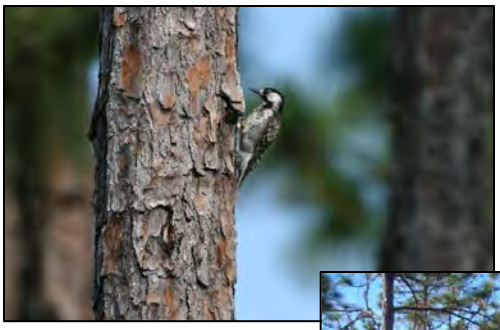
A Management Plan for

Triple N Ranch

Wildlife Management Area

2012 - 2022



Osceola County, Florida

Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, Florida 32399-1600

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Secretary

August 20, 2012

Mr. Gary Cochran
Marathon Building-Koger Center
2574 Seagate Drive, Suite 203
Tallahassee, Florida 32301

RE: Triple N Ranch Wildlife Management Area – Lease # 4226

Dear Mr. Cochran:

The Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the Triple N Ranch Wildlife Management Area land management plan. The next management plan update is due August 20, 2022.

Approval of this land management plan does not waive the authority or jurisdiction of any governmental entity that may have an interest in this project. Implementation of any upland activities proposed by this management plan may require a permit or other authorization from federal and state agencies having regulatory jurisdiction over those particular activities. Pursuant to the conditions of your lease, please forward copies of all permits to this office upon issuance.

Sincerely,

Marianne S. Gengenbach
Office of Environmental Services
Division of State Lands

www.dep.state.fl.us

A Management Plan
for
Triple N Ranch Wildlife Management Area

Osceola County, Florida

Owned by the Board of Trustees of the Internal Improvement Trust Fund
Managed by the Florida Fish and Wildlife Conservation Commission

May 2012

Eric Sutton, Division Director
Division of Habitat and Species Conservation

Florida Fish and Wildlife Conservation Commission | Triple N Ranch WMA Management Plan

LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

Lead Agency: Florida Fish and Wildlife Conservation Commission (FWC)
Common Name of Property: Triple N Ranch Wildlife Management Area (TNRWMA)
Location: Osceola County, Florida
Acreage Total: 16,295 acres
Acreage Breakdown:

Natural Communities	**Acres**		
Mesic Flatwoods	7,988.0	Baygall	206.2
Dome Swamp	2,397.1	Pasture - Semi-improved	91.5
Pasture - Improved	1,149.4	Mesic Hammock	48.8
Wet Prairie	1,050.2	Scrub	42.5
Ruderal	847.4	Clearing/ Regeneration	15.2
Depression Marsh	748.6	Xeric Hammock	5.1
Hydric Hammock	692.3	Artificial Pond	4.5
Dry Prairie	479.1	Canal/ Ditch	1.9
Wet Flatwoods	324.5	Developed	0.5
Scrubby Flatwoods	310.5		

Note: GIS-calculated acreage for land cover classification varies slightly from actual total acreage.

Lease/Management Agreement No.: 4226 (Appendix 13.1)
Use: Single _____
Multiple X

Management Responsibilities:

Agency	Responsibilities
FWC	LEAD, SUBLESSEE (Wildlife Management Area, resource protection, law enforcement)
SJRWMD	Co-owner/ Cooperator (water resources)
FFS	Cooperator (Forestry / fire)
DRP	Cooperator (Recreation and resource preservation)

Designated Land Use: Conservation, Wildlife Management Area.
Sublease (s): None.
Encumbrances: Apiary contract, cattle grazing contract, utility line easement, and housing agreement.
Type Acquisition: Save Our Rivers, Preservation 2000, Florida Forever.
Unique Features: Natural: Mesic flatwoods, dome swamp, depression marsh, dry prairie.
Archaeological/Historical: early American (19th to 20th century) logging road/railroad grade.
Management Needs: Habitat restoration and improvement; public access and recreational opportunities; hydrological preservation and restoration; exotic and invasive species maintenance and control; imperiled species habitat maintenance, enhancement, and restoration.
Acquisition Needs/Acreage: 27,023 acres remaining in the Osceola Pine Savannas Florida Forever Project (Figure 3); 18,218 acres within the TNRWMA FWC Florida Forever Additions and Inholdings List, and some potential additional acreage within the Optimal Conservation Planning Boundary (Figure 8).
Surplus Lands/Acreage: None.
Public Involvement: Management Advisory Group consensus building meeting and Public Hearing (Appendix 13.2).

DO NOT WRITE BELOW THIS LINE (FOR DIVISION OF STATE LANDS USE ONLY)

ARC Approval Date _____ BTIITF Approval Date: _____
Comments: _____

Management Plan Compliance Checklist - Natural Resource Lands	
Requirements	**Page**
18-2.021 Acquisition and Restoration Council.	
1. Executive Summary (Example #1) **This should be included in the packet and should be the first page.**	iii
Management Plans. Plans submitted to the division for ARC review under the requirements of Section 253.034 F.S.should be in a form and manner prescribed by rule by the board and in accordance with the provisions of S. 259.032 and should contain where applicable to the management of resources the following:	
2. The common name of the property.	1
3. A map showing the location and boundaries of the property plus any structures or improvements to the property. (Example #2)	6
4. The legal description and acreage of the property.	1, 101
5. The degree of title interest held by the Board, including reservations and encumbrances such as leases.	3
6. The land acquisition program, if any, under which the property was acquired.	2
7. The designated single use or multiple use management for the property, including other managing agencies.	53
8. Proximity of property to other significant State/local/federal land or water resources. (Example #3) **May be included in the map in item #2.**	3
9. A statement as to whether the property is within an Aquatic Preserve or a designated Area of Critical State Concern or an area under study for such designation. If yes, make sure appropriate managing agencies are notified of the plan.	4
10. The location and description of known and reasonably identifiable renewable and non-renewable resources of the property including, but not limited to, the following:	
A. Brief description of soil types, using U.S.D.A. maps when available;	9, 16
B. Archaeological and historical resources*;	50, 66
C. Water resources including the water quality classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Waters;	49
D. Fish and wildlife and their habitat;	17-48, 57-59
E. State and federally listed endangered or threatened species and their habitat;	27, 29, 17-27
F. Beaches and dunes;	49
G. Swamps, marshes and other wetlands;	17-27, 49
H. Mineral resources, such as oil, gas and phosphate;	16
I. Unique natural features, such as coral reefs, natural springs, caverns, large sinkholes, virgin timber stands, scenic vistas, and natural rivers and streams; and	17-27, 49
J. Outstanding native landscapes containing relatively unaltered flora, fauna, and geological conditions.	49
11. A description of actions the agency plans , to locate and identify unknown resources such as surveys of unkhnown archeological and historical resources.	53, 54, 66
12. The identification of resources on the property that are listed in the Florida Natural Areas Inventory. *Include letter from FNAI or consultant, where appropriate.*	11, 28, 48
13. A description of past uses, including any unauthorized uses of the property. (Example #4)	51
14. A detailed description of existing and planned use(s) of the property. (Example #5)	54-88
15. A description of alternative or multiple uses of the property considered by the managing agency and an explanation of why such uses were not adopted.	53
16. A detailed assessment of the impact of planned uses on the renewable and non-renewable resources of the property and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to mitigate damage caused by such uses.	54
17. A description of management needs and problems for the property.	54-88, 89
18. Identification of adjacent land uses that conflict with the planned use of the property, if any.	64, 66, 89, 299
19. A description of legislative or executive directives that constrain the use of such property.	3
20. A finding regarding whether each planned use complies with the State Lands Management Plan adopted by the Trustees on March 17, 1981, and incorporated herein by reference, particularly whether such uses represent "balanced public utilization", specific agency statutory authority, and other legislative or executive	53, 54, 97
21. An assessment as to whether the property, or any portion, should be declared surplus.	54
22. Identification of other parcels of land within or immediately adjacent to the property that should be purchased because they are essential to management of the property. **Clearly defined map of parcels can be used.**	13, 66-68
23. A description of the management responsibilities of each agency and how such responsibilities will be coordinated, including a provision that requires that the managing agency consult with the Division of Historical Resources before taking actions that may adversely affect archaeological or historic resources. (Example #6)	50, 66, 68, 74
24. A statement concerning the extent of public involvement and local government participation in the development of the plan, if any, including a summary of comments and concerns expressed. (Example #7)	14
Additional Requirements—Per Trustees	
25. Letter of Compliance of the management plan with the Local Government Comprehensive Plan. Letter from local government saying that the plan is in compliance with local government's comprehensive plan. Management Plan Compliance Checklist - Conservation Lands.xlsx	403

Management Plan Compliance Checklist - Natural Resource Lands	
Requirements	**Page**
253.034 State-Owned Lands; Uses. —Each entity managing conservation lands shall submit to the Division of State Lands a land management plan at least every 10 years in a form and manner prescribed by rule by the Board.	
26. All management plans, whether for single-use or multiple-use properties, shall specifically describe how the managing entity plans to identify, locate, protect and preserve, or otherwise use fragile nonrenewable resources, such as archaeological and historic sites, as well as other fragile resources, including endangered plant and animal species.	54-88
27. The management plan shall provide for the conservation of soil and water resources and for the control and prevention of soil erosion.	49-50, 68
28. Land management plans submitted by an entity shall include reference to appropriate statutory authority for such use or uses and shall conform to the appropriate polices and guidelines of the state land management plan.	2,53
29. All land management plans for parcels larger than 1,000 acres shall contain an analysis of the multiple-use potential of the parcel, which analysis shall include the potential of the parcel to generate revenues to enhance the management of the parcel.	53
30. Additionally, the land management plan shall contain an analysis of the potential use of private managers to facilitate the restoration or management of these lands.	91
31. A physical description of the land.	1, 15, 17-27
32. A desired outcome	54-88
33. A quantitative data description of the land which includes an inventory of forest and other natural resources; exotic and invasive plants; hydrological features; infrastructure, including recreational facilities; and other significant land, cultural, or historical features.	54-88
34. A detailed description of each short-term and long-term land management goal, the associated measurable objectives, and the related activities that are to be performed to meet the land management objectives. Each land management objective must be addressed by the land management plan, and where practicable, no land management objective shall be performed to the detriment of the other land management activities.	68-75
35. A schedule of land management activities which contains short-term and long-term land management goals and the related measurable objectives and activities. The schedule shall include for each activity a timeline for completion, quantitative measures, and detailed expense and manpower budgets. The schedule shall provide a management tool that facilitates development of performance measures.	68-88
36. A summary budget for the scheduled land management activities of the land management plan. For state lands containing or anticipated to contain imperiled species habitat, the summary budget shall include any fees anticipated from public or private entities for projects to offset adverse impacts to imperiled species or such habitats, which fees shall be used solely to restore, manage, enhance, repopulate, or acquire imperiled species habitat. The summary budget shall be prepared in such a manner that it facilitates computing an aggregate of land management costs for all state-managed lands using the categories described in s. 259.037(3).	89-91
37. Each management plan shall describe both short-term and long-term management goals, and include measurable objectives to achieve those goals. *Short-term and long-term management goals shall include measurable objectives for the following, as appropriate: (A) Habitat restoration and improvement;*	69
(B) Public access and recreational opportunities;	71
(C) Hydrological preservation and restoration;	72
(D) Sustainable forest management;	72
(E) Exotic and invasive species maintenance and control;	73
(F) Capital facilities and infrastructure;	73
(G) Cultural and historical resources;	74
(H) Imperiled species habitat maintenance, enhancement, restoration, or population restoration	69
253.036 Forest Management. —	
38. For all land management plans for parcels larger than 1,000 acres, the lead agency shall prepare the analysis, which shall contain a component or section prepared by a qualified professional forester which assesses the feasibility of managing timber resources on the parcel for resource conservation and revenue generation purposes through a stewardship ethic that embraces sustainable forest management practices if the lead management agency determines that the timber resource management is not in conflict with the primary management objectives of the parcel. (Example #8)	28, 64
259.032 Conservation And Recreation Lands Trust Fund; Purpose. —	

Management Plan Compliance Checklist - Natural Resource Lands	
Requirements	**Page**
(10)(a) State, regional or local governmental agencies or private entities designated to manage lands under this section shall develop and adopt, with the approval of the Board of Trustees, an individual management plan for each project designed to conserve and protect such lands and their associated natural resources. Private sector involvement in management plan development may be used to expedite the planning process.	
39. Individual management plans required by s. 259.032(10)(b), for parcels over 160 acres, shall be developed with input from an advisory group - **Management plan should list advisory group members and affiliations.**	14, 177
40. The advisory group shall conduct at least one public hearing **in each** county in which the parcel or project is located. **Managing agency should provide DSL/OES with documentation showing date and location of public hearing**.	183-215
41. Notice of such public hearing shall be posted on the parcel or project designated for management, advertised in a paper of general circulation, and announced at a scheduled meeting of the local governing body before the actual public hearing. **Managing agency should provide DSL/OES with copy of notice.**	183
42. The management prospectus required pursuant to 259.032 (9)(d) shall be available to the public for a period of 30 days prior to the public hearing.	216
43. Summary of Advisory Group Meeting should be provided to DSL/OES.	177
44. Individual management plans shall conform to the appropriate policies and guidelines of the state land management plan and shall include, but not be limited to:	
A. A statement of the purpose for which the lands were acquired, the projected use or uses as defined in s. 253.034, and the statutory authority for such use or	2
B. Key management activities necessary to **achieve the desired outcomes, including, but not limited to, providing public access,** preserving and protecting natural resources, **protecting cultural and historical resources,** restoring habitat, **protecting threatened and endangered species,** controlling the spread of nonnative plants and animals, performing prescribed fire activities, and other appropriate resource management activities.	54-88
C. A specific description of how the managing agency plans to identify, locate, protect, and preserve, or otherwise use fragile, nonrenewable natural and cultural resources.	54-88
D. A priority schedule for conducting management activities, based on the purposes for which the lands were acquired. (Example #10) **The schedule must include a goal, an objective, and a time frame for completion.**	54-88
E. A cost estimate for conducting priority management activities, to include recommendations for cost-effective methods of accomplishing those activities. *Using categories as adopted pursuant to 259.037, F.S., is suggested. These are: (1) Resource Management; (2) Administration; (3) Support; (4) Capital Improvements; (5) Visitor Services/Recreation; and (6) Law Enforcement.*	89-91
F. A cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired. The cost estimate shall include recommendations for cost-effective methods of accomplishing those activities. *Using categories as adopted pursuant to 259.037, F.S., is suggested. These are: (1) Resource Management; (2) Administration; (3) Support; (4) Capital Improvements; (5) Visitor Services/Recreation; and (6) Law Enforcement.(Example #10)* ***Include approximate monetary cost and cost effective methods. Can be placed in the appendix.***	89-91
45. A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	53
259.036 Management Review Teams.—	
46. The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan. ***Can be addressed in the body of the plan or addressed in an appendix. If not in agreement, the managing agency should reply in a statement in the appendix.***	54, 266
Other Requirements	
47. This checklist table at front of plan (pursuant to request of ARC and consensus agreement of managing agencies.)	
48. Accomplishments (implementation) from last plan (format variable by agency)	93-97
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1 Introduction and General Information

Adjacent to the small town of Holopaw in Osceola County, the 16,295-acre Triple N Ranch Wildlife Management Area (TNRWMA) is an excellent example of native pine-palmetto flatwoods scattered with wet and dry prairie, cypress domes, oak hammocks, and oak scrub. This rich tapestry of natural areas provides important habitat for a diverse assemblage of imperiled and common wildlife species.

Scenic Crabgrass Creek, a tributary of the St. Johns River, snakes across the area. On TNRWMA limited hunting increases your chances of harvesting a mature deer or Osceola turkey. A network of well-maintained and marked roads provides ample opportunities for hiking, wildlife viewing, bicycling, and horseback riding.

The TNRWMA is managed by the Florida Fish and Wildlife Conservation Commission (FWC) in cooperation with the St. Johns River Water Management District (SJRWMD) for the conservation and protection of fish and wildlife habitat and fish and wildlife-based public outdoor recreation. A wide range of operational and resource management actions are conducted on TNRWMA each year including prescribed burning; wildlife habitat restoration and improvement; exotic invasive species maintenance and control; road repairs and maintenance; imperiled species management, monitoring, and protection; facilities and infrastructure maintenance and repair; conservation acquisition and stewardship activities; archeological and historic resources monitoring and protection; and research related activities.

The following management plan is submitted for review to the Board of Trustees of the Internal Improvement Trust Fund (BOT) of the State of Florida through the Florida Department of Environmental Protection's (DEP) Division of State Lands (DSL), in compliance with paragraph seven of Lease No. 4226 (Appendix 13.1) and pursuant to Chapters 253 and 259, Florida Statutes (FS), and Chapters 18-2 and 18-4, Florida Administrative Code (FAC). The format and content were drafted in accordance with Acquisition and Restoration Council (ARC) requirements for management plans and the model plan outline provided by the staff of DSL.

1.1 Location

TNRWMA is in Osceola County, Florida, as depicted in Figure 1. As explained in Section 1.2, SJRWMD is a co-owner of a substantial portion of TNRWMA (Figure 2).

TNRWMA lies in the southern half of Osceola County, east of U.S. Highway 441 and south of U.S. Highway 192. TNRWMA comprises multiple sections in Township 27 South, Ranges 32 and 33 East and multiple sections in Township 28 South, Range 33 East. TNRWMA is located approximately one mile southeast of Holopaw, 11 miles north of Kenansville, and 15 miles southeast of St. Cloud.

Other cities near TNRWMA include Melbourne (22 miles east) in Brevard County, Kissimmee (23 miles northwest) in Osceola County, Haines City (33 miles west) in Polk County, and Orlando (34 miles northwest) in Orange County.

TNRWMA is bordered on the east by the Herky Huffman/Bull Creek Wildlife Management Area (HHBCWMA), a public wildlife management area that is also managed by FWC. To the north of TNRWMA lies a large portion of Deseret Ranch, a privately owned ranch that produces agricultural products including citrus, timber, and cattle. Immediately northwest of TNRWMA and southeast of the U.S. Highway 192 and U.S. Highway 441 intersection lies residential development in the community of Holopaw. Immediately west of TNRWMA and on the west side of U.S. Highway 441 lie privately owned agricultural land, primarily citrus groves. Adjacent to TNRWMA to the south is the Broussard Crescent J Conservation Easement. This 1,430 acre conservation easement within the Osceola Pine Savannas Florida Forever Project is held by the State of Florida and monitored by DEP. Immediately south of the Broussard Crescent J Conservation Easement lies Forever Florida, a private conservation area owned and managed by the Allen Broussard Conservancy totaling over 3,000 acres. These privately owned and managed conservation lands provide eco-tourism opportunities, conserve important natural resources and aid in landscape conservation connectivity in this area. Beyond this area to the south lie privately owned ranchlands.

The majority of TNRWMA is within the boundaries of the Osceola Pine Savannas Florida Forever project. Situated between TNRWMA and HHBCWMA lies the Kaschai Conservation Easement, an approximately 37 acre conservation easement held and monitored by the SJRWMD. Approximately 1.5 miles southwest of TNRWMA is the Whaley Conservation Easement, held by the State of Florida on approximately 3,710 acres of land, within the Big Bend Swamp/Holopaw Ranch Florida Forever Project. DEP monitors this easement. Within four miles southwest of TNRWMA lies the Three Lakes Wildlife Management Area (TLWMA), a public wildlife management area that is also managed by FWC.

1.2 Acquisition

The first purchase of TNRWMA was accomplished in November 1994 from the Maury L. Carter Trust III, Maury L. Carter Trust II, and the Hilltop Trust. This 8,893 acre tract was acquired by FWC and SJRWMD using Save Our Rivers funds partly appropriated to the SJRWMD from Preservation 2000 Land Acquisition Program (P-2000) bonds, and funds appropriated to FWC as its share of the P-2000 Inholdings and Additions Acquisition Program funding provided from P-2000 bond series. The tract lies completely within the SJRWMD and was established by FWC in July, 1995 as TNRWMA.

In 1996, the management boundary between TNRWMA and HHBCWMA was adjusted, resulting in a net decrease of approximately 1,279 managed acres in TNRWMA and a corresponding increase in managed acres at HHBCWMA. Also in 1996, the 1,366 acre Carter tract, which lies within the South Florida Water Management District (SFWMD),

was acquired by FWC utilizing P-2000 funds. Additionally, using P-2000 funds, FWC acquired the 1,915 acre McNamara tract in 1997, the 3,594 acre Equitable tract in 2000, and the 903 acre Yates tracts in 2000. In 2006, FWC acquired the 904 acre Vanosdol tract utilizing Florida Forever funds. All TNRWMA acquisitions, except the Carter tract, lie within the SJRWMD.

1.3 Management Authority

FWC's designation as the lead managing agency for TNRWMA is established under the authority granted by Lease Number 4226 from the DSL, as staff to the BOT. Further management authority derives from Article IV, Section 9 of the Florida Constitution as well as the guidance and directives of Chapters 253, 259, 327, 370, 372, 373, 375, 378, 403, 487, 597, and 870 of the FS. These laws provide FWC the authority to protect, conserve, and manage the State's fish and wildlife resources.

1.4 Management Directives

The 50-year BOT lease agreement directs FWC to "manage the leased premises only for the conservation and protection of natural and historical resources and resource-based, public outdoor recreation which is compatible with the conservation and protection of these public lands, as set forth in subsection 253.023(11), FS..." The lease agreement further directs FWC to "implement applicable Best Management Practices for all activities under this lease in compliance with paragraph 18-2.018(2)(h), FAC, which have been selected, developed, or approved by lessor, lessee, or other land managing agencies for the protection and enhancement of the leased premises."

1.5 Title Interest and Encumbrances

TNRWMA is owned by the citizens of the State of Florida. Under the Acquisition Agreement for TNRWMA, approved by FWC, SJRWMD, and the BOT on November 1, 1994, FWC and the SJRWMD jointly acquired 8,893 acres in the initial TNRWMA acquisition. However, as noted above, 1,279 acres of that original acquisition was transferred for management to the HHBCWMA, leaving 7,614 acres net acres from the original acquisition to be managed as TNRWMA. Title to lands acquired in the original TNRWMA acquisition jointly acquired by FWC and the SJRWMD is vested equally in the BOT and the SJRWMD, with each holding an undivided 50% interest in fee title to the land. Title to approximately 8,681 acres of land within TNRWMA that were acquired subsequent to the initial joint acquisition with the SJRWMD is vested solely with the BOT.

Currently, there is one apiary contract on TNRWMA. There is also a cattle grazing contract, utility line easement, and housing agreement. Details of those contracts are outlined in Appendix 13.1.

1.6 Proximity to Other Public Properties

TNRWMA is in the vicinity of a large number of publicly owned conservation areas. Table 1 list the conservation lands within a 20-mile radius of TNRWMA, which includes lands

managed by public and private entities to conserve cultural and natural resources within this region of central Florida and is also displayed in Figure 3. The configurations, locations, and proximities among habitats within and among these lands managed for conservation are important to conservation of the many endemic and rare species within this region of Florida.

Most of the public conservation lands in Table 1 are owned in full fee by a public entity. However, some of these conservation lands are protected by less-than-fee conservation easements consisting primarily of private owned and managed land with a public or private entity holding and monitoring a conservation easement. Conservation easements may be held by either public agencies or private entities, while the landowner who sells or otherwise grants the easement retains the remaining fee title interests. TNRWMA is not located within any Area of Critical State Concern (Chapter 380.05, FS).

Table 1. Conservation Lands in Proximity to TNRWMA.

United States Federal Government	Managing Agency
Malabar Transmitter Annex	DOD-AF

State of Florida	Managing Agency
Adams Ranch Conservation Easement	DACS-FFS
Holopaw State Forest	DACS-FFS
Lake Wales Ridge State Forest	DACS-FFS
Lake Kissimmee State Park	DEP-DRP
Brahma Island Conservation Easement	DEP-DSL
Broussard Conservation Easement	DEP-DSL
Whaley Conservation Easement	DEP-DSL
Herky Huffman/ Bull Creek Wildlife Management Area	FWC
Split Oak Forest Wildlife and Environmental Area	FWC
T. M. Goodwin Waterfowl Management Area	FWC
Three Lakes Wildlife Management Area	FWC
Tosohatchee Wildlife Management Area	FWC

Water Management District	Managing Agency
Kissimmee Chain of Lakes	SFWMD
Kissimmee River	SFWMD
Blue Cypress Conservation Area	SJRWMD
Canaveral Marshes Conservation Area	SJRWMD
Escape Ranch Conservation Easement	SJRWMD
Far Reach Ranch Conservation Easement	SJRWMD
Jane Green Creek Less-than-fee Easement Additions	SJRWMD

Water Management District	Managing Agency
Kaschai Conservation Easement	SJRWMD
Kempfer Property Conservation Easement	SJRWMD
Kempfer Property Flowage Easement	SJRWMD
Mills Ranch Conservation Easement	SJRWMD
River Lakes Conservation Area	SJRWMD
South Region Mitigation Archipelago	SJRWMD
Three Forks Conservation Area	SJRWMD
Wadsworth-Greenbaum Conservation Easement	SJRWMD
Willowbrook Conservation Easement	SJRWMD
Wolf Creek Ranch Conservation Easement	SJRWMD

Local Government	Managing Agency
Erna Nixon Park	Brevard County
Eagles Roost	Orange County
Henson Tract	Orange County
Isle of Pine Preserve	Orange County
Moss Park	Orange County
TM Ranch Mitigation Bank	Orange County
Lake Lizzie Conservation Area	Osceola County
Lake Runnymede Conservation Area	Osceola County
Lonesome Camp Ranch Conservation Area	Osceola County
Twin Oaks	Osceola County

US Charitable Environmental Organization	
Disney Wilderness Preserve	TNC
Bombing Range Ridge Conservation Easement	TNC

Acronym Key	**Agency Name**
DACS-FFS	Florida Department of Agriculture and Consumer Services, Florida Forest Service
DEP-DRP	Florida Department of Environmental Protection, Division of Recreation and Parks
DEP-DSL	Florida Department of Environmental Protection, Division of State Lands
DOD-AF	United States Department of Defense, Air Force
FWC	Florida Fish and Wildlife Conservation Commission
SFWMD	South Florida Water Management District
SJRWMD	St. Johns River Water Management District
TNC	The Nature Conservancy

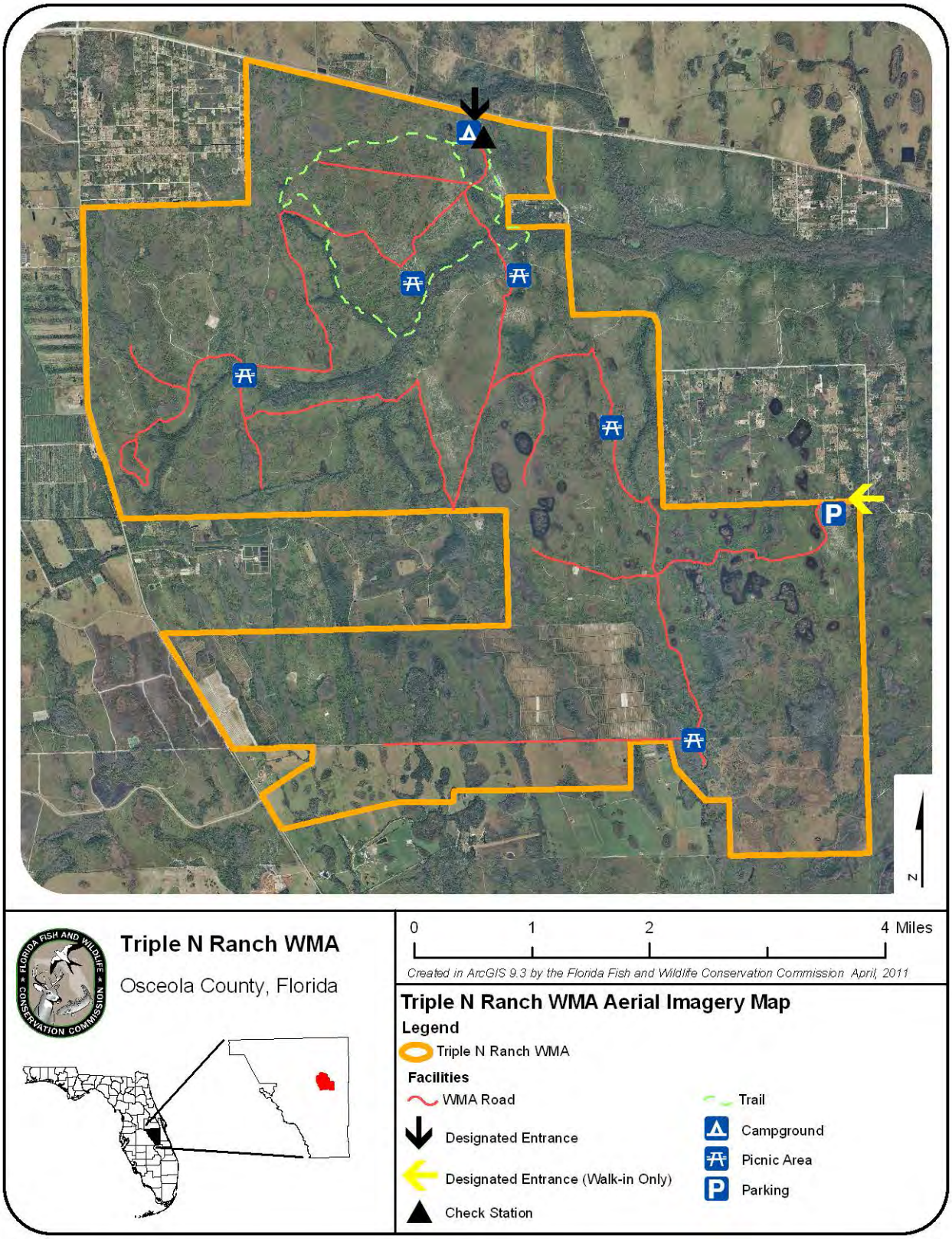


Figure 1. Basemap.

