes one of the largest contiguous bodies of high hammock land in Florida…In most respects, the region is quite similar to the Gainesville and Tallahassee Red Hills regions of northern Florida, regions notable for their picturesque hilly landscapes, abundance of exploitable mineral resources, fertile loamy-textured soils, extensive tracts of upland hardwood forest and a rich archaeological/historical heritage.

Dooris et al. (1999) further note that the Hernando Hammock represents the southern limits of the Southern Mixed Hardwood Forest Region of Alabama, Georgia, and northern Florida. And in addition: "The geologically-derived calcareous and phosphatic nature of the lands of Hernando Hammock, and, in turn, its derivative rich loamy soils and diverse hardwood forest communities, have combined to impart a distinctly un-Floridian appearance to the region."

At-risk species and resource priorities

No intensive faunal and floral surveys have been conducted on Fickett Hammock Preserve and no species lists are available. Therefore, present knowledge of the presence/absence and status of rare and imperiled species on the preserve is limited. Three state-imperiled species, two ferns and the gopher tortoise, have been confirmed within the preserve boundaries (Fig. 4.8). Several additional species of conservation concern occur nearby, but they are primarily associated with sandhill and therefore have very limited available habitat within Fickett Hammock (Table 4.2 and Fig. 4.8).

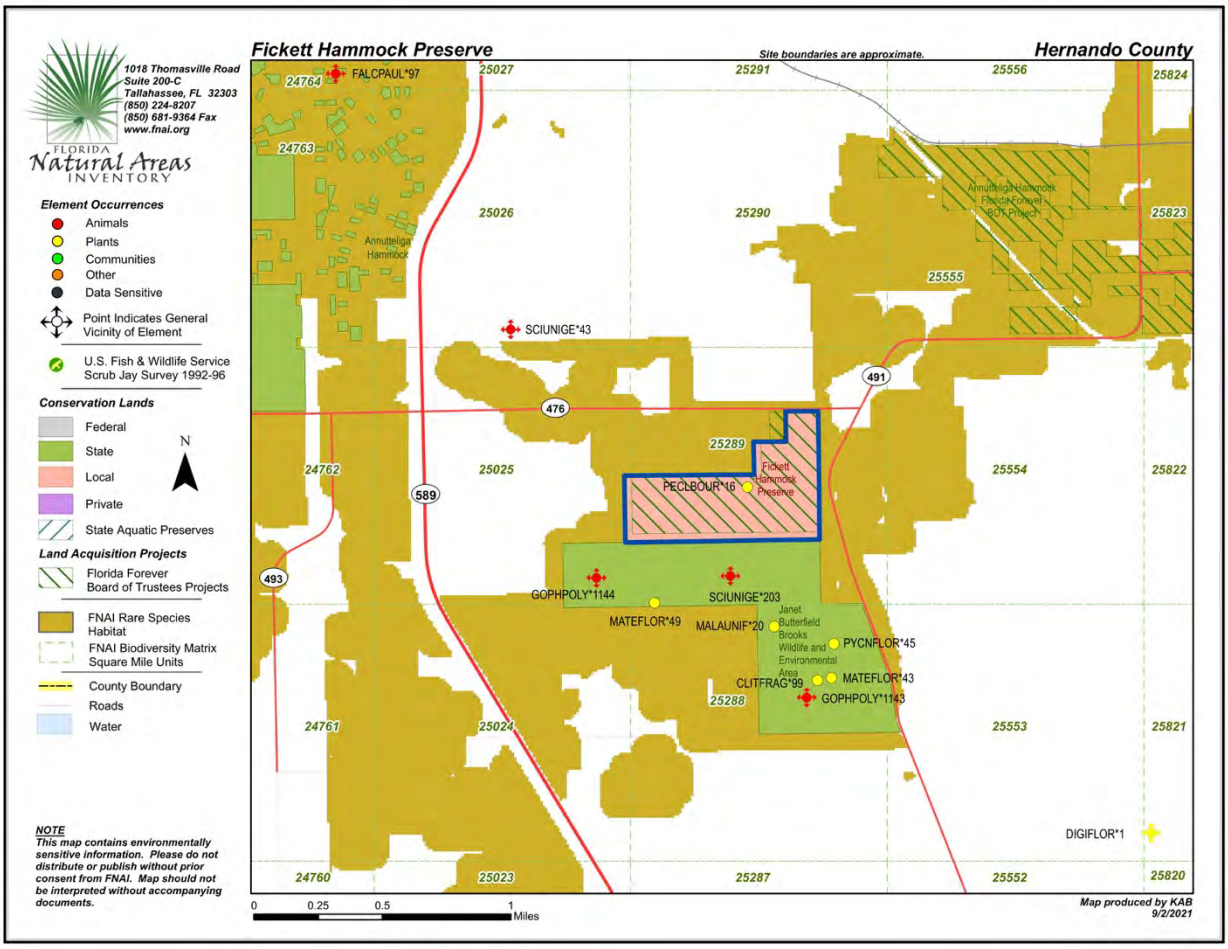

Figure 4.8. Species of conservation concern observed within or in the vicinity of Fickett Hammock Preserve. Species names on occurrences are abbreviations of the scientific names in Table 4.2

Table 4.2. Species of conservation concern with documented or potential occurrence on Fickett Hammock Preserve. In the far-right column, "close to" means that a species has been documented to occur within ca. 1 mile of the preserve boundaries. The species below are of concern due to their high G-ranks or S-ranks (3 or above), presence on the federal or state list of threatened and endangered species, or listing as Species of Greatest Conservation Need in the Florida Wildlife Action Plan. Note: Because there is not yet a comprehensive species or natural community inventory for Fickett Hammock, additional species of conservation concern that are not on the list below likely occur within the preserves.

Species	G rank	S rank	Federal status	State status	SGCN	Present, close to, or potentially on site
Animals						
Gopher tortoise (*Gopherus polyphemus*)	G3	S3	C	ST	Yes	**On site (2021)**
Southeastern fox squirrel	G5T5	S3				close

(*Sciurus niger niger*)						
Florida black bear (*Ursus americanus floridanus*)	G5T4*	S4				potentially
Common Ground-Dove (*Columbina passerina*)					Yes	potentially
