

# **Inventory, Assessment, and Restoration Potential of Ephemeral Wetlands on FFWCC Wildlife Management Areas**

## **Triple N Ranch WMA Final Report**



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## EXECUTIVE SUMMARY

Ephemeral wetlands are biologically unique systems that serve as focal points of animal and plant diversity in the southeastern United States. Despite their typically small size, these wetlands are extremely valuable in terms of biological diversity and ecological function. Historically, ephemeral wetlands were largely ignored by scientists, regulatory agencies, and land managers. Because of their small size, they were believed to have lower biological diversity and less significant ecological function than larger, more permanent water bodies. Consequently, many smaller, isolated wetlands have been destroyed or their ecological integrity degraded through human activities that include logging, ditching, draining, fire suppression, and mechanical site preparation. After over 20 years of research on hundreds of sites across the country, we now know that ephemeral wetlands are not just subsets of larger wetlands, but rather they hold their own unique and intrinsic biological value.

This pilot project was created to provide the Florida Fish and Wildlife Conservation Commission (FWC) with the site-specific tools and knowledge it needs in order to carry out the long-term ecological management of Florida's ephemeral wetlands by identifying them using remote sensing tools such as GIS, DOQQs, and topographic maps, conducting on-the-ground assessments of ephemeral wetland conditions using quantitative and qualitative metrics, and recommending restoration strategies for each identified wetland or management unit. Seven FWC-lead Wildlife Management Areas (WMAs) were selected for study: Aucilla WMA, Big Bend WMA, Caravelle Ranch WMA, Chassahowitzka WMA, Guana River WMA, Half Moon WMA, and Triple N Ranch WMA.

We used Digital Orthophoto Quarter Quadrangles (DOQQs) and topographic maps to remotely identify potential ephemeral wetlands on each property. We then ground-truthed potential ephemeral wetlands, obtained a GPS location, and conducted a standardized quick assessment of wetland and surrounding upland conditions. The data were entered into a GPS unit on site in order to generate a spatially referenced database for each property. Additional data were collected on a per property basis as requested by WMA personnel. Multiple photographs were taken of each wetland to provide a current "snapshot" of their physical appearance. We made restoration recommendations for each wetland based on wetland concerns identified in the field and the custom needs and challenges of each WMA.

We inventoried a total of 1513 isolated, ephemeral wetlands across the 7 WMA properties. The majority of wetlands (72%) were marshes. Forested swamps accounted for 9% of wetlands visited, shrub swamps 9%, and mixed swamps 8%. Another 2% of wetlands were of another classification such as borrow pits and sinkhole ponds. A total of 424 wetlands (28%) were in excellent condition with no associated wetland concerns. The three most prevalent wetland concerns were woody encroachment, feral hog damage, and roads/firelines.

Woody encroachment was the most ubiquitous wetland concern across all WMAs. A total of 494 wetlands (33%) were affected by woody plant encroachment. The percentage of wetlands impacted by woody plant encroachment varied per property from 3% of inventoried wetlands up to 74%. Half of all wetlands with woody encroachment were marshes. Within marshes, the

majority of woody encroachment was in the form of slash pine and wax myrtle encroaching from the wetland edge. Woody plant establishment in marshes represented a major threat to ephemeral wetlands in many of the visited WMAs and is largely a result of the lack of fire in the wetland basin. Canopies formed by woody plants in a marsh over time will shade out herbaceous marsh vegetation, eventually transforming the marsh into a swamp. To combat woody plant encroachment in marshes, we recommended that land managers remove encroaching woody plants in a single treatment using a variety of techniques depending on the situation, and subsequently implement long-term fire management in the wetland, if it wasn't already in effect.

There were 352 wetlands (23%) that were impacted by some degree of observable past or present feral hog activity. Some properties were more impacted by hogs than others, the percentage of wetlands impacted varied per property from 4% of inventoried wetlands up to 67%. Feral hogs can alter the plant and animal composition of wetlands and damage wetland soils. We made recommendations on feral hog management based on the severity of the damage and, using the generated database, the spatial extent of the damage. We recommended that trapping be used in combination with sport hunting and control hunting as a 3-pronged approach to reduce the impacts to ephemeral wetlands in heavily damaged areas of some properties.

Roads and firelines affected 2-19% of wetlands inventoried per property, a total of 125 wetlands (8%) were impacted project-wide. The placement of firelines and roads through or tangential to wetlands is detrimental to wetland habitat because the swath of exposed soil and denuded vegetation is a direct alteration of wetland habitat, can impact wetland hydroperiod, and can facilitate the spread of invasive species. Most, if not all, observed road-related impacts were created in the past. Now, current land managers must decide how to implement ephemeral wetland restoration of road impacts while balancing the need to access and partition the property for both public and managerial use. We made recommendations on a case-by-case basis.

Cattle grazing was permitted on 3 of the WMAs we visited. Cattle grazing pressure over time can degrade both wetland and upland habitats by altering plant communities and subsequently reducing landscape biodiversity. Furthermore, cattle frequently congregate in ephemeral wetland basins. Impacts to wetlands include nutrient overloading from concentrated urine and feces, trampling, altering plant community structure, facilitating the spread of invasive/exotic species, and soil compaction. We observed varying degrees of cattle impacts to wetlands during this project. Immediate recommended actions varied per property but in general we recommended cattle be phased out of WMAs altogether as part of a longer-term management strategy to maintain long-term ecological health of ephemeral wetlands and their surrounding uplands.

This pilot study has illuminated the need for future scientific research in several areas of ephemeral wetland restoration. There is a paucity of experimental data and peer-reviewed literature relating to the management of ephemeral wetlands. While some experimental data do exist, and we relied on it heavily for this report, most of the information we have compiled was acquired from our field expertise or through personal communications with land managers and other scientists. One major area that needs to be studied is the ecological response of wetlands to woody plant encroachment and the most effective methods for restoring wetlands impacted by woody encroachment. The long term effects of feral hogs on ephemeral wetland biodiversity

and community composition is another area for which there is little research. A final information gap we have identified is the fire ecology of ephemeral wetlands including targeted fire return interval, impacts of dormant versus growing season fires, and community composition response to varying fire regimes.

Although we've identified information gaps, this report is the most comprehensive compilation of knowledge about ephemeral wetland management and restoration to date. Results from this project provide an enormous database of the ecological status of ephemeral wetlands on state managed properties in Florida. This project also supplies baseline data that can be used in future studies of wetland response to management techniques and a template for future studies to identify, inventory, assess, and implement restoration actions for ephemeral wetlands on other properties.

The deliverables for this project include a final report for each of the 7 WMAs (of which this is one report), a spatially-referenced database of wetlands inventoried (in the form of a shapefile per property), and a catalog of wetland photographs. A DVD of reports, shapefiles, and photographs was sent to each of the 7 WMAs and to the AHRES project manager, Beacham Furse. The reports also were posted on, and the shapefiles made available upon request from, Coastal Plains Institute's website: [www.coastalplains.org](http://www.coastalplains.org).



## **ACKNOWLEDGEMENTS**

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## INTRODUCTION

Ephemeral wetlands are biologically unique systems that serve as focal points of animal and plant diversity in the southeastern United States. Despite their typically small size, these wetlands are extremely valuable in terms of biological diversity and ecological function. For example, at least 12 Florida amphibians, including the federally listed flatwoods salamander (*Ambystoma bishopi*, *A. cingulatum*) and other candidate species (e.g., striped newt (*Notophthalmus perstriatus*) and gopher frog (*Rana capito*)), breed exclusively in this wetland type (Dodd and Charest 1988, Means and Means 1998, Printiss and Hipes 1999, Enge and Wood 2000, Greenberg et al. 2003). Even small wetlands (<1 ha) can support a high diversity and density of species (Dodd 1992, Semlitsch 2000, Means 2007).

Ephemeral wetlands are usually small and isolated with a cyclic nature of drying and refilling. Termed “hydroperiod,” the duration an ephemeral wetland holds water can vary from 1 or 2 weeks to 1 or 2 years, and hydroperiod can vary from year to year and wetland to wetland. The water-holding capacity of a wetland is a function of multiple factors including underlying geology, soil characteristics, rainfall, wetland depth and size, evaporation, evapotranspiration, and tree canopy cover (Williams 1987, Hart and Newman 1995, Blood et al. 1997, Tiner et al. 2002). Bands of herbaceous vegetation around the wetland periphery, known as the littoral zone, move upslope and downslope depending on the water level of the wetland and reflect soil moisture conditions (LaClaire and Franz 1990).

The ephemeral nature and isolation of these wetlands make them unsuitable for fauna requiring longer hydroperiods, such as predatory fish. While some amphibians can breed in the presence of fish, the lack of predatory fish in ephemeral wetlands is essential to the successful reproduction of a large portion of Florida’s amphibian species.

Our region’s biological diversity is greatly enhanced by the presence of ephemeral wetlands. Ephemeral wetlands provide habitat to a large diversity of plants, invertebrates, reptiles, mammals, and birds (LaClaire 1992, Tiner et al. 2002, Comer et al. 2005, Scheffers et al. 2006, Means 2007). At least 10 federally and state-listed species facultatively or obligately utilize isolated wetlands for some portion of their life cycle (Hart and Newman 1995). These wetlands also serve as water sources for game species such as white-tailed deer (*Odocoileus virginianus*), bobwhite quail (*Colinus virginianus*), and waterfowl. Additionally, the aesthetic value of small wetlands is of great importance to a society that places a major emphasis on the value of water bodies.

The longleaf pine ecosystem, once widespread across the southeastern Coastal Plain, has been reduced to <2.2% of its original extent (Frost 2006). In just the past 50 years, a quarter of Florida’s forest and wetland habitats have been cleared (Cox et al. 1994). The cumulative effect of ephemeral wetland destruction in Florida has not been measured, but studies by Semlitsch and Bodie (1998) and Gibbs (1993) illuminate the problems associated with the loss of small wetlands. Small wetlands are crucial for maintaining

regional biological diversity and are important because they support plants, microcrustaceans, and aquatic insects that would be negatively impacted by their loss. From an amphibian metapopulation standpoint, reducing the number of wetlands reduces the amount of young individuals dispersing into surrounding uplands. Ephemeral wetland reduction also increases the dispersal distance among wetlands. While some amphibians can travel up to 2 km (Franz et al. 1988), these dispersal distances appear to be rare. The majority of individuals appear to stay within 1 km of their breeding wetland (Johnson 2003, Rosnik 2007), so increasing dispersal distance could negatively impact amphibian populations. An increase in dispersal distance also may increase the extinction rate of populations of small mammals, turtles, and other less vagile species (Gibbs 1993).

Historically, ephemeral wetlands were largely ignored by scientists, regulatory agencies, and land managers. These wetlands were generally thought to be subsets of larger wetlands. Because of their small size, they were believed to have lower biological diversity and less significant ecological function than larger, more permanent water bodies (Moler and Franz 1987). Studies over the past 20 years have dispelled that notion. We now know that ephemeral wetlands are not just subsets of larger wetlands, but rather they hold their own unique and intrinsic biological value. However, wetland regulations and management plans maintain their focus on larger wetlands. Consequently, many smaller, isolated wetlands have been destroyed or their ecological integrity degraded through human activities that include logging, ditching, draining, and mechanical site preparation. Additionally, fire suppression or improper use of prescribed fire has altered the natural conditions of many ephemeral wetlands.

Coastal Plains Institute (CPI) biologists recently completed a Florida Fish and Wildlife Conservation Commission (FWC) State Wildlife Grant project entitled “Management Strategies for Florida’s Ephemeral Ponds and Ephemeral Pond-Breeding Amphibians” (Means 2008). Through that project, CPI identified and prioritized the necessary steps to improve the management of ephemeral wetlands in Florida. Upon completion of that project, the next logical step in the goal of proper ecological management of Florida’s ephemeral wetlands was the development of the current project. Proper ephemeral wetland management was given the highest priority at “Ephemeral Pond-Breeding Amphibians: Threats and Research Gaps,” a 2007 meeting of amphibian biologists at which research needs of ephemeral wetlands and associated biota were identified and prioritized. The current project will provide FWC with the site-specific tools and knowledge it needs in order to carry out the long-term ecological management of Florida’s ephemeral wetlands by:

- 1) Identifying ephemeral wetlands using remote sensing tools such as GIS, DOQQs, and topographic maps
- 2) Conducting on-the-ground assessments of ephemeral wetland conditions using quantitative and qualitative metrics
- 3) Recommending restoration strategies for each identified wetland or management unit

Seven FWC-lead Wildlife Management Areas (WMAs) were selected for study based on FWC-identified restoration potential priorities and the distribution and occurrence of amphibian Species of Greatest Conservation Need, as identified from CPI's geo-referenced database developed as part of the recent CPI project funded by a State Wildlife Grant (Figure 1). This current project serves to assist FWC land managers by identifying, inventorying, and assessing the restoration need of ephemeral wetlands on the following WMAs:

- Aucilla (AWMA)
- Big Bend (BBWMA)
- Caravelle Ranch (CRWMA)
- Chassahowitzka (CWMA)
- Guana River (GRWMA)
- Half Moon (HMWMA)
- Triple N (TNRWMA)

This report provides an inventory, characterization, and restoration assessment for ephemeral wetlands on TNRWMA, the last of the 7 WMA's visited as part of this project.



**Figure 1.** Map depicting the location of the 7 FWC-lead WMAs targeted for this study.

## EPHEMERAL WETLAND ECOLOGY AND RESTORATION

Ephemeral wetlands also are known as temporary ponds, isolated wetlands, Carolina bays, seasonal ponds, cypress domes, sinkhole wetlands, seasonal marshes, intermittent ponds, pineland depressions, depressional wetlands, and vernal pools. They can be classified as either marshes, shrub swamps, or forested swamps (Whitney et al. 2004). Marshes are dominated by herbaceous vegetation; grasses and forbs that can be emergent, submergent or floating. Swamps are wetlands dominated by woody vegetation. Shrub swamps are dominated by shrubs and forested swamps are dominated by trees.

Both fire and water residency time (hydroperiod) play major roles in shaping the ecological function and the physical appearance of isolated wetlands in Florida landscapes. In the case of marshes, fire and hydroperiod work in unison to produce open, ephemeral, herbaceous marshes. A marsh is likely to succeed into a shrubby or forested swamp over time if two things occur in the wetland: 1) dry conditions ensue long enough for woody plants to become established in the newly exposed wetland floor; 2) fire is absent in the wetland during the dry period.

Historically, wildfires occurred during dry periods and burned across the Florida landscape. The absence of fire from an ephemeral wetland during a prolonged dry period enables the establishment of woody plants in a marsh. Woody invaders into marshes will create a shading effect over time and eliminate low-lying herbaceous vegetation through competitive exclusion. Succession of a marsh into a swamp can be a natural process but much more often, on lands that have been impacted by humans over the long-term, marshes are succeeding into shrub and forested swamps. Over the last century of human growth and development in Florida, a great many marshes in Florida may have succeeded into shrubby and forested swamps as a result of fire suppression induced by humans. This conversion of wetland type may be a factor in the decline of some ephemeral wetland-breeding species such as the striped newt and the gopher frog.

Just as it is possible for marshes to succeed to swamps, it is also possible for marshes to become too choked with herbaceous vegetation (i.e. sawgrass or maidencane) if they do not burn frequently enough. High densities of a single species in wetlands can eliminate open water pools, create a shading effect, and reduce species diversity. Grass-choked marshes are usually best managed with fire.

Dry periods coupled with lack of fire in an ephemeral marsh will lead to woody encroachment, competitive exclusion of herbaceous vegetation, and subsequent loss of marsh habitat. We have observed significant woody shrub and tree encroachment in many ephemeral marshes and swamps in most of the WMA's visited as part of this project. All wetlands exhibiting signs of fire suppression should be encouraged to burn during landscape level prescribed fires. Various other restoration techniques are available to catalyze restoration of fire-suppressed marshes. These additional techniques are discussed in the Wetland Concerns portion of the Site Assessment section. In the short term, marshes should be given higher restoration priority over swamps. Marshes



will rapidly succeed to swamps if not properly managed, whereas swamps are more enduring, already canopied, wetland habitats.

The most important management strategy for ephemeral wetlands and the surrounding landscape is to actively maintain or restore historic fire regimes. Fire suppression was identified as one of the top 8 threats to amphibian conservation (Means 2008) and frequently is cited as a cause for decline in wetland-breeding amphibian populations (Palis 1997, Franz and Smith 1999, Hipes 2003, Jensen and Richter 2005, Means 2007) as well as other taxa (Stoddard 1931, Mushinsky 1985, Brennan et al. 1998, USFWS 2003). The Florida Comprehensive Wildlife Conservation Strategy ranked “incompatible fire” as one of the highest overall threats across all Florida’s terrestrial habitat (FWC 2005). Most land managers recognize the necessity of fire to maintain the longleaf pine ecosystem, but there is debate regarding the importance of fire season versus fire frequency (Bishop and Haas 2005) and as to the appropriate fire frequency (Schurbon and Fauth 2003, Means et al. 2004, Robertson and Ostertag 2004). Additionally, many managers have to contend with managing units or entire properties that have heavy fuel loads resulting from long-term fire suppression. These heavy fuel loads present specific fire safety and ecological concerns.

Regardless of upland burn season and frequency, managers should ensure ephemeral wetland basins burn at least every 1-4 years (Wade et al. 1980, Printiss and Hipes 2000, Ripley and Printiss 2005, Means 2007). Because some wetlands may be severely fire suppressed, several treatments of annual or biennial burns may be necessary to initially suppress the hardwoods (Printiss and Hipes 2000). Historically, fires were ignited by lightning during the spring and early summer and had the potential to burn across large portions of the landscape (Robbins and Myers 1992). Wetlands were often dry during this time and fires were more likely to burn through the wetland basin. Fire reduces hardwood encroachment and buildup of organic matter (Wade et al. 1980). Fire also encourages growth of the herbaceous vegetation around the wetland edge, an area referred to as the littoral zone. This shallow zone is extremely important to adult amphibians for use as breeding and ovipositioning sites and to amphibian larval for food and cover habitat.

We primarily recommend the use of growing season prescribed fires in Florida landscapes in order to mimic the historical fire regimes that occurred here prior to European induced fire suppression. Embedded ephemeral wetlands within upland landscapes should be allowed and encouraged to burn. However, we recognize that dormant season burning may have to be conducted by land managers in many cases, especially in the initial phases of landscape restoration.

From an amphibian conservation perspective, burning of the wetland basin may be as important as the attention given to upland burn frequency and season. The U.S. Forest Service (USFS), in cooperation with Florida State University (FSU), are experimenting with whether dormant season upland burns combined with intentional burning of wetlands will improve conditions for flatwoods salamander populations in the Apalachicola National Forest (C. Hess, USFS/FSU, pers. com.). The uplands

surrounding the wetlands were burned during the USFS's normal winter burning season, but the researchers returned later when the wetland basin was dry and conducted a burn through the wetland basin. Because the fuel load of the surrounding area had been eliminated during recent burns, the researchers were able to conduct a hot, ring fire in the wetland basin. The resulting elimination of woody vegetation and the creation of an herbaceous community in the wetland basin were dramatic and extremely successful (C. Hess, USFS/FSU, pers. comm.). This method can be implemented to improve the ecological condition of ephemeral wetland basins suffering from fire-suppression due to dormant season burning when wetlands are typically filled with water.

The ecological health of an ephemeral wetland is unequivocally connected to that of the surrounding upland habitat (Semlitsch and Jensen 2001, Gibbons 2003, Semlitsch 2003). Wetlands are part of a larger landscape unit comprising a network of energy transfers and chemical interactions among organisms that are directly or indirectly dependent on surface water when it is present (Gibbons 2003). Studies of amphibians in ephemeral wetlands illuminate the enormous wetland-upland biomass exchange. In Florida, 14 amphibian species exclusively or principally breed in ephemeral wetlands and at least a dozen more species utilize the habitat opportunistically (Means 2008). These species spend the majority of their life cycle in the uplands, migrating to wetlands to breed. Travel distances of greater than 400 m have been recorded for many species (Lannoo 2005). The number of individual amphibians entering and exiting a wetland in a given year is often in the thousands (Dodd 1992, Johnson 2001, Means 2007) and even tens of thousands (Semlitsch et al. 1996, Means 2007).