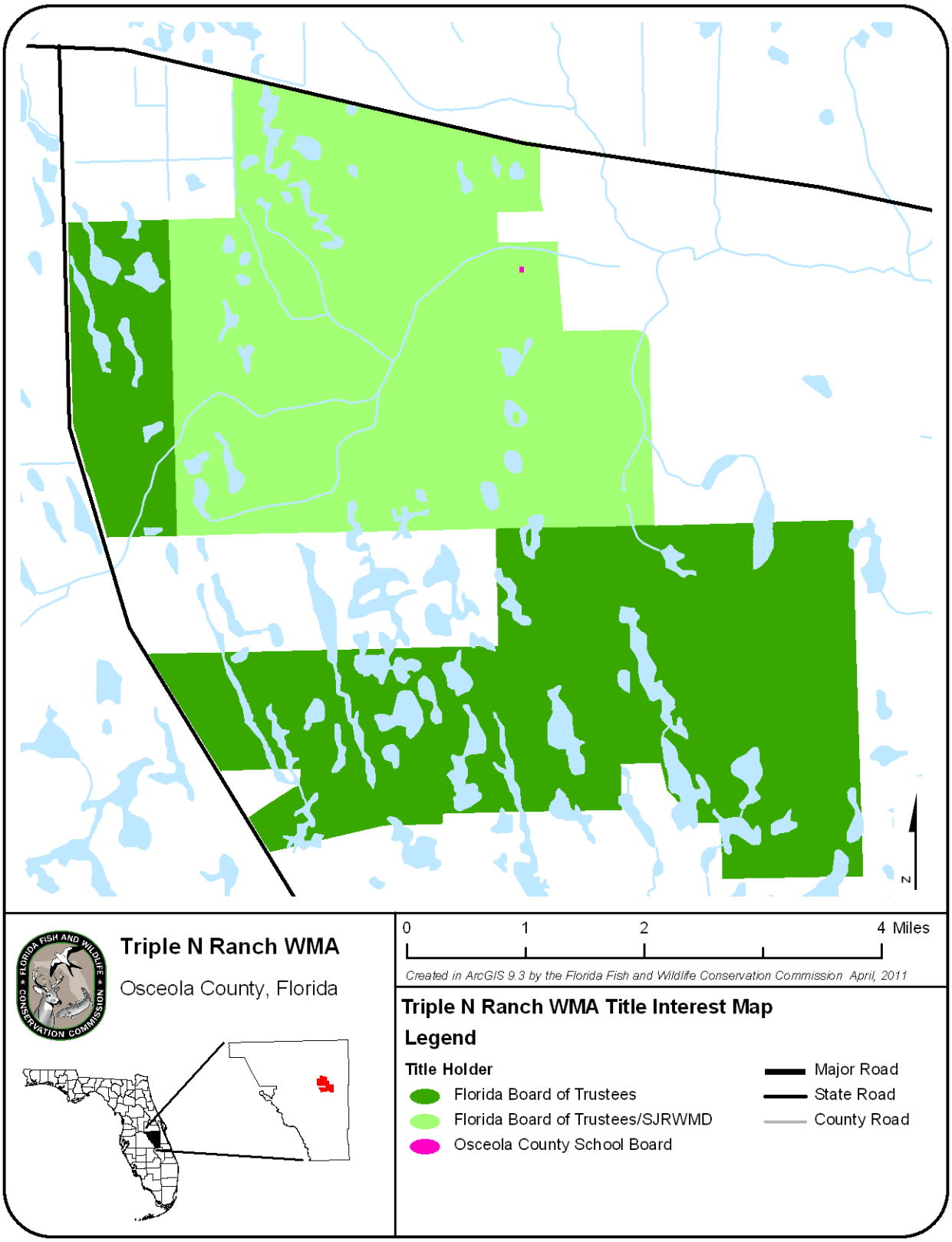
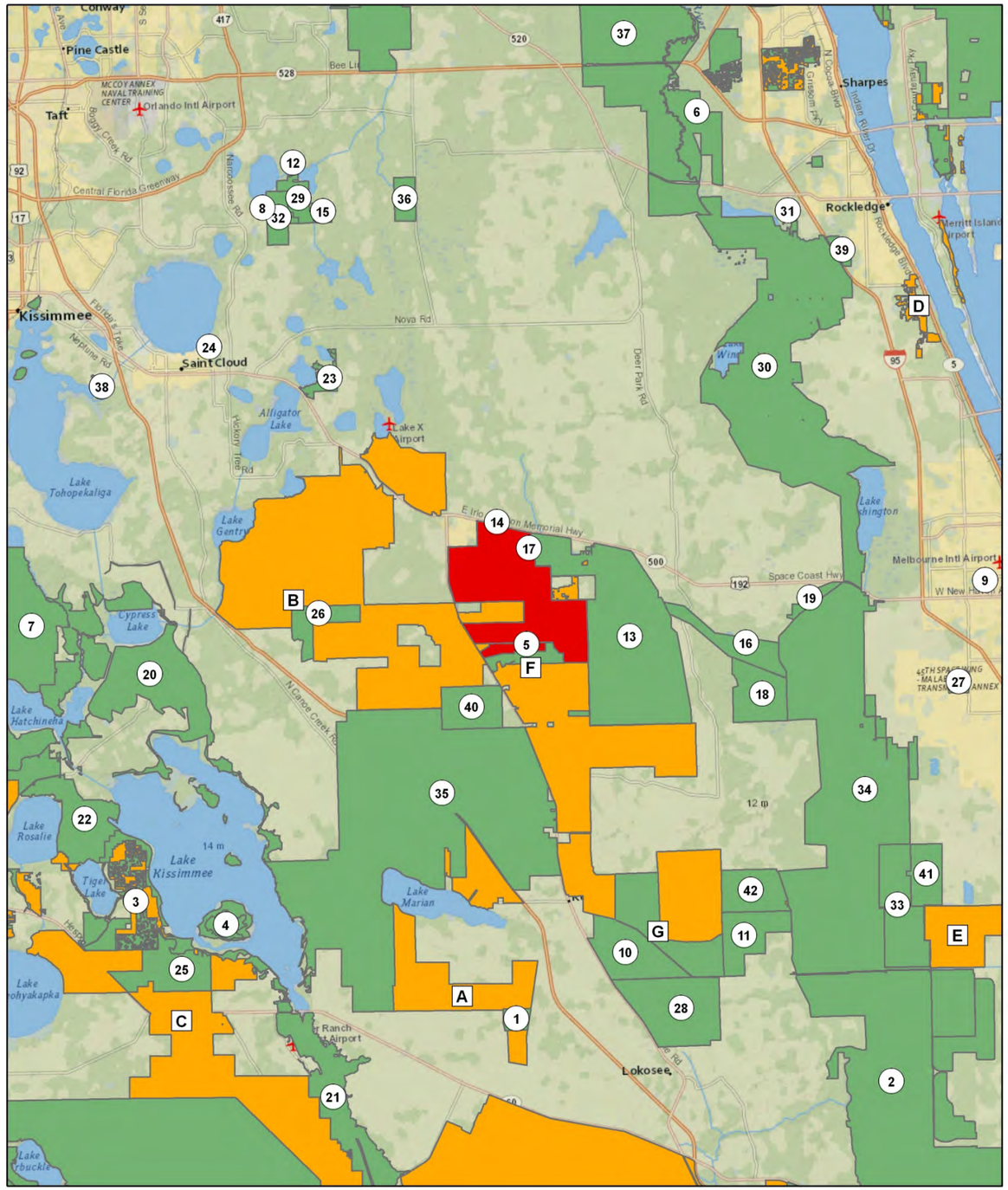


Figure 2. Title Interest.



Conservation Lands and Florida Forever Projects within a 20-mile Radius of Triple N Ranch WMA

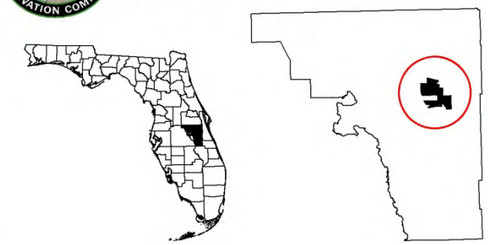
Conservation Lands	Map Label
Adams Ranch Conservation Easement	1
Blue Cypress Conservation Area	2
Bombing Range Ridge/TNC Conservation Easement	3
Brahma Island Conservation Easement	4
Broussard Conservation Easement	5
Canaveral Marshes Conservation Area	6
Disney Wilderness Preserve	7
Eagles Roost	8
Erna Nixon Park	9
Escape Ranch Conservation Easement	10
Far Reach Ranch Conservation Easement	11
Henson Tract	12
Herky Huffman/Bull Creek Wildlife Management Area	13
Holopaw State Forest	14
Isle of Pine Preserve	15
Jane Green Creek Less-than-fee Easement Additions	16
Kaschai Conservation Easement	17
Kempfer Property Conservation Easement	18
Kempfer Property Flowage Easement	19
Kissimmee Chain of Lakes	20
Kissimmee River	21
Lake Kissimmee State Park	22
Lake Lizzie Conservation Area	23
Lake Runnymede Conservation Area	24
Lake Wales Ridge State Forest	25
Lonesome Camp Ranch Conservation Area	26
Malabar Transmitter Annex	27
Mills Ranch Conservation Easement	28
Moss Park	29
River Lakes Conservation Area	30
South Region Mitigation Archipelago	31
Split Oak Forest Mitigation Park Wildlife and Environmental Area	32
T. M. Goodwin Waterfowl Management Area	33
Three Forks Conservation Area	34
Three Lakes Wildlife Management Area	35
TM Ranch Mitigation Bank	36
Tosohatchee Wildlife Management Area	37
Twin Oaks	38
Wadsworth-Greenbaum Conservation Easement	39
Whaley Conservation Easement	40
Willowbrook Conservation Easement	41
Wolf Creek Ranch Conservation Easement	42

Florida Forever Projects	Map Label
Adams Ranch	A
Big Bend Swamp/Holopaw Ranch	B
Bombing Range Ridge	C
Brevard Coastal Scrub Ecosystem	D
Brevard Coastal Scrub Ecosystem	E
Osceola Pine Savannas	F
Ranch Reserve	G

N

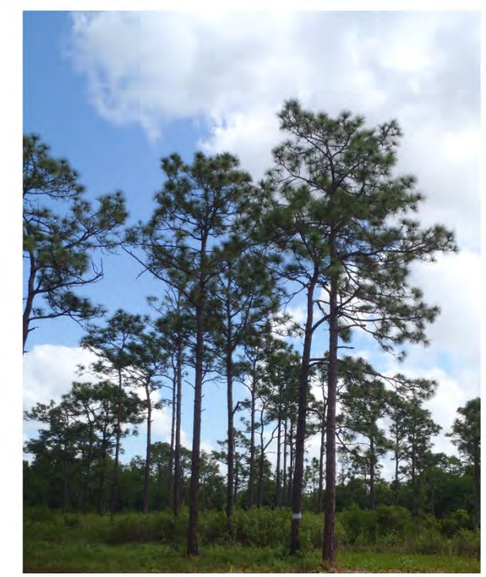
Triple N Ranch Wildlife Management Area

Osceola County, Florida
~16,295 Acres



Legend

- Triple N Ranch WMA
- Conservation Land
- Florida Forever Project



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Created in ArcGIS 9.3 by the Florida Fish and Wildlife Conservation Commission April 2012

Figure 3. Conservation Lands and Florida Forever Projects.

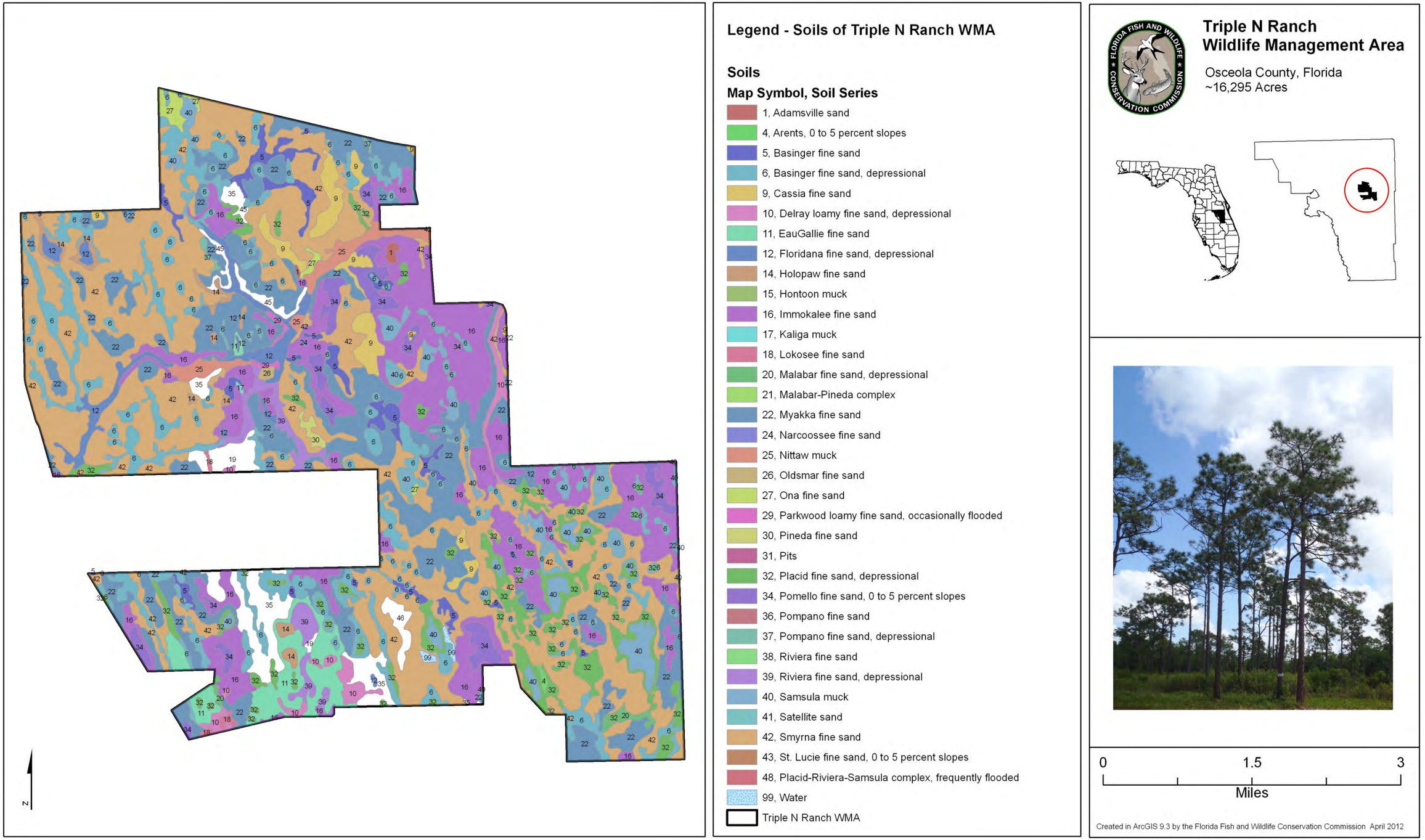


Figure 4. Soils of TNRWMA.

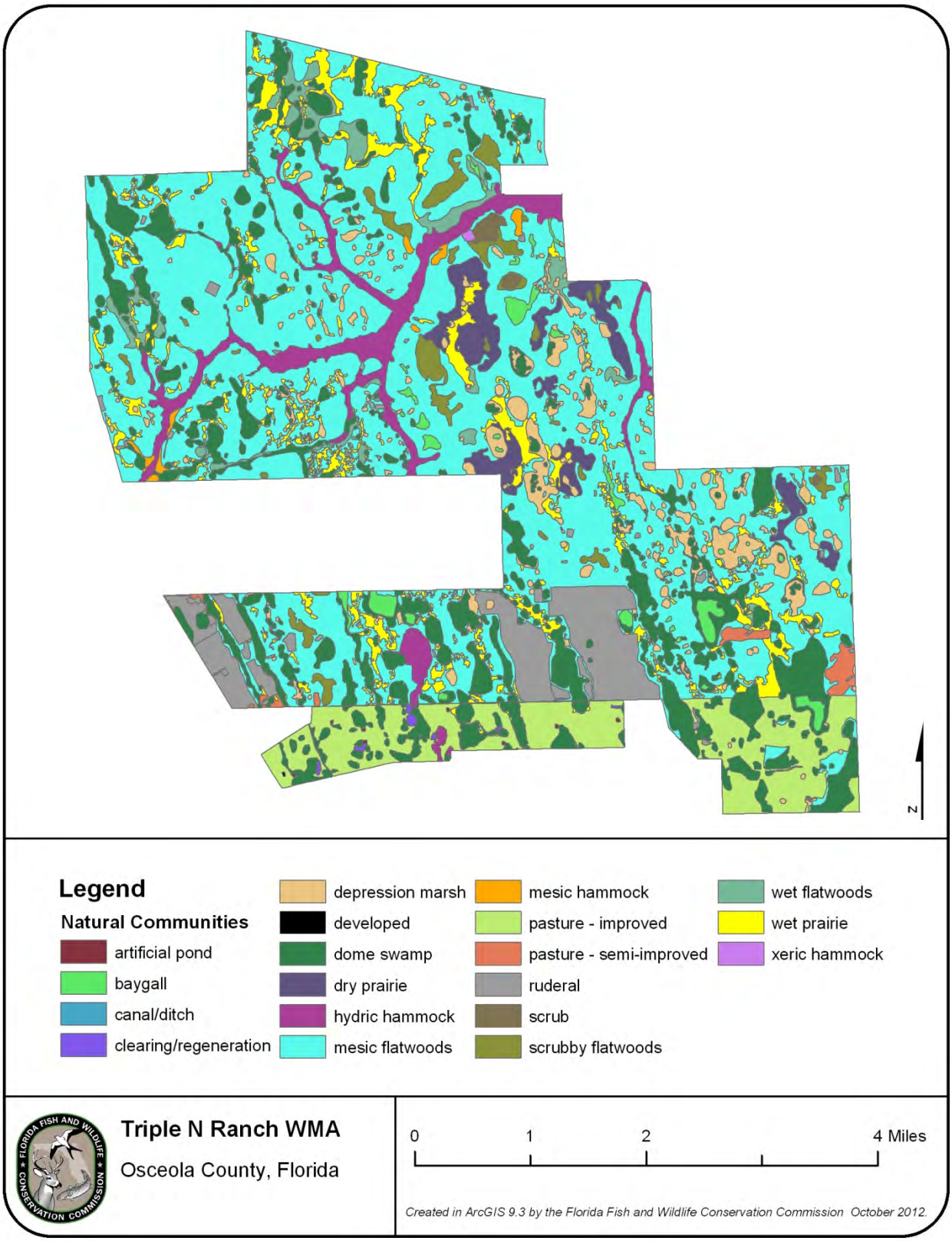


Figure 5. Natural Communities.

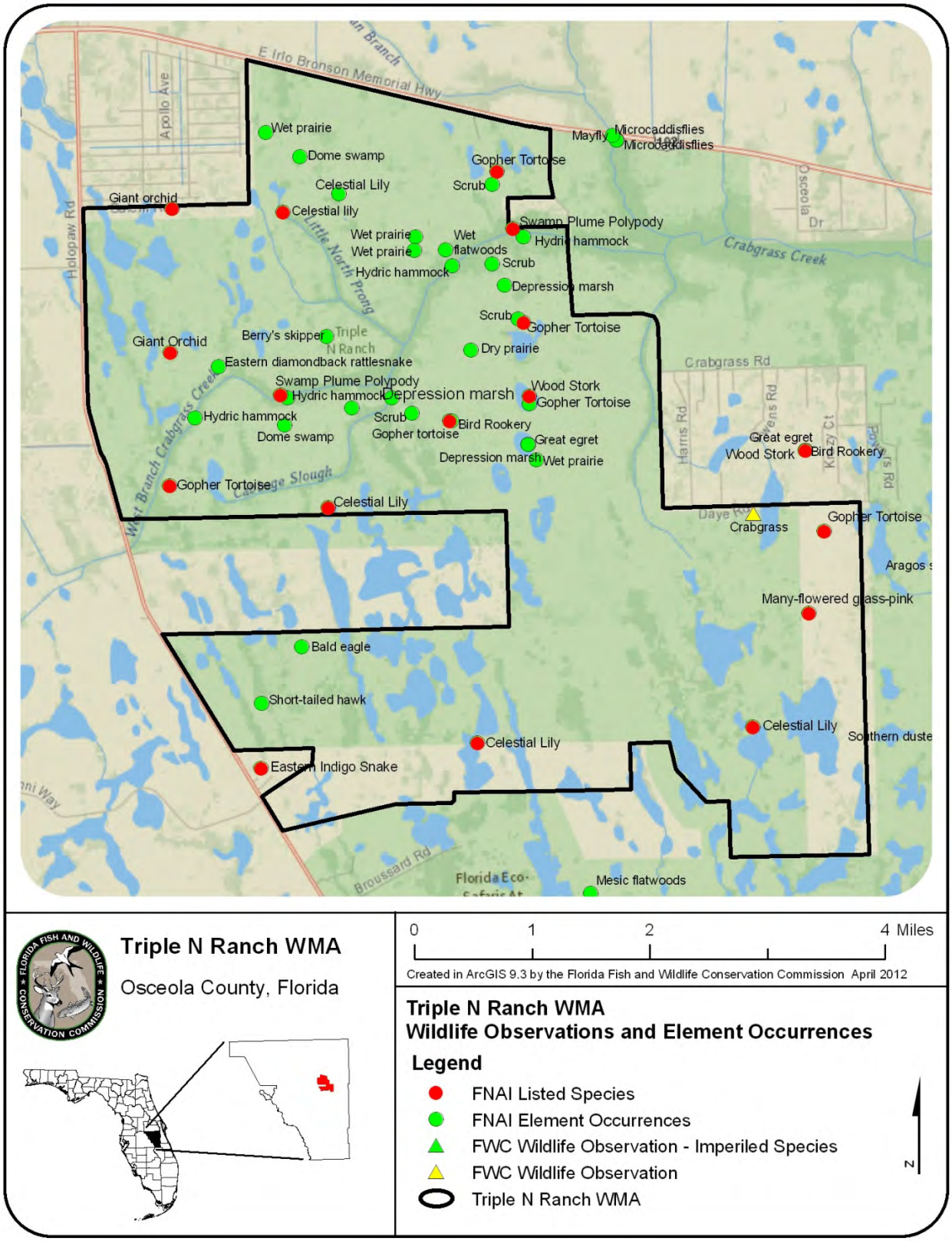


Figure 6. Element Occurrences and Wildlife Observations.