Plants						
Widespread polypody (*Pecluma dispersa*)	G5	S2		E		**On site (2021)**
Comb polypody (*Pecluma ptilota* var. *bourgeauana*)	G5TNR	S2		E		**On site (2021)**
Florida spiny-pod (*Matelea floridana*)	G2	S2		E		Close, including **just outside NE boundary**
Scrub pigeon-wing (*Clitoria fragrans*)	G2G3	S2	T	E		On-site (2021)
Green adder's-mouth orchid (*Malaxis unifolia*)	G2	S2		E		close
Florida mountain-mint (*Pycnanthemum floridanum*)	G3	S3		T		close

*Although not ranked high enough (G3 or S3 and above) to qualify for this list, we include the Florida black bear because it is a wide-ranging landscape species highly sensitive to habitat fragmentation by roads and development, with the Chassahowitzka population considered imperiled.

One animal species of conservation concern, the gopher tortoise (*Gopherus polyphemus*), has been observed on-site.

Two of the plant species of concern in Table 4.2 have been observed within Fickett Hammock Preserve:

The Comb polypody (*Pecluma ptilota* var. *bourgeauana*), is state imperiled (S2) and state-listed Endangered species, was observed within Fickett Hammock Preserve in 2011 (FNAI) and was confirmed on site by the Florida Forest Service and ESL in 2017 and by ESL and FWC in 2021. The widespread polypody (*Pecluma dispersa*) also has been recorded within the preserve, most recently by ESL and FWC in 2021. It, too, is state imperiled (S2) and a state-listed Endangered species. A third state imperiled (S2) and state-listed Endangered species, Florida spiny-pod (*Matelea floridana*) was observed just north of the northeastern boundary of the preserve and may occur within the boundaries. Other imperiled plants and animals in Table 4.2 have known occurrences somewhat farther away but still within one mile.

Another plant observed at Fickett Hammock in March 2021, tentatively identified as common atamasco-lily (*Zephyranthes atamasco*) (Fig. 4.9), is not listed by the state or federal

government and is not tracked by FNAI. However, the populations in Hernando County are at the southern limit of their range, disjunct from the closest populations in Marion County, whose populations are in turn disjunct from the species primary range in north Florida northward (https://florida.plantatlas.usf.edu/Plant.aspx?id=3473). Disjunct populations, because of their isolation (restricted gene flow) and divergent selective pressures, are likely to be genetically distinct and of high evolutionary significance (Lesica and Allendorf 1995).

Figure 4.9. Common atamasco-lily (*Zephyranthes atamasco*), a more northern species at the southern limit of its range, disjunct in Hernando County, and present in Fickett Hammock (although this should be confirmed by a botanist on the basis of a collected specimen). Photo by Reed Noss.