When considering how to properly restore and manage ephemeral wetlands, it is important to note that landscapes typically contain a multitude of ephemeral wetlands that may vary in hydroperiod, floral and faunal species composition, and other ecological characteristics. Whereas some ephemeral wetlands appear quite similar to one another, each is a unique ecological entity possessing unique ecological qualities and processes. Ephemeral wetlands are dynamic ecosystems that constantly undergo ecological succession, responding to abiotic (e.g. climate change, hydroperiod, fire) and biotic (e.g. plant succession, faunal reproductive activity, alteration by humans) factors that are continually ongoing. Whereas in some cases we will recommend how to manage wetlands that need specific attention, the goal of ephemeral wetland management should be to manage at a landscape level for long-term ecological health and biodiversity of the entire ecosystem, including all embedded ephemeral wetlands.

In cases where wetlands can be restored to mimic the natural condition that existed before alteration occurred, we make recommendations on how to accomplish this. We make every effort to tailor our recommendations to the specific needs of each WMA visited. Because little work has been conducted in the field of ephemeral wetland restoration, we may recommend experimenting with different restoration techniques. Any or all of the following techniques may be recommended for the proper, long-term, ecological management of specific ephemeral wetlands or management units that contain multiple similarly impacted wetlands visited within this project:

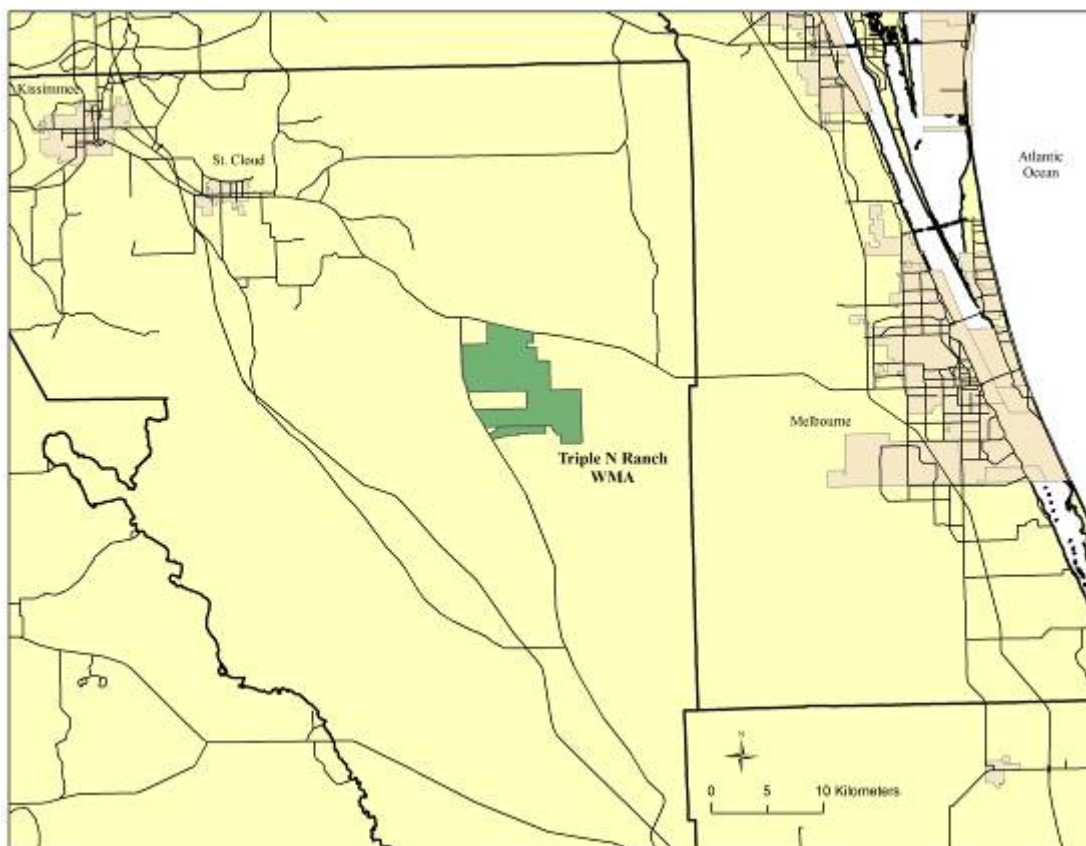
- 
- Landscape (or ecosystem) management
  - Prescribed growing season fire
  - Prescribed dormant season fire
  - Fireline placement
  - Spot use of herbicide on exotic or invasive flora
  - Filling or plugging of drainage ditches
  - Physical elimination/reduction of damaging exotic wildlife (e.g. hogs)
  - Grazing reduction/elimination
  - Hand removal of encroaching vegetation
  - Mechanical removal of encroaching vegetation
  - Mechanical flattening of bedding or windrows
  - Re-routing roads

## STUDY AREA

Triple N Ranch Wildlife Management Area is approximately 6,500 ha in size and is located in Osceola County, approximately 45 km west of the Atlantic Coast and 26 km southeast of the town of St. Cloud (Figure 2). The property was purchased by the state in parcels from 1996 – 2006. Prior to state ownership, the area was used as a cattle ranch and a hunting preserve.

The southern section of the property (Management Units 45-87) is the most recent acquisition and contains flatwoods, dry prairie and recovering pasture communities. Cattle are no longer allowed to graze on this area but the impacts of years of grazing are evident in the vegetation community. Cattle are now allowed to graze the northern section of the property. This section predominately contains fire-maintained, intact longleaf pine flatwoods and wet prairie communities. Crabgrass Creek flows through the property and there also are hundreds of isolated marshes and dome swamps.

Prescribed fire and chemical and mechanical treatments are the dominant management tools used on TNRWMA. The property is in fire-maintenance condition. Fires are prescribed in both the winter and the summer seasons.



**Figure 2.** Map depicting the location of TNRWMA. TNRWMA is located in Osceola County, approximately 45 km west of the Atlantic Ocean and 26 km southeast of the city of St. Cloud.

## METHODS

We conducted an initial meeting with Area Biologist J. Olson on 13 May 2010 to familiarize ourselves with land access, burning schedules, management priorities and concerns, and other pertinent issues. K. Kemp, AHRES representative, also attended the meeting.

We used Digital Orthophoto Quarter Quadrangles (DOQQs) and topographic maps to remotely identify potential ephemeral wetlands on the property. The number of wetlands on TNRWMA was too large (>635 potential wetlands) to conduct a complete inventory of the ephemeral wetlands in our allotted time frame. As per J. Olson's request, we sampled wetlands across the entire property to include a representative sample of the various habitat types, disturbance types, and locations.

For this study, ephemeral wetlands were defined as depressional features containing wetland-indicating vegetation, isolated from much larger and deeper wetland strands, swamps, basins, lakes, or other more permanent wetlands. We concentrated on ephemeral wetlands embedded in upland ecosystems. Unless specifically requested by a land manager, we did not visit wetlands surrounded by swampy lowlands such as hydric hammock and tidal marsh. No minimum or maximum size was required to designate a wetland as an ephemeral wetland, but this study focused on inventorying wetlands that were relatively small in size to assist land managers in potentially discovering wetlands that they formerly did not know existed.

We obtained a GIS location at each wetland using a TDS Recon 400x with a Garmin 10 Bluetooth. A standardized quick assessment of wetland and surrounding upland conditions was conducted and recorded on an ephemeral wetland inventory datasheet (Appendix A) and entered into the Recon datalogger. Multiple photographs were taken of each wetland to provide a current "snapshot" of their physical appearance. Definition of select data collected at each wetland follows.

### Wetland ID

Wetlands were given an ID that corresponds to the Management Unit (MU) number, and the wetland number. For example, 87-03 is the third wetland inventoried in MU 87.

### Wetland Type

We placed each wetland into one of 5 generalized categories based on descriptions from Ewel (1990), Kushlan (1990), and Whitney et al. (2004):

- Marsh – dominated by herbaceous vegetation rooted in or emergent from shallow water - examples include basin, depressional, swales, and wet prairie
- Shrub swamp – dominated by shrub or midstory woody vegetation
- Forested swamp – forested or wooded wetland - examples include heads, bogs, domes, strands, and hammocks

Mixed swamp – forested wetland with a heavy shrub midstory

Altered – damaged wetland whose original ecological classification is unrecognizable - examples include drained, logged, or mechanically altered wetlands

#### Basin Area

Length and width of wetland were measured using a range finder, where feasible. Basin area was estimated using the measure tool and DOQQs in ArcMap.

#### Hydroperiod

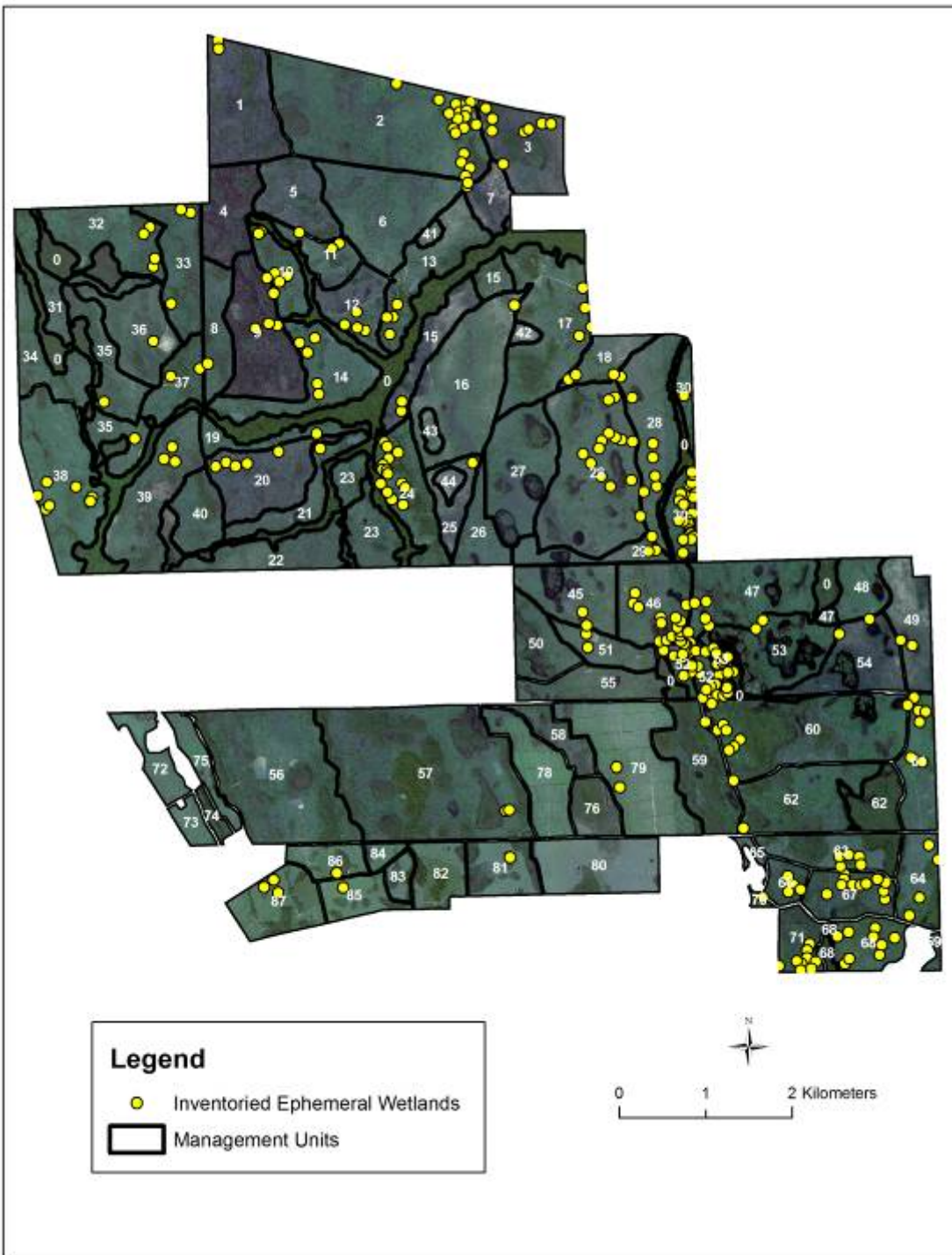
Highly Ephemeral – wetlands with a very short hydroperiod, estimated to have standing water only a few months out of a year. Estimations are based on wetland vegetation, soil conditions, and amount of standing water during site visit.

Ephemeral – wetlands with an intermediate hydroperiod, estimated to have standing water for up to 8-10 months out of a year. Estimations are based on wetland vegetation, soil conditions, and amount of standing water during site visit.

Semi-permanent – wetlands with a long hydroperiod, estimated to have standing water for more than a year. Estimations are based on wetland vegetation, soil conditions, and amount of standing water during site visit.

## SITE ASSESSMENT

We began our inventory of wetlands on 13 May 2010 and completed the assessment on 17 June 2010. We inventoried a total of 299 wetlands on the property (Figure 3).



**Figure 3.** Map of the 299 inventoried ephemeral wetlands on TNRWMA.



Overall the wetlands on this property were in very good ecological condition and were in fire-maintenance condition. Of the 299 wetlands we inventoried, 88 wetlands (29%) were in excellent condition with no associated disturbances or concerns. The major restoration concern on this property was related to the past and present effects of cattle grazing. Feral hog damage and ditches (drainage or roadside) were also wetland concerns.

We identified 115 ephemeral wetlands (39%) in which cattle were a wetland concern on TNRWMA. An additional 35 wetlands (12%) inventoried have not yet recovered from effects (direct and indirect) of past cattle grazing. Currently, cattle are allowed only on the northern section of the property, a section historically not grazed. This section predominately contains flatwoods that are in excellent ecological condition. The southern section of the property contains both healthy flatwoods and several MUs that are remnant pasturelands. Pasturelands were heavily grazed in the past and presently are in early stages of recovery.

We identified 54 ephemeral wetlands (18%) on TNRWMA affected by feral hog damage to some extent. Feral hog damage appears to be concentrated in some areas. If feral hogs continue to be active in these areas, taking aggressive action such as trapping or harvesting may be necessary to prevent wetland degradation.

We encountered 28 ephemeral wetlands (9%) on TNRWMA affected by ditching. Ditching occurred in both the southern portion and the northern portion of the property. In one area, a system of ditches impacts the hydrology of multiple wetlands.

### **Wetland Concerns**

Wetland Concerns were identified for each wetland to highlight areas that may need to be addressed. When deciding what concerns to address, we first recommend using a landscape perspective. The condition of an individual wetland is not as important as the condition of the wetlands as a whole over the landscape. In addition, there is no universally-accepted target condition for every wetland. A mosaic of different wetland conditions is desirable and increases the diversity of the property. For example, if only 1 or 2 wetlands in an area are impacted by woody encroachment, WMA personnel may decide to address this concern by using general landscape management techniques such as periodic, prescribed fire. However, if multiple wetlands are impacted, it may signify a larger issue that may need to be addressed and/or the affected wetlands may need to be custom managed through vegetation removal, burning when the wetland is dry, removing fire breaks, etc. We provided a database for each property to facilitate the use of GIS to spatially identify problem areas (see Database section below).

Depending on resource constraints, landscape conditions, the presence of focal species, or other factors it may be more advantageous to manage at an individual wetland level. Therefore, we also provided restoration actions for each individual wetland. These actions may need to be prioritized (see Restoration Prioritization section below).

Below we detail the impacts of each Wetland Concern and how it pertains to TNRWMA. Not all Wetland Concerns were identified on each property but we included them as a reference for WMA personnel.

### Bedding

Historically, much of Florida's flatwoods were bedded in order to provide higher, less water-logged sites on which to plant pine trees. Sometimes bedding was constructed through the edge or center of wetlands. Typically this practice occurred with smaller wetlands. We generally recommend allowing bedding to erode over time. However, more severely damaged wetlands, such as those with feral hog damage or altered hydrology, may provide a good experimental situation for mechanically flattening bedding in or around a wetland basin when the wetland is dry. If bedding removal proves successful (i.e. retention of native wetland plants, maintenance of hydroperiod), the method could be used on other, less severely damaged wetlands to restore bedding impacts. In some cases we may recommend specific wetlands where experimental bedding removal could be undertaken. All mechanical activity must be conducted when the wetland is completely dry to minimize soil damage and rut formation.

We encountered no wetlands impacted by bedding on TNRWMA.

### Cattle

Impacts of cattle grazing to a natural landscape in both wetlands and uplands include nutrient overloading from concentrated urine and feces, trampling, altering plant community structure, facilitation of invasive/exotic species colonization, and soil compaction. Cattle are the major wetland concern on TNRWMA, affecting 39% of the wetlands. Cattle grazing has enabled invasive pasture grasses to encroach into wetland basins. These invasive plants impacted 33 (11%) of the wetlands we inventoried. Some wetlands have the potential for cattle impacts based on management activities in the MU and some have already been impacted to varying degrees by cattle. If the current cattle grazing activities persist, then the ecological health of the TNRWMA likely will degrade over time from its current status. We believe it is very important to remove cattle from MU's that are considered to be high quality, intact pineland communities before these natural areas are more ecologically degraded by grazing. As part of this step, cattle from the northern units can be transported to southern units (i.e. MUs 68, 71, 86, 87) that already are converted to grass pasture by past grazing. The northern units will recover under the current fire management plan, and the southern units that already are pasturelands will remain in pasture providing high quality grazing for resident cattle. Under this scenario, the overall ecological health of the TNRWMA will not degrade, but will stay the same. We recommend that cows be phased out of WMAs altogether as part of a longer-term management strategy to maintain long-term ecological health of ephemeral wetlands and their surrounding uplands.

### Drainage Ditching, Berms, and Roadside Ditching

Ditches have been used in Florida to drain wetlands for decades. Drainage ditches alter the hydrological regime, and therefore the ecological character, of a wetland over time. Berms are linear, earthen raised rows usually running parallel to a ditch. These features sometimes run near, through, or around wetlands. Berms can alter wetland hydrology and provide a platform for the establishment of upland plant species through a wetland. Many times berms are created during road-building. The result is an elevated road with ditches on one or both sides of the road. In many cases, access roads run tangent to wetland edges, and have associated roadside

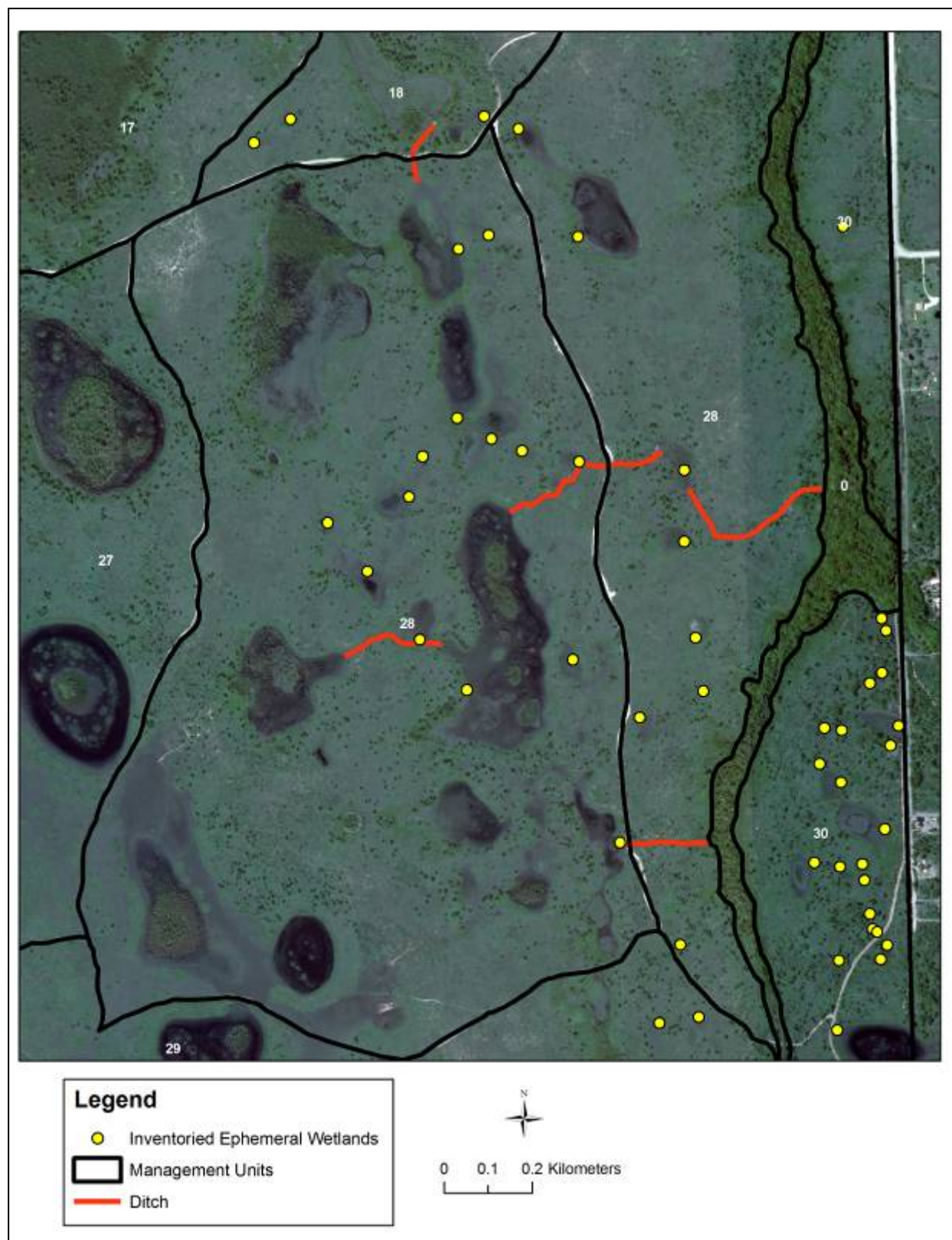
ditches of varying depth and hydroperiod. Roadside ditches along wetland edges can provide an unnatural avenue for connectivity to other wetlands located along the road. Roadside ditches may also become refuges for fish if they are deeper with longer hydroperiods than the affected wetland.