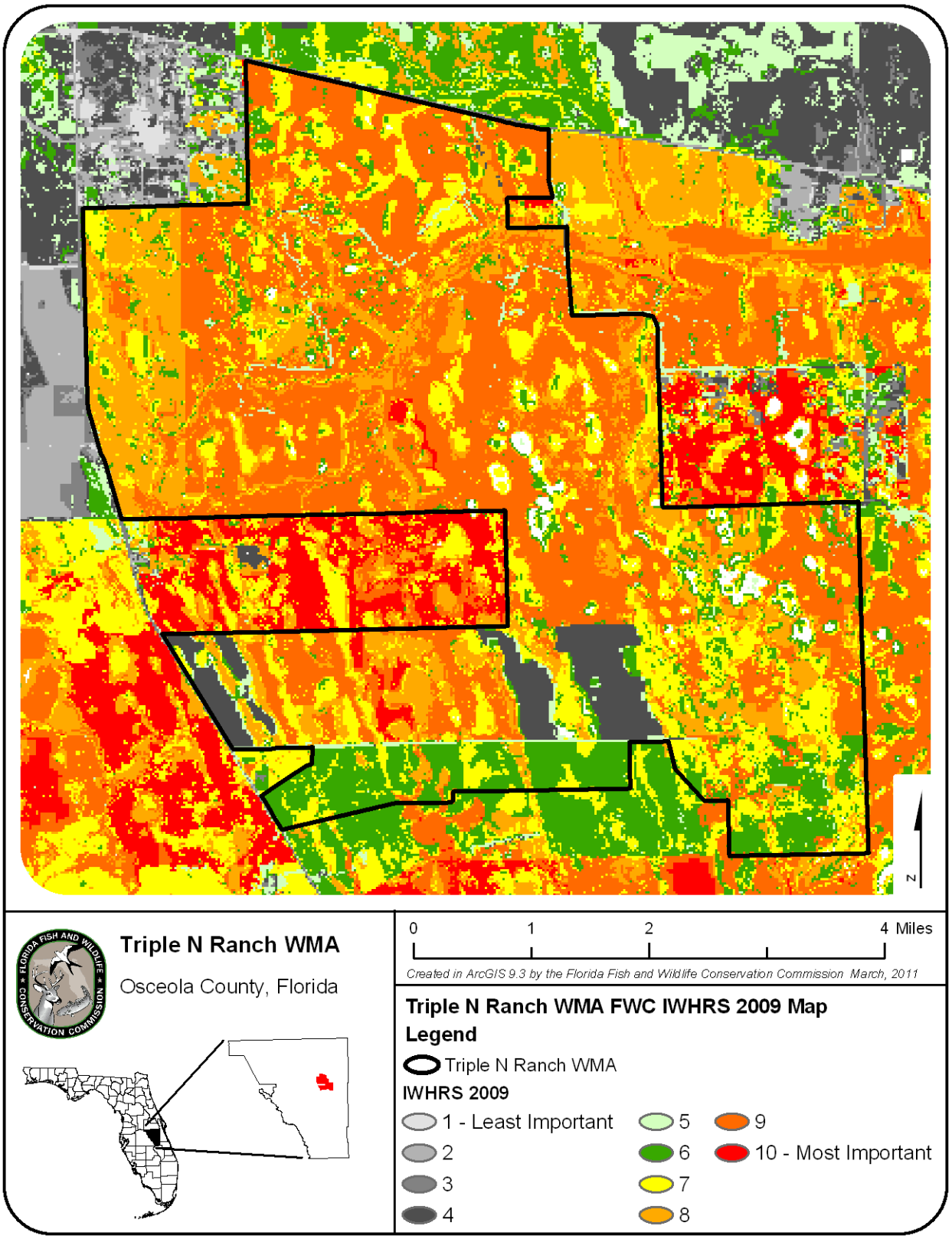


Figure 7. Integrated Wildlife Habitat Ranking System.

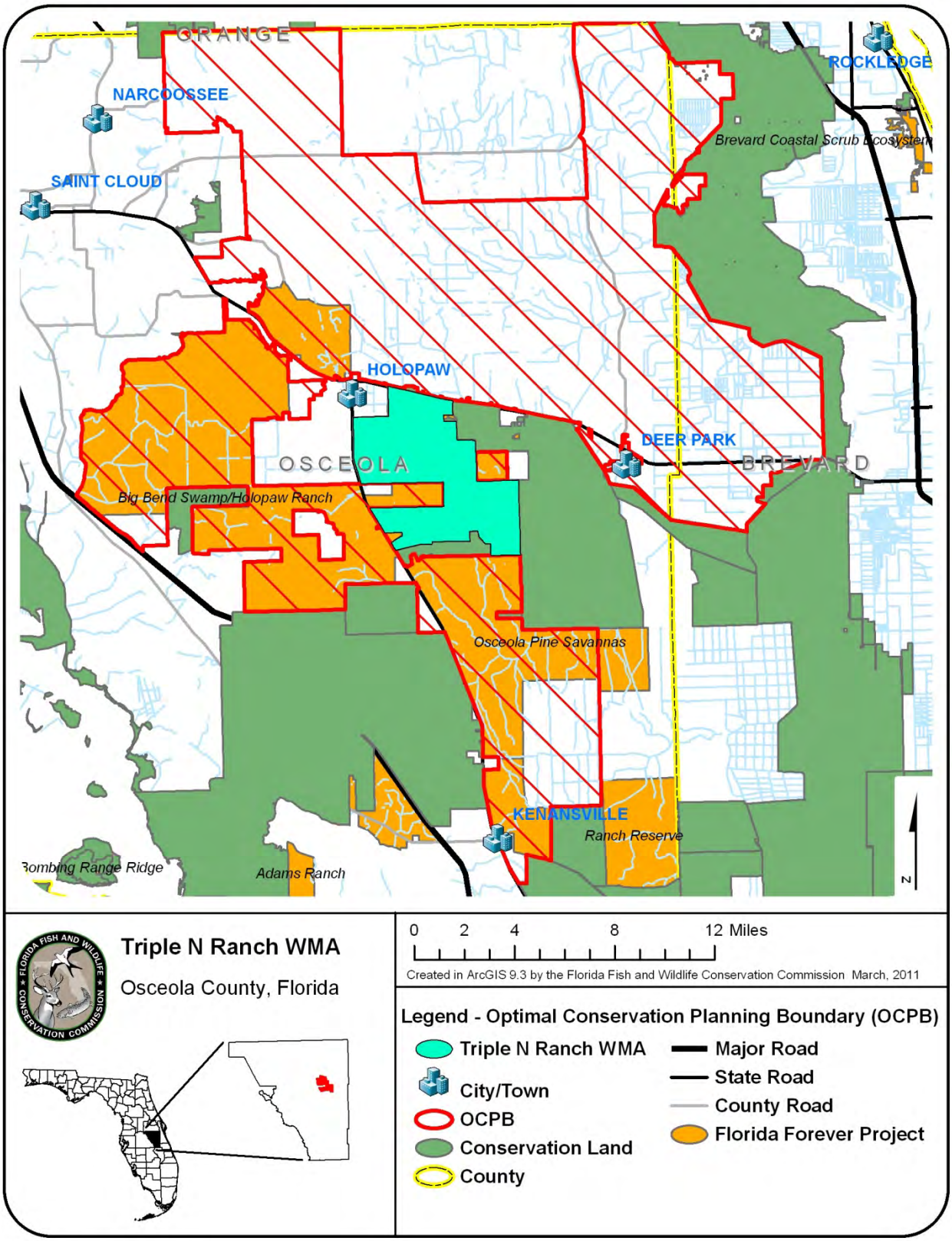


Figure 8. Optimal Conservation Planning Boundary.

1.7 Adjacent Land Uses

TNRWMA is currently zoned for Agricultural Development and Conservation. This designation allows for agriculture and silviculture uses and related industries, natural resource conservation/preservation, and low-density residential housing. Residential uses are allowed with a maximum density of one dwelling unit per five acres.

Adjacent to the northwest corner of TNRWMA and southeast of the U.S. Highway 192 and U.S. Highway 441 intersection lies Canaveral Acres, a residential subdivision created in the 1960's in Holopaw in Osceola County. This subdivision consists primarily of one acre residential lots. Outside of the Holopaw community, the land in the area surrounding the TNRWMA has a zoning designation of Agricultural Development and Conservation.

Currently, the majority of TNRWMA has a future land use designation of Rural/ Agricultural. Rural/Agricultural identifies a maximum residential density of one dwelling unit per five acres. Parts of TNRWMA and the majority of HHBCWMA immediately east of TNRWMA have a future land use designation of Conservation. With several exceptions described below, the remainder of the area around TNRWMA has a future land use designation of Rural/Agricultural.

West of U.S. Highway 441 lies an area with a future land use of Natural Resource Utility. According to the Osceola County Comprehensive Plan (August 2010), the Natural Resource Utility future land use category "is presented as a mechanism for managing the land use impacts of natural resource decisions in an efficient and environmentally responsible fashion consistent with all applicable statutes." This land use category encompasses water extraction wells, wastewater treatment facilities, and potable water processing facilities greater than 250,000 gallons per day as well as mineral and other extraction facilities, landfills, recycling or re-use processing facilities, and similar uses. Currently, a Class I solid waste landfill owned and managed by a private company, Omni Waste of Osceola County, LLC, operates within this area immediately west of TNRWMA on the west side of U.S. Highway 441.

The area in and around the community of Holopaw and the subdivision of Canaveral Acres has a future land use designation of Rural Settlement. This designation is intended to preserve existing rural communities while allowing a maximum residential density of two dwelling units per acre.

1.8 Public Involvement

FWC conducted a Management Advisory Group (MAG) meeting in Kissimmee, Florida on April 19, 2011 to obtain input from both public and private stakeholders regarding management of TNRWMA. Results of

this meeting were used by FWC to develop management goals and objectives and to identify opportunities and strategies for inclusion in this Management Plan. A summary of issues and opportunities raised by the MAG, as well as a listing of participants, is included as Appendix 13.2. Further, a public hearing, as required by Chapter 259.032(10), FS, was held in Kissimmee on May 19, 2011. The report of that hearing is also contained in Appendix 13.2. A website is also maintained for receipt of public input at http://myfwc.com/conservation/terrestrial/management-plans/develop-mps/. Additional testimony and input is received at a public hearing held by ARC. Input received from all public involvement efforts has been considered in the development of this Management Plan.

2 Natural and Cultural Resources

2.1 Physiography

2.1.1 Climate

The climate of Central Florida is humid-subtropical. Between October and May, cold fronts regularly sweep through the state which keeps conditions dry, particularly over the peninsula. In winters where an El Niño climate cycle exists, rainfall increases while temperatures are cooler statewide. Beginning in the spring, towards the end of the dry season, lightning originated wild fires become more common. There is a defined rainy season from June through September, which are also the months most at risk of tropical cyclones making landfall in the region. Easterly winds off the warm waters of the Gulf Stream running through the Florida Straits keep temperatures moderate across the central peninsula year round.

Osceola County's January temperatures range between 72˚ Fahrenheit (F) for the average high and 48˚ F for the average low. July temperatures range between 92˚ F for the average high and 72˚ F for the average low. Annually, Osceola County experiences an average of 116 days of rain and an average total rainfall of 53 inches.

2.1.2 Topography

The entire TNRWMA is above the 50-foot elevation line above mean sea level (MSL). The primary hydrologic feature of the area is Crabgrass Creek which flows to the east and into Bull Creek. Water in the area then flows into Jane Green Creek and into the St. Johns River. There are numerous creeks, ponds, and other isolated depressional areas throughout

the property which have been identified as being within the 100-year flood plain. The northeast corner of TNRWMA is basically level, ranging between 51 and 55 feet MSL. The southeast corner ranges up to 65 feet, while areas north of West Branch and Crabgrass Creek rise gradually to about 78 feet near U.S. 441, and 67 feet on the north near U.S. 192. Since elevation changes are so gradual, over expansive areas, the property appears generally flat.

2.1.3 Soils

There are 34 different soil series distributed across TNRWMA as shown in Figure 4. The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) defines a soil map unit as: "a collection of soil areas or non-soil areas (miscellaneous areas) delineated in a soil survey." Soil map units may contain multiple soil components, which are given names that are unique identifiers. Appendix 13.3 provides aggregation data for TNRWMA map units, including a more complete listing of attributes and soil components.

2.1.4 Geologic Conditions and Mineral Resources

To date, there are no known outstanding mineral interests on the lands acquired within TNRWMA. The geology of Osceola County, as reflected on the U.S. Department of Interior, United States Geological Survey's website (http://tin.er.usgs.gov/geology/state/fips-unit.php?code=f12097), is as follows:

2.1.4.1 Holocene sediments occur near the present coastline at elevations generally less than 5 feet. The sediments include quartz sands, carbonate sands and muds, and organics and cover 0.33% of Osceola County.

2.1.4.2 Shelly sediments of Plio-Pleistocene age are Tertiary-Quaternary Fossiliferous Sediments of Southern Florida. These mollusk bearing sediments of southern Florida contain some of the most abundant and diverse fossil faunas in the world. Lithologically these sediments are complex, varying from unconsolidated, variably calcareous and fossiliferous quartz sands to well indurated, sandy, fossiliferous limestones (both marine and freshwater). Clayey sands and sandy clays are present. These sediments form part of the surficial aquifer system and cover 4.2% of Osceola County.

2.1.4.3 Cypresshead Formation (Pliocene) is composed of siliciclastics and occurs only in the peninsula and eastern Georgia. It is at or near the surface from northern Nassau County southward to Highlands County forming the peninsular highlands. It appears that the Cypresshead Formation occurs in the subsurface southward from the outcrop region and similar sediments, the Long Key Formation, underlie the Florida Keys. The Cypresshead Formation is a shallow marine, near shore deposit equivalent to the Citronelle Formation deltaic sediments and the

Miccosukee Formation prodeltaic sediments. The Cypresshead Formation consists of reddish brown to reddish orange, unconsolidated to poorly consolidated, fine to very coarse grained, clean to clayey sands. Cross bedded sands are common within the formation. Discoid quartzite pebbles and mica are often present. Clay beds are scattered and not really extensive. In general, the Cypresshead Formation in exposure occurs above 100 feet AMSL. Original fossil material is not present in the sediments although poorly preserved molds and casts of mollusks and burrow structures are occasionally present. The presence of these fossil "ghosts" and trace fossils documents marine influence on deposition of the Cypresshead sediments. The permeable sands of the Cypresshead Formation form part of the surficial aquifer system. These sediments cover 1.8% of Osceola County.

2.1.4.4 Beach Ridge and Dune (Plestocene/Holocene) are Undifferentiated Quaternary Sediments. Much of Florida's surface is covered by a varying thickness of undifferentiated sediments consisting of siliciclastics, organics, and freshwater carbonates. The siliciclastics are light gray, tan, brown to black, unconsolidated to poorly consolidated, clean to clayey, silty, unfossiliferous, variably organic-bearing sands to blue green to olive green, poorly to moderately consolidated, sandy, silty clays. Organics occur as plant debris, roots, disseminated organic matrix and beds of peat. Freshwater carbonates, often referred to as marls in the literature, are scattered over much of the State. In southern Florida, freshwater carbonates are nearly ubiquitous in the Everglades. These sediments are buff colored to tan, unconsolidated to poorly consolidated, fossiliferous carbonate muds. Sand, silt and clay may be present in limited quantities. These carbonates often contain organics. The dominant fossils in the freshwater carbonates are mollusks. These sediments cover 29 % of Osceola County.

2.1.4.5 Undifferentiated sediments (Plestocene/Holocene) - Undifferentiated Quaternary Sediments – see description above (2.1.4.4) pertaining to siliciclastics, organics, and freshwater carbonates. These sediments cover approximately 65% of Osceola County.

2.2 Vegetation

The FWC completed natural communities mapping on TNRWMA through a contract with FNAI. Additionally, the compilation of the associated natural communities' dominant species, developed by FNAI for FWC, is compiled in the Plant Species Table 2.

Table 2. Plant Species of TNRWMA.

Plant Species Common Name	Scientific Name
American elm	*Ulmus americana*
Angle-pod	*Matelea gonocarpos*
Arrowhead	*Sagittaria* sp.
Bald cypress	*Taxodium distichum*
Bantam-buttons	*Syngonanthus flavidulus*
Bartram's rose-gentian	*Sabatia bartramii*
Basswood	*Tilia americana*
Beakrush	*Rhynchospora* sp.
Beardtongue	*Penstemon multiflorus*
Beautyberry	*Callicarpa americana*
Blue lupine	*Lupinus diffusus*
Blue butterwort	*Pinguicula caerulea*
Blue-eyed grass	*Sisyrinchium* sp.
Blueheart	*Buchnera floridana*
Bluestem	*Andropogon* sp.
Bog bachelor's button	*Polygala lutea*
Bottlebrush threeawn	*Aristida spiciformis*
Bromeliad	*Tillandsia* sp.
Bulrush	*Scirpus lineatus*
Bunched beaksedge	*Rhynchospora cephalantha*
Buttonbush	*Cephalanthus occidentalis*
Cabbage palm	*Sabal palmetto*
California willow	*Salix caroliniana*
Camphor-weed	*Pluchea* sp.
Cardinal airplant	*Tillandsia fasciculata*
Chaffhead	*Carphephorus sp.*
Chapmman's oak	*Quercus chapmanii*
Cinnamon fern	*Osmunda cinnamomea*
Coastalplain chaffhead	*Carphephorus corymbosus*
Coastalplain honeycombhead	*Balduina angustifolia*
Coastalplain staggerbrush	*Lyonia fruticosa*
Coinwort	*Centella erecta*
Comp polypody	*Pecluma ptilodon*
Crow poison	*Zigadenus densus*
Cypress witchgrass	*Dichanthelium dichotomum*
Dahoon	*Ilex cassine*
Dayflower	*Commelina erecta*
Deerberry	*Vaccinium stamineum*

Plant Species Common Name	Scientific Name
Diamond leaf oak	*Quercus obtusa*
Dwarf live oak	*Quercus minima*
Dwarf huckleberry	*Gaylussacia dumosa*
Dwarf palmetto	*Sabal minor*
Elliott's yellow-eyed grass	*Xyris elliottii*
Fetterbush	*Lyonia lucida*
Flatsedge	*Cyperus* sp.
Flattened pipewort	*Eriocaulon compressum*
Florida threeawn	*Aristida rhizomophora*
Gallberry	*Ilex glabra*
Gayfeather	*Liatris* sp.
Glaucous blueberry	*Vaccinium darrowii*
Giant airplant	*Tillandsia utriculata*
Golden polypody	*Phlebodium aureum*
Gopher apple	*Licania michauxii*
Green-fly orchid	*Epidendrum conopseum*
Hooded pitcherplant	*Sarracenia minor*
Indian pipe	*Monotropa uniflora*
Jack-in-the-pulpit	*Arisaema triphyllum*
Jamaica swamp sawgrass	*Cladium jamaicense*
Jointweed	*Polygonella polygama*
Lance-leaf violet	*Viola lanceolata*
Large sedge	*Carex gigantea*
Laurel-leaf greenbrier	*Smilax laurifolia*
Liveoak	*Quercus virginiana*
Lizard's tail	*Saururus cernuus*
Lob-leaf leafcup	*Polymnia uvedalia*
Loblolly bay	*Gordonia lasianthus*
Longleaf pine	*Pinus palustris*
Longleaf threeawn	*Aristida palustris*
Longlip ladiestresses	*Spiranthes longilabris*
Lopsided Indian grass	*Storghastrum secundum*
Low pinebarren milkwort	*Polygala ramosa*
Maiden fern	*Thelypteris* spp.
Maidencane	*Panicum hemitomon*
Marsh pennywort	*Hydrocotyle umbellata*
Meadowbeauty	*Rhexia* sp.
Milk pea	*Galactia* sp.
Milkwort	*Polygala cymosa*
Millet beaksedge	*Rhynchospora miliacea*

Plant Species Common Name	Scientific Name
Myrtle oak	*Quercus myrtifolia*
Myrtleleaf St. John's wort	*Hypericum myrtifolium*
Needleleaf	*Tillandsia* spp.
Nutgrass	*Scleria sp.*
Panic grass	*Dichanthelium spetum*
Panicum	*Panicum* sp.
Pawpaw	*Asimina reticulata*
Persimmon	*Diospyros virginiana*
Pickerelweed	*Pontederia cordata*
Piedmont pinweed	*Lechea torreyi*
Pignut hickory	*Carya glabra*
Pink sundew	*Drosera capillaris*
Pipewort	*Eriocaulon decangulare*
Plumed beaksedge	*Rhynchospora plumosa*
Poison ivy	*Toxicodendron radicans*
Pond cypress	*Taxodium ascendens*
Pop ash	*Fraxinus caroliniana*
Purple bladderwort	*Utricularia purpurea*
Queen's delight	*Styllingia sylvatica*
Rabbit tobacco	*Pterocaulon virgatum*
Red maple	*Acer rubrum*
Rein orchid	*Habenaria odontopetala*
Reindeer moss lichen	*Cladina* sp.
Resurrection fern	*Pleopeltis polypodioides*
Reticulate-leaved aster	*Aster reticulatus*
Rose pogonia	*Pogonia ophioglossoides*
Rose-gentian	*Sabatia calycina*
Roserush	*Lygodesmia aphylla*
Royal fern	*Osmunda regalis*
Runner oak	*Quercus pumila*
Rush	*Juncus* sp.
Rusty lyonia	*Lyonia ferruginea*
Sand live oak	*Quercus geminata*
Sandweed	*Hypericum fasciculatum*
Saw fern	*Blechnum serrulatum*
Saw palmetto	*Serenoa repens*
Sensitive briar	*Schrankia microphylla*
Shiny blueberry	*Vaccinium myrsinites*
Shiny lyonia	*Lyonia lucida*
Shoestring fern	*Vittaria lineata*

Plant Species Common Name	Scientific Name
Shortbristle horned beaksedge	*Rhynchospora corniculata*
Shortleaf rosegentian	*Sabatia brevifolia*
Silk bay	*Persea humilis*
Slash pine	*Pinus elliottii*
Small's yellow-eyed grass	*Xyris smalliana*
Southeastern sneezeweed	*Helenium pinnatifidum*
Southern beakrush	*Rhynchospora microcarpa*
Southern needleleaf	*Tillandsia setacea*
Southern umbrella-sedge	*Fuirena scirpoidea*
Southern wood fern	*Dryopteris ludoviciana*
Spiderwort	*Cuthbertia ornata*
St. Peter's wort	*Hypericum tetrapetalum*
Staggerbush	*Lyonia fruticosa*
St. John's-wort	*Hypericum reductum*
Sun-bonnets	*Chaptalia tomentosa*
Swamp bay	*Persea palustris*
Swamp blackgum	*Nyssa biflora*
Swamp dogwood	*Cornus foemina*
Swamp fern	*Blechnum serrulatum*
Swamp laurel oak	*Quercus laurifolia*
Swamp tupelo	*Nyssa biflora*
Swampforest beakedge	*Rhynchospora decurrens*
Sweetbay	*Magnolia virginiana*
Sweetgum	*Liquidambar styraciflua*
Sweetleaf	*Symplocos tinctoria*
Tall milkwort	*Polygala cymosa*
Tarflower	*Befaria racemosa*
Threadleaf beaksedge	*Rhynchospora filifolia*
Twinberry	*Myrcianthes fragrans*
Umbrella-sedge	*Juncus* sp.
Virginia chain fern	*Woodwardia virginica*
Water hickory	*Carya aquatica*
Water oak	*Quercus nigra*
Water pimpernel	*Samolus parviflorus*
Water hyssop	*Bacopa monniere*
Wax myrtle	*Myrica cerifera*
Whisk fern	*Psilotum nudum*
White-top aster	*Aster reticulatus*
White-top sedge	*Rhynchospora latifolia*
Wild coffee	*Psychotria nervosa*

Plant Species Common Name	Scientific Name
Wiregrass	*Aristida stricta*
Wood fern	*Dryopteris ludovicianum*
Yellow-eyed grass	*Xyris* sp.
Yellow-star grass	*Hypoxis curtissii*

2.2.1 FNAI Natural Community Descriptions

Vegetative community data for the majority of TNRWMA are from field reviews and assessments performed by the Florida Natural Areas Inventory (FNAI) in 2003 and updated in 2010 primarily using 2010 high resolution imagery. Other older aerial photography was consulted when the 2010 data did not aid in clarifying natural community assumptions. All natural communities were mapped according to the minimum mapping unit of 0.5 acres. Adjacent polygons with the same natural community type were merged to create a simplified map that conforms to FNAI's current data standards. Monitoring points from multiple years have been collected at this site. These points and the data they contained were used to adjust polygon delineations accordingly. The map changes were ground-truthed in the field in order to confirm changes.

Natural communities represent approximately 90% of the total vegetative cover of TNRWMA. The remainder of TNRWMA comprises altered ruderal and agricultural areas such as former citrus groves and pasture areas. The majority of these areas of altered vegetation have a land cover of ruderal (primarily former citrus groves) which covers approximately 6% of the entire area of TNRWMA, improved pasture (approximately 7% of entire area), or semi-improved pasture (approximately 1% of the entire area).

Almost two-thirds of TNRWMA is covered by upland natural communities. Mesic flatwoods account for the largest area of natural community type within TNRWMA and encompass a majority of the upland areas, covering approximately 49% of TNRWMA. Dry prairie accounts for 3% of the area of TNRWMA. Other upland community types are represented on TNRWMA to a lesser extent, including scrubby flatwoods, scrub, mesic hammock, and xeric hammock, each accounting for less than 1% of the entire TNRWMA.

Over one-fourth of TNRWMA is covered by wetland natural communities. Dome swamp (covering approximately 14% of the total area of TNRWMA), depression marsh (approximately 5% of the entire area), hydric hammock (approximately 4% of entire area), and wet prairie (approximately 6% of entire area) comprise the majority of wetland natural communities on TNRWMA. Other wetland community types occurring on TNRWMA include baygall and wet flatwoods, each representing less than 2% of TNRWMA. Following are detailed descriptions of the communities found on TNRWMA.

2.2.1.1 ***Baygall***

Baygall is composed of forested wetlands dominated by bay trees. At TNRWMA the canopy consists of loblolly bay, sweetbay, or a mixture of both. Slash pine and pond cypress may also be present in the canopy. The subcanopy consists of loblolly bay and sweetbay, plus swamp bay. Shrubs are primarily wax myrtle and shiny lyonia; swamp fern and sphagnum moss dominate the ground layer. Pockets of baygall are often found in the center of cypress swamps - possibly colonizing the area following harvest of the larger cypress. Baygalls can withstand a moderate fire frequency since the bay trees re-sprout following fire; however the bays can be killed during a drought, if fire burns into the peat layer, killing their roots.

2.2.1.2 ***Depression marsh***

Depression marsh is composed of herbaceous wetlands with concentric zones of vegetation found in circular depressions in a mesic flatwoods matrix. At TNRWMA depression marshes often surround dome swamps, which occur in the deepest portion of the depressions. The outer (driest) zone of depression marshes is usually composed of grasses and sedges, with an inner zone of shrubby St John's wort and, in some cases, a deeper zone of maidencane or pickerelweed. In some marshes, dense patches of sawgrass occupy the deeper zones. The outer zones of depression marshes are sparsely vegetated and subject to alternating inundation and desiccation.

2.2.1.3 ***Dome swamp***

Dome swamp is comprised of forested wetlands of deciduous trees, often found in depressions within a flatwoods matrix. Trees in the center are taller than those on the edges, giving the stand a dome-shaped profile. At TNRWMA the open canopy is formed by pond cypress; the subcanopy is usually sparse, consisting of evergreen hardwoods such as dahoon holly and sweetbay. The shrub layer may be sparse or very dense and is usually dominated by shiny lyonia and wax myrtle. Occasionally it may consist of a dense stand

of swamp bay. Swamp fern is often abundant in the herbaceous layer. Mature pond cypress may support large numbers of bromeliads of many different species. Pond cypress is resistant to fire and the shrubs can re-sprout. Bromeliads are killed by fire and must re-colonize from seed. Large cypress supporting many species of bromeliads are found in the larger dome swamps that fires burn through only very infrequently, whereas smaller, more frequently burned swamps have a simpler species composition, sometimes consisting only of young cypress with few epiphytes and little or no understory.

2.2.1.4 ***Dry prairie***

Dry prairie consists of upland areas of dwarf shrubs and grasses with few or no pines and many of the same species in the shrub and herbaceous layers as are found in mesic flatwoods. At TNRWMA wiregrass and low shrubs, primarily saw palmetto and dwarf live oak, form most of the cover, with taller shrubs being infrequent to absent, and the saw palmettos, often stunted. Longleaf pines are few to absent in this community. Dry prairies tend to occur on slightly higher land in the divides between tributaries to Crabgrass Creek or between large dome swamps or depression marshes. Frequent fires may prevent the establishment of longleaf pines in this community. At one site in this community and another in mesic flatwoods, dwarf live oak appeared to be replacing wiregrass in the ground layer, reaching over 50% cover. This may be a result of long-term winter burning, combined with grazing pressure, since winter burns, in contrast to spring and summer burns, do not stimulate wiregrass to flower and set seed to the extent that spring and early summer burns do (Parrott, 1967).