The statewide Critical Lands and Waters Identification Project (CLIP) shows Resource Priorities in the vicinity of Fickett Hammock Preserve (Fig. 4.10) (https://www.fnai.org/services/clip). CLIP was created in 2006 in response to the Century Commission for a Sustainable Florida's call for an identification of those lands and waters that are critical to the conservation of Florida's natural resources. CLIP was produced through a collaboration of the Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, Florida Fish and Wildlife Conservation Commission, and an independent Technical Advisory Group. CLIP is a GIS database of statewide conservation priorities for a broad range of natural resources, including biodiversity, landscape function, surface water, groundwater, and marine resources. The latest version of CLIP (v4.0) shows Fickett Hammock in the second highest priority category (2) for biodiversity, highest (1) for landscape, mostly lowest priority for surface water, but highest (1) for aggregated priorities (Fig. 4.10).

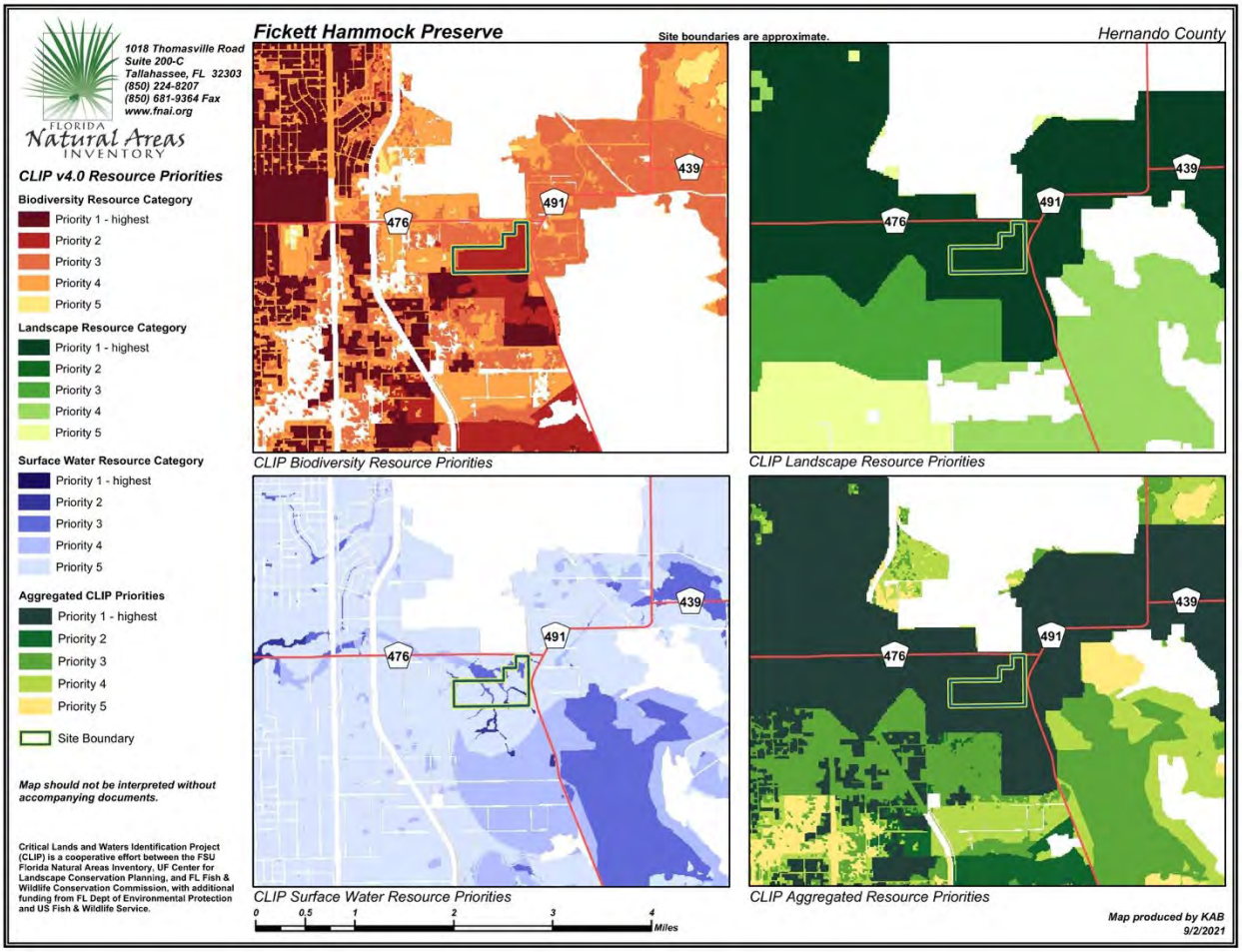

Figure 4.10. Resource Priorities in the vicinity of Fickett Hammock Preserve, as identified in the statewide Critical Lands and Waters Identification Project (CLIP), version 4.