It is important to break the connection between ditches and wetlands. We typically recommend filling in all drainage ditches, because it is likely that ditches affect the long-term hydrological regime of a wetland. If filling in the ditch is not an option, the ditch should be plugged as close to the wetland edge as possible.

In the case of roadside ditches tangent to isolated wetlands, we suggest experimental restoration of 1 or 2 wetlands. In order to preserve the drainage functionality of the ditches as well as sever the connectivity between ditches and wetland, 2 culverts could be employed to divert all water to the ditch on the opposite side of the road. The recipient ditch may need to be expanded to accommodate the increase in flow. The modified ditch and culvert system would need to be monitored during heavy rains and, if successful, the method could be used property-wide. An explanatory diagram is provided as Appendix B.

Sometimes ditches themselves are ephemeral and the wetland does not appear to be hydrologically impacted by the ditch. Although priority should be given to filling/plugging deep ditches, we still recommend filling ephemeral ditches because there may be unseen effects difficult to ascertain in a short period of time without ecological monitoring.

We encountered 2 wetlands affected by berms on TNRWMA, 2 of which were created to provide habitat for cattle. We identified 26 wetlands with ditches. In one area, the hydrology of at least 10 wetlands has been altered by a series of ditches that ultimately lead into a large drainage system (Figure 4). We recommended filling most ditches to break the connectivity of the wetlands.



**Figure 4.** Map depicting a system of ditches impacting the hydrology of an area on TNRWMA.

### Dug-outs

Dug-outs are features that were created primarily to serve as watering holes for cattle. These structures commonly were excavated within already existing wetland basins. Dug-outs alter the original hydrology of the surrounding wetland by providing a deep, permanent water body that may harbor predatory fish in wetlands that otherwise would not support fish. The unnatural presence of fish in ephemeral wetlands makes them unsuitable for certain rare amphibian species to breed such as the striped newt, gopher frog, and ornate chorus frog (*Pseudacris ornata*).

We recommend that deep dug-outs within ephemeral wetland basins be filled and leveled with the surrounding wetland bottom in order to restore the natural topography and hydrology of the original wetland basin. Existing earthen mounds can be the fill material source. Established permanent wetland animals (e.g. fish, turtles, alligators) could be trapped and moved to other suitable natural wetlands prior to filling the dug-out. Wetland vegetation should quickly reestablish over the filled area.

In a few cases, dug-outs were encountered in the uplands. There are two such examples on TNRWMA (64-03, 67-02). In such cases, we recommend leaving the dug-out intact and managing it as an isolated wetland since they have become functioning isolated wetlands over time. Alternatively, if the land manager wishes to restore uplands to original conditions, we also support the view that man-made wetlands in uplands could be filled during the upland restoration process. However, it is beyond the scope of the current project to make upland restoration recommendations.

We encountered 6 wetlands affected by dug-outs on TNRWMA.

### Feral Hog Damage

Feral hogs (*Sus scrofa*) have occupied Florida for almost 500 years (Belden and Frankenberg 1977) and have been recorded in all 67 counties of the state (Layne 1997). Among exotic mammals in Florida, feral hogs have the most destructive impact on natural habitats (Layne 1997). The list of these impacts is long and includes preventing the natural regeneration of native plants such as the longleaf pine (Lipscomb 1989), facilitating the spread of exotic species (Jensen and Vosick 1994), adversely affecting soil microarthropods (Vtorov 1993), transmitting disease (Forrester 1991, Maffei 1997), destroying the nests of birds, turtles, and snakes (Maffei 1997), and affecting species composition (Randall et al. 1997). Habitat damage by feral hogs is most pronounced in wet environments (Choquenot et al. 1996). From an amphibian conservation perspective, rooting and subsequent habitat alteration can destroy amphibian breeding habitat as well as upland refugia (Printiss and Hipes 2001, Means and Travis 2007). Foraging by feral pigs during amphibian breeding events has been observed and could result in the consumption of significant numbers of breeding adults (Jolley 2007).

Most land managers, biologists, and conservationists agree that feral hog reduction and removal should take place to reduce the many impacts hogs have on the natural environment. However, the removal of feral hogs from a property is problematic from both a political and ecological standpoint. The main political obstacle to hog removal often is a strong sport hunter's lobby.

Even if managers decide to reduce or remove hog populations, it is extremely difficult to fully eradicate them due, in part, to their high fecundity and the substantial resources required for total eradication. However, it is possible to significantly reduce hog populations and their impacts on a landscape with the use of certain removal techniques.

Sport hunting and direct culling have been used with varied success (Belden and Frankenberger 1977, Ferriter et al. 1997, Engeman et al. 2007). Other possible techniques include fencing of wetlands or wetland clusters (Hone and Atkinson 1983, Lipscomb 1989) and immunocontraception (Killian et al. 2006). Trapping hogs in baited pen traps is one of the most successful techniques to reduce feral swine in a landscape (Engeman et al. 2007; D. Printiss, The Nature Conservancy, pers. com.).

In a study on Eglin Air Force Base, hogs were trapped and control hunted on a portion of the property closed to sport hunting where hog populations were relatively high (Engeman et al. 2007). In this study, hog populations and impacts to seepage slopes were dramatically reduced within the closed-to-hunting zone in the first year of hog removal and reduced further in subsequent years. Furthermore, reductions of hogs and impacts also occurred property-wide where hunting has taken place for decades. The researchers calculated economic valuations of seepage slopes and demonstrated substantial benefit-cost ratios to application of swine removal over a three-year period.

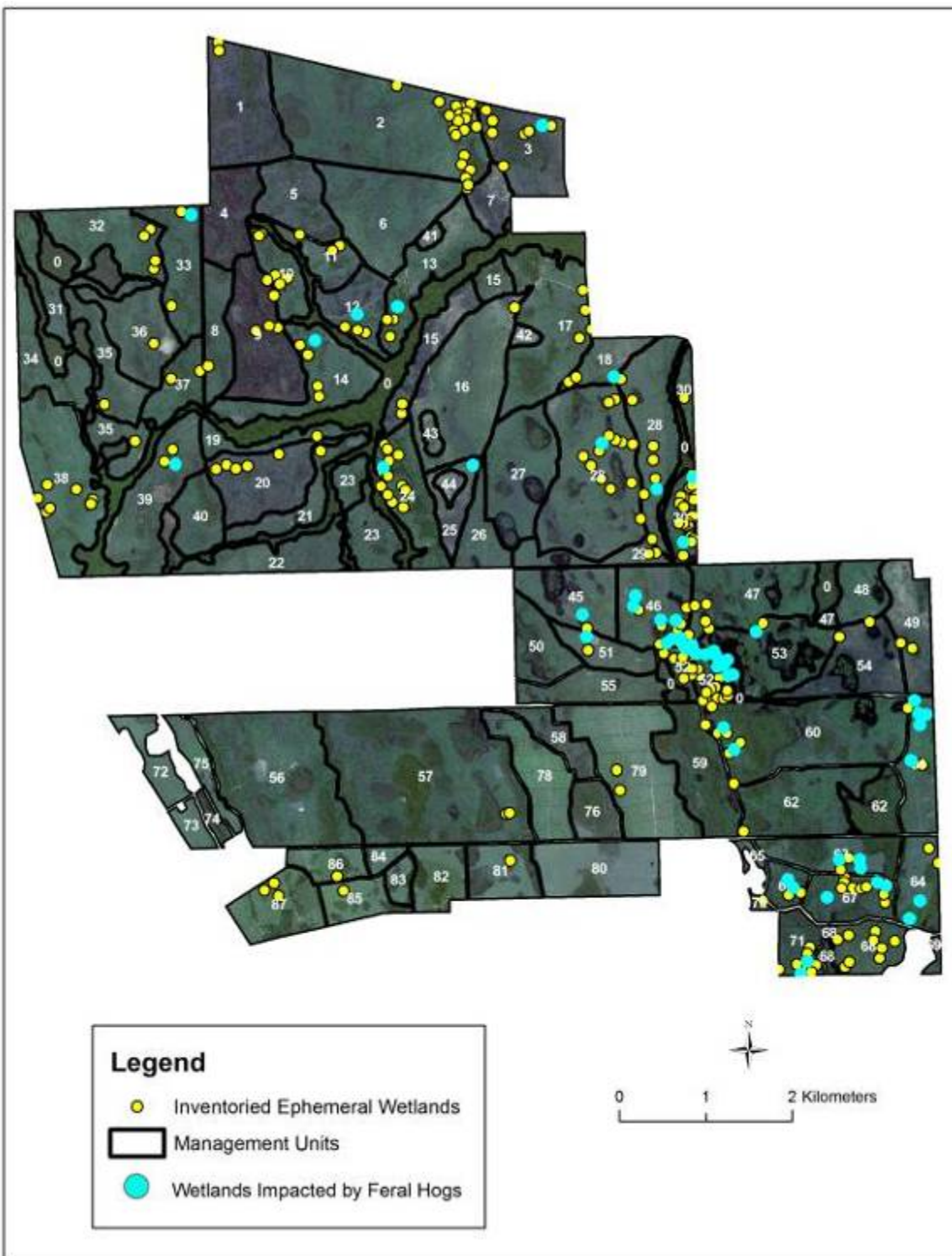
Funding to manage feral swine and restore habitat is finite and must be carefully managed to optimize the positive impact on the protected resources (Engeman et al. 2007). In spite of the difficulties encountered with feral hog removal, trapping and hunting can be used to successfully reduce hog populations and their impacts on a given property (e.g., Engeman et al. 2007).

On WMA's where hog populations are dense, sensitive areas that are sustaining heavy hog damage and areas with SGCN could be identified through ecological monitoring. Once identified, these areas could be targeted for hog removal as in the Engeman et al. (2007) study. Benefits mostly would occur in the targeted area, adjoining areas likely would also profit.

We encountered 54 wetlands (18%) impacted to some degree by feral hog damage on TNRWMA. Feral hog damage appears to be concentrated in some areas (Figure 4). There is a diagonal line of affected wetlands from the south of MU 46 southeast to MU 53. In fact, all but 2 wetlands in MU 53 have been damaged by feral hogs to some extent. If feral hogs continue to be active in these areas, taking aggressive action such as trapping or harvesting may be necessary to prevent wetland degradation.

We recommend that trapping be used in combination with sport hunting and control hunting as a 3-pronged approach to reduce the impacts to ephemeral wetlands on these MUs. Hog-trapping can be conducted using WMA personnel or by soliciting the services of the US Department of Agriculture Wildlife Services, the federal agency responsible for managing conflicts with wildlife (Engeman et al. 2007, US Department of Agriculture 1997). To simultaneously provide hunting opportunities and reduce hog impacts to sensitive areas, hunting could take place year-round and in management units (MU's) that have fewer sensitive areas and SGCN while the most sensitive areas are targeted for hog removal.





**Figure 5.** Map of ephemeral wetlands on TNRWMA with feral hog damage.



### Firelines/Management Unit Boundaries/Roads

The placement of firelines and roads through wetlands is detrimental to wetland habitat because the swath of exposed soil and denuded vegetation is a direct alteration of wetland habitat and can impact wetland hydroperiod. We recommend firelines and roads be rerouted at least 15m from a wetland edge to prevent damage to the wetland littoral zone. For wetlands that are located adjacent to MU boundaries, we recommend delineating the wetland edges with flagging or some other method so the machine operators will be alerted to diverge from their straight line paths.

We typically recommend allowing abandoned firelines to fill in with vegetation over time. However, WMA personnel have employed mechanical treatments to rework and restore fire plow lines in and around wetlands. Using a low-ground pressure bulldozer and disc for minimal ground disturbance, old wildfire suppression plow lines have been rehabilitated on CRWMA. WMA personnel have observed a more natural hydroperiod and the ability to reintroduce fire into the wetland basin (J. Slater, CRWMA, pers. com.). Firelines bisecting wetlands also have been reworked on GRWMA to address hydrological impacts (J. Ellenberger, GRWMA, pers. com.).

In some instances, a road does not appear to be negatively impacting a wetland and we do not recommend moving the road. In these cases, the action of re-routing a road might be more destructive than leaving it in place. Additionally, we recognize that there are cases where firelines and roads in or near wetlands cannot be rerouted. If firelines/roads cannot be moved, the affected wetlands can be monitored to ensure they burn periodically and do not become impacted by encroaching woody vegetation, sand run-off, or other disturbances. Firelines can be plowed and maintained when wetland is completely dry to prevent large ruts from developing. Vehicular traffic should be discouraged along these firelines.

Where MU boundaries mark a property line with a private landowner, we recommend contacting the private landowner to see if the MU boundary can be moved to encompass the entire wetland. If the wetland is of particular interest (surrounded by intact uplands, potential breeding location for striped newt, etc.), a land swap may be an option to acquire ownership of the entire wetland.

If the road cannot be re-routed, it may be appropriate to experiment with filling in a roadside ditch where it connects to the wetland (see Ditching section). More severely damaged wetlands provide a good opportunity for such an experiment. If successful at these wetlands, the method could be used on other, less severely damaged wetlands to restore ditch impacts. All activity must be conducted when the wetland is completely dry to minimize soil damage and rut formation.

Firelines and roads were not a major problem on TNRWMA. We encountered 4 wetlands affected by firelines/MU boundaries and 3 wetlands affected by a road. See individual pond characterization pages for details.

### Herbaceous Plant Density

The herbaceous community within a wetland is in constant ecological flux. Between fire and inundation, the density of herbaceous vegetation changes over time. For example, immediately

following a fire, standing crop biomass of herbaceous vegetation is almost or completely eliminated; however, roots, rhizomes, and seeds of these plants remain resident in the soil and regenerate quickly following fire. Over time, herbaceous vegetation grows back and, if too much time passes between fires or inundation, becomes extremely dense. Wetlands with dense herbaceous vegetation have low plant species diversity and often are completely dominated by one species, usually maidencane or sawgrass. Additionally, these wetlands provide poor habitat for amphibian reproduction and for other species.

For any given WMA property that has a multitude of isolated ephemeral wetlands, the optimum ecological condition is a mosaic of wetlands in different stages of flux. Unless multiple wetlands in an area exhibit dense herbaceous vegetation, long-term ecological fire management of the landscape is sufficient to favor ecological health of a single wetland. Prescribed burning of a choked herbaceous marsh reduces vegetation density, increasing sunlight into the wetland ecosystem, and increases overall ecological productivity of the wetland.

We encountered no wetlands on TNRWMA impacted by dense herbaceous vegetation.

### Logging

Old tree stumps or stump hummocks were observed in many ephemeral wetlands on multiple properties during this project, direct evidence of past logging practices. Most of the stumps appeared to be cypress. Sometimes, old logging stumps became hillocks or hummocks onto which woody shrubs established. This process was particularly prevalent on AWMA.

In some cases, cypress stumps were observed within swampy ephemeral wetlands that currently are forested by cypress trees. This indicates that the original plant community of the wetland re-established after logging within the wetland basin. In some wetlands, dense brush established on the old stump hummocks or as a result of fire suppression, and the cypress canopy did not reestablish. These wetlands became shrub swamps or marshes.

We did not report logging as a Wetland Concern in the Wetland Characterization section because all the logging we encountered occurred long ago and most logged wetlands we observed had reforested. We did describe the presence of stumps or hummocks in the wetland description paragraph in an effort to be as descriptive as possible. In general, we do not recommend that any action be taken to remove old stumps or hummocks, unless they exist within a densely brushy wetland that is a candidate for experimental brush removal, or otherwise needs some other restoration attention. If a wetland becomes densely brushy, and this process is facilitated by the presence of stump hummocks, periodic fire should keep brush in check and stump hummocks should oxidize.

### Planted Pine Trees

Public lands previously owned by timber companies often have evidence of past silviculture practices. Pine trees were planted through small wetland basins, often associated with bedding. Both the shade from the tree canopy and the needle duff can eliminate the herbaceous vegetation

vital to the ecological health of a marsh. In most cases, we recommend removing the planted pines in an ephemeral wetland.

We encountered no wetlands impacted by planted pine trees on TNRWMA

### Push Piles

Push piles are earthen mounds commonly formed during the process of land clearing. Heavy machinery is used to scrape clean the harvested landscape. After tree removal, remaining limbs, branches, small trees and shrubs often are pushed into piles and prepared for elimination by burning. Sometimes push piles are not burned, but left behind. In either case, an earthen hillock usually is created in the process, and logged landscapes can have these so-called “push piles” present for decades. Push piles can be several feet high and dozens of feet in diameter. During logging operations of the 20<sup>th</sup> century, it was not uncommon for land clearing personnel to create push piles within dried ephemeral wetland basins.

Push piles in wetlands can alter the original wetland ecology in at least 2 ways. First, there is the issue of direct reduction of wetland habitat. Second, a raised pile of dirt in a wetland favors establishment of small upland habitats where upland plants and trees can grow. If allowed to grow to maximum height, upland trees (most frequently pines) can create a canopy over a potentially large portion of a wetland. If the wetland in question originally was a marsh, the problem mirrors that of woody encroachment into a marsh, namely the shading and subsequent exclusion of native herbaceous wetland vegetation.

Push piles are unnatural and undesirable structures in wetlands. Depending on severity, push piles in ephemeral wetlands should be removed mechanically or be allowed to erode over time, depending on the size and impact of a given pile. Small piles having little impact on a given wetland should be allowed to erode over time. Large push piles in wetlands that are significantly impacting a given wetland should be mechanically removed when the wetland basin is dry. The dirt and any established trees can be removed and distributed in nearby uplands in such a way as to not damage uplands. Alternatively, dirt from push piles could be used for other purposes such as road and ditch fill, etc. A pile should be removed down to the level of the rest of the wetland basin.

We encountered no wetlands affected by a push pile on TNRWMA.

### Slash

Slash is a term used to describe the treefall and brush byproducts of logging operations. After tree removal, slash is scraped into piles for burning or left to decompose, or the slash is scattered across the ground to decompose. Sometimes slash is left in a wetland. Unless it is a minor amount, we do not recommend slash be left in a wetland. The slash we encountered within wetlands was usually a byproduct of recent mechanical tree thinning or brush removal as part of the restoration process. Depending upon the amount of brush left in a wetland, we recommend two different approaches to eliminate slash within wetlands.

If a significant portion of the wetland is covered with slash, the slash pile is dense, and/or mechanical treatment is needed for some other restoration concern, we recommend removal by root rake or mechanical means when the wetland is completely dry. Slash can be distributed in the uplands and should decompose and/or burn during the next prescribed fire. If the slash amount is minor and is not covering significant proportion of a wetland basin, we recommend encouraging fire in the wetland basin to eliminate the slash.

We encountered no wetlands affected by slash on TNRWMA.

### Upland Condition

Discussing upland management is beyond the scope of this project. However, we briefly characterized the uplands around each visited wetland. We used the phrase “Upland Condition” to identify wetlands surrounded by altered uplands or uplands needing restoration attention. When managing for the long-term ecological health of ephemeral wetlands, the ecological condition of surrounding uplands and upland corridors connecting multiple wetlands is equally important. For more information about wetland buffer zones, upland corridors and managing the uplands surrounding wetlands see Semlitsch and Jensen 2001, Semlitsch 2003, and Means 2008.

We encountered 50 wetlands (17%) that were surrounded by uplands impacted by cattle grazing. The full ecological function of these wetlands will not be restored unless the uplands also are restored.