2.2.1.5 ***Hydric hammock***

Hydric hammock is composed of forested wetlands with a canopy of hardwoods, usually including laurel oak and cabbage palm, often occurring along edges of floodplains or swamps. At TNRWMA this community is well developed, consisting of a tall forest of mature trees occurring along Crabgrass Creek and its tributaries. The diverse, closed

canopy consists of five equally abundant tree species, including diamond-leaf oak, red maple, sweetbay magnolia, American elm, and sweetgum, with bald cypress and swamp black gum along the creek banks and in wetter depressions. Water hickory is found in the forests along the main creek channel, but is infrequent or absent along the smaller tributaries. Cabbage palm is common in the subcanopy and also in the tall shrub layer. Wax myrtle is also frequent in the tall shrub layer, which is usually sparse. The short shrub layer is also sparse and consists primarily of blue palmetto. Two tropical species, twinberry and wild coffee, are found at a few sites in the tall and short shrub layers, respectively. The herbaceous layer is usually sparse, with occasional dense patches of ferns or beakrush. Epiphytes are abundant, including bromeliads, ferns and an orchid. Plume polypody, a rare epiphytic fern growing on live oaks, was found at two sites in the hydric hammock community. Mesic hammock or mesic flatwoods, both of which frequently have an understory of dense saw palmettos, form the ecotone between hydric hammock and the open flatwoods matrix. Fire appears to be very infrequent in the hydric hammock community. At one site where fire reached the interior of this community, it was drastically altered; the canopy was very open with standing dead trees present, the subcanopy consisted solely of scorched cabbage palms without any epiphytes, and only sawgrass occupied the herbaceous layer.

2.2.1.6 ***Mesic flatwoods***

Mesic flatwoods is comprised of upland forest with an open pine canopy and understory composed of varying mixtures of shrubs and grasses. At TNRWMA, this matrix community has an open, savannah-like aspect, formed by a mixture of wiregrass and low shrubs in the understory, with a canopy of widely scattered longleaf pines. In slight depressions, wiregrass may be supplanted by beakrush and other species of three-awn grasses. Many flowering herbs contribute to the diversity of this community. A variant of this community with a denser pine canopy, a dense shrub understory, and little or no wiregrass cover, occurred along the edges of Crabgrass Creek and its tributaries and around the edges of some dome swamps. Such sites may naturally result from more moist conditions and less frequent fires in the shelter of the creeks, favoring shrub growth over grasses.

2.2.1.7 ***Mesic hammock***

Mesic hammock consists of upland forest of evergreen broadleaved trees dominated by live

oak in the canopy and cabbage palm in the subcanopy. At TNRWMA, this community is uncommon, found in higher areas within, or on the border of, hydric hammocks. It may have a dense shrub layer of saw palmetto or have a sparse shrub and herbaceous layer. The dense shady canopy and dry ground make it a favorite spot for human and cattle to take shelter from the sun and this disturbance may account for the open understory at many sites.

2.2.1.8 ***Scrub***

Scrub is typified by upland shrub or forest community on dry sands dominated by scrub oaks and other shrubs, with or without a pine canopy. At TNRWMA this community consists of scrub oaks, i.e., myrtle oak, sand live oak, and Chapman's oak, which dominate the tall and short shrub layers, and a canopy of widely scattered longleaf pines. Other shrubs also found in flatwoods may be present to a lesser extent. Wiregrass and other herbaceous species are sparse or absent. Patches of bare white sand between the shrubs give this community a characteristic signature on aerial photographs. It occupies higher knolls surrounded by mesic flatwoods. Most of the scrub sites on TNRWMA were long unburned and support 10 – 15 ft. tall oaks.

2.2.1.9 ***Wet flatwoods***

Wet flatwoods is comprised of wetland forest with pine canopy and shrubby and/or herbaceous understory. At TNRWMA, this community consists of a moderately dense canopy of slash pine with a subcanopy of cabbage palm and sparse herbaceous layer of sawgrass and beakrush. It occurs in shallow drainageways connecting stands of hydric hammock along tributaries of Crabgrass Creek and has water flowing through it after heavy rains. The pine and cabbage palms are resistant to fire and sawgrass is able to resprout. This community may replace hydric hammock in areas where the drainageway of the tributaries is narrow and fires that start in the surrounding dry prairie or mesic flatwoods burn through the narrow wetland more frequently.

2.2.1.10 ***Scrubby flatwoods***

Scrubby flatwoods is composed of upland community similar to flatwoods in structure and species composition, with scattered clumps of scrub oaks in the tall and short shrub layers. It often occurs in the ecotone between flatwoods and scrub communities. At TNRWMA, clumps of scrub oaks in this community are very widely scattered in a matrix of mesic flatwoods vegetation, consisting of saw palmetto, wiregrass and dwarf live oak. At some sites the clumps of scrub oaks were up to 15 feet tall. The intervening flatwoods vegetation has more sandy openings between the plants than normal mesic flatwoods, allowing the community signature to be discerned on aerials. Some of the scrub oaks appear to be hybrids between Chapman's oak and sand live oak; they resemble the latter in having hairy leaf undersides and the former in having flat (vs. inrolled) leaves, without impressed veins on their upper surfaces. Like scrub, this community also occurs on slightly raised areas within the mesic flatwoods matrix. Repeated winter burns may have produced the unusual

structure of tall, very widely spaced clumps of scrub oaks at TNRWMA, by differentially killing smaller oak clones, without affecting larger clones. A regime of light winter fires (as opposed to more intense spring or summer burns) is thought to have created tall "oak domes" of sand live oak in Ocala National Forest due to the inflammability of the oak litter (Myers, 1990).

2.2.1.11 ***Wet prairie***

Wet prairie is a wetland herbaceous community characterized by wiregrass and/or wiry beakrushes. At TNRWMA, this community is characterized by wiregrass with an absence of pines and shrubs except for scattered plants of wax myrtle or St. John's wort. Also present are species of beakrush, some of which are also found in depression marshes and some found mainly in wet prairies alone. This community often borders the upper edges of depression marshes and may occupy large areas as the matrix community in which depression marshes and dome swamps are embedded. Wiregrass requires fire to reproduce and many of the herbs growing with it either require fire to flower or have their flowering enhanced by fire. In the absence of fire, wet prairies are invaded by wax myrtle or St. John's wort.

2.2.1.12 ***Xeric hammock***

Xeric hammock is an upland forest with a canopy of scrub oaks reaching stature of short trees. At TNRWMA, this community is at one site in an ecotone between hydric hammock along Crabgrass Creek and a scrub community on a higher knoll. The short canopy was dominated by sand live oak with an understory of saw palmetto. Herbaceous species are sparse. Xeric hammock usually develops where scrub is protected from fire, in this case by Crabgrass Creek.

2.2.2 Imperiled Plant Species

The state list of plants, which are designated endangered, threatened, or commercially exploited, are administered and maintained by DACS. Florida's Regulated Plant Index lists these species protected in accordance with Chapter 5B-40.0055 FAC. The federal agency that shares the authority to list plant species as endangered or threatened is the U.S. Fish and Wildlife Service (USFWS). There are six known listed plant species on TNRWMA (Table 3).

Hooded pitcherplant,
Sarracenia minor,
By Guy Anglin

Table 3. Imperiled Plant Species of TNRWMA.

Imperiled Plant Species		
Common Name	**Scientific Name**	**Status**
Celestial lily	*Nemastylis floridana*	SLE
Giant orchid	*Pteroglossaspis ecristata*	SLT
Hooded pitcherplant	*Sarracenia minor*	SLT
Large-flowered rosemary	*Conradina grandiflora*	SLT
Many-flowered grass-pink	*Calopogon multiflorus*	SLE
Swamp plume polypody	*Pecluma ptilodon*	SLE

Acronym Key	
SLE	State Listed Endangered
SLT	State Listed Threatened

2.2.3 Forest Resources

Section 253.036, FS requires that plans for natural areas 1,000 acres or greater in size include a professional forester's assessment of the resource conservation and revenue-producing potentials of the tract's forests. FWC utilizes forest management regimes consistent with the purposes for acquisition of this property. When silvicultural practices are necessary for restoration of wildlife habitat or ecosystem management objectives are deemed appropriate, personnel from the Florida Department of Agriculture and Consumer Services' Florida Forest Service (FFS) or a professional forestry consultant will be consulted. The FFS Timber Assessment is included as Appendix 13.4.

2.3 Fish and Wildlife Resources

The TNRWMA has a diverse assortment of fish and wildlife species (Tables 4 – 10). There are 19 known imperiled or protected animal species, also known as listed species, occurring within TNRWMA. In addition, there are numerous known occurrences of rare plants and animals, FWC wildlife observations, and FNAI element occurrences on and in the vicinity of TNRWMA (Figure 6). Also, FNAI has indicated that TNRWMA, as well as neighboring HHBCWMA and TLWMA offer important habitat for numerous butterfly species (Table 10; Appendix 13.5).

Common roadside-skipper, *Amblyscirtes vialis*

The FWC has developed a Geographic Information Systems (GIS)-based assessment tool that incorporates a wide variety of land cover and wildlife species data. This tool, the Integrated Wildlife Habitat Ranking System (IWHRS), ranks the Florida landscape based upon the habitat needs of wildlife as a way to identify ecologically significant lands in the state, and to assess the potential impacts of management and land-use changes. The IWHRS was developed to provide technical assistance to various local, regional, state, and federal agencies, and entities interested in wildlife needs and conservation in order to: (1) determine ways to avoid or minimize project impacts by evaluating alternative placements, alignments, and transportation corridors during early planning stages, (2) assess direct, secondary, and cumulative impacts to habitat and wildlife resources, and (3) identify appropriate parcels for public land acquisition for wetland and upland habitat mitigation purposes. The IWHRS (2009) indicates that TNRWMA has a mean wildlife value of 7.6 (Figure 7).

Splashing white-tailed deer, *Odocoileus virginianus*, By Jeremy Olson

Table 4. Imperiled Wildlife Species of TNRWMA.

Imperiled Wildlife Common Name	**Scientific Name**	**Status**
American alligator	*Alligator mississippiensis*	FT
Audubon's crested caracara	*Polyborus plancus audubonii*	FT
Bald eagle	*Haliaeetus leucocephalus*	*
Eastern indigo snake	*Drymarchon couperi*	FT
Florida black bear	*Ursus americanus floridanus*	ST
Florida panther	*Puma concolor coryi*	FE
Florida sandhill crane	*Grus canadensis pratensis*	ST
Florida scrub-jay	*Aphelocoma coerulescens*	FT
Gopher frog	*Lithobates capito*	SSC
Gopher tortoise	*Gopher polyphemus*	ST
Limpkin	*Aramus guarauna*	SSC
Osprey	*Pandion haliaetus*	SSC
Red-cockaded woodpecker	*Picoides borealis*	FE
Roseate spoonbill	*Platalea ajaja*	SSC
Sherman's fox squirrel	*Sciurus niger shermani*	SSC
Southeastern American kestrel	*Falco sparverius paulus*	ST

Imperiled Wildlife Common Name	Scientific Name	Status
Snowy egret	*Egretta thula*	SSC
Tricolored heron	*Egretta tricolor*	SSC
White ibis	*Eudocimus albus*	SSC
Wood stork	*Mycteria americana*	FE

*While the bald eagle has been both state and federally delisted, it is still governed by the state bald eagle rule and the federal Bald and Golden Eagle Protection Act (see http://myfwc.com/media/427567/Eagle_Plan_April_2008.pdf).

Table 5. Mammal Species of TNRWMA.

Mammal Species **Common name**	Scientific Name
Bobcat	*Lynx rufus*
Brazilian free-tailed bat	*Tadarida brasiliensis*
Cotton mouse	*Peromyscus gossypinus*
Coyote	*Canis latrans*
Eastern cottontail rabbit	*Sylvilagus floridanus*
Eastern gray squirrel	*Sciurus carolinensis*
Eastern mole	*Scalopus aquaticus*
Evening bat	*Nycticeius humeralis*
Feral hog	*Sus scrofa*
Florida black bear	*Ursus americana floridanus*
Florida panther	*Puma concolor coryi*
Gray fox	*Urocyon cinereoargenteus*
Hispid cotton rat	*Sigmodon hispidus*
Long-tailed weasel	*Mustela frenata*
Marsh rabbit	*Sylvilagus palustris*
Marsh rice rat	*Oryzomys palustris*
Nine-banded armadillo	*Dasypus novemcinctus*
Northern yellow bat	*Lasiurus intermedius*
Raccoon	*Procyon lotor*
River otter	*Lutra canadensis*
Seminole bat	*Lasiurus seminolus*
Short-tailed shrew	*Blarina carolinensis*
Southern flying squirrel	*Glaucomys volans*
Spotted skunk	*Spilogale putorius*
Striped skunk	*Mephitis mephitis*
Tricolored bat	*Perimyotis subflavus*
Virginia opossum	*Didelphis virginiana*

Mammal Species **Common name**	Scientific Name
White-tailed deer	*Odocoileus virginianus*

Table 6. Fish Species of TNRWMA.
The following are known native species to be present in the Upper St. Johns River system.

Fish Species **Common Name**	**Scientific Name**
American eel	*Anguilla rostrata*
Atlantic needlefish	*Strongylura marina*
Black crappie	*Pomoxis nigromaculatus*
Blackbanded sunfish	*Enneacanthus chaetodon*
Bluefin killifish	*Lucania goodei*
Bluegill	*Lepomis macrochirus*
Bluespotted sunfish	*Enneacanthus gloriosus*
Bowfin	*Amia calva*
Brook silverside	*Labidesthes sicculus*
Brown bullhead	*Ameiurus nebulosus*
Centrarchid	*Centrarchid* sp.
Chain pickerel	*Esox niger*
Channel catfish	*Ictalurus punctatus*
Clown goby	*Microgobius gulosus*
Coastal shiner	*Notropis petersoni*
Dollar sunfish	*Lepomis marginatus*
Flagfish	*Jordanella floridae*
Florida gar	*Lepisosteus platyrhincus*
Golden shiner	*Notemigonus crysoleucas*
Golden topminnow	*Fundulus chrysotus*
Inland silverside	*Menidia beryllina*
Lake chubsucker	*Erimyzon sucetta*
Largemouth bass	*Micropterus salmoides*
Least killifish	*Heterandria formosa*
Marsh killifish	*Fundulus confluentus*
Mosquitofish	*Gambusia affinis holbrooki*
Pirate perch	*Aphredoderus sayanus*
Pugnose minnow	*Opsopoedus emiliae*
Redbreast sunfish	*Lepomis auritus*
Redear sunfish	*Lepomis microlophus*
Sailfin molly	*Poecilia latipinna*
Seminole killifish	*Fundulus seminolis*
Speckled madtom	*Noturus leptacanthus*

Fish Species Common Name	Scientific Name
Spotted sunfish	*Lepomis punctatus*
Striped mullet	*Mugil cephalus*
Swamp darter	*Etheostoma fusiforme*
Tadpole madtom	*Noturus gyrinus*
Taillight shiner	*Notropis maculatus*
Warmouth	*Lepomis gulosus*
White catfish	*Ameiurus catus*
Yellow bullhead	*Ameiurus natalis*

Table 7. Reptiles Species of TNRWMA.

Reptile Species Common Name	Scientific Name
American alligator	*Alligator mississippiensis*
Broadhead skink	*Eumeces laticeps*
Brown anole	*Anolis sagrei*
Brown water snake	*Nerodia taxispilota*
Corn snake	*Pantherophis guttatus guttatus*
Dusky pigmy rattlesnake	*Sistrurus miliarius barbouri*
Eastern coachwhip	*Masticophis flagellum*
Eastern coral snake	*Micrurus fulvius fulvius*
Eastern diamondback rattlesnake	*Crotalus adamanteus*
Eastern garter snake	*Thamnophis sirtalis sirtalis*
Eastern glass lizard	*Ophisaurus ventralis*
Eastern hognose	*Heterodon platirhinos*
Eastern indigo snake	*Drymarchon couperi*
Eastern mud snake	*Farancia abacura abacura*
Florida box turtle	*Terrapene carolina bauri*
Florida brown snake	*Storeria victa*
Florida chicken turtle	*Deirochelys reticularia chrysea*
Florida cottonmouth	*Agkistrodon piscivorous conanti*
Florida green water snake	*Nerodia floridana*
Florida redbelly turtle	*Pseudemys nelsoni*
Florida snapping turtle	*Chelydra serpentina osceola*
Florida softshell turtle	*Apalone ferox*
Florida water snake	*Nerodia fasciata pictiventris*
Gopher tortoise	*Gopherus polyphemus*
Green anole	*Anolis carolinensis*
Ground skink	*Scincella lateralis*
Indo-Pacific gecko	*Hemidactylus garnotii*

Reptile Species Common Name	Scientific Name
Island glass lizard	*Ophisaurus compressus*
Peninsula cooter	*Pseudemys peninsularis*
Peninsula ribbon snake	*Thamnophis sauritus sackeni*
Pine woods snake	*Rhadinaea flavilata*
Scarlet kingsnake	*Lampropeltis triangulum elapsoides*
South Florida swamp snake	*Seminatrix pygaea cyclas*
Southeastern five-lined skink	*Eumeces inexpectatus*
Southern black racer	*Coluber constrictor priapus*
Southern ringneck snake	*Diadophis punctatus punctatus*
Striped crayfish snake	*Regina alleni*
Striped mud turtle	*Kinosternon baurii*
Yellow rat snake	*Elaphe obsoleta quadrivittata*

Table 8. Amphibian Species of TNRWMA.

Amphibian Species Common name	Scientific Name
Barking treefrog	*Hyla gratiosa*
Eastern narrowmouth toad	*Gastrophryne carolinensis*
Florida chorus frog	*Pseudacris nigrita verrucosa*
Florida cricket frog	*Acris gryllus dorsalis*
Florida gopher frog	*Lithobates capito*
Greater siren	*Siren lacertina*
Green treefrog	*Hyla cinerea*
Greenhouse frog	*Eleutherodactylus planirostris*
Little grass frog	*Pseudacris ocularis*
Narrow-striped dwarf siren	*Psuedobranchus axanthus axanthus*
Oak toad	*Anaxyrus quercicus*
Pig frog	*Lithobates grylio*
Pinewoods treefrog	*Hyla femoralis*
Southern cricket frog	*Acris gryllus gryllus*
Southern leopard frog	*Lithobates sphenocephalus*
Southern toad	*Anaxyrus terrestris*
Squirrel treefrog	*Hyla squirella*
Two-toed amphiuma	*Amphiuma means*

Table 9. Bird Species of TNRWMA.

Bird Species Common Name	Scientific Name
Acadian flycatcher	*Empidonax virescens*
American bittern	*Botaurus lentiginosus*
American coot	*Fulica americana*
American crow	*Corvus brachyrhynchos*
American goldfinch	*Carduelis tristis*
American kestrel	*Falco sparverius*
American pipit	*Anthus rubescens*
American redstart	*Setophaga ruticilla*
American robin	*Turdus migratorius*
American woodcock	*Scolopax minor*
Anhinga	*Anhinga anhinga*
Bachman's sparrow	*Aimophila aestivalis*
Bald eagle	*Haliaeetus leucocephalus*
Baltimore oriole	*Icterus galbula*
Barn owl	*Tyto alba*
Barn swallow	*Hirundo rustica*
Barred owl	*Strix varia*
Belted kingfisher	*Ceryle alcyon*
Black vulture	*Coragyps atratus*
Black-and-white warbler	*Mniotilta varia*
Black-bellied plover	*Pluvialis squatarola*
Black-bellied whistling duck	*Dendrocygna autumnalis*
Black-crowned night-heron	*Nycticorax nycticorax*
Blackpoll warbler	*Dendroica striata*
Black-throated blue warbler	*Dendroica caerulescens*
Blue jay	*Cyanocitta cristata*
Blue-gray gnatcatcher	*Polioptila caerulea*
Blue-headed vireo	*Vireo solitarius*
Boat-tailed grackle	*Quiscalus major*
Bobolink	*Dolichonyx oryzivorus*
Brown thrasher	*Toxostoma rufum*
Brown-headed cowbird	*Molothrus ater*
Brown-headed nuthatch	*Sitta pusilla*
Carolina chickadee	*Poecile carolinensis*
Carolina wren	*Thryothorus ludovicianus*
Cattle egret	*Bubulcus ibis*
Chimney swift	*Chaetura pelagica*
Chuck-wills'-widow	*Caprimulgus carolinensis*
Common grackle	*Quiscalus quiscula*

Bird Species Common Name	Scientific Name
Common ground dove	*Columbina passerina*
Common moorhen	*Gallinula chloropus*
Common nighthawk	*Chordeiles minor*
Common snipe	*Gallinago gallinago*
Common yellowthroat	*Geothlypis trichas*
Cooper's hawk	*Accipiter cooperii*
crested caracara	*Polyborus plancus*
Double crested cormorant	*Phalacrocorax auritus*
Downy woodpecker	*Picoides pubescens*
Eastern bluebird	*Sialia sialis*
Eastern kingbird	*Tyrannus tyrannus*
Eastern meadowlark	*Sturnella magna*
Eastern phoebe	*Sayornis phoebe*
Eastern screech-owl	*Otus asio*
Eastern towhee	*Pipilo erythrophthalmus*
European starling	*Sturnus vulgaris*
Fish crow	*Corus ossifragus*
Florida sandhill crane	*Grus canadensis pratensis*
Glossy ibis	*Plegadis falcinellus*
Gray catbird	*Dumetella carolinensis*
Great blue heron	*Ardea herodias*
Great crested flycatcher	*Myiarchus crinitus*
Great egret	*Ardea alba*
Great horned owl	*Bubo virginianus*
Great-crested flycatcher	*Myiarchus crinitus*
Greater yellowlegs	*Tringa melanoleuca*
Green heron	*Butorides virescens*
Hooded merganser	*Lophodytes cucullatus*
House sparrow	*Passer domesticus*
House wren	*Troglodytes aedon*
Killdeer	*Charadrius vociferus*
King rail	*Rallus elegans*
Laughing gull	*Larus atricilla*
Le Conte's sparrow	*Ammodramus leconteii*
Least bittern	*Ixobrychus exilis*
Least sandpiper	*Calidris minutilla*
Lesser yellowlegs	*Tringa flavipes*
Limpkin	*Aramus guarauna*
Little blue heron	*Egretta caerulea*
Loggerhead shrike	*Lanius ludovicianus*

Bird Species Common Name	Scientific Name
Magnolia warbler	*Dendroica magnolia*
Mallard	*Anas platyrhynchos*
Merlin	*Falco columbarius*
Mottled duck	*Anas fulvigula*
Mourning dove	*Zenaida macroura*
Northern bobwhite	*Colinus virginianus*
Northern cardinal	*Cardinalis cardinalis*
Northern flicker	*Colaptes auratus*
Northern harrier	*Circus cyaneus*
Northern mockingbird	*Mimus plyglottos*
Northern parula	*Parula americana*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Osprey	*Pandion haliaetus*
Palm warbler	*Dendroica palmarum*
Pied-billed grebe	*Podilymbus podiceps*
Pileated woodpecker	*Dryocopus pileatus*
Pine siskin	*Carduelis pinus*
Pine warbler	*Dendroica pinus*
Prairie warbler	*Dendroica discolor*
Purple martin	*Progne subis*
Red-bellied woodpecker	*Melanerpes carolinus*
Red-breasted merganser	*Mergus serrator*
Red-cockaded woodpecker	*Picoides borealis*
Red-eyed virio	*Vireo olivaceus*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Ring-billed gull	*Larus delawarensis*
Rock dove	*Columba livia*
Roseate spoonbill	*Platalea ajaja*
Ruby-crowned kinglet	*Regulus calendula*
Ruby-throated hummingbird	*Archilochus colubris*
Savannah sparrow	*Passerculus sandwichensis*
Sharp-shinned hawk	*Accipiter striatus*
Short-tailed hawk	*Buteo brachyurus*
Snowy egret	*Egretta thula*
Sora	*Porzana carolina*
Summer tanager	*Piranga rubra*
Swainson's thrush	*Catharus ustulatus*

Bird Species Common Name	Scientific Name
Swallow-tailed kite	*Elanoides forficatus*
Swamp sparrow	*Melospiza georgiana*
Tree swallow	*Tachycineta bicolor*
Tricolored heron	*Egretta tricolor*
Tufted titmouse	*Baeolophus bicolor*
Turkey vulture	*Cathartes aura*
Veery	*Catharus fuscescens*
Virginia rail	*Rallus limicola*
Western sandpiper	*Calidris mauri*
White ibis	*Eudocimus albus*
White-eyed vireo	*Vireo griseus*
Wild turkey	*Meleagris gallopavo*
Willet	*Catoptrophorus semipalmatus*
Wood duck	*Aix sponsa*
Wood stork	*Mycteria americana*
Worm-eating warbler	*Helmitheros vermivorum*
Wwhite-crowned sparrow	*Zonotrichia leucophrys*
Yellow-bellied sapsucker	*Sphyrapicus varius*
Yellow-billed cuckoo	*Coccyzus americanus*
Yellow-crowned night-heron	*Nyctanassa violaceus*
Yellow-rumped warbler	*Dendroica coronata*
Yellow-throated warbler	*Dendroica dominica*

Table 10. Butterfly Species of TNRWMA.

Butterfly Species Common Name	Scientific Name
Aaron's skipper	*Poanes aaroni*
American lady	*Vanessa virginiensis*
Arogos skipper	*Atrytone arogos*
Barred yellow	*Eurema daira*
Berry's skipper	*Euphyes berryi*
Black swallowtail	*Papilio polyxenes*
Brazilian skipper	*Calpodes ethlius*
Carolina satyr	*Hermeuptychia sosybius*
Ceraunus blue	*Hemiargus ceraunus*
Clouded skipper	*Lerema accius*
Cloudless sulphur	*Phoebis sennae*
Common buckeye	*Junonia coenia*

Butterfly Species Common Name	Scientific Name
Confused cloudywing	*Thorbes confusis*
Dainty sulphur	*Nathalis iole*
Delaware skipper	*Anatrytone logan*
Dun skipper	*Euphyes vestris*
Eastern tiger swallowtail	*Papilio glaucus*
Eufala skipper	*Lerodea eufala*
Fiery skipper	*Hylephila phyleus*
Florida dusted skipper	*Atrytonopsis hianna loammi*
Georgia satyr	*Neonympha areolata*
Giant swallowtail	*Papilio cresphontes*
Gray hairsteak	*Strymon melinus*
Great purple hairstreak	*Atlides halesus*
Great southern white	*Ascia monuste*
Gulf fritillary	*Agraulis vanillae*
Horace's duskywing	*Erynnis horatius*
Juvenal's duskywing	*Erynnis juvenalis*
Least skipper	*Ancyloxpyha numitor*
Little metalmark	*Calelphelis virginiensis*
Little yellow	*Eurema lisa*
Long-tailed skipper	*Urbanus proteus*
Meske's skipper	*Hesperia meskei*
Monarch	*Danaus plexippus*
Monk skipper	*Asbolis capucinus*
Northern cloudywing	*Thorybes pylades*
Oak hairstreak	*Satyrium favonius*
Ocola skipper	*Panoquina ocola*
Palamedes swallowtail	*Papilio palamedes*
Palatka skipper	*Euphyes pilatka*
Palmetto skipper	*Euphyes arpa*
Pearl crescent	*Phyciodes tharos*
Phaon crescent	*Phyciodes phaon*
Queen	*Danaus gilippus*
Red admiral	*Vanessa atalanta*
Red-banded hairstreak	*Calycopis cecrops*
Sachem	*Atalopedes campestris*
Silver-spotted skipper	*Epargyreus clarus*
Sleepy orange	*Eurema nicippe*
Southern broken-dash	*Wallengrenia otho*
Southern skipperling	*Copaeodes minimus*
Spicebush swallowtail	*Papilio troilus*

Butterfly Species Common Name	Scientific Name
Swarthy skipper	*Nastra lherminier*
Tawny-edged skipper	*Polites themistocles*
Tropical checkered-skipper	*Pyrgus oileus*
Twin-spot skipper	*Oligoria maculata*
Variegated fritillary	*Euptoieta claudia*
Viceroy	*Limenitis archippus*
Whirlabout	*Polites vibex*
White M hairstreak	*Parrhasius m-album*
White peacock	*Anartia jatrophae*
Zarucco duskywing	*Erynnis zarucco*
Zebra heliconian	*Heliconius charithonia*
Zebra swallowtail	*Eurytides marcelllus*

2.3.1 Imperiled Fish and Wildlife Species

Imperiled fish and wildlife are those species listed as threatened or endangered by FWC, USFWS, or the National Oceanic and Atmospheric Administration – National Marine Fisheries Service. This designation is also commonly known as "listed species." TNRWMA has documented occurrences of 20 imperiled wildlife species (Table 4).