Non-native and invasive species

There have been no inventories for invasive non-native species at Fickett Hammock, though several species have been documented by Hernando during site reviews and maintenance activities. None are mentioned in the 2010 management plan or were observed during a site visit in March 2021. The following invasive species have been observed on Fickett Hammock, so surveys and control efforts should be planned before they become problematic:

- Skunk Vine
- Japanese climbing fern
- Air potato
- Cogon Grass
- Caesars weed
- Camphor tree
- Coral ardisia
- Tuberous sword fern
- Chinese privet

Site development, improvements, and access

Existing improvements

Fickett Hammock has a 2.36-mile hiking loop traversing the preserve and is accessible by foot only. Pets on leashes are welcome.

Other structures and facilities noted in the 2010 Management Plan are the following:

- The preserve currently has a driveway, parking lot, and retention pond adjacent to Centralia Road near its northeast corner.
- The emergency access road is gated.
- A sign adjacent to Centralia Road identifies the preserve.
- The access road crosses a concrete pipe culvert. As part of planned subdivision improvements, underground drainage using buried concrete pipe was installed along one of the access roads to drain surface water to the west, rerouting a natural drainage.

Improvements made since the 2010 Management Plan are:

- Boundary fencing has been installed along the eastern and northern property lines
- Fencing around the parking lot has been improved.
- Boundary signs have been posted.