### Vehicular damage

Vehicles as a wetland concern usually are related to either recreational use or a result of mechanical activity related to vegetation clearing. Vehicles can impact ephemeral wetlands by compacting soil, destroying the wetland littoral zone, creating ruts that can alter hydrology, and/or facilitating the spread of invasive species. Additionally, the open soil left from vehicular damage can encourage further damage from feral hogs. In the case of recreational vehicles, gates, fencing, and road closures may be needed to reduce access and have been used successfully in some areas (C. Petrick, U.S. Forest Service, pers. com.). We recommend machinery be used around wetlands only when the wetlands are completely dry.

In general, ruts and tracks can be left to erode and revegetate over time. If a wetland is highly damaged and mechanical activity is recommended for another reason, the vehicular damage could be treated mechanically. We acknowledge that some minor vehicular ruts may be created along the edge of wetlands while personnel are working to mechanically remove dense vegetation for the purpose of habitat restoration. To keep rut formation and soil damage to a minimum, all mechanical activity should be conducted when the wetland is completely dry.

We identified 8 ephemeral wetlands on TNRWMA affected by vehicles. In addition to damaging soil and vegetation, the open soil left from vehicular damage encourages further damage from feral hogs (example 60-05).

### Woody Vegetation Encroachment

Throughout the evolutionary history of the longleaf pine-wiregrass ecosystem, wildfires frequently occurred during the growing season and were common across the Florida landscape, particularly during dry periods (Means, 1996, Platt 1999). Since European colonization, humans have altered the natural fire regime in Florida by suppressing fire during the hot, dry growing season or, more recently, by prescribe burning during the dormant season. Suppressing fire during the growing season allows for dried, exposed wetland soils to be colonized by encroaching woody shrubs and trees. The practice of prescribed dormant season burning, while frequent, corresponds to the time when wetlands typically hold water, a condition which prevents thorough burning of wetlands. During this project, we have observed many ephemeral wetlands with dense, encroaching woody vegetation. This change in community structure has altered the fire feedback mechanism necessary to maintain a fire-adapted wetland community (Martin and Kirkman 2009).

The encroachment of woody vegetation usually manifests as a dense brush ring around the wetland edge, gradual encroachment from the wetland edge, and/or the colonization of plants throughout the wetland basin. Slash pine and wax myrtle are the two most predominant encroaching species into marshes we observed. These native Florida plant species normally occur in the upland/wetland ecotone and along the edge of wetlands and are maintained at low densities under a natural fire regime. However, during drought and fire suppression, these species can vigorously colonize open wetlands in unnaturally high densities along the edge and across the wetland basin. Once established, these species can shade out and exclude herbaceous vegetation, particularly in marshes.

Woody encroachment in marshes is considered on a case by case basis but generally we define it as having greater than 5% of the wetland basin covered by off-site, encroaching species that clearly have become established across the wetland basin during a dry period and fire suppression. Woody-encroached marshes should be managed in the short-term both by fire and other techniques that focus on the direct thinning of invading species. Encroaching woody vegetation in marshes, particularly slash pine and wax myrtle, should be addressed as soon as possible because succession and subsequent exclusion of marsh habitat can happen relatively quickly. Woody encroachment in a forested swamp is defined by having greater than 50% of the wetland midstory covered by shrubs.

There are some woody species that naturally grow in parts of marshes. Buttonbush, for example, is a wetland shrub that often becomes established in deeper sink depressions within marshes where a natural fire shadow exists in the wetland because of increased hydroperiod. Deep areas are less likely to burn over time because they are usually water-filled. These deep areas will and should burn during dry periods. Any native shrubs or trees that become established in the deepest part of a marsh should not be removed—prescribed fire alone is the proper management tool.

Our primary recommendation to reduce encroaching woody vegetation is the use of prescribed fire. If upland burning occurs during a period of wetland inundation, fire crews can return later in the year when the wetlands are dry and provide fire to any unburned wetlands. Because the

surrounding uplands will have little to no fuel load, a hot, ring fire can be ignited around the wetland basin, thereby improving chances the entire basin burns. This technique has been successful in restoring an herbaceous community to hardwood-encroached wetlands (C. Hess, USFS/FSU, pers. com.) and has been used successfully as a management technique (N. Dwyer, HMWMA, pers. com.). Sometimes specific attention to lighting fire at the edges or center of a wetland during regular upland burns may be all that is needed. If a fire shadow exists around the wetland, a combination of mowing and chopping of shrubs can be very effective to get fire into the wetland and change the vegetation composition, particularly with saw palmetto (J. Ellenberger, GRWMA, pers. com.).

We recognize that some wetlands are dominated by deciduous hardwoods that will not readily burn and there are cases with larger wetlands where hardwood encroachment is too extensive and/or budget or logistical constraints prevent the use of prescribed fire alone. Some of these wetlands provide a good experimental situation for mechanically removing the vegetation. If the desired results are achieved, the method could be used to restore other wetlands.

Below we provide alternative restoration recommendations for each of the 3 woody encroachment scenarios. These alternative recommendations should be used as a tool to return the wetland to a restored state, after which the wetland can be managed by fire alone. Martin and Kirkman (2009) were able to re-establish the herbaceous community-fire feedback mechanism in hardwood dominated wetlands by removing hardwoods and taking advantage of a persistent seed bank. Their paper is an important reference and represents one of the only published experiments on hardwood removal in southern ephemeral wetlands.

In cases where there is uncertainty about how to manage an impacted ephemeral wetland, we recommend acting on the side of caution and simply manage the surrounding landscape and associated wetlands with frequent prescribed fire. Assuming that everything else in the landscape is functioning close to naturally, frequent fire and periodic inundation will ultimately restore wetland function.

Dense brush rings occur when fire is not allowed to burn to the wetland edge, usually due to the presence of a fireline or because burning occurs when the wetland contains water. Mechanical removal can be used to reduce a thick and potential hazardous fuel load, after which the use of regular, growing-season fire can be used to maintain the natural ecology and prevent re-sprouting. Where mechanical treatment prior to burning is necessary, we recommend using a gyrotrack or bushog (mower). Single pass, single drum roller-chopping, followed by burning, also has successfully been used around wetland edges to reduce the midstory component while allowing grasses and herbs to germinate (J. Slater, CRWMA, pers. com.). All mechanical activity must be conducted when the wetland is completely dry to minimize soil disturbance and rut formation.

Woody vegetation encroaching from the wetland edge occurs during a dry period when the wetland is dry for an extended period of time. Woody vegetation (primarily pine and wax myrtle) from the surrounding uplands then has an opportunity to encroach and establish if fire is not allowed to burn into the wetland. Sometimes, there are large, mature slash and loblolly pines established around the outer wetland margin or in slightly elevated regions that connect multiple

depressions within a single large marsh. Large pines should be thinned and harvested using the least disruptive techniques to the wetland. Similarly, wax myrtle shrubs encroaching from the wetland edge can be thinned by chopping or bush hogging, depending on severity of encroachment. We recommend a single thinning of encroaching woody species per marsh in the short-term. After the thinning event, a marsh could be managed solely by periodic prescribed fires over the long-term.

Establishment of woody vegetation in a wetland basin also occurs during a dry period when the wetland is dry for an extended period of time accompanied by a lack of fire. In this scenario, woody vegetation (primarily slash pine trees and wax myrtle) sprouts and colonizes across the entire wetland basin, not just along the wetland edge. There are cases where simply hand chopping young slash pine trees will suffice in small wetlands. Very small pine trees and wax myrtle likely would be killed by the next inundation or fire. If the marsh is large, there are hundreds of invading slash pine trees or wax myrtle, and/or the dbh of the woody vegetation is too large then a bush hog or shredder may be more suitable.

As part of the restoration of a hydrologically modified wetland on GRWMA, approximately 12 ha of willow and wax myrtle were successfully treated using a shredder followed by the reintroduction of fire into the wetland basin (J. Ellenberger, GRMWA, pers. com.). On AWMA, where heavily encroached titi swamps were also impacted by hummocks and old push piles, a low ground pressure track hoe and dozer combination was used to remove the titi and thick organic material down to the mineral soil. The herbaceous vegetation response was variable but generally positive (M. Wilbur, AWMA, pers. com.). In severely disturbed wetlands with dense shrub encroachment Martin and Kirkman (2009) successfully used an industrial mower to remove all small saplings (up to 10 cm dbh) from wetland basins. Large trees can be removed by hand or girdled. Spot herbicide may be necessary on some tree species to prevent re-sprouting (Martin and Kirkman 2009).

All mechanical and herbicide treatments must be conducted when the wetland is completely dry to minimize soil damage and rut formation and to reduce the risk of herbicide entering the aquatic system. We were unable to locate any sufficient references that unequivocally show herbicides are safe in wetlands. We did find references related to the toxicity of herbicides to amphibians (Berrill et al. 1994, Cheek et al. 1999, Relyea 2005a, Relyea 2005b) as well as the long-term persistence of herbicides in soil (Bell 1997). Herbicide treatments should be selected as a last resort and used with extreme caution. Some general guidelines to follow include: minimizing non-target vegetation spread, using chemicals only on one patch of the site at a time and evaluating the impact, conducting treatments when the wetland during the dry season when the wetland is completely dry and not expected to hydrate, and using the chemical with the least impact. We found 3 publications that may be useful if herbicide is selected as a management tool: Langeland 2006, Ferrell et al. 2006, Langeland et al. 2009.

Woody encroachment was not a major wetland concern on TNRWMA. We encountered only 9 wetlands that had some degree of encroachment by woody vegetation. We attribute the lack of woody encroachment to the current rigorous prescribed burn schedule.



## Restoration Prioritization

Because resources are finite, not all recommended restoration actions can be employed immediately. Ultimately, the prioritization of wetland restoration is up to the land manager and their objectives, resource availability, and logistical constraints. However, we provide here some general ideas to assist managers in prioritizing restoration of wetlands:

- Conduct biological surveys for rare species, particularly amphibians and other species dependent on ephemeral wetlands. Prioritize restoration actions based on the results of these surveys (i.e. feral hog control or other aggressive actions).
- Prioritize the filling of ditches that are either permanent or connect to permanent water sources over the filling of ephemeral ditches that connect to ephemeral water sources.
- Address woody encroachment in marshes before swamps because succession and subsequent exclusion of marsh habitat can happen relatively quickly.
- Consider resources required and condition of the uplands

## Database

In addition to this report, a shapefile was provided that includes all the wetlands inventoried on the property. The shapefile includes an attribute table with fields associated with the following information:

- |                           |                               |
|---------------------------|-------------------------------|
| • Wetland ID              | • Dominant midstory species   |
| • Wetland type            | • Herbaceous coverage (%)     |
| • Basin area              | • Dominant herbaceous species |
| • Hydroperiod             | • Herbaceous distribution     |
| • Canopy coverage (%)     | • Wetland concerns            |
| • Dominant canopy species | • Upland community type       |
| • Midstory coverage (%)   | • Upland conditions           |
| •                         |                               |

This database provides a quick reference for land managers to not only locate ephemeral wetlands on each property, but to know wetland attributes associated with each location and spatially identify major wetland concerns (ex. Figure 5).

## Wetland Characterizations and Descriptions

The following pages provide photographs and descriptions of the 299 ephemeral wetlands assessed on TNRWMA. The MUs are organized numerically. The wetland nomenclature uses the MU number and the wetland number. For example, 87-03 is the third wetland inventoried in MU 87. Additional photographs were provided on the accompanying CD.

**Wetland ID: 01-01**

**Description:** This wetland is a 0.2 ha ephemeral forested swamp. This circular cypress dome is divided in half by a 1 m tall earthen berm. Cypress trees dominate the northern half of the wetland and a mix of cypress and pine trees dominate the southern half. The tree canopy covers >75% of the basin. Wax myrtle and other shrubs dominate the midstory, and cover 5-25% of the wetland. Sedges/grasses grow throughout the northern half of the wetland and fern grow throughout the southern half. The herbaceous vegetation covers >75% of the basin. There is a heavy presence of cattle in the wetland, including cattle feces. Past fires have burned through the wetland basin. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Berm, Cattle

**Restoration Action Recommended:** When the wetland is completely dry, remove the berm and sculpt the area flat. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 01-02**

**Description:** This wetland is a 0.4 ha ephemeral forested swamp. Cypress, pine, and palm trees dominate the canopy, and cover 50-75% of the basin. There is an island of palmetto in the wetland center. Wax myrtle dominates the midstory, and covers 5-25% of the wetland. Sedges/grasses and fern grow throughout the wetland, and cover >75% of the basin. There is a heavy presence of cattle in the wetland, including cattle trails and feces. Past fires have burned through the wetland basin. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-01**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern grow in the wetland center and sedges/grasses predominately grow in a ring around the wetland edge. The herbaceous vegetation covers 50-75% of the basin. The wetland has steep sides and is a ‘pothole’ pond in a circular sink depression. The adjacent uplands are mesic flatwoods with some patches of scrubby flatwoods. The uplands are managed with prescribed fire. Cattle are allowed in this MU and animal trails are abundant in the uplands.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 02-02**

**Description:** This wetland is a 0.5 ha ephemeral marsh. A young cypress dome is forming in the center and covers 25-50% of the wetland. The rest of the wetland is open with abundant and recently killed stems of *Hypericum*. Sedges/grasses grow throughout the wetland, and cover 50-75% of the basin. The east end of the wetland has a sandy area denude of vegetation. This area may be a result of grazing pressure; there are cattle tracks and feces present. The adjacent uplands are mesic flatwoods with some patches of scrubby flatwoods. The uplands are managed with prescribed fire. Cattle are allowed in this MU and animal trails are abundant in the uplands.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-03**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. The herbaceous vegetation is diverse and covers >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods with some patches of scrubby flatwoods. The uplands are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 02-04**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Dead *Hypericum* stems are abundant due to inundation, as are broomsedge and other herbaceous vegetation. The herbaceous vegetation covers >75% of the basin. There is evidence of cattle grazing in and around the wetland, including trails and cattle feces. The adjacent uplands are mesic flatwoods with some patches of scrubby flatwoods. The uplands are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-05**

**Description:** This wetland is a <0.1 ha ephemeral marsh. Small cypress trees grow in a ring around the wetland, and cover 5-25% of the basin. There is no midstory cover. Emergent vegetation grows in the wetland center and sedges/grasses around the outer edge. The herbaceous vegetation covers 50-75% of the basin. Small fish (*Gambusia*) were present on the day of our visit. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-06**

**Description:** This wetland is a 0.5 ha semi-permanent marsh likely succeeding to a cypress dome. Cypress trees grow in the wetland interior, and cover 50-75% of the basin. There is no midstory cover. The outer half of the wetland is an open grassy marsh with *Hypericum*. The herbaceous vegetation covers 50-75% of the basin. There are cattle tracks and feces in the wetland. Fresh ATV tracks are present around the wetland edge. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Vehicular damage

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands. The ATV tracks are not severe and are likely a one-time occurrence. We mention it here to highlight a general concern about driving vehicles in and around wetlands.

**Wetland ID: 02-07**

**Description:** This wetland is a 0.7 ha ephemeral forested swamp. The wetland was likely a marsh that has succeeded to a cypress dome. Cypress trees grow in the wetland interior, and cover 50-75% of the basin. There is no midstory cover. Sedges/grasses grow around the wetland edges, and cover 50-75% of the basin. There are animal trails, likely cattle, around the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-08**

**Description:** This wetland is a 0.1 ha highly ephemeral marsh. There is no tree canopy cover. A small patch of wax myrtle grows in the wetland center, and covers 5-25% of the basin. There are several old dead wax myrtle shrubs as well, likely killed during the last fire. Fern and sedges/grasses grow throughout the wetland, and cover >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 02-09**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows in a patch on the deeper west side of the wetland, sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. Cattle trails are light on the east side of the wetland. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-10**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant in the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There are cattle trails around the wetland edge. The wetland appears to be healthy with diverse herbaceous vegetation, despite the presence of cattle. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 02-11**

**Description:** This wetland is a 1.0 ha semi-permanent marsh. Two deeper holes on the north and west sides of the wetland have become cypress domes. Small cypress trees grow scattered across the whole wetland basin as well. The cypress trees cover 5-25% of the wetland. Sedges/grasses and maidencane grow throughout the wetland, and cover 50-75% of the basin. Cattle trails and grazing are evident around the wetland edge. Fish were present on the day of our visit. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-12**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. Emergent vegetation and maidencane grow in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. There are cattle trails around the wetland edge. The wetland appears to be healthy despite the presence of cattle. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 02-13**

**Description:** This wetland is a 0.1 ha semi-permanent marsh. There is no tree canopy or midstory cover. Emergent vegetation and maidencane grow in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. Small fish were present in the wetland on the day of our visit. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-14**

**Description:** This wetland is a 0.9 ha semi-permanent forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. Fetterbush grows in clumps in the wetland interior, and covers 5-25% of the wetland. A diverse array of herbaceous vegetation grows throughout the wetland, and covers 50-75% of the basin. Small fish were present in the wetland on the day of our visit. Cattle trails are light around the wetland edge. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 02-15**

**Description:** This wetland is a 0.2 ha semi-permanent forested swamp. This wetland appears to be a marsh succeeding to a swamp. Cypress trees grow in a ring around the wetland, and cover 50-75% of the basin. There is no midstory cover. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. Small fish were present in the wetland on the day of our visit. Cattle trails are light around the wetland edge. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-16**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows throughout the wetland, and covers 50-75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 02-17**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy. *Hypericum* is abundant within the wetland. Sedges/grasses grow throughout the wetland, and cover 25-50% of the basin. There are cattle trails around the wetland edge. The wetland appears to be healthy despite the presence of cattle. However, we do not know if the sedge/grass component was reduced, and the *Hypericum* increased, due to grazing. This wetland may connect to a large swamp to the east during times of high water. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 02-18**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and fern grow throughout the wetland, and cover >75% of the basin. No evidence of cattle was observed in this sink depressional pond, although cattle are allowed in this MU. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 02-19**

**Description:** This wetland is a 0.1 ha ephemeral marsh. Two small gum trees grow in the wetland center but provide <5% canopy cover. There is no midstory cover. This healthy marsh has diverse groundcover vegetation that covers >75% of the basin. No evidence of cattle was observed although cattle are allowed in this MU. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 03-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and short emergent vegetation grow throughout the wetland, and cover >75% of the basin. No evidence of cattle was observed in this wetland, although cattle are allowed in this MU. A recent fire burned through the entire wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 03-02**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned through the entire wetland basin. There is a cattle trail through the south side of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 03-03**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A cattle trail leads into the wetland. A fire recently burned into the wetland edges. Feral hog damage is old and recovering. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Feral hog damage, Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 03-04**

**Description:** This wetland is a 0.1 ha semi-permanent marsh. There is no tree canopy or midstory cover. Emergent vegetation grows in the deeper wetland center and sedges/grasses grow throughout. The herbaceous vegetation covers 5-25% of the basin. A recent fire burned into the wetland edges. This sink depressional marsh appears very healthy. No evidence of cattle was observed, although cattle are allowed in this MU. Fish were present on the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 03-05**

**Description:** This wetland is a 0.1 ha semi-permanent marsh. There is no tree canopy or midstory cover. This circular, sink depression has a deeper, open center with sedges/grasses and emergent vegetation growing around the shallower edges. The herbaceous vegetation covers 25-50% of the basin. A shallow fireline/ditch leads from the wetland's east side to a large swamp. There are cattle tracks in the fireline. Fish were present on the day of our visit. The adjacent uplands are mesic and scrubby flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle, Fireline

**Restoration Action Recommended:** Although the fireline does not appear to function as a ditch draining the wetland, we recommend re-routing the fireline. Allow vegetation to regenerate along the fireline and move future firelines, if needed, into the uplands. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 03-06**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and *Sphagnum* grow throughout the wetland, and cover >75% of the basin. A fire recently burned through the wetland basin. No evidence of cattle was observed in this wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 03-07**

**Description:** This wetland is a 0.1 ha ephemeral marsh. Cypress trees grow in a strand on the north side of the wetland, and cover 5-25% of the basin. There is no midstory cover. Maidencane grows in the wetland center and a diverse array of sedges/grasses and other herbaceous vegetation grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. A fire recently burned to the wetland edge. No evidence of cattle was observed in this wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 03-08**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern grow in the wetland interior and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. A fire recently burned into the wetland edges. Cattle trails are evident around the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 06-01**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Cattle have trampled the herbaceous vegetation in this wetland. The vegetation is sparse and covers 5-25% of the basin. This wetland provides a good example of the damage cattle can do to a wetland. There are several piles of bottle trash in the wetland. The adjacent uplands are mesic and scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Trash

**Restoration Action Recommended:** Remove the trash from the wetland. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 07-01**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Emergent vegetation grows in scattered patches, and covers 25-50% of the basin. The wetland is heavily impacted by cattle. There is a persistent odor of feces and urine. Wetland vegetation is denuded presumably from cattle grazing. This wetland serves as an example of the negative effects that cattle can have on wetlands. There is some sediment build up due to run-off from a nearby road. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Road

**Restoration Action Recommended:** If the road cannot be rerouted away from the wetland, consider maintaining a siltation fence to prevent sedimentation from impacting the wetland. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 08-01**

**Description:** This wetland is a 0.5 ha highly ephemeral marsh. There is no tree canopy or midstory cover. A high diversity of wetland grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including cattle feces. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 09-01**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* and sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of past fire and cattle in the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 09-02**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* and sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence cattle in the wetland, including tracks and feces. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 09-03**

**Description:** This wetland is a <0.1 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover 50-75% of the wetland. There is no midstory cover. Sedges/grasses and emergent vegetation grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including feces. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 09-04**

**Description:** This wetland is a 1.0 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the wetland. The midstory is dominated by small cypress trees and wax myrtle, and covers 5-25% of the wetland. A great diversity of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. There is some evidence of cattle in the wetland, including trails and feces. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 09-05**

**Description:** This wetland is a 0.6 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows in the wetland center and sedges/grasses and *Hypericum* grow around the outer edge. The herbaceous vegetation covers 50-75% of the basin. The vegetation was recently trampled by cattle and the wetland is heavily grazed. This wetland provides a good example of the negative effects of cattle in wetlands. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 10-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including tracks and feces. An auto track bisects the western edge of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Vehicular damage

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands. If the auto track is necessary, reroute it away from the wetland.