On November 8, 2010, new threatened species rules approved by the FWC went into effect. All federally listed species that occur in Florida will now be included on Florida's list as federally-designated endangered or federally-designated threatened species. In addition, the state has implemented a listing process to identify species that are not federally listed, but that may be at risk of extinction. These species will be called state-designated threatened. All previous state-designated imperiled species were grandfathered on the list and are currently undergoing status reviews. The FWC will continue to maintain a separate species of special concern category until all the former imperiled species have been reviewed and those species are either determined to be state-designated threatened or removed from the list.

TNRWMA has a diverse assortment of animal species. FNAI has identified approximately 13,549 acres (or approximately 83% of TNRWMA) of potential habitat for several plant and animal species including some that are listed as imperiled or threatened and endangered. Included is habitat suitable for Eastern indigo snake, Florida sandhill crane, and red-cockaded woodpecker. Following are abbreviated descriptions and management prescriptions for select imperiled species documented on TNRWMA. More detailed descriptions and management prescriptions are available on the FWC website: http://www.myfwc.com/wildlifehabitats/profiles/. A further evaluation of potential management needs for these species will be conducted as part of FWC's Wildlife Conservation Prioritization and Recovery (WCPR) program (see Section 4.3.2).

2.3.1.1 *American Alligator*

Alligators prefer fresh water lakes and slow-moving rivers and their associated wetlands, but they also can be found in brackish water habitats. Alligators are opportunistic feeders. Their diets include prey species that are abundant and easily accessible. Juvenile alligators eat primarily insects, amphibians, small fish, and other invertebrates. Adult alligators eat rough fish, snakes, turtles, small mammals, and birds.
Alligators are ectothermic –they rely on external sources of heat to regulate their body temperature. Alligators control their body temperature by basking in the sun or moving to areas with warmer or cooler air or water temperatures. Alligators are most active when temperatures are between 82° to 92° F. They stop feeding when the ambient temperature drops below approximately 70° F and they become dormant below 55° F. Alligators are dormant throughout much of the winter season. During this time, they can be found in burrows (or "dens") that they construct adjacent to an alligator hole or open water, but they occasionally emerge to bask in the sun during spells of warm weather.

Alligator eggs are susceptible to drowning, being crushed by the female, and predation. Raccoons are the primary predator, although hogs, otters, and bears have been reported to depredate nests. Small alligators are eaten by a variety of predators including raccoons, otters, wading birds, and fish; however, larger alligators may be their most significant predator. The most significant mortality factors for adult alligators include cannibalism, intraspecific fighting, and hunting by humans.

2.3.1.2 *Audubon's Crested Caracara*

Historically, crested caracaras were thought to occur in native dry prairie systems. However, because of the degradation of much of the historic native dry prairie, much of the crested caracara population is found on improved or semi-improved pastures on private cattle ranches. Historical accounts suggest that up until the 1940s, statewide abundance was considerably higher than it is today.

Crested caracaras are non-migratory across their range in Florida. Average home range size is 1,200 hectares (3,000 acres). The nesting territory is the core of the home range within approximately 1.0 km of the nest site. Nests are typically built 13 – 59 ft. above the ground in a cabbage palm in an open area with scattered trees. The microhabitat around nest site typically includes low ground cover and low shrub density (Morrison 2001, USFWS

1999). Caracaras construct new nests each year, but they are often in the same tree as the previous year (Morrison 2001).

The primary threat to the crested caracara in Florida is habitat fragmentation and degradation due to development and conversion to agricultural uses such as citrus, as well as inadequate land management. Also of concern is the fact that only approximately 7% of the potential crested caracara habitat in Florida is located on managed lands; the remainder is on private lands that are not protected from current or future detrimental land use practices. Vehicle collisions are also a cause of mortality, particularly for fledglings and juveniles.

Given the large percentage of potential crested caracara habitat on private lands, it is unlikely this species can be conserved exclusively on conservation lands. Cooperation with private land owners will be essential to the conservation of this species.

2.3.1.3 ***Bald Eagle***

Bald eagle populations in the contiguous 48 states were declining sharply throughout most of the 20th century. After protection under the Endangered Species Act and a ban on the pesticide dichlorodiphenyltrichloroethane, populations stabilized. After 1989, populations began to increase rapidly leading to delisting in August of 2007. The Florida population has increased > 300 % since 1980. The primary threats to bald eagle populations are development in nesting territories and poor water quality. For more detail, see the FWC's Bald Eagle Biological Status Report at http://myfwc.com/media/1356261/Bald_Eagle_BSR.pdf.

Photo by Michael Melford, National Geographic

Management should protect nest trees from catastrophic wildfire or disease outbreaks (e.g., regular prescribed fire, timber thinning). Clearcutting should not be done within 330 ft. of a nest tree and thinnings should preserve large mature trees as alternate sites in case of loss of the nest tree. See National Bald Eagle Management Guidelines http://www.fws.gov/pacific/eagle/NationalBaldEagleManagementGuidelines.pdf and the FWC Management Plan http://myfwc.com/wildlifehabitats/managed/bald-eagle/.

2.3.1.4 ***Eastern Indigo Snake***

Eastern indigo snakes utilize a mosaic of natural communities throughout the year. They are most commonly associated with scrub, sandhill, and scrubby flatwoods, where they occur in or near gopher tortoise burrows that they utilize as refugia to escape cold and desiccation. They are also known to use others burrows (e.g., cotton rat), hollows, and bases

of trees and stumps, ground litter, trash piles, and rock piles. The use of prescribed burning will create and maintain suitable habitat for this species and frequency of fire should mimic natural fire return intervals for the natural communities.

This species was listed as threatened because of population declines associated with loss of habitat and a lack of land management, over-collection by pet traders, and mortality associated with gassing gopher tortoise burrows to kill rattlesnakes. Currently, the most significant factor is thought to be habitat loss, degradation, and fragmentation (USFWS 2007). Conversion of suitable habitat to residential development, commercial development, and incompatible silviculture negatively impact this species. Its large home range compounds these problems. Predation by domestic pets and highway mortality contribute to population reductions.

2.3.1.5 ***Florida Black Bear***

Black bears were historically more abundant/widespread than currently; however, the recent trend is stable to increasing in most of Florida. Black bears occur widely but discontinuously throughout Florida. The long-term future of black bears in Florida is uncertain because of their large spatial requirements, the fragmented nature of remaining populations, the small size of some populations, and increasing human development and activity leading to negative interactions with people.

Habitat loss and fragmentation have greatly impacted bears in Florida. Human development has increased through time and currently presents one of the greatest threats to bears. Other potentially important threats include human-caused mortality (e.g. bear/vehicle collisions, poaching) and incompatible habitat management. FWC is in the process of developing a statewide management plan for the species.

Best management practices for the Florida black bear are to preserve large unbroken tracts of habitat and restore connectivity when habitat has been fragmented. Successful management prescriptions must consider highly variable food habits as well as the effects of fire, timber management, and expanding development. Managers could also attempt to

reduce bear/vehicle collisions through the construction of over/underpasses. Managers should consider extending the time between prescribed fires in occupied bear range. Short fire rotations (2 – 3 years) in upland sites may be insufficient to allow important mast-producing species to recover peak fruiting performance. However, burns that leave a mosaic of conditions would likely benefit this species. Managers should not take measures to burn patches that originally went unburned. When possible in occupied bear habitat, fire should be excluded from dense (denning) vegetation during January to April. Managers should consider prohibiting palmetto fruit harvesting. See FWC Bear Management Plan when complete and (Maehr et al. 2001).

2.3.1.6 ***Florida Sandhill Crane***

Florida sandhill cranes utilize a variety of open habitats including prairies, freshwater marshes, pastures, open pinelands, agricultural areas, and transition zones between these habitats. Habitat loss and degradation is the most common threat to this species.
Upland habitats should be relatively open with a majority of the vegetative cover equal to or less than 20 inches in height (Stys 1997, Nesbitt 1996).
Prescribed burning or mowing can be used to maintain upland habitats in suitable condition for use by Florida sandhill cranes. Florida sandhill cranes respond to these activities positively by using the habitat for foraging.

Southwest Florida Water Management District Photo

Management and protection of nesting areas is important. Florida sandhill cranes are sensitive to nest disturbance during the breeding season. Known nests should be protected by a 400 foot buffer to reduce likelihood of disturbance. Any planned water level manipulations in proximity to crane nests should be evaluated prior to implementation to assess the potential for flooding or draining existing wetlands with nests or detrimentally impacting foraging habitat.

2.3.1.7 ***Gopher Frog***

Gopher frogs are restricted to the Coastal Plain of the southeastern U.S. and are considered rare throughout their range. The species is believed to be declining and at risk for extinction throughout its range (Semlitsch et al. 1995; Greenberg 2001).
Gopher frogs in Florida use gopher tortoise burrows as refuges and are considered a gopher tortoise commensal species. Because of this fact, their range is a sub-set of the gopher tortoise range. Gopher frogs do not occupy tortoise habitat lacking sufficient wetlands for breeding. Gopher frogs spend much of their time in refuges such as gopher tortoise

burrows, rodent burrows and crayfish holes. Their preferred habitat is longleaf pine-turkey oak sandhills, but they also are found in pine flatwoods, sand pine scrub, and xeric hammocks. They are rarely found more than a mile away from breeding habitat.

Photo by J.D. Wilson

Habitat loss is the greatest threat to gopher frogs as longleaf pine ecosystems are developed, clearcut, and/or converted to plantations of off-site pines (i.e., slash, loblolly, and sand pine). Other threats to this species include habitat fragmentation, fire suppression, the introduction of fish to breeding ponds, and mortality along roadways. Ditching of breeding ponds and off-road vehicle use in these areas also may reduce reproductive success. In Florida, gopher frogs are believed to be declining as suitable habitat is lost through lack of management and conversion to agriculture and development.

2.3.1.8 ***Gopher Tortoise***

The gopher tortoise is a management responsive species that when present can be an indicator of properly managed upland pine or grassland habitats. This species is often considered a keystone species because many other species make use of the burrows dug by gopher tortoises. Tortoise grazing and mound building also alter the surrounding habit making it suitable for other species. Gopher tortoise habitat management requires frequent controlled burns and maintenance of an open tree canopy. Fire can be useful in maintaining a diverse grass and legume dominated groundcover at a height where it is suitable for tortoise foraging. This management regime also benefits a large suite of species including several listed species.

A wide variety of plants make up the gopher tortoise diet. Broadleaf grasses, sedges, grass-like asters, legumes, and various fruits are consumed. Preferred foraging areas are relatively open and have low-growing, diverse herbaceous vegetation that is readily accessible. Home range varies widely based on habitat quality, season, and sex of the tortoise, and generally ranges from 0.25 to 5 acres. Gopher tortoises generally use several burrows during the year and can move a mile (1.6 kilometers) or more to occupy a new burrow. Adults have been documented as moving up to 200 m from burrows to forage. These tortoises are also capable of long movements such as the 0.74 km movement of one sub-adult.

The primary threat to gopher tortoises in Florida is habitat destruction, fragmentation, and degradation, particularly from urbanization and development, agriculture, and

phosphate/heavy metals mining (Diemer 1986, 1987; Berish [Diemer] 1991; McCoy and Mushinsky 1995; Berish 2001, Smith et al. 2006). In central Florida, urban growth and development, phosphate mining, and citrus production are the primary threats (Auffenberg and Franz 1982; Diemer 1986, 1987). Habitat fragmentation of rural areas by roads and increased vehicular traffic due to development result in increased road mortality of gopher tortoises, which are often drawn to roadsides because of available forage (Franz and Auffenberg 1978; Landers and Buckner 1981; Landers and Garner 1981; Lohoefener 1982; Diemer 1986, 1987; Berish 2001; Mushinsky et al. 2006).

2.3.1.9 ***Limpkin***

In the late 19th and early 20th centuries, limpkins were heavily hunted and greatly reduced in numbers except in more remote locations. Furthermore, wetland drainage reduced usable habitat, especially in the northern Everglades, upper St. Johns River Valley, and the Kissimmee River Valley. Breeding Bird Survey data indicate a decline from 1966 through 1993, although recent years are relatively stable.

Photo by Dick Daniels

Major threats include changes in water quantity or quality t
abundance or availability. These include hydrology alteration, invasive exotic aquatic plants, pollution, siltation, etc. There are also concerns that the timing of aquatic plant control may affect apple-snail populations in regards to eliminating cover and oviposition sites.

Since this species is capable of significant dispersal, emphasis should be placed on protecting/maintaining as much habitat as possible. The conservation of limpkin habitat can be accomplished by identifying important wetland areas where wetland regulations may offer some degree of habitat protection. Due to the limpkins reliance on apple snails, healthy apple snail populations are important, therefore, healthy eel grass and good water quality are also important.

2.3.1.10 ***Red-cockaded Woodpecker***

This species has likely experienced a 97% reduction in numbers and amount of potential habitat with most of this loss occurring during the mid 1900's. The declining trend possibly continues despite some local increases on public lands. Intensive management actions have allowed for population expansions and even limited reintroductions. Florida contains approximately 25% of the world population of red-cockaded woodpeckers (RCW).

The RCW require open, mature (>60 years) pine stands. Fire suppression allows hardwood and shrub encroachment into these pine stands making them unsuitable to RCWs. Home

range for breeding groups can be from 100 to 400 acres, with south Florida groups tending to have larger home ranges.

Territory size is likely influenced by the quality of the habitat, as well as the density of RCWs in the area. High quality habitat tends to have older pines stocked at an intermediate density with an open stand structure that is typically maintained by regular fire. Arthropods are the primary food item, though fruits and seeds are also eaten. Males tend to forage in the tree crown; females commonly forage on the trunk and lower branches.

Loss and degradation of habitat is the primary threat to RCWs. The vast majority of RCW habitat has been subject to pine harvest which removed the old growth pine, and has been converted via development, agriculture or silviculture. Most public lands are years away from having optimal RCW habitat, even where RCWs currently occur. The isolation of small fragmented populations caused by habitat loss has resulted in genetic and demographic threats, as well as the potential for catastrophic events to cause threats. Even large, relatively secure populations may be at risk to a large catastrophic event, such as a major hurricane.

Translocation and the use of artificial cavities in combination with good land management that includes appropriate prescribed fire and silvicultural practices have been instrumental in perpetuating small isolated populations. Reintroduction has proven effective.

2.3.1.11 ***Sherman's Fox Squirrel***

Sherman's fox squirrel has likely experienced an 85% decline in the last 100 years. Although present at many conservation areas, Sherman's fox squirrel has been eliminated from much of its former habitat.

This subspecies occupies longleaf pine sandhills and flatwoods. The best habitat often contains both

pines and oaks, such as along the edges of longleaf pine savannas and live oak forests (Kantola and Humphrey 1990), especially where there are large, mature trees and fires occur at intermediate frequency. An open, herbaceous-dominated understory is important to fox squirrels for food gathering and detection of predators. The diet of the fox squirrel consists primarily of plant material such as nuts, seeds, fungi, fruit, and buds. Pine seed is preferred. They also have been known to occasionally eat animal material such as insects and bird eggs.

The largest threats to Sherman's fox squirrels are habitat destruction, alteration and degradation, and associated fragmentation. Declines have been attributed to habitat being converted to pine plantations, row crop agriculture, development, and habitat degradation due to a lack of prescribed fire. Prescribed burning can benefit this species by promoting the growth of favorable understory vegetation.

2.3.1.12 ***Southeastern American Kestrel***

The southeastern American kestrel has undergone a marked population decline and a contraction in its range in recent decades. Once widely distributed throughout seven southeastern states, the southeastern American kestrel occurs today primarily in Florida, the coastal plain of South Carolina, and the Mississippi Gulf coast. It is sporadically distributed elsewhere in small, fragmented populations.

Southeastern American kestrels usually nest in cavities in dead pine trees; these cavities are often created by woodpeckers and other natural processes. American kestrels often perch on telephone wires at the edge of a field or other open area. From this vantage they hunt for insects (especially grasshoppers and dragonflies), lizards, and small mammals.

The loss of nesting snags, especially longleaf pine, appears to be the main reason for the decline of kestrel populations in the southeast. In addition, since kestrels avoid pine plantations and hardwood stands, the loss of open foraging habitat has been a contributing factor.

2.3.1.13 ***Wading Birds (snowy egret, tricolored heron, white ibis, roseate spoonbill)***

Habitat for wading birds such as the snowy egret, tricolored heron, white ibis, and roseate spoonbill include marshes, ponds, lakes, rivers, and shallow coastal habitats. Habitat loss is a major threat to populations of wading birds as wetlands are destroyed or hydrology is altered. A reduction in suitability and availability of nesting sites and colonies also threaten populations. Many colonies are threatened by invasive exotics species. Invasive plant species may adversely alter vegetative structure and invasive animal species may

prove to be efficient nest predators. Certain aquaculture practices have also contributed to mortality and loss of wading birds. Environmental contaminants once threatened populations of wading birds. However, research now suggests most effects of contaminants on wading birds are sub-lethal except for possible mercury contamination in certain regions of the Everglades.

2.3.1.14 ***Wood Stork***

These large wading birds nest colonially in a variety of inundated forested wetlands. They forage mainly in shallow water in freshwater marshes, swamps, ponds, tidal creeks, flooded pastures, and ditches, where they seek food sources. Wood storks are sensitive to manipulation of water regimes and loss of wetland habitat, which affect both nesting sites and feeding areas. Wood storks usually feed within 16 miles of their colony but often fly great distances in search of feeding grounds, sometimes as much as 60 – 80 miles. Wood storks require flooded, woody vegetation to establish a nest and if food is scarce due to droughts or wetland drainage, hatchlings will not survive and the adults may abandon nesting. Wood storks have been especially sensitive to the lowering of water-surface levels in south and central Florida in the past several decades. These changes in water levels have triggered many colonies to move northward in search of more favorable habitats.

2.3.2 FWC Wildlife Observations and FNAI Element Occurrences

FNAI assigns ranks to "element" occurrences, which are an exemplary or rare component of the natural environment. As defined by FNAI, an "element" is any exemplary or rare component of the natural environment such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. An element occurrence is a single extant habitat which sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element. This ranking system was developed by The Nature Conservancy and the Natural Heritage Program Network based on the element's global rank (element's worldwide status) or state rank (status of element in Florida). The FNAI ranking system and definitions are located on the following website: www.fnai.org/ranks.cfm.

Known locations of FWC wildlife occurrences and FNAI element occurrences from the most recent GIS databases of the respective agencies are displayed in Figure 6. Appendix 13.6 contains a letter from FNAI authorizing FWC to utilize their database for purpose of displaying known plant and animal resources.

2.4 Native Landscapes

Some of the native landscapes found on TNRWMA include mesic flatwoods, dome swamp, wet prairie, depression marsh, hydric hammock, dry prairie, wet flatwoods, scrubby flatwoods, baygall, mesic hammock, scrub, and xeric hammock and are fully described in the vegetation section 2.2.

2.5 Water Resources

TNRWMA provides an upland buffer to the waters of Crabgrass Creek, Jane Green Creek, and the Upper St. Johns River Basin. Crabgrass Creek, a tributary of the St. Johns River, snakes across TNRWMA.

2.5.1 Surface Water Classification of Osceola County

Surface waters in the State of Florida are characterized under five classifications. Class I includes surface water bodies used for potable water supplies. Class II includes surface water bodies used for shellfish propagation and harvesting areas. Class III contains all surface water bodies utilized for recreation and propagation and maintenance of a healthy well balanced population of fish and wildlife. Class IV includes all surface water bodies utilized for agricultural water supplies. Class V includes all surface water bodies used for navigation, utility, and industrial use.

All rivers, creeks, swamps, bogs, or any other surface water features in Osceola County are classified as Class III Freshwater or Marine water, and should follow the Class III Freshwater or Marine Water Criteria as established in Chapter 62-302.400 FAC.

All waters on TNRWMA, including Crabgrass Creek and its tributaries and all isolated wetlands, are considered Class III waters by DEP. None of these waters are designated as Outstanding Florida Waters. Outstanding waters and outstanding national resource waters found in Osceola County include waters within the Prairie Lakes Unit of the TLWMA.

2.5.2 Surface Water Quality of Osceola County

Two watersheds are present throughout Osceola County. The watersheds are the Upper St. Johns and the Kissimmee watersheds. The Kissimmee watershed, USGS Cataloging Unit 03090101, covers the entire Subject Property.

In accordance with Section 303(d) of the federal Clean Water Act, every two years each state must identify its polluted waterbodies and submit this list to the U.S. Environmental Protection Agency (USEPA). These are water quality limited estuaries, lakes, and streams that fall short of state surface water quality standards, and are not expected to improve

within the next two years. These standards are the criteria used to ensure that our waters can be used for recreational purposes (fishing, swimming, boating, and drinking) and industrial and agricultural purposes.

The USEPA requires states to set priorities for cleaning up threatened waters and to establish a Total Maximum Daily Load (TMDL) for each. A TMDL, or water cleanup plan, entails an analysis of how much pollution a waterbody can take and remain healthy for its intended uses. The cleanup plan also includes recommendations for controlling pollution, and a monitoring program to test the plan's effectiveness.

The Phase I Environmental Site Assessment indicated there are 57 waterbodies, which are segments of major surface waters, located in the Kissimmee watershed cited in the 2006 303(d) list. The impairments within these waterbodies include; mercury (in fish tissue), nutrients, dissolved oxygen, and fecal coliforms..

2.5.3 Aquifer Classification of Osceola County

In Osceola County, the non-artesian aquifer is composed mainly of sand and shells with varying amounts of clay. This aquifer provides only limited quantities of water. Wells developed in this aquifer are used mainly to water lawns and livestock and for limited domestic supplies. There are two types of artesian aquifers located in Osceola County: secondary artesian aquifers and the Floridan Aquifer. Secondary artesian aquifers are found in the undifferentiated sediments and more extensively in the Hawthorn Group. Generally, secondary artesian aquifers yield less water than the Floridan Aquifer but yield more water than the non-artesian aquifers. In Osceola County, secondary artesian aquifers provide water that is less mineralized than that of the Floridan Aquifer but provide water that is more mineralized than that of the non-artesian aquifers. In Osceola County, the Floridan Aquifer includes the Lake City Limestone, the Avon Park Limestone, the Ocala Group, and parts of the Hawthorn Group. The aquifer consists of alternating layers of limestone and dolomite or dolomite limestone. The major part of the ground water recharge in Osceola County comes from annual rainfall. However, some water enters the Floridan Aquifer by underground flow from outside the region. The Floridan Aquifer does produce more potable water than the non-artesian and the secondary artesian aquifers. Most of the domestic and commercial supplies in the county are drawn from the Floridan Aquifer (Scott, 1978).

2.6 Beaches and Dunes

There are no beaches or dunes within TNRWMA.

2.7 Cultural Resources

The Department of State, Division of Historical Resources (DHR) provides recent data on occurrences of Florida's cultural resources to the FWC. Examination by GIS indicates that an early American (19th to early 20th century) logging road/railroad grade crossing has been identified on the southern portion of TNRWMA. This site may be eligible for listing on the

National Register of Historic Places. A field survey was also completed in 1996 by DHR on the extent of TNRWMA at that time. That survey identified one 20th century artifact scatter in close proximity to TNRWMA in addition to one previously identified prehistoric archaeological site on TNRWMA. It is likely that additional archaeological sites occur in the area.

2.8 Scenic Resources

TNRWMA is an excellent example of native range and pine-palmetto flatwoods scattered with wet and dry prairie, cypress domes, oak hammocks, and oak scrub. Scenic Crabgrass Creek, a tributary of the St. Johns River, snakes across the area. A network of well-maintained and marked roads provides ample opportunities for hiking, wildlife viewing, biking, and horseback riding to view these resources. Complete descriptions of the natural communities found on TNRWMA are fully described in the vegetation section 2.2.

3 Uses of the Property

3.1 Previous Use and Development

Prior to European settlement, the landscape of Florida, including this area of the peninsula, was settled and used by a variety of aboriginal peoples whose culture relied mainly on hunting, fishing, and subsistence agriculture. Though some land alteration occurred, only minor alteration of the landscape is thought to have taken place until the advent of European settlement beginning with the Spanish occupation of Florida in the sixteenth century. Along with more advanced agricultural practices, the Spanish and other settlers brought live stock, primarily cattle and hogs, to Florida. This began an era of broad use of the landscape for agriculture.

Rangeland cattle grazing and other agricultural practices began to be utilized in a more systematic way and occurred through much of the central Florida peninsula throughout most of the European settlement era from the 16th through the 20th century. Use of these agricultural practices began an era of increased alteration of the natural landscape. However, it wasn't until the 19th and 20th century that major settlement and more extensive alteration of the landscape in the area began with the widespread use of agriculture and associated development.

Historical development associated with the early settlement of the TNRWMA is similar to other early settlements in east-central Florida. Exploitation of timber resources and agricultural development were the main factors that opened the area to settlers. One of the original settlers, George W. Hopkins, purchased approximately 104,000 acres in 1902. The adjacent HHBCWMA represents a portion of the Hopkins' original tract. Construction of the Union Cypress Railroad began in 1902 and was followed by the development of a timber company of the same name. Completion of Flagler's east coast railroad to Melbourne provided the means to move timber to northern markets. Timber harvesting operations in

the Bull Creek and Jane Green Swamp, east of TNRWMA, began in 1912 and was concluded by 1928.