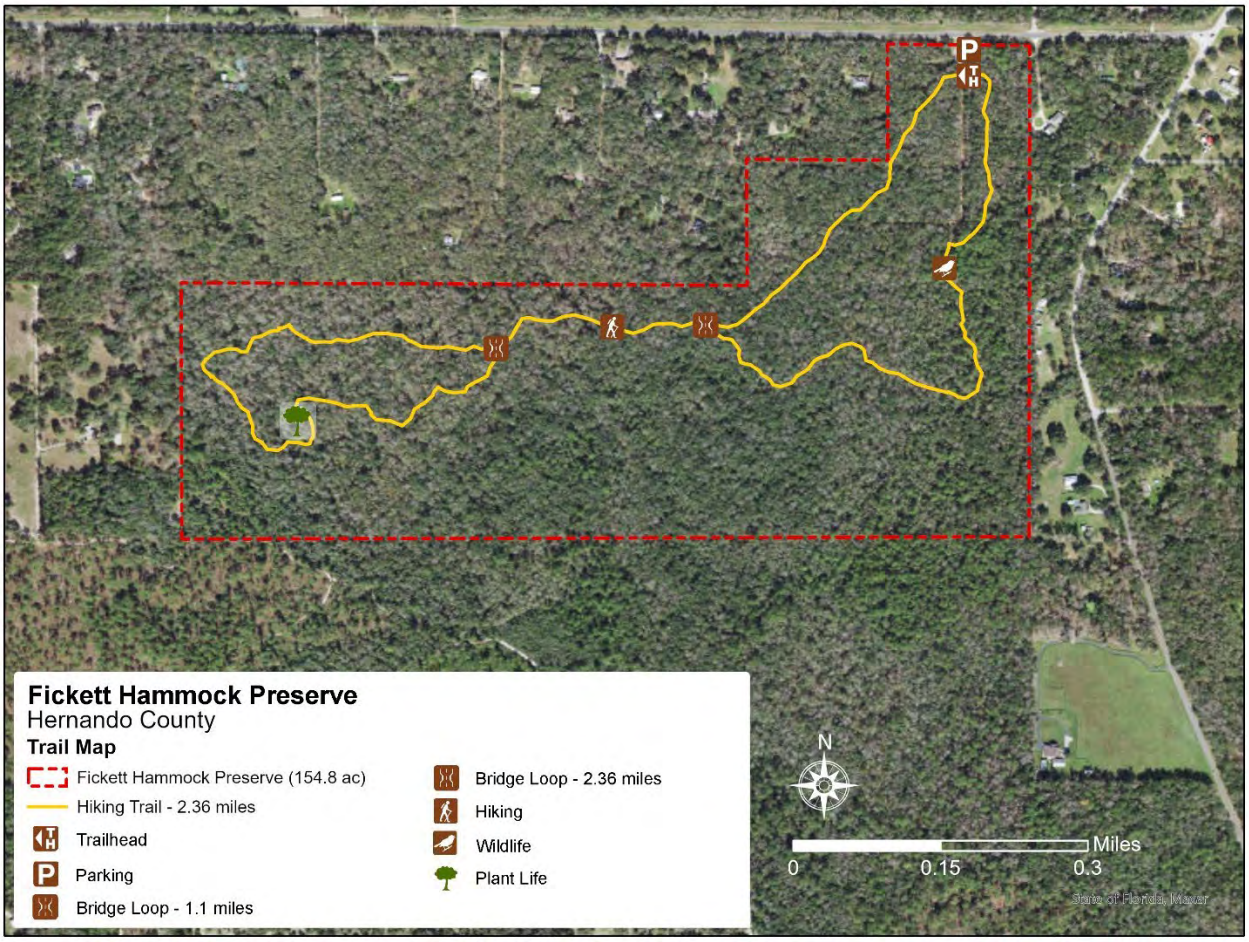

Figure 4.11. The existing 2.36-mile hiking trail system at Fickett Hammock, with the parking area and trailhead shown.

Proposed improvements

Planned structures and facilities include a kiosk, pavilion, wildlife resistant trash and recycling receptacles, and restroom.

Access

Access to the preserve is provided by a parking lot at 15482 Centralia Road, Brooksville, FL 34614.

Easements, concessions, or leases

None.

High-priority conservation values (summary)

As a remnant of the once vast upland hardwood forest, which comprised the Hernando Hammock Belt, the hardwood forest community at Fickett Hammock is the primary conservation value of this preserve. Further field surveys of flora and fauna are likely to reveal additional conservation values.

Desired outcomes and strategies

The desired outcome for management of Fickett Hammock Preserve is all natural communities restored to or maintained in high-quality condition, both for their habitat values for native species and for an improved visitor experience.

Strategies and tasks necessary to achieve this desired outcome include:

- Vegetation surveys of all natural communities on site. These are necessary to confirm the present and probable historic natural community composition and distribution within the preserve, which in turn are necessary to refine management goals and objectives. For example, detailed surveys of the (former) flatwoods community on the far east side of the preserve would help determine its historic boundary with the upland hardwood forest and would inform decisions on whether restoration of the flatwoods is appropriate and feasible.

- Thorough biological inventories to create reasonably comprehensive lists of native and non-native plants, animals, and fungi present on the preserve. Surveys should be conducted using the best-accepted survey protocols for each taxonomic group. For example, breeding bird surveys should be conducted during the appropriate season, utilizing point counts and/or transects. Nest searches should be conducted for species of conservation concern. Gopher tortoises and their commensals should be surveyed using transects and burrow cameras. Other herpetofauna and small mammals should be sampled using drift fence/pitfall trap arrays with funnel traps along the fences. Plants and fungi should be surveyed using transects and time-constrained searches of appropriate habitats. All surveys should be conducted by highly trained and experienced field biologists with expertise in the taxonomic groups concerned.

- Species-specific management plans should be created for each species of conservation concern documented on site. These can be brief.

- Natural community-specific restoration and management plans should be developed for all natural and seminatural communities documented on site. The sandhill on the southwestern corner of the preserve is adjacent to the sandhill at Janet Butterfield Brooks WEA. The FWC is updating the management plan for this WEA; perhaps prescribed burns and other management activities could be coordinated with FWC for this area.

- Continue systematic surveys and treatment of invasive plants within the preserve to maintain ecological value of the natural communities.

- The long fire-excluded flatwoods on the eastern side of the preserve will be challenging to restore. It is a small area bordering private land and the hardwoods that invaded long ago have reached canopy status. Managers will have to decide whether the difficult restoration of this area is worth the effort or whether instead it is preferable to let it remain as hardwood forest and add to the overall acreage of the upland hardwood forest, to which it can be expected to converge in species composition over time in the absence of management. The upland hardwood forest is not a fire-dependent community, but it naturally experiences fire creeping in from the edges with fire-dependent communities.

- An adaptive management approach accompanied and informed by ecological monitoring should guide all management decisions. Refer to Chapter 7 (Management Protocols, Best Management Practices, and Performance Measures) for guidance on fire management, invasive non-native species control, viability of species of conservation concern, landscape context , adaptation to climate change, and visitor management.