**Wetland ID: 10-02**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and *Hypericum* grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including feces. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 10-03**

**Description:** This wetland is a 0.8 ha ephemeral marsh. A cypress dome is forming in the center of the wetland. The tree canopy covers 5-25% of the basin. There is no midstory cover. *Hypericum* is abundant within the wetland. Maidencane grows beneath the cypress and sedges/grasses grow in the marsh area outside the cypress dome. The herbaceous vegetation covers 50-75% of the basin. Recent drying in the wetland has exposed bare soil; grasses are re-sprouting. A cattle trail/shallow ditch flows southeast from the wetland and connects this wetland with 10-02 during times of high water. It is unclear whether the ditch feature started as a cattle trail or was human-constructed. Regardless of its origin, the feature is now acting as a ditch that drains the wetland during times of high water. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Fill the ditch to break connectivity with the wetland. Alternatively, the ditch could be plugged and vegetation allowed to regenerate. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 10-04**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including feces. A cattle trail/ditch (see 10-03 description) enters this wetland from the northwest side, connecting the wetland with 10-03. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Fill the ditch to break connectivity with the wetland. Alternatively, the ditch could be plugged and vegetation allowed to regenerate. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 10-05**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 11-01**

**Description:** This wetland is a 0.6 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the wetland. The midstory is dominated by wax myrtle, and covers 50-75% of the wetland. The outer half of the wetland is brushy, the interior is more open. Maidencane and fern grow in the wetland center and sedges/grasses grow around the other edges of the wetland. The herbaceous vegetation covers >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 11-02**

**Description:** This wetland is a 0.6 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the wetland. There is no midstory cover. Fern and sedges/grasses grow throughout the wetland, and cover >75% of the basin. This wetland appears to burn frequently. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 11-03**

**Description:** This wetland is a 0.2 ha ephemeral forested swamp. This wetland is likely a marsh succeeding to a cypress dome. Cypress trees dominate the canopy, and cover 50-75% of the wetland. The midstory is dominated by wax myrtle, and covers 5-25% of the wetland. Fern and sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including a muddy area with heavy trampling and feces. A MU boundary/road was routed through the north side of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Road

**Restoration Action Recommended:** Re-route the MU boundary/road northward around the wetland. The uplands in this management unit are in good ecological condition. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 12-01**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* was abundant but was recently killed by inundation and fire. Maidencane grows in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. A recent fire burned through half of the wetland. There is evidence of cattle in the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 12-02**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. Pickerelweed grows in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. A recent fire burned into the wetland edges. There is evidence of cattle in the wetland, including tracks and feces. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 12-03**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Pickerelweed grows in the wetland center, maidencane grows throughout, and sedges/grasses grow in a ring around the wetland. The herbaceous vegetation covers >75% of the basin. There is evidence of cattle in the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 12-04**

**Description:** This wetland is a 0.3 ha ephemeral marsh. A small patch of gum trees grow in the wetland center but cover <5% of the basin. There is no midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned through the wetland basin. There are a few cattle tracks in the wetland but no trails have formed. Feral hog damage is minor. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 13-01**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Maidencane and sedges/grasses grow throughout the wetland, and cover >75% of the basin. Feral hog damage is minor. The adjacent uplands are mesic flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 13-02**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover 50-75% of the basin. A recent fire burned through the wetland basin. Cattle have formed a trail along the edge of the wetland. This wetland may connect with 13-03 to the west during times of high water. The adjacent uplands are a mix of mesic and scrubby flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 13-03**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned through the wetland basin. Cattle have formed a trail along the edge of the wetland. This wetland may connect with 13-02 to the east during times of high water. The adjacent uplands are a mix of mesic and scrubby flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 13-04**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover 50-75% of the basin. A recent fire burned completely through the wetland basin. Cattle have formed a trail along the edge of the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire and mechanical vegetation removal.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 14-01**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 14-02**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and fern grow throughout the wetland, and cover >75% of the basin. Feral hog damage is minor. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 14-03**

**Description:** This wetland is a 0.7 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. The midstory is dominated by wax myrtle, and covers 5-25% of the wetland. Sedges/grasses grow in a ring around the cypress dome and maidencane grows throughout the wetland. The herbaceous vegetation covers >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are a mix of mesic and scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 14-04**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout this healthy marsh, and cover >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 14-05**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. A high diversity of sedges/grasses and sawgrass grow throughout the wetland, and cover >75% of the basin. A game trail runs along the edge of the wetland but there is no evidence of cattle tracks. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 15-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant within the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 15-02**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 16-01**

**Description:** This wetland is a 1.3 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. A very shallow ditch on the south end connects the wetland to shallow roadside ditches. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching

**Restoration Action Recommended:** We recommend plugging the ditch to restore the wetland's isolation. However, the ditch is shallow so connection with the roadside ditches is likely infrequent. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 17-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy cover. Wax myrtle grows around the wetland edge, and covers 5-25% of the wetland. Large sedge clumps grow in the wetland interior; other herbaceous vegetation is low-lying and appears to have been grazed. The herbaceous vegetation covers >75% of the basin. There is a fireline/MU boundary along the eastern edge of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire. Cattle are allowed in this MU and animal trails are abundant in the uplands.

**Wetland Concerns:** Cattle, fireline/MU boundary

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands. If possible re-route MU boundary/fireline further to the east.



**Wetland ID: 17-02**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy cover. A ring of wax myrtle is forming around the wetland, and covers 5-25% of the wetland. Sedges/grasses and emergent vegetation grow throughout the wetland, and cover >75% of the basin. There are cattle tracks in the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire. Cattle are allowed in this MU and animal trails are abundant in the uplands.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** Continue periodic fire in the wetland to prevent the encroachment of wax myrtle. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 17-03**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy cover. Wax myrtle is beginning to encroach from the wetland edge, and covers 5-25% of the wetland. Maidencane and emergent vegetation grow in the wetland center and sedges/grasses grow around the wetland edge. The herbaceous vegetation covers >75% of the basin. Cattle tracks and trails are plentiful. The wetland is surrounded by a dense palmetto ring and mesic flatwoods. Cattle are allowed in this MU and animal trails are abundant in the uplands.

**Wetland Concerns:** Cattle, Woody encroachment

**Restoration Action Recommended:** Encourage fire to burn in the wetland basin to reduce the encroaching woody vegetation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 17-04**

**Description:** This wetland is a 0.7 ha ephemeral marsh. There is no tree canopy cover. Wax myrtle is forming a ring around the north side of the wetland, and covers 5-25% of the wetland. Sedges/grasses and short, emergent vegetation grow throughout the wetland, and cover >75% of the basin. The native vegetation is intact but beginning to show impacts from grazing. Evidence of cattle grazing, tracks, and feces is abundant. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 18-01**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is feral hog damage in the wetland center and evidence of cattle grazing on the southern end of the wetland near the road. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 18-02**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A diverse array of sedges/grasses grow throughout the wetland, and cover >75% of the basin. Cattle have worn a trail through the middle of the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 18-03**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A diverse array of sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is some evidence of cattle in the wetland. A recent fire burned through the wetland basin. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 19-01**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Recent inundation killed once abundant *Hypericum*. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. The herbaceous vegetation has been grazed and there are cattle tracks and feces within the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 20-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. The wetland has been impacted by cattle. There are multiple cattle trails in the wetland, denuded areas from grazing, and feces throughout. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 20-02**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is dense in the wetland interior. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There are areas of bare soil due to recent drying and cattle grazing. Cattle trails and feces are present along the wetland edge. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 20-03**

**Description:** This wetland is a 4.8 ha ephemeral forested swamp surrounded by marsh. This large, cross-shaped wetland has 3 areas of cypress dome connected by marsh. Cypress trees cover 50-75% of the basin. There is no midstory cover but *Hypericum* is abundant within the wetland. Sedges/grasses grow throughout the wetland, and cover 50-75% of the basin. Cattle trails are present throughout the wetland and there is evidence of grazing on the herbaceous vegetation. Cattle impacts are heavy around the wetland edge. Small fish were present in the wetland on the day of our visit. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 20-04**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and other herbaceous vegetation grow throughout the wetland, and cover >75% of the basin. The wetland has been impacted by cattle. A shallow ditch/incised cattle trail leads from the north side of the wetland to a nearby road. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Fill the ditch/trail to restore the wetland's isolation. The uplands in this management unit are in good ecological condition. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 20-05**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in and around the wetland but there is still a diversity of herbaceous vegetation. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 21-01**

**Description:** This wetland is a 1.1 ha ephemeral marsh. This elongate marsh is varied in its vegetative structure. The northern third of the wetland is a small cypress stand. Sawgrass grows densely in the southern two-thirds of the wetland, and sedges/grasses grow around the wetland edge. *Hypericum* is common within the wetland. The tree canopy covers <5% of the basin and the herbaceous vegetation covers >75% of the wetland. There is evidence of cattle in the wetland, including tracks and feces. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 24-01**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 24-02**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Sphagnum* grows in scattered patches and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 24-03**

**Description:** This wetland is a 0.7 ha ephemeral marsh. There is no tree canopy or midstory cover. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 24-04**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. *Hypericum* also is common. There is evidence of cattle in the wetland (feces) although the wetland still appears to be healthy. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 24-05**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Feral hog damage is patchy and minor. We observed no evidence of cattle in the wetland, although cattle are allowed in this MU. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 24-06**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. The herbaceous vegetation has been grazed and is not very diverse. A cattle trail is prominent through the wetland center. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 24-07**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. We observed no evidence of cattle in the wetland, although a nearby wetland (24-06) has been impacted. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 24-08**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A cattle trail runs through the wetland basin. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 24-09**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including trails and feces. The adjacent uplands are mesic flatwoods to the east and a creek with hardwood swamp to the west.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 24-10**

**Description:** This wetland is a 0.1 ha highly ephemeral marsh. Pine trees have encroached into the wetland and cover 25-50% of the basin. There is no midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Cattle trails lead into the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Woody encroachment

**Restoration Action Recommended:** Remove pine trees from wetland interior. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 24-11**

**Description:** This wetland is a 0.3 ha ephemeral marsh. Pine trees have encroached into the wetland and cover 5-25% of the basin. There is no midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Cattle trails lead into the wetland. A small, flowing creek drains the south side of the wetland. We were unable to tell if this feature is natural or is an old, shallow ditch. The adjacent uplands are a mix of mesic and scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Woody encroachment

**Restoration Action Recommended:** If the creek was formed by human activity, we recommend plugging the ditch to eliminate connectivity. Remove pines from wetland interior. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 24-12**

**Description:** This wetland is a 0.6 ha semi-permanent marsh. Pine and holly trees dominate the canopy, and cover 5-25% of the basin. The midstory is a mix of wax myrtle, buttonbush, and fetterbush, and covers 5-25% of the wetland. Sawgrass grows throughout the wetland, and covers >75% of the basin. This wetland may connect with a larger swamp to the east during times of high water. Pig frogs were calling on the day of our visit. The adjacent uplands are a mix of mesic and scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 24-13**

**Description:** This wetland is a <0.1 ha ephemeral marsh. Pine trees have encroached into the wetland and cover 5-25% of the basin. There is no midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Cattle trails lead into the wetland. An auto track was created through the west side of the wetland. The adjacent uplands are a mix of mesic and scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Woody encroachment (minor), Vehicular damage

**Restoration Action Recommended:** The woody encroachment is minor, the pine trees could be removed or the wetland could be managed with prescribed fire alone. Abandon the current track and re-route to the west of the wetland. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 24-14**

**Description:** This wetland is a 0.2 ha ephemeral marsh. Pine trees dominate the canopy, and cover 5-25% of the basin. There is no midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. The vegetation in this wetland is indicative of an ephemeral pond but a small, barely flowing stream connects this wetland to a swampy stream to the west. We were unable to discern if this stream is a human-constructed ditch or a natural feature. There is evidence of cattle in the wetland, including trails and feces. The adjacent uplands are a mix of mesic and scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Woody encroachment (minor), Ditching (possibly)

**Restoration Action Recommended:** The woody encroachment is minor, the pine trees could be removed or the wetland could be managed with prescribed fire alone. Fill in the ditch if it is human-constructed. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 25-01**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. Feral hog damage is minor and patchy. There is evidence of cattle in the wetland, including feces. This wetland may connect to a long strand of low, marshy, open flatwoods to the north during times of high water. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Feral hog damage

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-01**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned into the wetland edges. There is evidence of cattle in the wetland, though no negative impacts are evident. The adjacent uplands are mesic flatwoods to the east and a creek with hardwood swamp to the west.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-02**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Trails, likely from cattle, have formed around the wetland edge. Feral hog damage is old and has grown over with vegetation. A recent fire burned into the wetland basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-03**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and *Sphagnum* grow throughout the wetland, and cover >75% of the basin. There are light cattle trails and grazing evident on the vegetation. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-04**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. This appears to be a very healthy marsh. A recent fire burned into the wetland edges. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-05**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There are cattle tracks and trails in the wetland, although the vegetation is still diverse and intact. A ditch enters the wetland on the north side and exits on the south end, draining the wetland to a creek and to 28-06. Fish were present in the ditch and the pond on the day of our visit. A recent fire burned to the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Fill the ditches to restore the wetland's isolation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-06**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A ditch enters the south end of the wetland and exits the east end, connecting this wetland with 28-05. Fish were present in the ditch's deeper holes on the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching

**Restoration Action Recommended:** Fill the ditches to restore the wetland's isolation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-07**

**Description:** This wetland is a 2.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and *Sphagnum* grow throughout the wetland, and cover >75% of the basin. This appears to be a very healthy marsh with minimal cattle presence. A recent fire burned into the wetland edges. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-08**

**Description:** This wetland is a 0.6 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant within the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is a system of cattle trails through the wetland. What appears to be a fenced-in, rectangular study plot is in the north end of the wetland. A recent fire burned through the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-09**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant within the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is a cattle trail through the wetland, but the wetland appears to be very healthy. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-10**

**Description:** This wetland is a 2.6 ha semi-permanent marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Emergent vegetation grows in a deeper hole in the south end of the wetland, sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. There are cattle trails around the wetland edge. Fish and pig frogs were present on the day of our visit, indicating longer hydroperiod. A shallow ditch leads out of the north end of the wetland and spills over a nearby access road. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-11**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There are cattle trails and tracks around the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-12**

**Description:** This wetland is a 1.6 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant within the wetland. Small, emergent vegetation is common in the wetland interior and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. There are cattle trails into and around the edge of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-13**

**Description:** This wetland is a 1.9 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. Cattle trails are present, particularly around the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-14**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A diverse array of grasses and other herbaceous vegetation grows throughout, and covers >75% of the basin. There is a cattle trail around the wetland edge and severe feral hog damage in the wetland center. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-15**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. There is a cattle trail around the wetland edge. Fish were present on the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-16**

**Description:** This wetland is a 0.9 ha ephemeral marsh. This fairly large wetland has 2 lobes, with deeper areas in both the north and south ends. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Sedges/grasses and emergent vegetation grow throughout the wetland, and cover >75% of the basin. Cattle trails and feces are present in the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-17**

**Description:** This wetland is a 0.1 ha ephemeral marsh. It appears to be an herbaceous marsh succeeding to a cypress dome. Large cypress trees cover 25-50% of the basin and small cypress trees cover 5-25% of the basin. *Sphagnum* is widespread in the wetland center, and sedges/grasses and other herbaceous vegetation grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. There is evidence of cattle in the wetland, including tracks and feces. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-18**

**Description:** This wetland is a 0.6 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. Cattle trails are present in the wetland. A drainage ditch enters the southwest corner of the wetland and exits the southeast corner, flowing into a large swamp system. Wetland 28-06 also connects to this large swamp system. Silt and sand has accumulated where the ditch enters the wetland. Small fish were present in the wetland on the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Filling both ditches should eliminated the runoff issue and restore the wetland's isolation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-19**

**Description:** This wetland is a 9.3 ha ephemeral mix of marsh and forested swamp. A cypress dome covers 25% of the basin. There is no midstory cover. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. Cattle trails and tracks are present in the wetland. A ditch on the west side connects this wetland with 28-18 and a ditch on the north side connects this wetland with 28-06. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Fill both ditches to restore the wetland's isolation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-20**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. There is evidence of cattle in the wetland, including tracks and feces. Small fish (may be *Gambusia*) were present on the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 28-21**

**Description:** This wetland is a 1.2 ha ephemeral marsh. It appears to be the north end of a long strand; the south end narrowly connects to the strand. There is no tree canopy or midstory cover. *Hypericum* is common in the wetland interior. Grasses/sedges grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including trails and feces. A ditch flows from the east side of the wetland basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Fill the ditch on the east side of the wetland to restore the wetland's isolation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 28-22**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Sphagnum* and sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including tracks and feces. A recent fire burned to the wetland edges. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 29-01**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. The herbaceous vegetation is low-lying, possible from cattle grazing. There are cattle trails around the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 29-02**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is a deeper hole in the northeast quadrant of the wetland. There is evidence of cattle around the wetland edge but the wetland appears to be very healthy. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-01**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant within the wetland. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. A road/property boundary clips the east side of the wetland. A recent fire burned into the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Road/Property boundary

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands. The road does not appear to be negatively impacting the wetland and, given that it is a property boundary, we do not recommend any restoration action to address the road.