TNRWMA was part of the last large open range cattle ranching in the United States, which persisted until 1949 when the Florida Legislature passed the Fence Law requiring all cattle to be fenced. The Seminoles first herded cattle here at the beginning of the 19th century. American colonists replaced them after the Second Seminole War (1842) when the surviving Indians sought refuge in the Everglades and Big Cypress. In the later part of the 19th century, it was not unusual for these early cowmen to see wolves and hear panthers as they moved their herds across the range from Kissimmee to Tampa. At the beginning of the 20th century, south of Orlando was the only place east of the Mississippi River where the population density was less than two persons per square mile.

The prairie was home to the Florida cow, a small, bony, long-horned descendant of Spanish cattle able to survive heat, drought, insects, and poor forage, and the rugged, independent semi-nomadic Florida cow hunter who rounded up and herded cattle with the help of well-trained dogs. Each year from February to the end of March, cattlemen burned the prairie to kill back pine saplings, oak, and palmetto and to encourage the growth of grass. Early in the 20th century, lumbering and naval stores industries followed the railroad south. At first, large stands of pine were turpentined, then the larger saw timber was cut, and finally the pulpwood was removed.

Throughout TNRWMA are hammocks where homesteads once stood. Prior to State acquisition, the property was used as a cattle ranch, citrus groves, and as a hunting preserve for the owner's family and friends.

3.2 Purpose for Acquisition of the Property

TNRWMA was purchased as an addition to the SJRWMD Bull Creek Project and was the first tract acquired within the Osceola Pine Savannas Conservation And Recreation Lands (CARL) Project boundary, priority # 22 in the 1996 Conservation CARL Annual Report. Among the State's purposes for acquisition, as expressed in the CARL Annual Report, are to link the HHBCWMA and TLWMAs, helping to ensure the survival of prairie wildlife species such as the swallow-tailed kite and crested caracara. According to the CARL Annual Report, the acquisition would also protect the watershed of Bull Creek and provide a large area for the public to enjoy hunting, wildlife observation, and other activities.

FWC's land management objectives for the TNRWMA are consistent with the original CARL objectives and purpose. These objectives are also consistent with the acquisition purpose and management goals set forth under the Preservation 2000 Act and the Florida Forever Act which established the purpose for lands the FWC has acquired and continues to manage under both of these programs.

3.3 Single or Multiple-use Management

TNRWMA will be managed under the multiple-use concept as a Wildlife Management Area. TNRWMA will provide fish and wildlife-based recreation and educational opportunities, while protecting the natural and cultural resources found on the area. Any natural and cultural resources of TNRWMA will be managed under the guidance of ARC, the Conceptual State Lands Management Plan, and as outlined in the original purposes for acquisition.

3.3.1 Analysis of Multiple-use Potential

The following actions or activities have been considered under the multiple-use concept as possible uses to be allowed on TNRWMA. Uses classified as "Approved" are considered to be in accordance with the purposes for acquisition, as well as with the Conceptual State Lands Management Plan, and with the FWC agency mission, goals and objectives as expressed in the Agency Strategic Plan (Appendix 13.7). Uses classified as "Conditional" indicate that the use may be acceptable but will be allowed only if approved through a process other than the Management Plan development and approval process (e.g., special-use permitting, managed-area regulation and rule development). Uses classified as "Rejected" are not considered to be in accordance with one or more of the various forms of guidance available for planning and management:

	Approved	**Conditional**	**Rejected**
Apiaries	✓		
Astronomy		✓	
Bicycling	✓		
Cattle grazing		✓	
Citrus or other agriculture			✓
Ecosystem services and maintenance	✓		
Ecotourism		✓	
Environmental Education	✓		
Fishing	✓		
Geocaching	✓		
Hiking	✓		
Horseback riding	✓		
Hunting	✓		
Linear facilities			✓
Preservation of cultural sites	✓		
Preservation of historical sites	✓		
Primitive camping		✓	
Protection of imperiled species	✓		
Off-road vehicle use			✓
Shooting sports park	✓		
Soil and water conservation	✓		

	Approved	Conditional	Rejected
Timber harvest		✓	
Wildlife observation	✓		

3.3.2 Assessment of Impact of Planned Uses of the Property

To communicate FWC's planned uses and activities, specific management intentions, long- and short-term goals and with associated objectives, identified challenges, and solution strategies have been developed for TNRWMA (Sections 4 -7). A detailed assessment of the benefits and potential impacts of planned uses and activities on natural and cultural resources was an integral part of the development of the management activities and intent, goals, objectives, challenges, and strategies sections of this Management Plan.

3.4 Acreage That Should Be Declared Surplus

On conservation lands where FWC is the lead manager, FWC evaluates and identifies areas for potential surplus. This evaluation consists of GIS modeling and analysis, aerial photography interpretation, and consideration of management and operational needs. Also, FWC considers recommendations for surplus lands as they relate to Florida's "No Net Loss of Hunting Lands" legislation (Ch. 379.3001 FS), as well as surplus restrictions for lands acquired through the Federal Aid in Wildlife Restoration Act (Pittman – Robertson).
The FWC has evaluated TNRWMA and has determined that all portions of the area are being managed and operated for the original purposes of acquisition, remain integral to the continued conservation of important fish and wildlife resources, and continue to provide quality fish and wildlife-based recreational opportunities to the public. Therefore, no portion of the property should be considered or declared surplus.

4 Management Activities and Intent

The following section provides a description of agency plans to locate, identify, protect, preserve or otherwise use fragile natural resources and nonrenewable cultural resources. In general, the FWC management intent for TNWMA is to restore and maintain natural communities in a condition that sustains ecological processes and conserves biological diversity, especially fish and wildlife resources. In conjunction with this primary emphasis, it is FWC's intent to provide quality fish and wildlife-based recreational opportunities on TNRWMA. FWC will utilize the best available data, guidelines, natural resource management practices, and recreational management practices to achieve these outcomes in accordance with the original purposes for acquisition. Furthermore, the management activities described in this section are in compliance with those of the Conceptual State Lands Management Plan.

4.1 Land Management Review

A land management review was conducted in December of 2009 and the results of that review and FWC responses to recommendations are included as Appendix 13.8. It was determined that TNRWMA is being managed in accordance with the purposes for

acquisition and that management practices, including public access, are in compliance with the management plan.

4.2 Habitat Restoration and Improvement

On TNRWMA, the FWC will focus on managing for native habitat, emphasizing maintenance of high-quality natural communities, and restoration of disturbed areas. Habitat manipulation by mechanical means will be restricted to areas of overgrown midstory, ruderal areas, service road margins, and wildlife viewing openings and their associated agricultural plantings. Exotic plant species will be monitored and chemical and mechanical measures will be used for eradication and control. The FFS will be consulted whenever disease or insect outbreaks make it necessary to consider timber salvage operations or when restoration objectives may involve silvicultural operations.

4.2.1 Objective-Based Vegetation Management

The FWC uses a comprehensive resource management approach to managing FWC-managed areas. Restoring the form and function of Florida's natural communities is the foundation of this management philosophy. FWC uses Objective-based Vegetation Management (OBVM) to monitor how specific vegetation parameters are responding to FWC management. OBVM includes the delineation of management units and quantification of the desired future condition for the natural community.

The first step in implementing OBVM is to map the current and historic natural communities on the managed area using the FNAI Natural Community Classification. The FWC contracts with FNAI to provide these mapping services. A natural community, as defined by FNAI, is a distinct and recurring assemblage of populations of plants, animals, fungi and microorganisms naturally associated with each other and their physical environment.

After natural communities have been mapped, management units are delineated. Delineating management units takes into account the distribution and extent of the current and/or historic mapped natural communities, existing and proposed infrastructure, and other management considerations. The FWC land managers then identify the predominant current or historic natural community within each management unit that guides the type and frequency of management activities that should be applied.

At the same time, measurable habitat management objectives referred to as 'desired future conditions' are established for natural communities identified for management. Desired future conditions are defined by desirable ranges for vegetation structural attributes such as canopy cover, shrub height and cover, and ground cover.

Vegetation monitoring samples the selected parameters with the results being compared to the established desired future conditions. All monitoring performed under OBVM is completed using the program's Vegetation Monitoring Standard Operating Procedures (http://myfwc.com/media/119340/OBVM_Monitoring_Standard_Operating_Procedure.pdf.)

Initial mapping and vegetation sampling provides FWC staff with baseline data indicating natural community structure, distribution, and condition on the area. Comparing the subsequent monitoring results to desired future conditions, provides key operational information on a management unit's vegetation structural status at a given point in time and trend over time. Using this information, managers can evaluate, adjust and modify their management practices to meet the stated objectives. The Case Study of Objective-based Vegetation Management for TNRWMA can be found as Appendix 13.9.

4.2.2 Prescribed Fire and Fire Management

Under natural conditions, periodic spring and summer fires occurred in the fire-adapted communities of Florida. Plant species composition reflects the frequency and intensity of these fires. In the absence of fire, fire-adapted mesic flatwoods may follow a successional pattern of conversion from a mixed pine-hardwood forest to a predominantly hardwood community through time. Site-specific combinations of prescribed fire, mechanical and chemical vegetation control, reforestation, and restoration of natural water regimes are likely necessary actions needed to restore and maintain historic natural communities.

The FWC will continue to utilize a prescribed burning program on the fire-adapted portions of TNRWMA. The use of a prescribed fire management regime increases habitat and wildlife species diversity. Different burning intervals, intensities, and seasonal timing of prescribed burns (dormant vs. growing seasons), will assist in creating habitat diversity and a mosaic of vegetation patterns. This mosaic condition is designed to have both frequently burned and fire shadow aspects.

Additionally, fires are allowed to burn into the edges of marshes, swamps, and other wetlands in order to maintain these habitats. The majority of TNRWMA will be burned on a two to four-year rotation, with an emphasis during the spring and early summer months of the growing season.

Whenever possible, existing firebreaks such as roads and trails, as well as natural breaks such as creeks and wetlands, will be used to define burning compartments. Disk harrows, mowing, and foam lines will be used as necessary to minimize disturbance and damage created by fire plows.

On some areas, prescribed burning may be limited by the buildup of mid-story fuels and a lack of understory fuels in the areas invaded by a brushy understory. This condition has distinctly negative impacts for most wildlife species. Mechanical control of brush on upland sites by roller chopping can reduce shading and encourage the grasses and forbs that are necessary to sustain a prescribed fire program. Single drum, with standard blades, one-pass roller chopping or aerator style choppers can be a valuable management tool, enabling the application of prescribed fire in areas heavily invaded by dense woody vegetation.

Mechanical soil disturbance in ecotones will be avoided, with the possible exception of wildfire suppression, in order to protect habitats for important rare species that often occur between flatwoods and riparian drainages. Silvicultural site preparation and creation of firebreaks are avoided when possible in these zones.

In addition to the general prescribed fire management guidelines described above, see the area-specific Prescribed Fire Plan (Appendix 13.10), which includes delineation of burn management units, detailed descriptions of prescribed fire methodology, safety, and smoke management guidelines.

4.2.3 Habitat Restoration

Habitat restoration is also referred to in this management plan as natural community restoration. Restoration activities will include removal of off-site species, planting of native groundcover species including wiregrass, longleaf pine reforestation, and planting of other appropriate native mid-story and canopy tree species. Upon successful restoration of these altered areas, they will be monitored and maintained.

4.3 Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration

4.3.1 Fish and Wildlife

Due to the variety and high quality of natural communities, a diversity of associated wildlife, including rare and imperiled species, as well as common game and non-game species can be found on TNRWMA. In managing TNRWMA, an emphasis will be placed on the conservation, protection, and management of the natural communities that support these wildlife species.

Wildlife management emphasis is placed on documenting the occurrence and abundance of rare and imperiled species on the property. Following species inventory work, management practices are designed to restore, enhance, or maintain imperiled species and their habitats. Resident wildlife will be managed for optimum diversity and abundance. In addition to resident wildlife, TNRWMA provides resources critical to many migratory birds including waterfowl, passerines, raptors, and shorebirds. Habitats important to migratory species will be protected, maintained, or enhanced. The FWC will continue to update inventories for select species, with emphasis on rare and imperiled fish and wildlife species. Monitoring of wildlife species will continue as an ongoing effort for the area.

Rare and imperiled species and their habitats will be protected and restored by following approved Federal and FWC recovery plans, guidelines, and other scientific recommendations. Land management activities, including the application of prescribed fire, will take into account imperiled species requirements and habitat needs. Potential for negative impacts from recreational activities will also be considered and monitored.

The FWC intends to manage game populations on a sustained-yield basis to assure healthy game populations and a high-quality recreational experience. In general, game wildlife populations will be managed to provide continued recreational sport hunting and wildlife viewing opportunities.

4.3.2 Imperiled Species - Wildlife Conservation Prioritization and Recovery

The FWC has identified the need to: 1) demonstrate optimal wildlife habitat conservation on FWC-managed lands; 2) develop science-based performance measures to evaluate management; 3) recover imperiled species; and 4) prevent future imperilment of declining wildlife species. To help meet these needs, the FWC uses a comprehensive resource management approach to managing FWC-managed areas. Restoring the form and function of Florida's natural communities is the foundation of this management philosophy. The FWC uses the WCPR program to ensure management is having the desired effect on wildlife.

The goal of WCPR is to provide assessment, recovery, and planning support for the FWC-managed areas to enhance management of focal species and the recovery of imperiled species. WCPR program objectives include prioritizing what FWC does for imperiled and focal species on FWC-managed areas; ensuring the actions taken on these areas are part of statewide conservation programs and priorities; and informing others about the work accomplished on lands FWC manages.

The WCPR program helps FWC take a proactive, science-based approach to species management on FWC-managed lands. This approach assesses information from statewide potential habitat models and Population Viability Analysis, and in conjunction with input from species experts and people with knowledge of the area, creates site-specific wildlife assessments for imperiled wildlife species and a select suite of focal species. Staff combines these assessments with area-specific management considerations to develop a wildlife management strategy for the area. Each strategy contains area-specific measurable objectives for managing priority species and their habitat, prescribes management actions to achieve these objectives, and establishes monitoring protocols to verify progress towards meeting the objectives. The FWC intends for the strategy to promote the presence of, and ensure the persistence of imperiled wildlife and select focal species on the area by providing FWC managers with information on actions they should take (provided the necessary resources are available).

In summary, for FWC-managed areas, the WCPR program helps assess imperiled and focal wildlife species needs and opportunities, prioritize what FWC does for imperiled and focal species, prescribe management actions to aid in species recovery, prescribe monitoring protocols to allow evaluation of the species' response to management, and ensure the information is shared with others. Through the actions of this program, FWC will facilitate fulfilling the needs of focal and imperiled wildlife species on TNRWMA. In the long-term, by implementing these strategies on FWC-managed lands and continuing to assess wildlife

species' needs, FWC will continue to play an integral role in aiding the recovery of imperiled species and preventing the future imperilment of declining wildlife species.

4.4 Exotic and Invasive Species Maintenance and Control

The FWC will continue efforts to control the establishment and spread of Florida Exotic Pest Plant Council (FLEPPC) Category I and II plants on TNRWMA. Control techniques may include mechanical, chemical, biological, and other appropriate treatments. Treatments utilizing herbicides will comply with instructions found on the herbicide label and employ the Best Management Practices for their application.

4.5 Public Access and Recreational Opportunities

4.5.1 Americans with Disabilities Act

When public facilities are developed on FWC-managed areas, FWC complies with the Americans with Disabilities Act (Public Law 101-336). As new facilities are developed, the universal access requirements of this law are followed in all cases except where the law allows reasonable exceptions. Recreation facilities in semi-primitive or primitive zones will be planned to be universally accessible to the degree possible except as allowed by the ADA where:

1. Compliance will cause harm to cultural or historic sites, or significant natural features and their characteristics.

2. Compliance will substantially alter the nature of the setting and therefore the purpose of the facility.

3. Compliance would not be feasible due to terrain or prevailing construction practices.

4. Compliance would require construction methods or materials prohibited by federal or state statutes, or local regulations.

4.5.2 Recreation Master Plan

It is the intention of FWC to take a comprehensive approach to the planning and administration of fish and wildlife-based recreational opportunities for TNRWMA. To accomplish this, FWC has worked with recreational stakeholders and the general public to develop a Recreation Master Plan (Appendix 13.11) that will be used to develop appropriate infrastructure that will thereby support the recreational use of the area by the general public. This Recreation Master Plan includes planning for parking, trail design, and interpretation. The Recreation Master Plan evaluates the recreation potential for TNRWMA and plans for a diversity of existing and potential recreational opportunities on a regional scale along with HHBCWMA and TLWMA.

4.5.3 Recreation Carrying Capacity

Baseline carrying capacities for recreational users on FWC-managed lands are established by conducting a site specific sensitivity analysis using available data for the site. The intent of the carrying capacity analysis is to minimize wildlife and habitat disturbance and provide the experience of being "immersed in nature" that visitors to FWC-managed areas desire. Carrying capacities are just a first step; management of recreational use requires a means of monitoring visitor impacts. Responding to these impacts may require adjusting the carrying capacities as necessary. The carrying capacities generated though this process are used as a tool to help plan and develop recreation opportunities. The current recreation carrying capacity of TNRWMA is 350 visitors per day. Based on an analysis of the overall approved uses and supported recreational opportunities, and the anticipated proportional visitation levels of the various user groups, FWC has determined that TNRWMA can support 504 visitors per day once additional trails and structures are developed. The conceptual design of the public shooting sports complex (Section 4.5.10; Appendix 13.11) is to be developed in three phases based on available funding and public use potential. Upon completion of Phase I of the shooting sports complex, the additional daily estimated carrying capacity is 316 additional visitors; upon completion of Phase II of the shooting sports complex, the additional carrying capacity is 300 additional visitors; and upon completion of Phase III, the additional carrying capacity is 24 additional visitors. Therefore, upon completion of each planned phase of the shooting sports complex, the total carrying capacity of the shooting sports complex is 640 visitors per day. Consequently, upon completion of all of the planned recreational improvements, including the planned shooting sports complex, the total projected carrying capacity of TNRWMA is 1,144 visitors per day. Recreation carrying capacities will be periodically reevaluated, and additional capacity may be contemplated as part of the implementation process. Details on the establishment of the carrying capacity, as well as the recreation facility monitoring protocol, can be found in Appendix 13.11.

4.5.4 Wildlife Viewing

TNRWMA affords a wide variety of native wildlife species that are available for visitors' enjoyment for observation and photography. The quality and diversity of habitats found on TNRWMA attracts a diverse suite of wildlife species including waterfowl and wading bird species in the wetlands, passerine bird species in the uplands, and various mammalian, reptile, and amphibian wildlife throughout TNRWMA. Lists of probable wildlife species that may be observed by visitors to TNRWMA can be found in Section 2.3 of this management plan. The TNRWMA Bird List can be downloaded from the following website: http://myfwc.com/media/305334/TripleNRanch_birdlist.pdf.

4.5.5 Hunting

TNRWMA currently offers special opportunity deer, small game, wild hog, special opportunity spring turkey, and migratory bird hunting seasons. Hunting opportunities offered on TNRWMA are periodically evaluated. The FWC will investigate the feasibility of

offering additional hunting seasons, possibly to include special opportunity archery and special opportunity muzzleloading seasons.

4.5.6 Fishing

There are some creekbed, pond, and other isolated depressional areas throughout TNRWMA that provide fishing opportunities. Crabgrass Creek may be fishable and navigable by canoe during periods of high water levels.

4.5.7 Trails

Currently, there are 7.96 miles of multi-use trails on TNRWMA. The FWC determines the feasibility of adding additional trails when developing Recreation Master Plans. FWC will continue to periodically reevaluate the potential for trail connectivity to other conservation areas and will monitor trails for user impacts to natural communities.

4.5.7.1 Hiking

Hiking access is year-round; however there is no hiking during special opportunity hunts. A 7.2-mile loop hiking trail, constructed by the Florida Trail Association, offers a four to eight hour hiking session. The trail is well marked, but the terrain is very uneven and much of the trail is wet during the summer and fall. A shorter 1.6-mile loop is also available. Most of the trail is single-track with few road segments. Additional trail-hiking opportunities of up to 5.5 miles to connect the TNRWMA trails with HHBCWMA will be developed as part of the Recreation Master Plan implementation process.

4.5.7.2 Bicycling

Biking access is year-round except during special opportunity hunts. There are miles of well-marked loop roads. Most of the roads are in good condition except for a few soft spots southeast of Crabgrass Creek.

4.5.7.3 Equestrian

Horseback riding is allowed year-round except during special opportunity hunts. Trailer parking and non-potable water is available in the hunt camp area. All horseback riders must have proof of current negative Coggins Test results for their horses when on state lands. Children under the age of 16 are required to wear a helmet when riding on public lands. For more detailed information on Nicole's Law, visit the following website: http://laws.flrules.org/files/Ch_2009-105.pdf.

4.5.8 Camping

Currently, camping is allowed at the designated hunter campsite during hunting periods. Only tents, trailers, and self-propelled camping vehicles may be used for camping. Additional camping opportunities are not being considered in the Recreation Master Plan created for TNRWMA.

4.5.9 Geocaching

Geocaching, also known as Geographic Positioning System (GPS) Stash Hunt or GeoStash, is a contemporary combination of orienteering and scavenger hunting generally utilizing a GPS receiver unit. Geocache websites routinely promote good stewardship. However, the potential exists for resource damage, user conflicts or safety issues caused by inappropriately placed caches and/or links that do not provide adequate information about the area.

It is the policy of the FWC to allow placement of geocaches only in those locations that do not present the potential for resource damage, user conflicts or threats to the safety of the activity participants. The placement of geocaches on FWC-managed lands is governed by specific guidelines. These guidelines may be found on the following FWC website: http://myfwc.com/media/1074886/FWC_Geocache_Guidelines.pdf .

4.5.10 Astronomy

Due to its remote location in rural Osceola County, the TNRWMA affords a lower level of nighttime light pollution, and thus is conducive to the viewing of stars and planets. The open upland areas of the dry prairies and mesic flatwoods provide for a broad view of the nighttime sky.

4.5.11 Interpretation

FWC considers interpretation of the natural and cultural resources of TNRWMA to be an important component of the overall outdoor recreational experience enjoyed by visitors to the area. Interpretive signage and area regulation information are provided within kiosks located at designated public access points for TNRWMA. The Recreation Master Plan for TNRWMA proposes additional interpretive materials to include a trail map/guide, a recreation guide, additional signage and Spanish language materials. Many of the publications may cover HHBCWMA and/or TLWMA.

4.5.12 Apiaries

The use of apiaries is approved for TNRWMA, and is deemed to be consistent with purposes for acquisition, is in compliance with the Conceptual State Lands Management Plan, and is consistent with the FWC agency mission, goals, and objectives as expressed in the agency strategic plan and priorities document. The FWC Apiary Policy (Appendix 13.12) will be followed with regards to site location, management, and administration of apiaries.

4.5.13 Environmental Education

FWC will continue to make interpretive and educational programs available. Interpretive signage and area regulation information are provided within kiosks located at the public access point for TNRWMA. Additional educational resources are offered through the MyFWC.com website.

4.5.14 Shooting Sports Complex

It is the mission of FWC to continue the heritage of hunting by developing safe, responsible, and knowledgeable hunters. FWC must also fulfill the requirements of Section 372.5717 FS, regarding hunter safety courses and education to the public. This statute requires FWC to institute and coordinate hunter safety courses. The establishment of an adequate number of public shooting ranges is necessary to provide the facilities needed to teach these and related courses. Hunter education is essential to the success of many of FWC's responsibilities. Education of the hunting community about the proper use of firearms, protection afforded endangered species, and the importance of protection of wildlife habitat are all significant aspects of FWC's duties.

The FWC currently operates eight public shooting ranges throughout the state. These facilities are used for hunter safety training purposes and as a place for sportsmen and women to enhance their skills so they can responsibly harvest game animals. Currently, there are no public shooting ranges in Osceola County where Florida's hunter safety program can offer the public a place to take a course and participate in the firing of the firearms used in hunting. The area surrounding Osceola County has some of the highest demand for hunter safety courses in the state. The hunter safety program has great cooperation, but limited use, of the privately owned shooting facilities in neighboring counties.

There was a series of site analyses of prospective lands within the vicinity to determine potential areas where a shooting sports complex might be most appropriate. It was determined that TNRWMA had a high level of feasibility due to its isolated location, facility requirements, and to have the least impact on the TNRWMA natural communities; the proposed shooting complex on TNRWMA is on ~350 acres of a disturbed area previously a citrus grove.

FWC has provided conceptual designs for the shooting complex and has allocated $1.4 million of federal aid funds towards the Osceola County site. As stated previously, the conceptual design of the shooting complex is laid out so that it can be built in phases based on public use and acquired funding. Elements of the conceptual design include the following:

- 50 foot pistol range – 20 positions
- 15/25 yard pistol range – 35 positions
- 50/100 yard rifle range – 28 positions
- 200 yard rifle range – 20 positions
- 10 Bay Action Pistol Range
- 5-Stand Sporting Clays Range
- 15 station sporting clays range
- 1,000 yard high-power rifle range – 12 positions
- 3 Trap/Skeet Fields
- Clubhouse, restrooms, classroom, and maintenance facilities

A Customized Market Report by the National Shooting Sports Foundation (NSSF) was conducted. Their report analyzes state level data (e.g., population, projected growth, supplies retailers, nearby ranges, household surveys) within a 15, 35, and 50-mile radius of TNRWMA in order to estimate participation. The results of that analysis are found in Appendix 13.13.

FWC will identify and coordinate with partners in order to develop, operate, and manage the shooting sports complex. Osceola County has indicated potential interest in assisting with the development of the shooting sports complex. This facility could provide a training site for hunter education students, volunteers, and law enforcement personnel and an opportunity for the public to practice their firearms proficiency so they can ethically harvest game. An outline of the proposed complex footprint is displayed in Figure 9.

4.6 Hydrological Preservation and Restoration

4.6.1 Hydrological Assessment

A hydrological assessment for TNRWMA has not been completed. The FWC will coordinate with the SJRWMD to conduct or otherwise obtain a site-specific hydrological assessment to identify potential hydrology restoration needs, and address potential hydroperiod, water quality and quantity impacts on adjacent landowners. Pursuant to the recommendations of the hydrological assessment, FWC will implement a hydrological restoration plan as feasible and appropriate.

4.6.2 Water Resource Monitoring

The FWC will cooperate with the SJRWMD and DEP to develop and implement appropriate surface and groundwater quality and quantity monitoring protocols for TNRWMA. In this capacity, FWC will primarily rely on the expertise and staff support of the SJRWMD and DEP to conduct these monitoring activities.

4.7 Forest Resource Management

An assessment of the timber resources of TNRWMA was conducted by the FFS. The management of timber resources will be considered in the context of this Timber Assessment (Appendix 13.4) and the overall land management goals and activities.

The FWC will continue to manage timber resources for wildlife benefits and natural community restoration. The primary management technique for encouraging reforestation is protection of young trees and seedlings on these sites from damage. However, where natural regeneration is lacking, artificial reforestation may be implemented. On suitable sites, FWC will continue to plant appropriate pine species in areas of former citrus groves, pastures of the former Equitable, Yates, and Vanosdol tracts, and in completed groundcover restoration areas. Forested wetlands are managed for stands with old growth characteristics. Snags will be protected to benefit cavity-nesting species.