**Wetland ID: 30-02**

**Description:** This wetland is a 0.1 ha ephemeral marsh. A recent fire burned entirely through the wetland, and killed many encroaching wax myrtles. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and new post-fire growth is emerging. There is evidence of cattle in the wetland, including trails and feces. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-03**

**Description:** This wetland is a 0.1 ha ephemeral marsh. A recent fire burned through the entire wetland basin. There is no tree canopy. Wax myrtle grow scattered throughout the wetland basin, the recent fire killed a few of the shrubs. Sedges/grasses grow throughout the wetland, and new post-fire growth is emerging.. There are cattle trails in the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-04**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* and wax myrtle grow in a ring around the wetland edge. Sedges/grasses, fern, and *Sphagnum* grows throughout the wetland. The herbaceous vegetation covers >75% of the basin. A recent fire burned to the wetland edge. Old feral hog damage has eroded and now is covered with vegetation. Cattle trails and feces are present along the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-05**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy. Wax myrtle are scattered throughout the wetland, and cover 5-25% of the basin. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned through the south and east side of the wetland. There are cattle feces and a cattle trail along the wetland edge. The wetland is situated adjacent to a hardwood hammock that is associated with a creek to the north. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** Frequent fire will manage the wax myrtle that is beginning to encroach. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-06**

**Description:** This wetland is a 0.1 ha ephemeral marsh. This circular pond could be an old dug-out feature that is now functioning as an ephemeral wetland. A recent fire burned entirely through the wetland. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and new post-fire growth is emerging. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-07**

**Description:** This wetland is a <0.1 ha ephemeral marsh. A recent fire burned completely through the wetland basin. There is no tree canopy or midstory cover. A diverse array of herbaceous vegetation grows throughout, and new post-fire growth is emerging. A cattle trail leads into the wetland from the north side. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-08**

**Description:** This wetland is a 0.1 ha ephemeral marsh. A recent fire burned well into the wetland interior. There is no tree canopy or midstory cover. *Hypericum* is abundant within the wetland. A diverse array of herbaceous vegetation grows throughout and there is a patch of fern growing in the wetland center. New post-fire herbaceous growth is emerging. Cattle trails are present around the wetland edges. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-09**

**Description:** This wetland is a <0.1 ha ephemeral marsh. A recent fire burned completely through the wetland basin. There is no tree canopy or midstory cover. Sedges/grasses and other herbaceous vegetation grows throughout the wetland, and new post-fire growth is emerging. A cattle trail is present along the eastern edge of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-10**

**Description:** This wetland is a 0.2 ha ephemeral marsh. A recent fire burned through about 40% of the basin, particularly on the north and east sides. There is no tree canopy or midstory cover. A diverse array of *Hypericum* and herbaceous vegetation grows throughout, and new post-fire growth is emerging. A cattle trail along the northern edge connects this wetland with 30-09. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-11**

**Description:** This wetland is a 0.8 ha semi-permanent marsh. A recent fire burned through 30-40% of the basin. There is no tree canopy or midstory cover. *Hypericum* grows in a ring around the wetland center. Sawgrass grows in the wetland interior, and sedges/grasses grow around the wetland edge. The herbaceous vegetation covers >75% of the wetland. There is some evidence of cattle present in the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-12**

**Description:** This wetland is a <0.1 ha ephemeral marsh. A recent fire burned completely through the wetland basin. There is no tree canopy or midstory cover. A diverse array of herbaceous vegetation grows throughout, and new post-fire growth is emerging. A cattle trail is present around the eastern half of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-13**

**Description:** This wetland is a <0.1 ha ephemeral marsh. A recent fire burned completely through the wetland basin. There is no tree canopy or midstory cover. Due to the recent fire, *Sphagnum* grows in scattered patches, and the herbaceous vegetation only covers 25-50% of the basin. No evidence of cattle was observed in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-14**

**Description:** This wetland is a 0.1 ha ephemeral marsh. A recent fire burned through 60% of the basin, on the north and east sides. There is no tree canopy or midstory cover. A diverse array of *Hypericum* and herbaceous vegetation grows throughout the wetland. This elongated marsh has deeper potholes in both ends. Small fish were present on the day of our visit. No evidence of cattle was observed in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-15**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. A recent fire burned through the wetland edges. *Hypericum* is common within the wetland. A diverse array of sedges/grasses and other herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. Small fish, likely *Gambusia*, were present on the day of our visit. A small cattle trail runs along the eastern side of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-16**

**Description:** This wetland is a <0.1 ha ephemeral marsh. A recent fire burned halfway through the wetland basin, but did not quite reach the wetland center. There is no tree canopy or midstory cover. *Hypericum* is common in the wetland. A diverse array of *Sphagnum*, sedges/grasses, and other herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. Small fish, likely *Gambusia*, were present on the day of our visit. Cattle trails lead into the basin edge from multiple directions of the uplands. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-17**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. The herbaceous vegetation is dominated by *Sphagnum*, and covers >75% of the basin. A recent fire burned through the majority of the wetland basin. No evidence of cattle was observed in the wetland, although cattle are allowed in this MU. The wetland is surrounded by a dense palmetto ring, although 2/3 of the palmetto was burned in the recent fire. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-18**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Fern grow in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers 50-75% of the basin. A recent fire burned through the majority of the wetland basin. A narrow land bridge separates this wetland from 30-19 to the east and there is a cattle trail along the land bridge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-19**

**Description:** This wetland is a <0.1 ha ephemeral marsh. A recent fire burned completely through the wetland basin. There is no tree canopy or midstory cover. A diverse array of herbaceous vegetation grows throughout the wetland, and new post-fire growth is emerging. A narrow land bridge separates this wetland from 30-18 to the west. There is evidence of cattle along the wetland edge, including feces. This pond is proximal to an access road with a shallow roadside ditch system. However, high ground separates the two so they will seldom connect. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-20**

**Description:** This wetland is a 0.1 ha ephemeral marsh. *Hypericum* is common within the wetland. Fern grow in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. There are 3 deeper holes within the wetland. A recent fire burned through half of the wetland basin. There is no tree canopy or midstory cover. No evidence of cattle was observed in the wetland, although cattle are allowed in this MU. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-21**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow in a ring around the wetland edge, and cover 5-25% of the basin. A recent fire burned through the wetland basin. A small cattle trail leads into the wetland on the east side. Small fish were present on the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 30-22**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned a quarter of the wetland, mostly on the east side. Old feral hog damage is patchy and has grown over with vegetation. A small cattle trail leads into the wetland on the north side. Small fish were present on the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 30-23**

**Description:** This wetland is a 1.9 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common around the outer half of the wetland. Maidencane grows in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the wetland. A ditch connects the wetland to a roadside ditch on the west side. There is a cattle trail on the north end. The eastern edge of the wetland is on private property and has a fenceline running through it and a private residence. Small fish were present on the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditching

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 32-01**

**Description:** This wetland is a 0.7 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. The midstory is dominated by wax myrtle and small cypress trees, and covers 5-25% of the basin. A diversity of sedges/grasses, maidencane, *Sphagnum*, and fern grow throughout the wetland, and cover >75% of the basin. A recent fire burned to the wetland edge. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 32-02**

**Description:** This wetland is a 0.4 ha highly ephemeral wetland. There is no tree canopy or midstory cover. A recent fire burned through the wetland basin. Sedges/grasses grow throughout the wetland, and new post-fire growth is emerging. There is evidence of cattle in the wetland, including tracks and feces. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 32-03**

**Description:** This wetland is a 1.0 ha ephemeral forested swamp. It is a cypress dome is surrounded by an open marsh. Cypress trees dominate the canopy, and cover 50-75% of the basin. There is no midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, including tracks, feces, and grazed vegetation. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 32-04**

**Description:** This wetland is a 0.2 ha ephemeral wetland. There is no tree canopy or midstory cover. Maidencane grows in the wetland center and sedges/grasses grow around the outer ring of the wetland. The herbaceous vegetation covers >75% of the basin. There are cattle tracks in the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 33-01**

**Description:** This wetland is a 0.1 ha ephemeral wetland. There is no tree canopy or midstory cover. This wetland is dominated by cordgrass, with *Sphagnum* growing beneath. The herbaceous vegetation covers >75% of the basin. No evidence of cattle was observed in the wetland, although cattle are allowed in this MU. The adjacent uplands are a mix of mesic and scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 33-02**

**Description:** This wetland is a 0.1 ha ephemeral wetland. There is no tree canopy or midstory cover. A diversity of sedges/grasses grow throughout the wetland, and cover >75% of the basin. This open marsh is scalloped with old feral hog damage. The damaged areas are now grown over with redroot. No evidence of cattle was observed in the wetland, although cattle are allowed in this MU. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 33-03**

**Description:** This wetland is a 0.1 ha ephemeral wetland. There is no tree canopy cover. A few wax myrtles grow scattered throughout the wetland, and cover 5-25% of the basin. *Hypericum* is common in the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Old feces provide evidence of cattle utilizing the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 35-01**

**Description:** This wetland is a 0.4 ha ephemeral forested wetland. Cypress and gum trees dominate the canopy, and cover 50-75% of the wetland. The midstory is dominated by small cypress trees, and cover 5-25% of the basin. Sedges/grasses and maidencane grow throughout the cypress dome, and cover >75% of the basin. There are cattle trails around the wetland edge. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 35-02**

**Description:** This wetland is a 0.4 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the wetland. There is no midstory cover. A diversity of herbaceous vegetation grows throughout the cypress dome, and covers >75% of the basin. No evidence of cattle was observed in the wetland, although cattle are allowed in this MU. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 36-01**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant throughout the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. The herbaceous vegetation appears diverse and healthy despite the cattle tracks and grazing evident in the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 37-01**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* was abundant throughout the wetland before most were killed by inundation. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. This wetland has been impacted by cattle. There were obvious signs of grazing, a pervasive urine smell, and cattle feces throughout the wetland. A shallow ditch on the east side of the wetland connects to a nearby canal. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle, Ditch

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation. The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 37-02**

**Description:** This wetland is a 0.1 ha semi-permanent marsh. There is no tree canopy or midstory cover. Sedges/grasses and emergent vegetation grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 38-01**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. This wetland has been impacted by cattle. There were obvious signs of grazing, tracks, and cattle feces throughout the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 38-02**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* was abundant throughout the wetland before most were killed by inundation. Pickerelweed and other emergent vegetation grow in the deeper wetland center and sedges/grasses grow in a ring around the wetland edge. The herbaceous vegetation covers >75% of the basin. Cattle trails are abundant around the wetland edge. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 38-03**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover 50-75% of the basin. This wetland has been impacted by cattle. There were obvious signs of grazing, many deep tracks, and cattle feces throughout the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 38-04**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Cattle are heavily grazing the wetland vegetation and plant diversity is low. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 38-05**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is abundant in the wetland interior. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of cattle in the wetland, particularly on the east side. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 38-06**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* grows in a ring around the wetland. Maidencane grows in the deeper wetland center and a high diversity of sedges/grasses grows throughout the wetland. The herbaceous vegetation covers >75% of the basin. There are cattle trails through the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 38-07**

**Description:** This wetland is a 0.9 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common in the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There are cattle trails and feces within the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 39-01**

**Description:** This wetland is a 0.8 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. There is no midstory cover. Maidencane and sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned to the wetland edges. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 39-02**

**Description:** This wetland is a 0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and redroot grow throughout the wetland, and cover >75% of the basin. A recent fire burned entirely through the wetland basin. Feral hog damage is moderate and patchy. This wetland has been trampled by cattle and the herbaceous vegetation has been grazed. There is an old fireline ditch near the east side of the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.

**Wetland ID: 39-03**

**Description:** This wetland is a 0.5 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover 50-75% of the basin. The midstory is dominated by small palm trees, and covers 5-25% of the wetland. Fern, *Sphagnum*, and sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned to the wetland edges. There are cattle tracks and trails around the wetland edge. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Cattle

**Restoration Action Recommended:** The uplands in this MU are in good ecological condition, although we have observed some cattle-related effects in both wetlands and uplands in some areas. We recommend removing cattle from this unit to prevent destruction of the intact flatwoods community and the embedded wetlands.



**Wetland ID: 45-01**

**Description:** This wetland is a 0.8 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Emergent vegetation grows in the wetland center, and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. There is a distinct game trail along the south side of the wetland. The adjacent uplands are mostly scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 45-02**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* grows in a ring around the outer edge of the wetland. Maidencane grows in the wetland center, and sedges/grasses grow around the wetland edge. The herbaceous vegetation covers >75% of the basin. There is a distinct game trail around the edge of the wetland. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 46-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. Gum trees grow in the north and south ends of the wetland, and cover 5-25% of the basin. There is no midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Fern are now growing on old, patchy feral hog damage. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None

**Wetland ID: 46-02**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern grow throughout the wetland, and redroot and sedges/grasses also are common. The herbaceous vegetation covers 50-75% of the basin. Feral hog damage is old and growing over with vegetation. The wetland had dried just before the day of our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None



**Wetland ID: 46-03**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Sphagnum* grows throughout the wetland and fern and redroot grow in scattered patches. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 46-04**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. A high diversity of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. This wetland may connect to a semi-permanent swamp to the north during times of high water. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 46-05**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern and sedges/grasses grow throughout the wetland, and cover >75% of the basin. Feral hog damage is extensive. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None

**Wetland ID: 46-06**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A high diversity sedges/grasses, fern, and redroot grows throughout the wetland, and covers 50-75% of the basin. Feral hog damage is recent and widespread. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None



**Wetland ID: 46-07**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 46-08**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A high diversity of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. Feral hog damage is old and patchy. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None



**Wetland ID: 46-09**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Redroot grows in the wetland interior and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 46-10**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. It appears that a fire burned through the wetland basin and then the wetland was inundated with water. On the day of our visit, the wetland had recently dried, exposing bare soil. Emergent vegetation grows in the wetland interior and sedges/grasses grow sparsely throughout the wetland. The herbaceous vegetation covers 25-50% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 46-11**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. It appears that a fire burned through the wetland basin and then the wetland was inundated with water. On the day of our visit, the wetland had recently dried, exposing bare soil. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 46-12**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern grow in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. Feral hog damage, both old and new, is patchy in the wetland. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None



**Wetland ID: 46-13**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern grow on areas damaged by feral hogs and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None

**Wetland ID: 46-14**

**Description:** This wetland is a 3.6 ha semi-permanent mixed marsh and forested swamp. It appears to be a marsh succeeding to a cypress dome. Cypress trees dominate the canopy, and cover 25-50% of the basin. The midstory is dominated by small cypress trees, and covers 5-25% of the wetland. A large diversity of maidencane, *Sphagnum*, and sedges/grasses grows throughout the wetland, and covers >75% of the basin. Small fish were present on the day of our visit. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 46-15**

**Description:** This wetland is a 3.0 ha ephemeral marsh. There is a cypress dome on the south end of the wetland, the cypress trees cover 5-25% of the basin. There is no midstory cover. *Hypericum* grows in a ring around the wetland center. Maidencane grows in the wetland interior, and sedges/grasses grow in an outer ring around the wetland interior. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 47-01**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common in the wetland. Maidencane grows in the wetland interior and a diverse array of sedges/grasses grows in an outer ring around the wetland interior. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 47-02**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common in the wetland. Maidencane grows in the wetland interior and sedges/grasses grow in an outer ring around the wetland interior. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 47-03**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows densely throughout the wetland, and covers >75% of the basin. Small fish were present on the day of our visit. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 47-04**

**Description:** This wetland is a 1.3 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows in the wetland interior and sedges/grasses grow in an outer ring around the wetland interior. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 47-05**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows in the wetland interior and sedges/grasses grow in an outer ring around the wetland interior. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 49-01**

**Description:** This wetland is a 1.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane is the dominant herbaceous vegetation, and it covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 49-02**

**Description:** This wetland is a 1.5 ha ephemeral marsh. There is no tree canopy or midstory cover. This wetland has high plant diversity, but it is dominated by maidencane. The herbaceous vegetation covers >75% of the basin. A small upland land bridge separates this wetland from 49-01. A dug linear feature bisects the north end of the wetland, possibly an old fireline ditch. The ditch does not appear to be impacting the wetland hydrology and will erode over time. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching

**Restoration Action Recommended:** None



**Wetland ID: 51-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common in the wetland interior. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. Feral hog damage is patchy. The adjacent uplands are a scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None

**Wetland ID: 51-02**

**Description:** This wetland is a 0.9 ha ephemeral marsh. A small cluster of cypress trees grows near the wetland center, but covers <5% of the basin. There is no midstory cover. *Hypericum* is common within the wetland. The herbaceous vegetation is diverse and covers >75% of the basin. The adjacent uplands are scrubby flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-01**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. The wetland appears to have dried shortly before our visit. *Sphagnum* and fern grow in the wetland interior and are surrounded by a sedge/grass ring. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-02**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common in the wetland basin. *Sphagnum*, fern, and redroot grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-03**

**Description:** This wetland is a <0.1 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover 50-75% of the wetland. The midstory is dominated by fetterbush, and covers 5-25% of the wetland. *Sphagnum* grows throughout, and covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-04**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern are abundant throughout the north lobe of the wetland, which is drier than the southern lobe. The southern lobe is deeper and had dried just before our visit. A diversity of maidencane, *Sphagnum*, fern, and sedges/grasses covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-05**

**Description:** This wetland is a <0.1 ha semi-permanent marsh. There is no tree canopy or midstory cover. Emergent vegetation grows in the deep wetland center; maidencane and *Sphagnum* grow in a ring around the deep hole. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-06**

**Description:** This wetland is a <0.1 ha ephemeral marsh. It has two lobes. The north lobe is deeper and still held water on the day of our visit. Sphagnum, redroot, and sedges/grasses grow throughout the north lobe. The south lobe was dry on the day of our visit and covered with *Sphagnum*. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-07**

**Description:** This wetland is a 1.3 ha ephemeral marsh. A few cypress trees have sprouted along the south end of the wetland and a cypress dome is forming in the wetland center. Cypress trees cover 5-25% of the basin. Maidencane grows in the wetland center and a diversity of sedges/grasses grows throughout the wetland. The herbaceous vegetation covers >75% of the basin. An old fireline ditch is still evident around the south end of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Fireline

**Restoration Action Recommended:** The old fireline may still be serving as a firebreak, as evidenced by the presence of young cypress trees in the area. The wetland may need to be custom burned in the future.

**Wetland ID: 52-08**

**Description:** This wetland is a <0.1 ha ephemeral marsh. It is likely a karst depression and has dark, tannic water. There is no tree canopy or midstory cover. The wetland is almost entirely open water with no emergent vegetation. Sedges/grasses grow around the wetland edge, and cover 5-25% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-09**

**Description:** This wetland is a <0.1 ha ephemeral marsh. It is a karst depression and has dark, tannic water. There is no tree canopy or midstory cover. The wetland is almost entirely open water with no emergent vegetation. *Sphagnum* grows around the wetland edge, and covers 25-50% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-10**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. It appears a roller-chopper was driven through the middle of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Vehicular damage

**Restoration Action Recommended:** None, the vehicular tracks will erode over time. To prevent future damage, avoid driving machinery around the wetland edges. If necessary, flag the wetland edges before contractors perform mechanical activity in the uplands.



**Wetland ID: 52-11**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* grows in a ring around the wetland. Maidencane grows in the wetland center and *Sphagnum* is distributed around the outer ring of the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-12**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. The wetland had dried just before our visit, and exposed bare soil. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-13**

**Description:** This wetland is a 1.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland interior. A rich diversity of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-14**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Sphagnum* grows in the wetland's deeper center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-15**

**Description:** This wetland is a 0.9 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Emergent vegetation grows in a deeper area of the wetland on the west side and a rich diversity of grasses and flowering plants grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-16**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows throughout the wetland, and covers >75% of the basin. A recent fire burned into the wetland edges. A shallow ditch connects the wetland to a nearby roadside ditch system. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation.



**Wetland ID: 52-17**

**Description:** This wetland is a 0.3 ha ephemeral marsh. It has 4 distinct deep holes spaced evenly throughout the wetland basin. There is no tree canopy or midstory cover. Because of the different character of each pothole, the herbaceous vegetation varies across the wetland basin and includes maidencane, sedges/grasses, and emergent vegetation. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-18**

**Description:** This wetland is a 1.6 ha ephemeral forested swamp. It has distinct 3 lobes. The north lobe is more marsh-like in character with scattered cypress trees, the south lobe also is more open, and the center lobe has a denser midstory. The entire wetland tree canopy is dominated by cypress trees, and covers 50-75% of the basin. The midstory is dominated by wax myrtle and fetterbush, and covers 5-25% of the wetland. Maidencane grows throughout, and covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-19**

**Description:** This wetland is a <0.1 ha ephemeral marsh. It is a karst depression with dark, tannic water and an open-water center. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, except in the deepest center, and cover >75% of the basin. A recent fire burned deep into the interior of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-20**

**Description:** This wetland is a 0.5 ha ephemeral marsh. It is a comma-shaped wetland with deeper holes at each end. There is no tree canopy or midstory cover. The north end has abundant maidencane; the south end has a deeper hole in which emergent vegetation grows. The herbaceous vegetation covers >75% of the basin. A recent fire burned through the wetland basin, except in the deeper hole. A shallow ditch connects the east side of the south hole with a nearby roadside ditch system. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation.



**Wetland ID: 52-21**

**Description:** This wetland is a <0.1 ha ephemeral marsh. It is the east end of a single pond that was bisected by Road 8. The road construction created 2 separate wetlands, this one and 52-22. There is no tree canopy or midstory cover. A high diversity of herbaceous vegetation covers >75% of the basin. There is minor feral hog damage in the wetland. A shallow ditch connects this wetland to the adjacent, ephemeral roadside ditch system. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching, Feral hog damage Road,

**Restoration Action Recommended:** Because the ditch connects to an ephemeral roadside ditch system, it likely is not impacting the wetland. However, we recommend filling all ditches connected to wetlands if restoration is a goal.