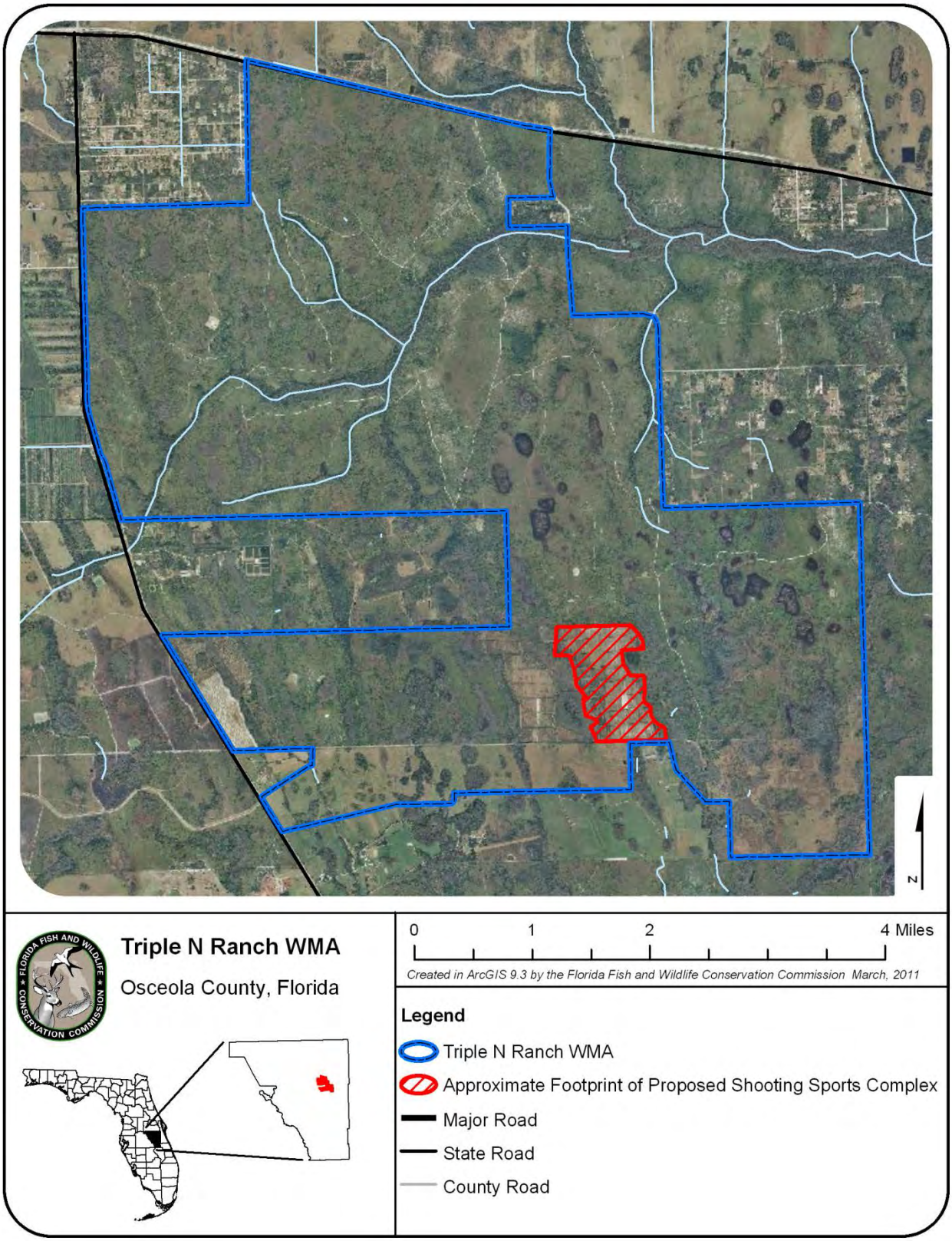


Figure 9. Public Shooting Sports Complex.

4.8 Cultural and Historical Resources

The FWC will follow procedures outlined by DHR and will continue to locate other features on the area. FWC will contact professionals from DHR for assistance prior to any ground-disturbing activity on the area.

The FWC will monitor the known recorded sites and submit updates of additional sites to DHR for inclusion in their Master Site file. In addition, FWC will ensure management staff has DHR Archaeological Resources Monitoring training. Furthermore, FWC will refer to and follow DHR's Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (Appendix 13.14) for management of these resources, and prior to any facility development, or ground disturbing activities.

4.9 Capital Facilities and Infrastructure

FWC's land management philosophy is designed to conserve the maximum amount of wildlife habitat while providing the minimal number of capital facilities and infrastructure necessary to effectively conduct operational and resource management activities, and provide ample opportunities for fish and wildlife-based recreation. For these reasons, planned capital facilities and infrastructure will focus on improving access, recreational potential, hydrology, or other resource and operational management objectives.

Currently, there are 13 facilities on TNRWMA including a staff residence, field office, check station, campground, vault toilet, pole barn, and storage structures. As described in Section 2.4.1 of the Management Plan, for any public facilities that are developed on FWC-managed areas, FWC complies with the Americans with Disabilities Act (Public Law 101-336).

4.10 Conservation Acquisition and Stewardship Partnerships

The FWC utilizes a three-tiered approach to identifying, acquiring or otherwise protecting important conservation lands adjacent to or in proximity to existing FWC-managed areas. This involves development of an Optimal Resource Boundary (ORB), Optimal Conservation Planning Boundary (OCPB) and associated Conservation Action Strategy (CAS). Increasingly, cooperative land steward partnership efforts with private landowners plays an integral role in this effort as does ongoing conservation acquisition, either through fee-simple or less-than-fee conservation easements. In combination, this tiered model helps FWC to further the regional conservation of important fish and wildlife habitats through a comprehensive cooperative approach towards conservation.

4.10.1 Optimal Resource Boundary

This three tiered model begins with the development of an ORB, which is a resource-based analysis on a regional scale that integrates important FWC conservation research and analysis into practical planning, acquisition, and management efforts through GIS analysis. The ORB focuses on critical and important wildlife species or habitat considerations such as rare and imperiled species habitat within a particular region or

ecosystem-like area on a landscape scale within which a FWC managed area is contained while eliminating urban areas or lands that have already been conserved or protected.

4.10.2 Optimal Conservation Planning Boundary

The second tier is known as the OCPB. The OCPB combines the regional natural resources identified in the ORB, as well as regional and local area conservation planning, including habitat conservation and restoration, habitat linkages, management challenges, land use and zoning issues, infrastructure including roads and developments, improving access, eliminating inholdings, providing prescribed burn buffers, resolving boundary irregularities, water resource protection, and conserving other important natural and cultural resources.

The OCPB provides the basis for development of a broader CAS for TNRWMA. Although the OCPB provides the basis for potential voluntary future conservation acquisitions, it is designed to function primarily as a conservation planning boundary. The OCPB identifies surrounding lands and natural resources that may be important to the continued viability of fish and wildlife populations in the region. As they are currently managed, these lands appear to contribute to regional conservation and may support conservation landscape linkages.

4.10.3 Conservation Action Strategy

The CAS is the third tier, and implements the results of the ORB and OCPB tiers. This element of the process incorporates the conservation planning recommendations into an action strategy that prioritizes conservation needs. The CAS is integral to the development of conservation stewardship partnerships and also implements the current approved process for establishing the FWC Florida Forever Inholdings and Additions acquisition list. Primary components of the CAS include:

- FWC Landowner Assistance Program (LAP)
- FWC conservation planning
- FWC Additions and Inholdings Program work plan
- Forest Stewardship Program proposals
- Florida Forever acquisition project proposals and boundary modifications
- Non-FWC fee simple and less-than-fee acquisitions (conservation easements)
- Federal or state grant proposals
- Regional or local acquisition proposals
- Local, state, and federal planning proposals
- Non-governmental organization acquisition proposals

Continued conservation of these lands may be aided by available voluntary landowner stewardship programs, conservation easements, and in some cases, potential voluntary conservation acquisitions. Participation in any FWC conservation effort is entirely voluntary and at the sole choice of willing landowners.

Private landowners seeking assistance with habitat management will find it offered within FWC's LAP. The FWC employs biologists who are available to provide wildlife-related assistance with land-use planning and habitat management. There are many forms of assistance that include technical, financial, educational, and various forms of recognition that seek to award landowners who manage their wildlife habitat responsibly. More information on FWC's LAP program and online habitat management tools are available online at http://myfwc.com/conservation/special-initiatives/lap/.

4.10.4 FWC Florida Forever Additions and Inholdings Acquisition List

Currently, FWC has identified 18,218 acres of potential additions or inholdings for TNRWMA. In addition, 27,023 acres of the Osceola Pine Savannas Florida Forever project remain to be acquired.

4.11 Research Opportunities

The FWC intends to cooperate with researchers and universities as feasible and appropriate. For TNRWMA, the FWC will continue to assess and identify research needs, and pursue research and environmental education partnership opportunities as appropriate. Research proposals involving the use of the area are evaluated on an individual basis. All research activities on TNRWMA must have prior approval by FWC.

4.12 Soil Conservation

Soil disturbing activities will be confined to areas that have the least likelihood of experiencing erosion. On areas that are disturbed prior to acquisition, continued assessments will be made to determine if soil erosion is occurring, and if so, appropriate measures will be implemented to stop or control the effects of this erosion.

4.13 Cooperating Agencies

FWC is responsible for the management and operation of TNRWMA as a provision in the lease agreement with the BOT. All requirements of the Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties document from the DHR are followed with regard to any ground-disturbing activities. FFS assists FWC by providing technical assistance on forest resource management. FWC cooperates and consults with the SJRWMD and SFWMDs for the monitoring and management of both ground and surface water resources.

5 Resource Management Goals and Objectives

The management goals described in this section are considered broad, enduring statements designed to guide the general direction of management actions to be conducted to achieve a desired future outcome for TNRWMA. The objectives listed within each management goal offer more specific management guidance and measures and are considered the necessary steps to accomplish the management goals. Many of the objectives have specific target dates for completion and all of them are classified as having either short-term (less than two years) or long-term (up to ten years) timelines for completion.

5.1 Habitat Restoration and Improvement

Goal: Maintain, improve, or restore imperiled species populations and habitats.

Short-term

5.1.1 Continue to prescribe burn 6,000 acres of fire-adapted natural communities per year.

5.1.2 Maintain 13,170 acres (100%) of fire-adapted natural communities within a 2 – 4 year target fire return interval.

5.1.3 Implement the prescribed burn plan.

5.1.4 Continue Objective Based Vegetation Management.

5.1.5 Conduct habitat/natural community improvement (roller chopping) in mesic flatwoods on 100 acres per year.

5.1.6 To maintain vegetation at a low fuel load density, continue the existing ten-year cattle grazing lease.

Long-term

5.1.7 Continue to prescribe burn 6,000 acres of fire-adapted natural communities per year.

5.1.8 Continue to maintain 13,170 acres (100%) of fire-adapted natural communities within a 2-4 target fire return interval.

5.1.9 Continue to conduct OBVM.

5.1.10 Continue groundcover restoration on 80 acres of former citrus grove in the south-western portion of TNRWMA, along US 441.

5.1.11 Begin groundcover restoration on an additional 40 acres of former citrus grove in the south-western portion of TNRWMA, along US 441.

5.1.12 Continue to initiate groundcover restoration on an average of 40 acres per year.

5.1.13 Continue habitat/natural community improvement (roller chopping) in mesic flatwoods on 100 acres per year.

5.1.14 Upon completion of groundcover restoration on 40 acres per year of former citrus grove, restore overstory, including planting of appropriate pine species.

5.1.15 To maintain vegetation at a low fuel load density, continue the existing ten-year cattle grazing lease through 2018.

5.1.16 Evaluate the effectiveness and efficacy of cattle grazing as a vegetation management tool.

5.2 Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration

Goal: Maintain, improve, or restore imperiled species populations and habitats.

Short-term

5.2.1 Develop and implement a WCPR strategy for select imperiled and focal wildlife species.

5.2.2 Contingent on the results of the WCPR strategy, continue to monitor four imperiled and focal wildlife species: red-cockaded woodpecker (RCW), gopher tortoise, Southern bald eagle, and Northern bobwhite.

5.2.3 In cooperation with the management of HHBCWMA, continue to annually monitor RCW clusters.
5.2.4 Continue to supplement the RCW population through nest box inserts and translocation.
5.2.5 Continue to collect opportunistic wildlife species occurrence data.

Long-term

5.2.6 Continue to implement WCPR strategy by managing identified habitats and monitoring identified species.
5.2.7 Contingent on the results of the WCPR strategy, continue to monitor four imperiled and focal wildlife species: RCW, gopher tortoise, Southern bald eagle, and Northern bobwhite.
5.2.8 In cooperation with the management of HHBCWMA, continue to annually monitor RCW clusters.
5.2.9 Continue to supplement the RCW population through nest box inserts and translocation as feasible and appropriate.
5.2.10 Continue to collect opportunistic wildlife species occurrence data.

5.3 Other Game and Non-game Wildlife Habitat Maintenance, Enhancement, Restoration, or Population Restoration

Goal: Maintain, improve, or restore game and non-game species populations and habitats.

Short-term

5.3.1 Continue to conduct annual spotlight monitoring surveys for white-tailed deer.
5.3.2 Continue to collect biological data at check stations.
5.3.3 Continue to collect opportunistic wildlife occurrence data.
5.3.4 Continue to maintain ~40 acres of wildlife food plots.
5.3.5 Primarily through mowing, continue to maintain ~55 acres of existing wildlife openings.
5.3.6 Continue to maintain and monitor 11 wood duck boxes.
5.3.7 Construct and install up to 12 additional wood duck boxes if needed.

Long-term

5.3.8 Continue to conduct annual spotlight monitoring surveys for white-tailed deer.
5.3.9 Continue to collect biological game species harvest data at check stations.
5.3.10 Continue to collect opportunistic wildlife occurrence data.
5.3.11 Continue to maintain ~40 acres of wildlife food plots.
5.3.12 Primarily through mowing, continue to maintain ~55 acres of existing wildlife openings.
5.3.13 Continue to maintain and monitor up to 23 wood duck boxes.

5.4 Public Access and Recreational Opportunities

Goal: Provide public access and recreational opportunities.

Short-term

5.4.1 Continue to maintain public access and recreational opportunities to allow for a recreational carrying capacity of 350 visitors per day.
5.4.2 Continue to maintain 7.96 miles of trails.
5.4.3 Continue to provide the bird list, website, and entrance kiosk for interpretation and educational information.
5.4.4 Implement recommendations of the Recreation Master Plan for TNRWMA (Appendix 13.11).
5.4.5 Contingent on the recommendations and implementation of the Recreation Master Plan, and if determined to be feasible and appropriate, develop additional public access and recreational opportunities which include additional trails and structures to allow for a carrying capacity of 504 visitors per day outside of the shooting sports complex.
5.4.6 In cooperation with identified partners, initiate Phase I development of the public shooting sports complex (Appendix 13.11) to allow for a carrying capacity of 316 visitors per day at the complex.
5.4.7 Coordinate with the U.S. Forest Service and Florida Trail Association to make regional connections to the Florida National Scenic Trail through TNRWMA and/or HHBCWMA to Tosohatchee WMA and TLWMA.
5.4.8 Continue to provide hunting opportunities including special opportunity deer season, small game season, wild hog still season, special opportunity spring turkey season, and migratory bird seasons.
5.4.9 Investigate the feasibility of establishing special opportunity archery and special opportunity muzzleloading hunts.
5.4.10 Continue to manage white-tailed deer using quality deer management techniques including the harvest of antlered deer having four or more points on one side.

Long-term

5.4.11 Upon implementation of the Recreation Master Plan, continue to maintain public access and recreational opportunities to allow for a recreational carrying capacity of up to 504 visitors per day outside of the shooting sports complex.
5.4.12 Continue to provide the bird list, website, and entrance kiosk for interpretation and educational information.
5.4.13 Create a trail map/guide, recreation guide, additional interpretive signage, and evaluate the potential for Spanish language materials.
5.4.14 Continue to monitor trails biannually for visitor impacts.
5.4.15 Continue to maintain 7.96 miles of trails.
5.4.16 Designate and mark as many as 5.5 miles of additional trails to connect TNRWMA trails with HHBCWMA.
5.4.17 Implement recommendations of the Recreation Master Plan.

5.4.18 As feasible and appropriate, continue development of Phase II and III of the public shooting sports complex (Appendix 13.11) to allow for a carrying capacity of 640 visitors per day at the complex.

5.4.19 Reassess recreational opportunities every three years.

5.4.20 Continue to coordinate with the U.S. Forest Service and Florida Trail Association to make connections for the Florida National Scenic Trail through TNRWMA and/or HHBCWMA to Tosohatchee WMA and TLWMA.

5.4.21 Solicit cooperation from other agencies, counties, stakeholders, and regional landowners to investigate regional recreational opportunities, including linking hiking, and multi-use trail systems among regional public and/or private areas.

5.4.22 Identify and provide for emerging recreational trends (e.g., geocaching, bicycling) as appropriate.

5.4.23 Continue to identify partnerships that could provide for environmental educational programs and outreach.

5.4.24 Continue to provide hunting opportunities including special opportunity deer, small game, wild hog, special opportunity spring turkey, and migratory bird hunts; if approved, continue to provide hunting opportunities for special opportunity archery and special opportunity muzzleloading.

5.4.25 Continue to manage white-tailed deer using quality deer management techniques including the harvest of antlered deer having four or more points on one side.

5.5 Hydrological Preservation and Restoration

Goal: Protect water quality and quantity, restore hydrology to the extent feasible, and maintain the restored condition.

Short-term

5.5.1 Coordinate with the SJRWMD to conduct or otherwise obtain a site-specific hydrological assessment to identify potential hydrology restoration needs, and address potential hydroperiod, water quality and quantity impacts on adjacent landowners.

5.5.2 To maintain and enhance natural hydrological functions, install and maintain low-water crossings and culverts as appropriate.

Long-term

5.5.3 To enhance natural hydrological functions, continue to install and maintain low-water crossings and culverts as appropriate.

5.5.4 Pursuant to the recommendations of the hydrological assessment, implement a hydrological restoration plan as feasible and appropriate.

5.5.5 If determined to be appropriate based on the hydrological assessment, restore former citrus grove impoundments (~20 acres) to natural communities.

5.6 Forest Resource Management

Goal: Manage timber resources to improve or restore natural communities for the benefit of wildlife.

Short-term

5.6.1 Cooperate with the FFS to update the existing Timber Assessment as necessary.

5.6.2 As necessary and appropriate, consult with the FFS or a professional forestry consultant regarding forest management activities.

5.6.3 On suitable sites, continue to plant longleaf pine in areas of former citrus grove, pasture of the former Equitable, Yates, and Vanosdol tracts, and in completed groundcover restoration areas.

Long-term

5.6.4 As necessary and appropriate, continue to consult with the FFS or a professional forestry consultant regarding forest management activities.

5.7 Exotic and Invasive Species Maintenance and Control

Goal: Remove exotic and invasive plants and animals and conduct needed maintenance- control.

Short-term

5.7.1 As necessary, annually treat at least 50 acres of Florida Exotic Pest Plant Council (FEPPC) Category I and Category II invasive exotic plant species including lygodium, tropical soda apple, cogon grass, and Brazilian pepper.

5.7.2 Through hunting, continue control measures on one exotic/nuisance animal species (feral hog).

Long-term

5.7.3 As necessary, continue to annually treat at least 50 acres of FEPPC Category I and Category II invasive exotic plant species including lygodium, tropical soda apple, cogon grass, and Brazilian pepper.

5.7.4 Through hunting, continue control measures on one exotic/nuisance animal species (feral hog).

5.8 Capital Facilities and Infrastructure

Goal: Develop the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.

Short-term

5.8.1 Continue to maintain 13 facilities including staff residence, office, check station, campground, vault toilet, pole barn, and other storage structures.

5.8.2 Maintain 60.9 miles of roads.

5.8.3 As necessary, maintain, improve, or repair 7.96 miles of existing trails.

5.8.4 Improve or repair three facilities including the staff residence, staff office and the primary entrance sign.

5.8.5 Improve two miles of roads with a capping material of shell or limestone.

Long-term

5.8.6 Monitor trails and infrastructure biannually for visitor impacts.

5.8.7 Continue to maintain 13 facilities.

5.8.8 Continue to maintain 60.9 miles of roads.
5.8.9 Designate and mark as many as 5.5 miles of new trails to connect TNRWMA trails with HHBCWMA.
5.8.10 Continue to maintain, improve, or repair up to 13.4 miles of existing trails.
5.8.11 Construct up to ten new facilities including a public shooting sports complex, up to seven covered picnic tables, a kiosk, and a picnic shelter/pavilion.
5.8.12 Improve six additional miles of roads with a capping material of shell or limestone.
5.8.13 Cooperate with DHR or trained FWC staff in determining appropriate locations and designing site plans for development of facilities and infrastructure.

5.9 Cultural and Historical Resources

Goal: Protect, preserve, and maintain the cultural resources of the WMA.

Short-term

5.9.1 Ensure all known sites are recorded in the Florida Department of State's DHR Master Site file.
5.9.2 Continue to monitor, protect, and preserve the three identified cultural sites in accordance with DHR.
5.9.3 Coordinate with DHR to assess the need for conducting a cultural resource survey.

Long-term

5.9.4 As determined appropriate and necessary by DHR, continue to monitor, protect and preserve the three identified cultural sites.
5.9.5 As feasible and appropriate, continue to coordinate with DHR to provide for cultural resource management training for FWC staff.

5.10 Research Opportunities

Goal: Explore and pursue cooperative research opportunities.

Short-term

5.10.1 Continue to cooperate with researchers and universities as appropriate.
5.10.2 Continue to assess the need for and pursue research and environmental education partnership opportunities as appropriate.

Long-term

5.10.3 Continue to cooperate with researchers and universities as appropriate.
5.10.4 Continue to assess the need for and pursue research and environmental education partnership opportunities as appropriate.

5.11 Conservation Acquisition and Stewardship Partnerships

Goal: Enhance wildlife conservation, resource and operational management through development of an optimal boundary.

Short-term

5.11.1 Identify potential important wildlife habitat, landscape-scale linkages, wildlife corridors, operational/resource management.

5.11.2 Continue to identify and pursue acquisition needs and conservation stewardship partnerships.

5.11.3 Develop and maintain a GIS shapefile and other necessary data to facilitate nominations from the FWC optimal boundary for FWC's Landowner Assistance and Land Acquisition Programs.

5.11.4 Develop a CAS.

5.11.5 Contact and inform adjoining landowners about the FWC LAP to pursue non-acquisition conservation stewardship partnerships.

5.11.6 Determine which parcels should be nominated for addition to the FWC acquisition list.

5.11.7 Identify potential non-governmental organization partnerships and grant program opportunities.

5.11.8 Determine efficacy of conducting an adjacent landowner's assistance/conservation stewardship partnership workshop.

Long-term

5.11.9 To minimize fragmentation of the area, continue to identify strategic parcels to revise the completed optimal boundary for WMA as deemed necessary.

5.11.10 Continue to maintain a GIS shapefile and other necessary data to facilitate nominations from the FWC optimal boundary for the FWC Landowner Assistance Program and for the Land Acquisition Program.

5.11.11 Continue to determine which nominated parcels should be added to the FWC acquisition list.

5.11.12 Propose nominations of selected properties as additions to the FWC acquisition list. Pursue acquisition of parcels added to the FWC acquisition list as acquisition work plan priorities and funding allow.

5.11.13 Pursue acquisition of parcels added to the FWC acquisition list as acquisition work plan priorities and funding allow.

5.11.14 Periodically (at least every three to five years) continue to contact and meet with adjacent landowners for willingness to participate in the CAS.