**Wetland ID: 52-22**

**Description:** This wetland is a <0.1 ha ephemeral marsh. It is the west end of a single pond that was bisected by Road 8. The road construction created 2 separate wetlands, this one and 52-21. There is no tree canopy or midstory cover. A high diversity of herbaceous vegetation covers >75% of the basin. There is a patch of what appears to be torpedograss in the wetland. There is minor feral hog damage in the wetland. This wetland is connected to an ephemeral roadside ditch system. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Invasive species, Road, Ditching

**Restoration Action Recommended:** Because the ditch connects to an ephemeral roadside ditch system, it likely is not impacting the wetland. However, we recommend filling all ditches connected to wetlands if restoration is a goal.



**Wetland ID: 52-23**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern and sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is minor feral hog damage in the wetland that is now grown over with fern. The wetland had dried recently before our visit. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:**

**Wetland ID: 52-24**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Emergent vegetation grows in the deeper wetland center, sedges/grasses are more common around the outer ring of the wetland, and *Sphagnum* grows throughout the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-25**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Emergent vegetation grows in the deeper wetland center; sedges/grasses are more common around the outer ring of the wetland. The herbaceous vegetation is diverse and covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-26**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows in the deeper wetland center; sedges/grasses are more common around the outer ring of the wetland. The herbaceous vegetation covers >75% of the basin. A recent fire burned into the wetland edges. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-27**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. The wetland dried just before the day of our visit, exposing bare soil. Sedges/grasses grow sparsely throughout the wetland, and cover 5-25% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 52-28**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is a 0.2 m tall and 0.5 m wide dead grass mound in the wetland, possibly a nest. The wetland is adjacent to a large swamp to the south. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 52-29**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern grows in the wetland interior and sedges/grasses grow in a ring around the outer edge. The herbaceous vegetation covers >75% of the basin. Feral hog damage is old and almost eroded flat. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** None

**Wetland ID: 52-30**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows in the deeper wetland center and sedges/grasses grow in the shallower areas. The herbaceous vegetation covers >75% of the basin. The vegetation and soil on the north end of the wetland have been damaged by what appears to be a roller chopper. Feral hogs have rooted in the vehicle tracks. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Vehicular damage

**Restoration Action Recommended:** Avoid driving machinery around the wetland edges. If necessary, flag the wetland edges before contractors perform mechanical activity in the uplands. Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.



**Wetland ID: 52-31**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and redroot grow throughout the wetland, and cover 50-75% of the basin. Feral hog damage is widespread and severe. A game trail connects 52-30 to 52-31 through the uplands. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.

**Wetland ID: 53-01**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland and *Sphagnum* is common around the wetland edge. The herbaceous vegetation is diverse and covers >75% of the basin. Feral hog damage is minor and confined to the wetland edges. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.



**Wetland ID: 53-02**

**Description:** This wetland is a 0.4 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows throughout the wetland, and covers >75% of the basin. Feral hog damage is patchy along the wetland edges. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.

**Wetland ID: 53-03**

**Description:** This wetland is a <0.1 ha ephemeral marsh. It is a perfectly circular sink karst depression with dark, black water. There is no tree canopy or midstory cover and no visible herbaceous vegetation. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 53-04**

**Description:** This wetland is a <0.1 ha ephemeral marsh. This small, oval marsh has a deeper hole in the south end. There is no tree canopy or midstory cover. Emergent vegetation and *Sphagnum* grow around the edge of the hole, and sedges/grasses grow throughout the rest of the wetland. The herbaceous vegetation covers 50-75% of the basin. There is feral hog damage throughout most of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.

**Wetland ID: 53-05**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses grow throughout the wetland and *Sphagnum* is common around the wetland edge. The herbaceous vegetation covers >75% of the basin. Feral hog damage is patchy around the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.



**Wetland ID: 53-06**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and fern grow throughout the wetland, and redroot grows over areas damaged by feral hogs. The herbaceous vegetation covers >75% of the basin. Feral hog damage is extensive over half of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.

**Wetland ID: 53-07**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses and maidencane grow throughout most of the wetland and redroot is sprouting over feral hog damage. The herbaceous vegetation covers 50-75% of the basin. Feral hog damage is severe over a third of the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.



**Wetland ID: 53-08**

**Description:** This wetland is a 0.4 ha ephemeral marsh. The north end of the wetland is deeper with a developing cypress swamp. Cypress trees cover 25-50% of the total wetland. A recent fire burned through the wetland, pruning the encroaching feterbush. The remaining feterbush covers 5-25% of the wetland. A diversity of maidencane, sedges/grasses, fern, and *Sphagnum* grows throughout the wetland, and covers >75% of the basin. Feral hog damage is patchy. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.

**Wetland ID: 53-09**

**Description:** This wetland is a <0.1 ha ephemeral marsh. It is a circular sink depressional pond with black water. There is no tree canopy or midstory cover. Sedges/grasses and redroot grow sparsely throughout the wetland, and cover 5-25% of the basin. Feral hog damage is patchy and confined to the wetland edges. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.



**Wetland ID: 53-10**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Emergent vegetation grows in the wetland center and redroot grows on areas damaged by feral hogs. The herbaceous vegetation covers >75% of the basin. Feral hog damage is widespread and grown over with vegetation. The wetland is adjacent to Access Road 9 and is connected to the shallow roadside ditches. The ditches appear to be more ephemeral than the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Roadside ditches

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes. Because the ditch connects to an ephemeral roadside ditch system, it likely is not impacting the wetland. However, we recommend filling all ditches connected to wetlands if restoration is a goal.

**Wetland ID: 53-11**

**Description:** This wetland is a 0.4 ha ephemeral forested swamp. Cypress trees cover 50-75% of the wetland. Sedges/grasses, fern, and redroot grow throughout the wetland, and cover >75% of the basin. This wetland may represent a marsh succeeding to a cypress dome. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 54-01**

**Description:** This wetland is a 6.4 ha ephemeral marsh. A few cypress trees have established in the central and south ends of the wetland. The tree canopy covers 5-25% of the wetland. There is no midstory cover. *Hypericum* grows in a ring around the wetland center. A diverse array of maidencane, sedges/grasses, and other herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 54-02**

**Description:** This wetland is a 0.4 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the wetland. There is no midstory cover. Maidencane and sedges/grasses grow throughout the wetland, and cover >75% of the basin. A recent fire burned into the wetland edges. Dead mosquito fish (*Gambusia*) were present in recent dry-up holes. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 57-01**

**Description:** This wetland is a 0.1 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the wetland. The midstory is dominated by wax myrtle, and covers 25-50% of the basin. Fern grow in the wetland center and sedges/grasses grow in a ring around the outer edge. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 57-02**

**Description:** This wetland is a 0.3 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the wetland. The midstory is dominated by fetterbush, and covers 25-50% of the basin. Fern grow throughout the wetland and sedges/grasses grow in a ring around the outer edge. The diverse herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 60-01**

**Description:** This wetland is a 1.3 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* grows in a ring around the wetland center. Maidencane grows in the wetland center and a diverse array of sedges/grasses and other herbaceous vegetation grow around the outer ring of the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 60-02**

**Description:** This wetland is a 1.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* grows in a ring around the wetland center. Maidencane grows in the wetland center and a diverse array of sedges/grasses, emergent and other herbaceous vegetation grow around the outer ring of the wetland. The herbaceous vegetation covers 50-75% of the basin. Small fish were present on the day of our visit. A shallow ditch on the west side connects this wetland to nearby roadside ditches. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation.



**Wetland ID: 60-03**

**Description:** This wetland is a 0.3 ha semi-permanent marsh. There is no tree canopy or midstory cover. *Hypericum* is common within the wetland. Sedges/grasses and other herbaceous plants grow throughout the wetland, and cover >75% of the basin. Fish were present on the day of our visit. A ditch was created along the south end of the wetland when the MU boundary was constructed. The MU boundary/road bisects the wetland, a small portion of which remains to the south. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching, MU boundary/fireline

**Restoration Action Recommended:** Fill the ditch with sand to restore the wetland hydroperiod. If feasible, re-route the MU boundary/road to the south away from the wetland.

**Wetland ID: 60-04**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy cover. Several small loblolly pine trees are establishing in the wetland, and cover 5-25% of the basin. Fern grow in the wetland center and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. Vehicular tracks, likely from a roller-chopper, have damaged the soil throughout the wetland. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Vehicular damage

**Restoration Action Recommended:** None - the tracks will heal over time. Avoid driving machinery around the wetland edges. If necessary, flag the wetland edges before contractors perform mechanical activity in the uplands.



**Wetland ID: 60-05**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Sphagnum* grows in the deeper hole on the east end of the wetland and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. The perimeter and west ends have vehicular damage, likely from a roller-chopper. Feral hogs have taken advantage of the open soil and caused further damage. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Vehicular damage

**Restoration Action Recommended:** Avoid driving machinery around the wetland edges. If necessary, flag the wetland edges before contractors perform mechanical activity in the uplands.

**Wetland ID: 60-06**

**Description:** This wetland is a 0.2 ha ephemeral marsh. It is an open marsh with multiple deeper holes. There is no tree canopy or midstory cover. *Hypericum* is abundant throughout the wetland. Maidencane grows in the deeper hole on the southeast end and a diverse array of sedges/grasses grows throughout the wetland. The herbaceous vegetation covers >75% of the basin. A game trail runs along the wetland edge. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 60-07**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. *Sphagnum* carpets the wetland floor and small emergent vegetation grows throughout the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 60-08**

**Description:** This wetland is a 0.1 ha ephemeral marsh. It is elongate with 3 deeper holes. There is no tree canopy or midstory cover. *Hypericum* is abundant within the wetland. Sedges/grasses grow throughout the wetland, and fern, redroot, and other herbaceous plants grow in the deeper holes. The herbaceous vegetation covers >75% of the basin. Feral hog damage is minor and patchy. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:**



**Wetland ID: 60-09**

**Description:** This wetland is a 0.2 ha ephemeral forested swamp. Cypress and loblolly bay trees dominate the canopy, and cover 25-50% of the basin. The midstory is dominated by fetterbush, and covers 25-50% of the wetland. *Sphagnum* grows throughout the wetland, and fern grow in scattered patches. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None

**Wetland ID: 60-10**

**Description:** This wetland is a 3.0 ha ephemeral marsh. A small cypress dome grows in the wetland center but covers <5% of the basin. There is no midstory cover. *Hypericum* is common around the outer edge of the wetland. Maidencane grows in the wetland center and a diverse array of sedges/grasses and other herbaceous vegetation grow around the outer ring of the wetland. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 61-01**

**Description:** This wetland is a 0.2 ha ephemeral marsh. It is a diffuse, shallow marsh with edges that are broad ecotones with the surrounding flatwoods. There is no tree canopy or midstory cover. Maidencane and sedges/grasses grow throughout the wetland, and cover >75% of the basin. Old feral hog damage is severe, and left deep gouges and hillocks. New feral hog damage is predominately in the wetland center. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.

**Wetland ID: 61-02**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* grows in a ring around the wetland center. Redroot grows in the wetland center and sedges/grasses grow around the outer ring of the wetland. The herbaceous vegetation covers >75% of the basin. Feral hog damage is severe in the wetland center. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.



**Wetland ID: 61-03**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* grows in a ring around the wetland edge. Fern grows in scattered patches and sedges/grasses grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. Feral hog damage, both old and new, is minor. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.

**Wetland ID: 61-04**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. A diverse array of herbaceous vegetation grows throughout the wetland, and covers >75% of the basin. Feral hog damage, both old and new, is minor. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.



**Wetland ID: 61-05**

**Description:** This wetland is a 0.7 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* is fairly common throughout the wetland. Maidencane is the dominant herbaceous vegetation, and covers >75% of the basin. Old feral hog damage is widespread and has grown over with vegetation. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Feral hog damage

**Restoration Action Recommended:** Consider trapping or hunting feral hogs in this area because of the prevalence of feral hog damage and the high quality of the marshes.

**Wetland ID: 61-06**

**Description:** This wetland is a 1.7 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover 50-75% of the basin. Fetterbush grows only in the wetland interior, and covers 5-25% of the wetland. *Hypericum* is abundant throughout the wetland. Sedges/grasses grow around the outer ring of the wetland, and cover 50-75% of the basin. The adjacent uplands are a mix of scrubby and mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** None

**Restoration Action Recommended:** None



**Wetland ID: 62-01**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. Fern and sedges/grasses grow throughout the wetland, and cover >75% of the basin. A 50 m long ditch connects the west side of the wetland to nearby roadside ditches. The adjacent uplands are mesic flatwoods that are managed with prescribed fire.

**Wetland Concerns:** Ditching

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation.

**Wetland ID: 63-01**

**Description:** This wetland is a 0.3 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover 50-75% of the basin. The midstory is dominated by fetterbush, and covers 5-25% of the wetland. Fern and sedges/grasses grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland edges.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 63-02**

**Description:** This wetland is a 0.7 ha ephemeral mixed swamp. Cypress trees dominate the canopy, and cover 50-75% of the basin. The midstory is dominated by fetterbush and wax myrtle, and covers >75% of the wetland. Fern grow sparsely throughout the wetland, and cover 5-25% of the basin. There is evidence of fire around the wetland edges. Old tree stumps are present in the wetland, evidence of past logging. The adjacent uplands are pasture created by past cattle grazing.

**Wetland Concerns:** Feral hog damage, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 63-03**

**Description:** This wetland is a 0.1 ha ephemeral mixed swamp. Cypress trees dominate the canopy, and cover 25-50% of the basin. The midstory is dominated by wax myrtle and fetterbush, and cover >75% of the basin. Sedges/grasses and fern grow sparsely throughout the wetland, and cover 5-25% of the basin. A shallow ditch leads from the south end of the wetland and connects to 63-04. A recent fire pruned some of the brushy understory. The adjacent uplands are flatwoods and pasture created by past cattle grazing.

**Wetland Concerns:** Ditching, Upland condition

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 63-04**

**Description:** This wetland is a 1.0 ha ephemeral mixed swamp. Cypress trees dominate the canopy, and cover 50-75% of the basin. The midstory is dominated by fetterbush and wax myrtle, and covers >75% of the wetland. Fern, sedges/grasses, and redroot grow in a ring around the wetland edge and *Sphagnum* grows in scattered patches. The herbaceous vegetation covers 5-25% of the basin. Fetterbush has colonized old stump hummocks. A recent fire burned to the wetland edges. The adjacent uplands are flatwoods and pasture created by past cattle grazing.

**Wetland Concerns:** Feral hog damage, Upland condition, Woody encroachment

**Restoration Action Recommended:** Ensure the next fire burns into the wetland basin. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 63-05**

**Description:** This wetland is a 0.7 ha ephemeral forested swamp. It has an outer ring of cypress and a largely open interior with very widely scattered cypress trees. The tree canopy covers 25-50% of the basin. The midstory is dominated by fetterbush, and covers 25-50% of the wetland. Maidencane and redroot grow throughout the wetland, and cover >75% of the basin. Feral hog damage is extensive. Fetterbush grows on old stump hummocks. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland edges.

**Wetland Concerns:** Feral hog damage, Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 64-01**

**Description:** This wetland is a 0.4 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. The midstory is dominated by various hardwoods, and covers 5-25% of the wetland. Fern and redroot grow throughout the wetland, and cover >75% of the basin. Feral hog damage is widespread and severe. A very shallow ditch clips the west side of the wetland along an access track. A recent fire burned all the way through the wetland. The adjacent uplands are mesic flatwoods managed with prescribed fire.

**Wetland Concerns:** Feral hog damage, Ditching

**Restoration Action Recommended:** Because the ditch connects to an ephemeral roadside ditch system, it likely is not impacting the wetland. However, we recommend filling all ditches connected to wetlands if restoration is a goal.

**Wetland ID: 64-02**

**Description:** This wetland is a <0.1 ha semi-permanent marsh. There is no tree canopy or midstory cover. Emergent vegetation, rush, sedges/grasses, and cattail grow throughout the wetland, and cover >75% of the basin. Fish were present on the day of our visit. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland edges.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 64-03**

**Description:** This wetland is a <0.1 ha semi-permanent dug-out. It has steep edges and a deep center. We could not discern whether this wetland was modified or created from the uplands. There is no tree canopy or midstory cover. Sedges/grasses grow sparsely throughout the wetland, and cover 5-25% of the basin. The adjacent uplands are pasture created by past cattle grazing.

**Wetland Concerns:** Dug-out, Upland condition

**Restoration Action Recommended:** None - Even though this wetland appears to be human-constructed, it now is functioning as an ephemeral wetland. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 64-04**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows densely throughout the wetland, and covers >75% of the basin. Feral hog damage rings the wetland. There is a small earthen mound in the north end. The adjacent uplands are pasture created by past cattle grazing.

**Wetland Concerns:** Feral hog damage, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 66-01**

**Description:** This wetland is a 0.2 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover 50-75% of the basin. There is a dense patch of fetterbush and wax myrtle on the south side of the wetland. The midstory covers 5-25% of the wetland. Maidencane, emergent vegetation, and *Sphagnum* cover >75% of the basin. There is some feral hog damage in the wetland. The adjacent uplands are mesic flatwoods and pasture created by past cattle grazing.

**Wetland Concerns:** Feral hog damage, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 66-02**

**Description:** This wetland is a 0.6 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. The midstory is dominated by wax myrtle, and covers 5-25% of the wetland. Fern and sedges/grasses grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are mesic flatwoods and pasture created by past cattle grazing.

**Wetland Concerns:** Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 66-03**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. *Hypericum* grows in a thin ring around the wetland center. Maidencane grows in the wetland interior, and sedges/grasses grow in a ring around the wetland. The herbaceous vegetation covers >75% of the basin. Small fish were present on the day of our visit. The adjacent uplands are mesic flatwoods and pasture created by past cattle grazing.

**Wetland Concerns:** Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 66-04**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane and pickerelweed grow throughout the wetland, and cover >75% of the basin. There is a distinct ring of feral hog damage around the wetland. The adjacent uplands are mesic flatwoods and pasture created by past cattle grazing.

**Wetland Concerns:** Feral hog damage, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 67-01**

**Description:** This wetland is a 0.3 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. There is no midstory cover. Sedges/grasses and fern grow throughout the wetland, and cover >75% of the basin. A grass, possibly torpedograss, is abundant in the wetland interior. Feral hog damage is minor and patchy. The adjacent uplands are mesic flatwoods and pasture created by past cattle grazing.

**Wetland Concerns:** Feral hog damage, Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 67-02**

**Description:** This wetland is a 0.1 ha semi-permanent marsh. We could not discern whether this wetland was modified or created from the uplands. It is currently functioning as an ephemeral wetland. There is no tree canopy or midstory cover. Emergent vegetation and sedges/grasses grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses, including torpedograss, have encroached into the wetland edges.

**Wetland Concerns:** Dug-out, Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 67-03**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Bahia grass grows around the outer edge and torpedograss grows in the wetland center. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 67-04**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses, including torpedograss, grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 67-05**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Bahia grass grows around the outer edge of the wetland, and torpedograss and rush grow in the wetland center. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 67-06**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses, including torpedograss, grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 67-07**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. A diversity of native and non-native grasses, including bahia grass and torpedograsses, grows throughout the wetland, and covers >75% of the basin. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 67-08**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A diversity of native and non-native grasses, including torpedograsses, grows throughout the wetland, and covers >75% of the basin. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 67-09**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows throughout the wetland, and covers >75% of the basin. There are old cypress stumps in the wetland, signifying this wetland was once a cypress dome. A small dirt berm was created on the south side of the wetland. The adjacent uplands are pasture created by past cattle grazing.

**Wetland Concerns:** Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 67-10**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane and torpedograsses are the dominant herbaceous vegetation, and pickerelweed grows in the wetland center. The herbaceous vegetation covers >75% of the basin. Feral hog damage is minor. The adjacent uplands are pasture created by past cattle grazing. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Feral hog damage, Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 67-11**

**Description:** This wetland is a 0.9 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover 50-75% of the basin. The midstory is dominated by fetterbush and young cypress trees, and covers 5-25% of the wetland. Maidencane and *Sphagnum* grow throughout the wetland, and cover >75% of the basin. The west half of the wetland has dense brush and appears to be a fire shadow. The east half of the wetland shows evidence of fire. There is feral hog damage in the wetland. This wetland may connect to 67-10 during times of high water. The adjacent uplands are pasture created by past cattle grazing.

**Wetland Concerns:** Feral hog damage, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 68-01**

**Description:** This wetland is a 0.5 ha ephemeral marsh. There is no tree canopy or midstory cover. Emergent vegetation and sedges/grasses grow throughout the wetland basin, and cover >75% of the basin. Although cattle are no longer allowed on this MU, evidence of past grazing is present in the wetland. The adjacent uplands are pasture with widely scattered pine trees and shrubs.

**Wetland Concerns:** Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 68-02**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses, including bahia grass, grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 68-03**

**Description:** This wetland is a 0.4 ha semi-permanent marsh. There is no tree canopy or midstory cover. Maidencane and emergent vegetation grow in scattered patches, and cover 50-75% of the basin. This marsh has been deeply dug-out in a semi-circle and a 2 m tall earthen mound was created in the wetland center. Fish were present on the day of our visit. The adjacent uplands are pasture with widely scattered pine trees and shrubs.

**Wetland Concerns:** Dug-out, Upland condition

**Restoration Action Recommended:** Fill the wetland with the earthen berm in order to restore the natural hydrology. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 68-04**

**Description:** This wetland is a 0.2 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses, including bahia grass and possibly torpedograsses, grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland basin.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 68-05**

**Description:** This wetland is a 0.3 ha ephemeral marsh. There is no tree canopy or midstory cover. A high diversity of sedges/grasses, including bahia grass, grow throughout the wetland, and cover >75% of the basin. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland basin.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 68-06**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Rush grow in the deeper wetland center, sedges/grasses, including bahia grass, grow around the wetland perimeter. A grass, possibly torpedograsses, is abundant in the wetland interior. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland basin.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 68-07**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A grass, possibly torpedograsses, and a small legume are common in the wetland, and maidencane grows in scattered patches. The herbaceous vegetation covers >75% of the basin. There is evidence of fire throughout the wetland basin. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 68-08**

**Description:** This wetland is a 0.2 ha ephemeral marsh. There is no tree canopy or midstory cover. Maidencane grows throughout the wetland, and covers >75% of the basin. There is fire evidence throughout the wetland interior. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 68-09**

**Description:** This wetland is a 0.5 a ephemeral marsh. There is no tree canopy or midstory cover. Maidencane and emergent vegetation grow throughout the wetland basin, and bahia and possibly torpedograsses grow in the south end of the wetland. It appears a hole has been dug in the wetland center, creating a longer hydroperiod. Fish were present in the deeper hole on the day of our visit. A recent fire burned into the wetland edges. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland.

**Wetland Concerns:** Dug-out, Invasive species, Upland condition

**Restoration Action Recommended:** Fill the dug-out hole to restore wetland hydroperiod. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 70-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. A high diversity of herbaceous vegetation, including fern, redroot, emergent vegetation, rush, and sedges/grasses, grows throughout the wetland and covers >75% of the basin. A short earthen berm surrounds the wetland, indicating this wetland was likely created for cattle. The adjacent uplands are pasture with widely scattered pine trees and shrubs.

**Wetland Concerns:** Berm, Upland condition

**Restoration Action Recommended:** The wetland is functioning as a healthy, ephemeral wetland so we do not recommend altering the berm. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 71-01**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Sedges/grasses, including bahia grass, grow throughout the wetland, and cover >75% of the basin. Even though cattle are no longer allowed on this MU, cattle trails and grazing are still evident throughout the wetland. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland basin.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 71-02**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Rush and emergent vegetation grow in the deeper wetland center, and sedges/grasses grow around the edges of the wetland. The herbaceous vegetation covers >75% of the basin. Even though cattle are no longer allowed in this MU, grazing effects are still evident throughout the wetland. The adjacent uplands are pasture with widely scattered pine trees and shrubs.

**Wetland Concerns:** Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 71-03**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Rush grow in the deeper wetland center, and maidencane and sedges/grasses grow in a ring around the wetland center. The herbaceous vegetation covers >75% of the basin. A shallow ditch leads out of the south end of the wetland. There is moderate feral hog damage on the southern edge of the wetland. Even though cattle are no longer allowed in this MU, damage from past grazing is still evident. The adjacent uplands are pasture with widely scattered pine trees and shrubs.

**Wetland Concerns:** Ditching, Feral hog damage, Upland condition

**Restoration Action Recommended:** Fill ditch to restore the wetland's isolation. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 71-04**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Rush grow in the deeper wetland center, and bahia grass is common within the shallower areas of the wetland. The herbaceous vegetation covers >75% of the basin. A shallow ditch bisects the eastern edge of the wetland. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland basin.

**Wetland Concerns:** Ditching, Invasive species, Upland condition

**Restoration Action Recommended:** Fill the ditch to restore the wetland's isolation. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 71-05**

**Description:** This wetland is a 0.1 ha semi-permanent marsh. Cypress trees grow in the northeast corner of the wetland, and cover 5-25% of the basin. There is no midstory cover. Emergent vegetation grows in the deeper wetland center, sedges/grasses grow around the wetland edges, and maidencane is patchy throughout. The herbaceous vegetation covers >75% of the basin. There is a 2 m earthen berm on the northeast side of the wetland and a section of the wetland was dug deeper, presumable for cattle. A ditch leads from the south side of the wetland. Fish were present on the day of our visit. The adjacent uplands are pasture with widely scattered pine trees and shrubs.

**Wetland Concerns:** Berm, Ditching, Dug-out, Upland condition

**Restoration Action Recommended:** Fill ditch to restore the wetland's isolation. When the wetland is dry, fill the dug-out with the earthen mound and flatten the bottom. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 71-06**

**Description:** This wetland is a <0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Native sedges/grasses grow in the wetland center, and grazed bahia grass grows around the wetland edge. The herbaceous vegetation covers >75% of the basin. The adjacent uplands are pasture with widely scattered pine trees and shrubs.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 71-07**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Rush grow in the deeper wetland center, and grazed bahia grass grows around the wetland edge. The herbaceous vegetation covers >75% of the basin. Even though cattle are no longer allowed on this MU, trampling damage is still evident in the wetland. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland basin.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 71-08**

**Description:** This wetland is a <0.1 ha highly ephemeral marsh. There is no tree canopy or midstory cover. Bahia grass and broomsedge are the dominant herbaceous vegetation, and cover >75% of the basin. Old feral hog damage is extensive and has grown over with vegetation. The adjacent uplands are pasture with widely scattered pine trees and shrubs. Pasture grasses have encroached into the wetland basin.

**Wetland Concerns:** Feral hog damage, Invasive species, Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 71-09**

**Description:** This wetland is a 0.1 ha ephemeral marsh. There is no tree canopy or midstory cover. Pickerelweed and maidencane grow throughout the wetland, and cover >75% of the basin. A fireline/property boundary and fence line runs along the west edge of the wetland. A vehicular track is forming around the wetland perimeter, likely a result of driving the fireline and avoiding the wet, western side of the pond. Even though cattle are no longer allowed in this MU, damage from past grazing is still evident around the wetland edges. The adjacent uplands are pasture with widely scattered pine trees and shrubs.

**Wetland Concerns:** Fireline, Invasive species, Upland condition, Vehicular damage

**Restoration Action Recommended:** Re-route the track 10m into the pasture uplands on the north, east, and south sides of the wetland. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 79-01**

**Description:** This wetland is a 0.5 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. There is no midstory cover. Sedges/grasses grow throughout the wetland, and cover >75% of the basin. There is evidence of past fire throughout the wetland. The adjacent uplands are an old citrus grove with cogongrass present.

**Wetland Concerns:** Upland condition

**Restoration Action Recommended:** Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 79-02**

**Description:** This wetland is a 1.2 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. The midstory is dominated by fetterbush, wax myrtle, and various other hardwood species, and covers 5-25% of the wetland. Sedges/grasses, including what appears to be torpedograss, and fern grow throughout the wetland, and cover >75% of the basin. Two drainage channels were constructed on the east and south side of the wetland and a deeper ditch runs along the south end inside the wetland. A deep, circular pond, likely human-constructed, is on the southeast corner of the wetland. The adjacent uplands are an old citrus grove with cogongrass present.

**Wetland Concerns:** Ditching, Dug-out, Invasive species, Upland condition

**Restoration Action Recommended:** Fill ditches to restore the wetland's isolation. If the pond is human-constructed, fill the pond to restore the wetland hydroperiod. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 81-01**

**Description:** This wetland is a 1.2 ha ephemeral shrub swamp. It appears to be a brushy marsh succeeding to a mixed swamp. Cypress trees dominate the canopy, and cover 5-25% of the basin. The midstory is dominated by wax myrtle, and covers 50-75% of the wetland. Sedges/grasses and fern grow throughout the wetland, and cover >75% of the basin. A deep ditch drains the south end of the wetland and the wetland shows signs of desiccation. There is evidence of past fire around the wetland edges. The adjacent uplands are pasture created by past grazing. Bahia grass and torpedograss are present in the uplands and appear to have encroached into the wetland as well.

**Wetland Concerns:** Ditching, Invasive species, Upland condition, Woody encroachment

**Restoration Action Recommended:** Fill ditch to restore the wetland hydroperiod. Continue providing regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 85-01**

**Description:** This wetland is a 0.9 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover 50-75% of the basin. There is no midstory cover. Sedges/grasses, rush, and emergent vegetation grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. Old cypress stumps provide evidence that this wetland has been a cypress dome for a long time. The adjacent uplands are pasture created by past grazing. Pasture grasses appear to have encroached into the wetland as well.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Provide regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 86-01**

**Description:** This wetland is a 0.5 ha ephemeral forested swamp. Cypress trees dominate the canopy, and cover >75% of the basin. The midstory is dominated by wax myrtle, and covers 5-25% of the basin. Sedges/grasses, rush, and emergent vegetation grow throughout the wetland. The herbaceous vegetation covers >75% of the basin. Old cypress stumps provide evidence that this wetland has been a cypress dome for a long time. The adjacent uplands are pasture created by past grazing. Pasture grasses appear to have encroached into the wetland as well.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Provide regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 87-01**

**Description:** This wetland is a 0.4 ha ephemeral forested swamp. It appears to be a marsh succeeding to a swamp. Cypress trees dominate the canopy, and cover 25-50% of the basin. There is no midstory cover. Sedges/grasses, rush, and emergent vegetation grow throughout the wetland. The herbaceous vegetation is dense and covers >75% of the basin. The adjacent uplands are pasture created by past grazing. Pasture grasses appear to have encroached into the wetland as well.

**Wetland Concerns:** Invasive species, Upland condition, Woody encroachment

**Restoration Action Recommended:** Provide regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



**Wetland ID: 87-02**

**Description:** This wetland is a 1.2 ha ephemeral forested swamp. Cypress and gum trees dominate the canopy, and cover 25-50% of the basin. The midstory is dominated by wax myrtle, and covers 5-25% of the wetland. A diversity of sedges/grasses, rush, emergent vegetation, and other herbaceous vegetation grow throughout the wetland. The herbaceous vegetation is dense and covers >75% of the basin. At first glance, this wetland appears to be a marsh succeeding to a swamp. However, old cypress stumps provide evidence that this marsh was once a cypress swamp. Therefore, this wetland is returning to its original state as a cypress swamp. The adjacent uplands are pasture created by past grazing. Pasture grasses appear to have encroached into the wetland as well.

**Wetland Concerns:** Invasive species, Upland condition

**Restoration Action Recommended:** Provide regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.

**Wetland ID: 87-03**

**Description:** This wetland is a 1.0 ha ephemeral mixed swamp. It appears to be a marsh succeeding to a swamp. Cypress and maple trees dominate the canopy, and cover 25-50% of the basin. The midstory is dominated by wax myrtle, and covers 25-50% of the wetland. A diversity of sedges/grasses, rush, and emergent vegetation grow throughout the wetland. The herbaceous vegetation is dense and covers >75% of the basin. The adjacent uplands are pasture created by past grazing. Pasture grasses appear to have encroached into the wetland as well.

**Wetland Concerns:** Invasive species, Upland condition, Woody encroachment

**Restoration Action Recommended:** Provide regular fire to the landscape - in order to restore the full ecological function of the wetland, the uplands will need to be restored.



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**Appendix A. Wetland Survey Form.**

Management Area: \_\_\_\_\_ Date: \_\_\_\_\_ Wetland ID: \_\_\_\_\_ Photos: \_\_\_\_\_

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**Wetland Basin Assessment**


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Wetland Type:

☐ Marsh                      ☐ Shrub swamp                      ☐ Forested swamp                      ☐ Mixed swamp  
☐ Altered                      ☐ Other:

Basin area: \_\_\_\_\_

Hydroperiod:    ☐ Highly Ephemeral                      ☐ Ephemeral                      ☐ Semi-Perm

% Canopy Cover:

☐ <5%                      ☐ 5-25%                      ☐ 25-50%                      ☐ 50-75%                      ☐ >75%

Dominant Canopy:

☐ N/A                      ☐ Cypress                      ☐ Gum                      ☐ Pine                      ☐ Cypress/gum  
☐ Holly                      ☐ Cypress/pine                      ☐ Cypress/holly                      ☐ Gum/pine                      ☐ Gum/holly  
☐ Holly/pine                      ☐ Other:

Sub-canopy Cover:

☐ <5%                      ☐ 5-25%                      ☐ 25-50%                      ☐ 50-75%                      ☐ >75%

Dominant Sub-canopy:

☐ N/A                      ☐ Wax Myrtle                      ☐ Willow                      ☐ Titi                      ☐ Buttonbush                      ☐ Fetterbush  
☐ Gallberry                      ☐ Holly                      ☐ Other:

% Herbaceous Cover:

☐ <5%                      ☐ 5-25%                      ☐ 25-50%                      ☐ 50-75%                      ☐ >75%

Dominant Herbaceous Groundcover:

☐ N/A                      ☐ Maidencane                      ☐ Sphagnum                      ☐ Rush                      ☐ Sedge/Grass  
☐ Sawgrass                      ☐ Emergents                      ☐ Fern                      ☐ Redroot                      ☐ Other:

Herbaceous Distribution:

☐ Sparse                      ☐ Ring around edge                      ☐ Scattered patches                      ☐ Throughout                      ☐ Other:

Wetland Restoration Concerns:

☐ Hog damage                      ☐ Logging                      ☐ Slash                      ☐ Ditching                      ☐ Woody Encroachment  
☐ Choked w/herb.                      ☐ Fireline                      ☐ Cattle                      ☐ Invasive Species                      ☐ Push Piles  
☐ Bedding                      ☐ Desiccation                      ☐ Vehicular                      ☐ Other:

Comments:

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**Upland Assessment**


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Surrounding Community Type:

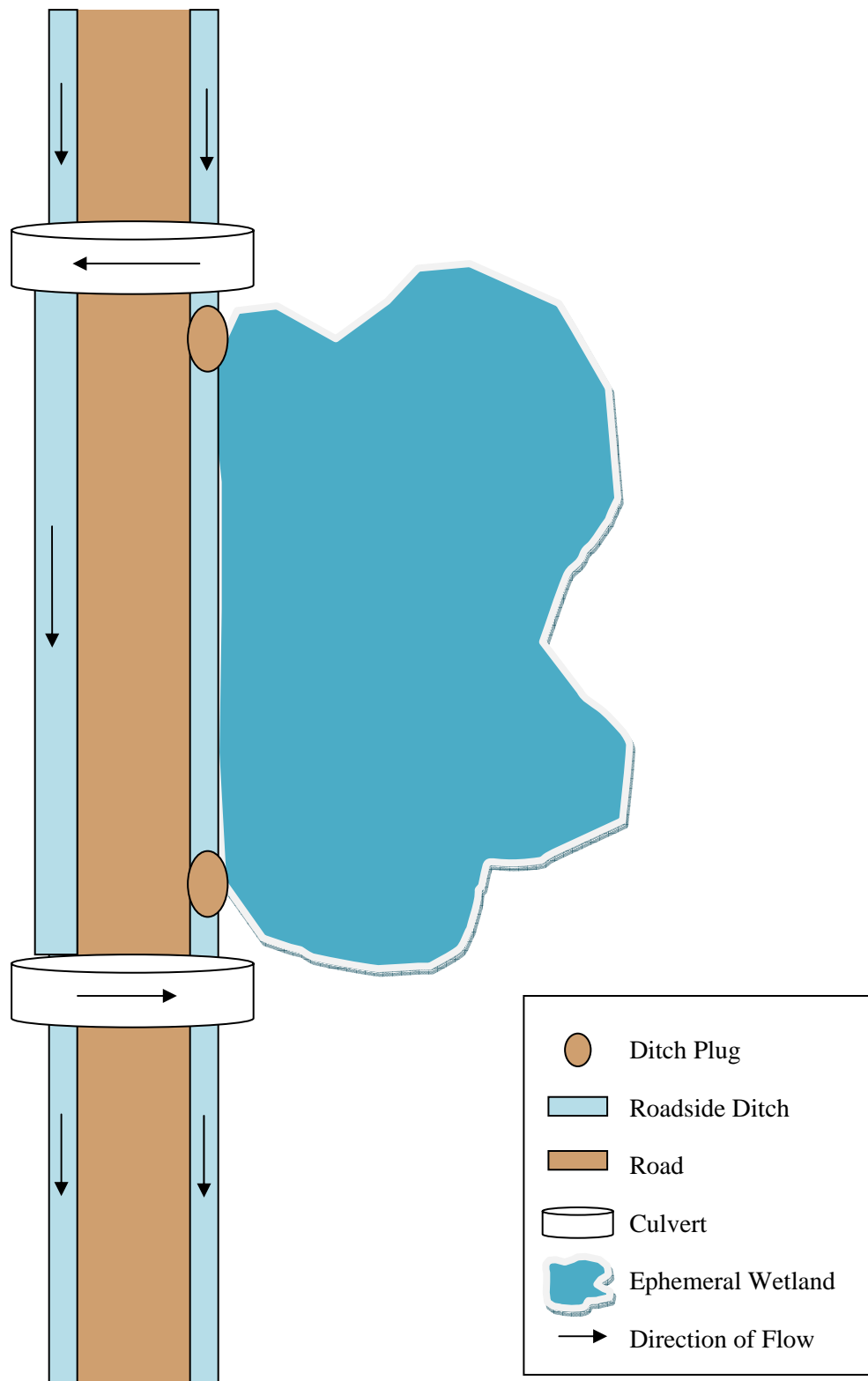
☐ Mesic flatwoods                      ☐ Wet flatwoods                      ☐ Scrubby flatwoods                      ☐ Upland pine forest  
☐ Wet prairie                      ☐ Pasture                      ☐ Old field                      ☐ Sandhill                      ☐ Other:

Upland Condition:

☐ Fire suppressed                      ☐ Has burned                      ☐ Old bedding                      ☐ Pine plantation  
☐ Hog damage                      ☐ Invasive species                      ☐ Grazing                      ☐ Other:

Comments:

**Appendix B.** Suggested method to break connectivity between an ephemeral wetland and tangent roadside ditch. This method is recommended as an experimental approach to restore the hydrology of wetlands connected to permanent ditches.





**Appendix C.** Scientific names of common plants encountered during this project, listed alphabetically by common name.

Bahia grass	<i>Paspalum notatum</i>
Black gum	<i>Nyssa sylvatica</i>
Broomsedge	<i>Andropogon sp.</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Cogongrass	<i>Imperata cylindrica</i>
Cordgrass	<i>Spartina sp.</i>
Corkwood	<i>Leitneria floridana</i>
Dog fennel	<i>Eupatorium capillifolium</i>
Fetterbush	<i>Lyonia lucida</i>
Gallberry	<i>Ilex glabra</i> (short gallberry), <i>Ilex tomentosa</i> (tall gallberry)
Hackberry	<i>Celtis sp.</i>
Japanese climbing fern	<i>Lygodium japonicum.</i>
Laurel oak	<i>Quercus laurifolia</i>
Lizard's tail	<i>Saururus cernuus</i>
Loblolly bay	<i>Gordonia lasianthus</i>
Maidencane	<i>Panicum hemitomon</i>
Muscadine grape	<i>Vitis rotundifolia</i>
Myrtle-leaved holly	<i>Ilex myrtifolia</i>
Persimmon	<i>Diospyros virginiana</i>
Pickernelweed	<i>Pontederia cordata</i>
Pond cypress	<i>Taxodium ascendens</i>
Red bay	<i>Persea borbonia</i>
Redroot	<i>Lachnanthes caroliniana</i>
Sawgrass	<i>Cladium jamaicense</i>
Sand pine	<i>Pinus clausa</i>
Slash pine	<i>Pinus elliottii</i>
Smartweed	<i>Polygonum hydropiperoides</i>
St. Johns wort	<i>Hypericum spp.</i>
Sweet gum	<i>Liquidambar styraciflua</i>
Sweet bay magnolia	<i>Magnolia virginiana</i>
Titi	<i>Cliftonia monophylla</i> (black titi), <i>Cyrilla racemiflora</i> (swamp titi),
Torpedograss	<i>Panicum repens</i>
Wax myrtle	<i>Myrica cerifera</i>