5.11.15 Coordinate landowner assistance/ conservation stewardship partnership workshop as deemed appropriate.

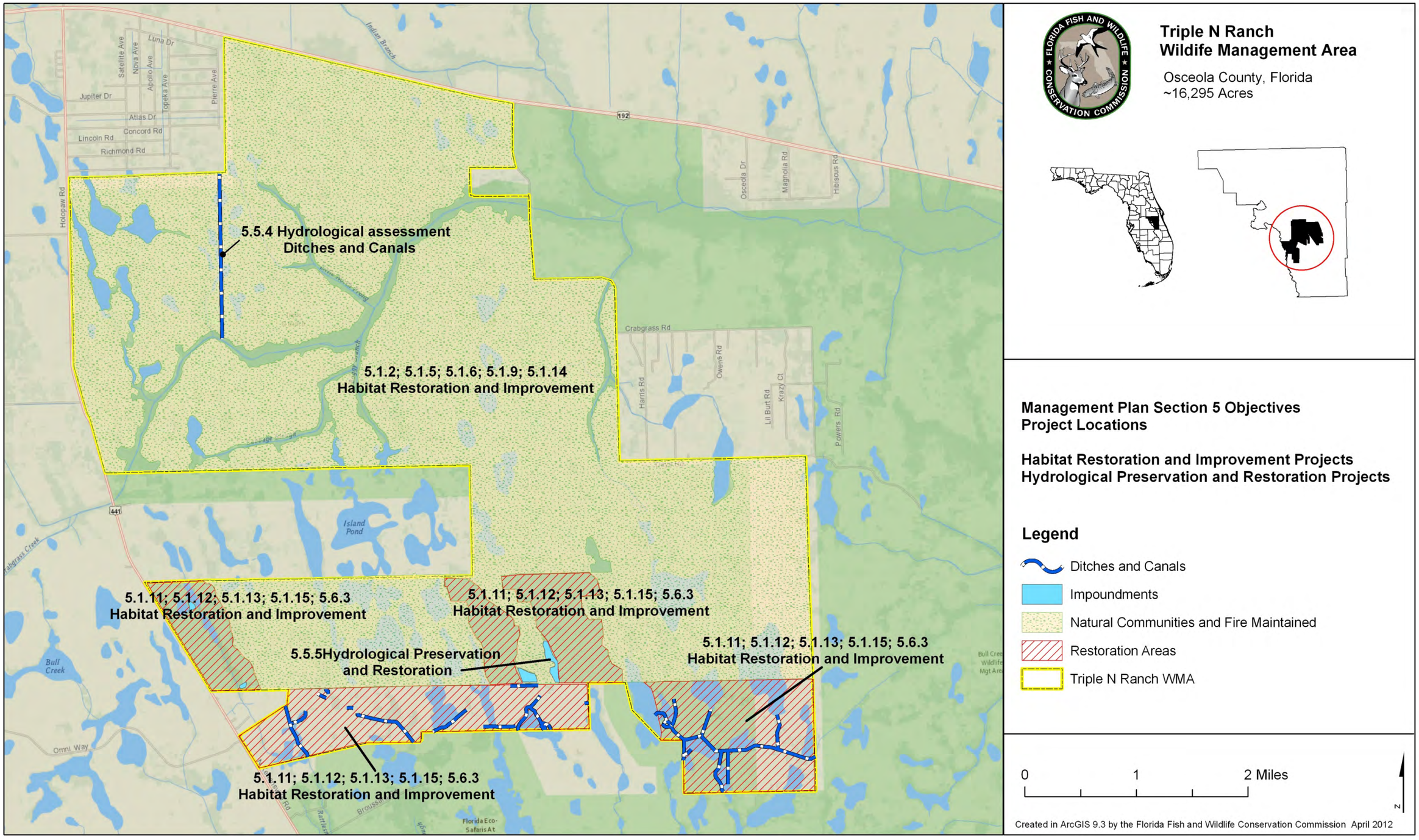
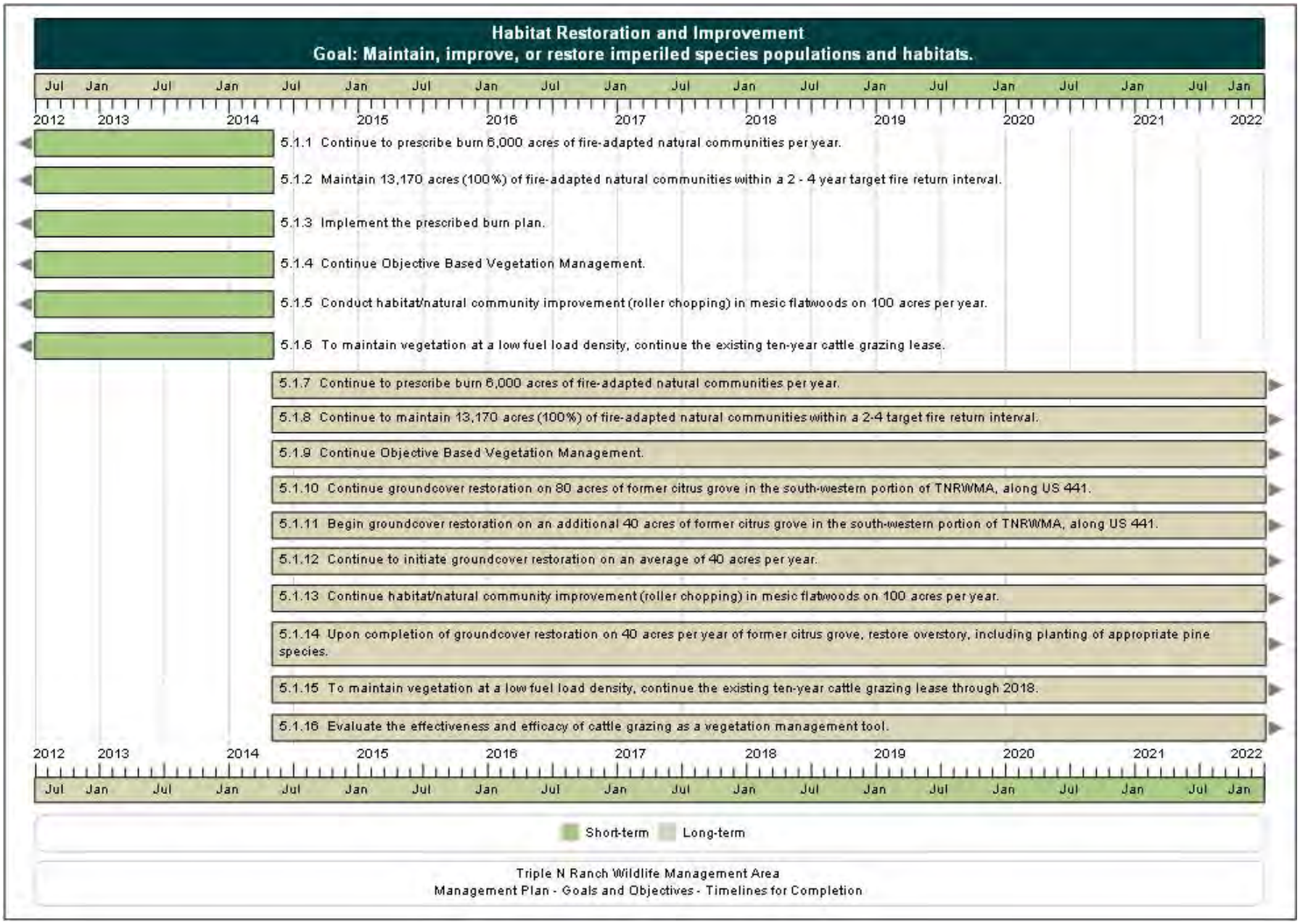
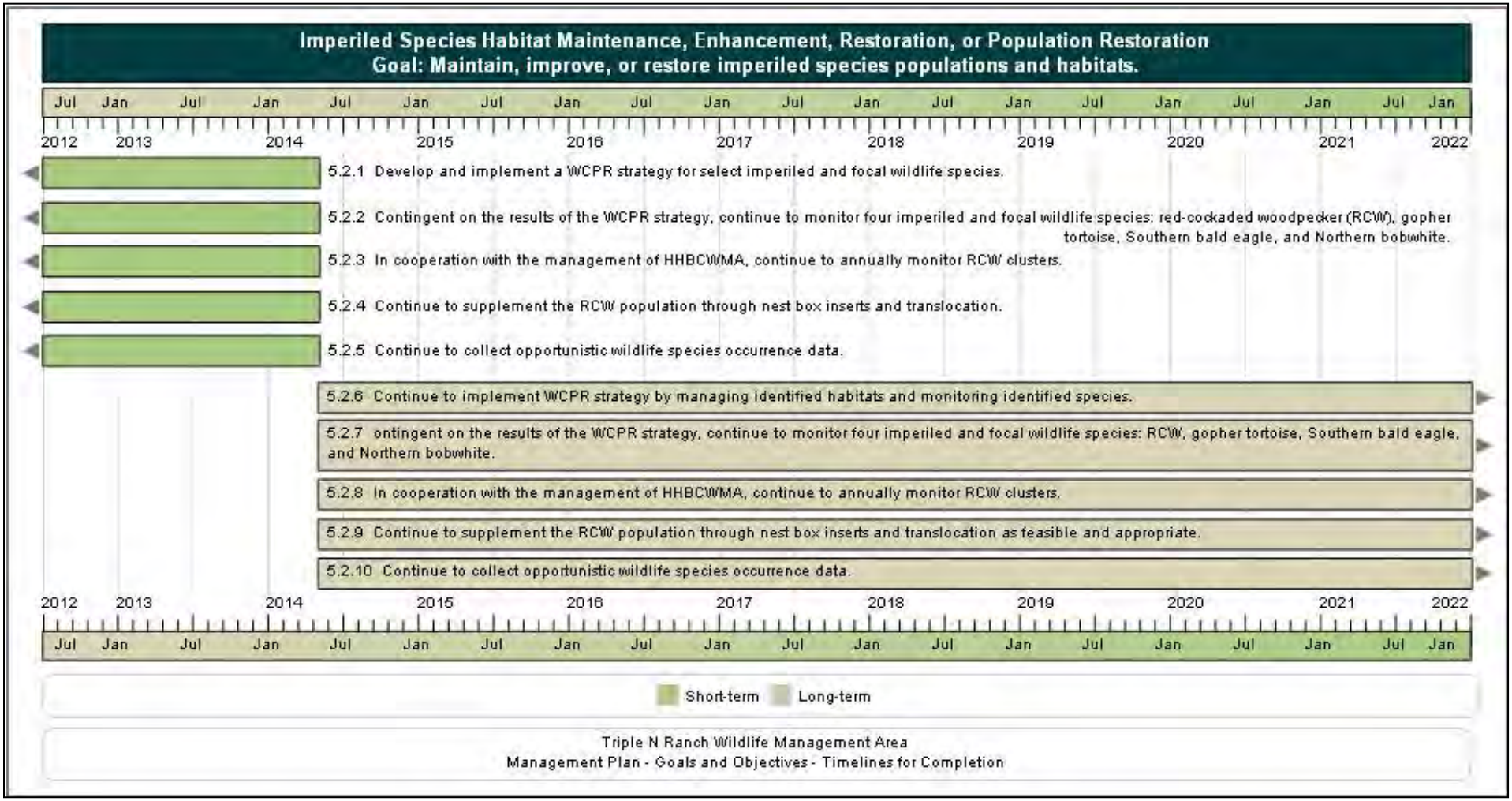


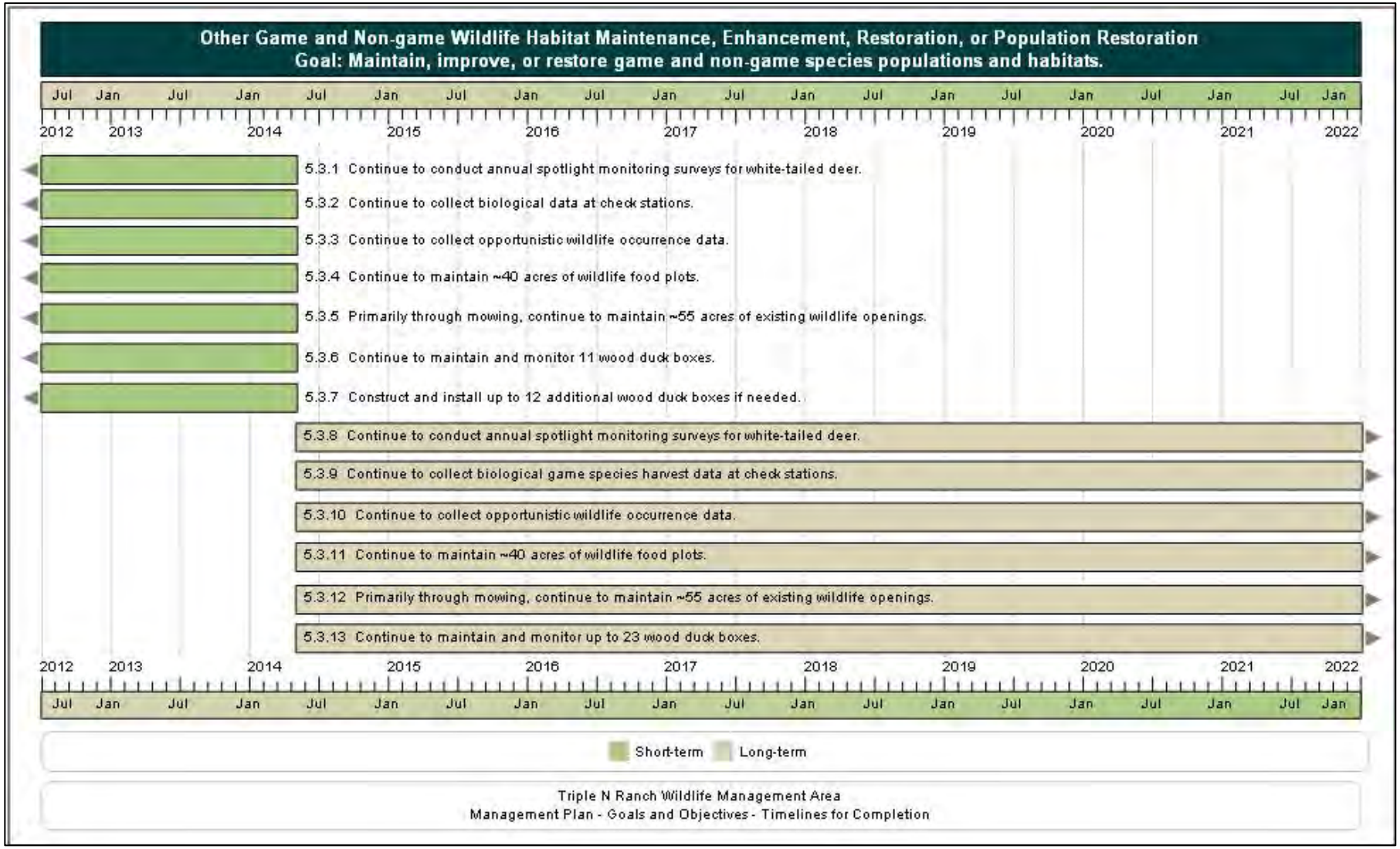
Figure 6. Project Locations.

6 Schedule: Timelines for Completion of Resource Management Goals and Objectives

The following section presents the short and long-term goals and objectives for the management of TNRWMA graphically in a timeline format. These timelines directly reflect the short and long-term goals and objectives presented above in Section 5.


Habitat Restoration and Improvement
Goal: Maintain, improve, or restore imperiled species populations and habitats.
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.1.1 Continue to prescribe burn 6,000 acres of fire-adapted natural communities per year.
5.1.2 Maintain 13,170 acres (100%) of fire-adapted natural communities within a 2 - 4 year target fire return interval.
5.1.3 Implement the prescribed burn plan.
5.1.4 Continue Objective Based Vegetation Management.
5.1.5 Conduct habitat/natural community improvement (roller chopping) in mesic flatwoods on 100 acres per year.
5.1.6 To maintain vegetation at a low fuel load density, continue the existing ten-year cattle grazing lease.
5.1.7 Continue to prescribe burn 6,000 acres of fire-adapted natural communities per year.
5.1.8 Continue to maintain 13,170 acres (100%) of fire-adapted natural communities within a 2-4 target fire return interval.
5.1.9 Continue Objective Based Vegetation Management.
5.1.10 Continue groundcover restoration on 80 acres of former citrus grove in the south-western portion of TNRWMA, along US 441.
5.1.11 Begin groundcover restoration on an additional 40 acres of former citrus grove in the south-western portion of TNRWMA, along US 441.
5.1.12 Continue to initiate groundcover restoration on an average of 40 acres per year.
5.1.13 Continue habitat/natural community improvement (roller chopping) in mesic flatwoods on 100 acres per year.
5.1.14 Upon completion of groundcover restoration on 40 acres per year of former citrus grove, restore overstory, including planting of appropriate pine species.
5.1.15 To maintain vegetation at a low fuel load density, continue the existing ten-year cattle grazing lease through 2018.
5.1.16 Evaluate the effectiveness and efficacy of cattle grazing as a vegetation management tool.
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
Short-term
Long-term
Triple N Ranch Wildlife Management Area
Management Plan - Goals and Objectives - Timelines for Completion


Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration
Goal: Maintain, improve, or restore imperiled species populations and habitats.
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.2.1 Develop and implement a WCPR strategy for select imperiled and focal wildlife species.
5.2.2 Contingent on the results of the WCPR strategy, continue to monitor four imperiled and focal wildlife species: red-cockaded woodpecker (RCW), gopher tortoise, Southern bald eagle, and Northern bobwhite.
5.2.3 In cooperation with the management of HHBCWMA, continue to annually monitor RCW clusters.
5.2.4 Continue to supplement the RCW population through nest box inserts and translocation.
5.2.5 Continue to collect opportunistic wildlife species occurrence data.
5.2.6 Continue to implement WCPR strategy by managing identified habitats and monitoring identified species.
5.2.7 ontingent on the results of the WCPR strategy, continue to monitor four imperiled and focal wildlife species: RCW, gopher tortoise, Southern bald eagle, and Northern bobwhite.
5.2.8 In cooperation with the management of HHBCWMA, continue to annually monitor RCW clusters.
5.2.9 Continue to supplement the RCW population through nest box inserts and translocation as feasible and appropriate.
5.2.10 Continue to collect opportunistic wildlife species occurrence data.
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
Short-term
Long-term
Triple N Ranch Wildlife Management Area
Management Plan - Goals and Objectives - Timelines for Completion


Other Game and Non-game Wildlife Habitat Maintenance, Enhancement, Restoration, or Population Restoration
Goal: Maintain, improve, or restore game and non-game species populations and habitats.
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.3.1 Continue to conduct annual spotlight monitoring surveys for white-tailed deer.
5.3.2 Continue to collect biological data at check stations.
5.3.3 Continue to collect opportunistic wildlife occurrence data.
5.3.4 Continue to maintain ~40 acres of wildlife food plots.
5.3.5 Primarily through mowing, continue to maintain ~55 acres of existing wildlife openings.
5.3.6 Continue to maintain and monitor 11 wood duck boxes.
5.3.7 Construct and install up to 12 additional wood duck boxes if needed.
5.3.8 Continue to conduct annual spotlight monitoring surveys for white-tailed deer.
5.3.9 Continue to collect biological game species harvest data at check stations.
5.3.10 Continue to collect opportunistic wildlife occurrence data.
5.3.11 Continue to maintain ~40 acres of wildlife food plots.
5.3.12 Primarily through mowing, continue to maintain ~55 acres of existing wildlife openings.
5.3.13 Continue to maintain and monitor up to 23 wood duck boxes.
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
Short-term
Long-term
Triple N Ranch Wildlife Management Area
Management Plan - Goals and Objectives - Timelines for Completion

Public Access and Recreational Opportunities
Goal: Provide public access and recreational opportunities.

May Nov May Nov May Nov May Nov May Nov May Nov May Nov May Nov May Nov May Nov May Nov May

2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

5.4.1 Continue to maintain public access and recreational opportunities to allow for a recreational carrying capacity of 350 visitors per day.

5.4.2 Continue to maintain 7.96 miles of trails.

5.4.3 Continue to provide the bird list, website, and entrance kiosk for interpretation and educational information.

5.4.4 Implement recommendations of the Recreation Master Plan for TNRWMA.

5.4.5 Contingent on the recommendations and implementation of the Recreation Master Plan, and if determined to be feasible and appropriate, develop additional public access and recreational opportunities which include additional trails and structures to allow for a carrying capacity of 504 visitors per day outside of the shooting sports complex.

5.4.6 In cooperation with identified partners, initiate Phase I development of the public shooting sports complex to allow for a carrying capacity of 316 visitors per day at the complex.

5.4.7 Coordinate with the U.S. Forest Service and Florida Trail Association to make regional connections to the Florida National Scenic Trail through TNRWMA and/or HHBCWMA to Tosohatchee WMA and TLWMA.

5.4.8 Continue to provide hunting opportunities including special opportunity deer season, small game season, wild hog still season, special opportunity spring turkey season, and migratory bird seasons.

5.4.9 Investigate the feasibility of establishing special opportunity archery and special opportunity muzzleloading hunts.

5.4.10 Continue to manage white-tailed deer using quality deer management techniques including the harvest of antlered deer having four or more points on one side.

5.4.11 Upon implementation of the Recreation Master Plan, continue to maintain public access and recreational opportunities to allow for a recreational carrying capacity of up to 504 visitors per day outside of the shooting sports complex.

5.4.12 Continue to provide the bird list, website, and entrance kiosk for interpretation and educational information.

5.4.13 Create a trail map/guide, recreation guide, additional interpretive signage, and evaluate the potential for Spanish language materials.

5.4.14 Continue to monitor trails biannually for visitor impacts.

5.4.15 Continue to maintain 7.96 miles of trails.

5.4.16 Designate and mark as many as 5.5 miles of additional trails to connect TNRWMA trails with HHBCWMA.

5.4.17 Implement recommendations of the Recreation Master Plan.

5.4.18 As feasible and appropriate, continue development of Phase II and III of the public shooting sports complex (Appendix 13.11) to allow for a carrying capacity of 640 visitors per day at the complex.

5.4.19 Reassess recreational opportunities every three years.

5.4.20 Continue to coordinate with the U.S. Forest Service and Florida Trail Association to make connections for the Florida National Scenic Trail through TNRWMA and/or HHBCWMA to Tosohatchee WMA and TLWMA.

5.4.21 Solicit cooperation from other agencies, counties, stakeholders, and regional landowners to investigate regional recreational opportunities, including linking hiking, and multi-use trail systems among regional public and/or private areas. Solicit cooperation from other agencies, counties, stakeholders, and regional landowners to investigate regional recreational opportunities, including linking hiking, and multi-use trail systems among regional public and/or private areas.

5.4.22 Identify and provide for emerging recreational trends (e.g., geocaching, bicycling) as appropriate.

5.4.23 Continue to identify partnerships that could provide for environmental educational programs and outreach.

5.4.24 Continue to provide hunting opportunities including special opportunity deer, small game, wild hog, special opportunity spring turkey, and migratory bird hunts; if approved, continue to provide hunting opportunities for special opportunity archery and special opportunity muzzleloading. Continue to provide hunting opportunities including special opportunity deer, small game, wild hog, special opportunity spring turkey, and migratory bird hunts; if approved, continue to provide hunting opportunities for special opportunity archery and special opportunity muzzleloading.

5.4.25 Continue to manage white-tailed deer using quality deer management techniques including the harvest of antlered deer having four or more points on one side.

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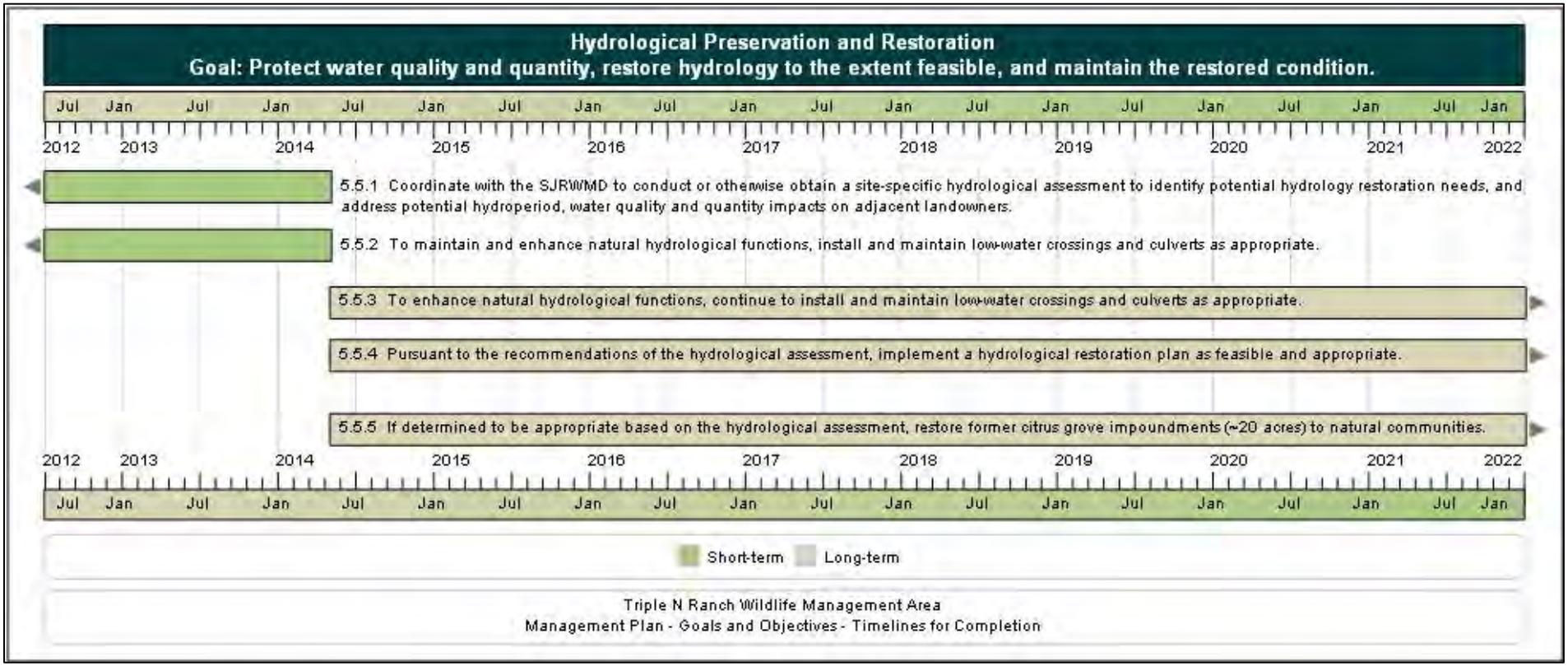
Triple N Ranch Wildlife Management Area
Management Plan - Goals and Objectives - Timelines for Completion


Hydrological Preservation and Restoration
Goal: Protect water quality and quantity, restore hydrology to the extent feasible, and maintain the restored condition.
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2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.5.1 Coordinate with the SJRWMD to conduct or otherwise obtain a site-specific hydrological assessment to identify potential hydrology restoration needs, and address potential hydroperiod, water quality and quantity impacts on adjacent landowners.
5.5.2 To maintain and enhance natural hydrological functions, install and maintain low-water crossings and culverts as appropriate.
5.5.3 To enhance natural hydrological functions, continue to install and maintain low-water crossings and culverts as appropriate.
5.5.4 Pursuant to the recommendations of the hydrological assessment, implement a hydrological restoration plan as feasible and appropriate.
5.5.5 If determined to be appropriate based on the hydrological assessment, restore former citrus grove impoundments (~20 acres) to natural communities.
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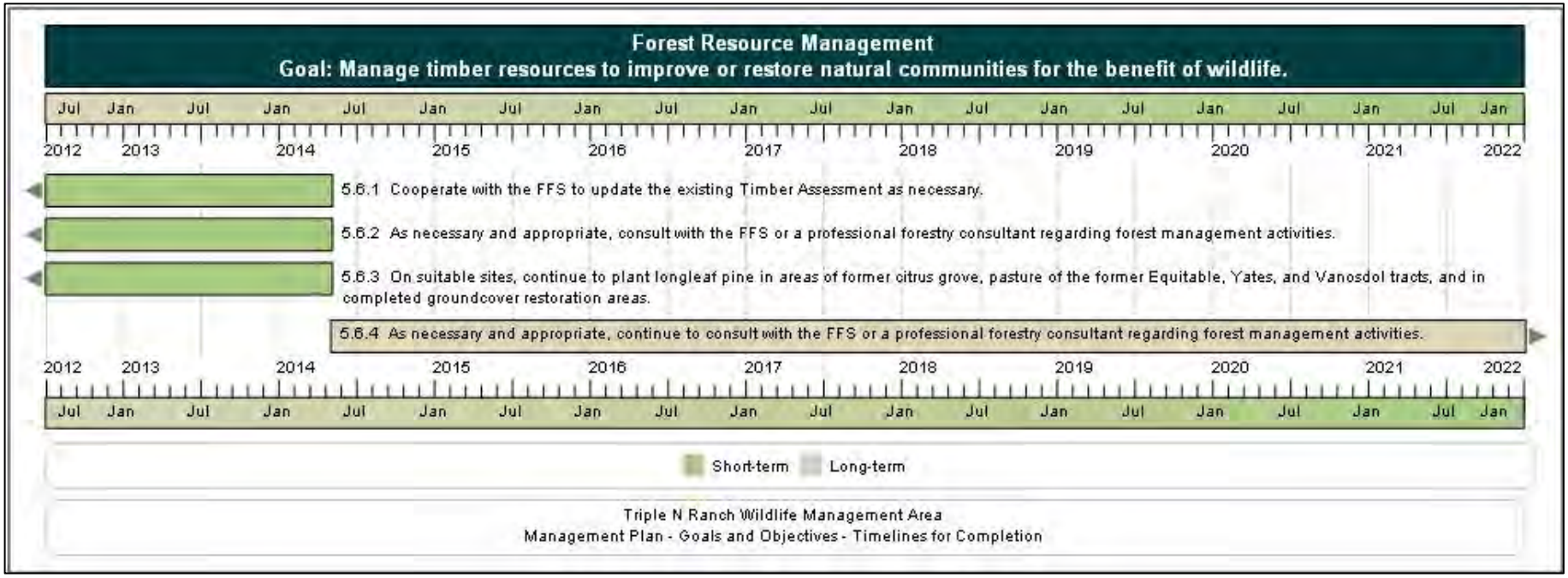
Forest Resource Management
Goal: Manage timber resources to improve or restore natural communities for the benefit of wildlife.
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.6.1 Cooperate with the FFS to update the existing Timber Assessment as necessary.
5.6.2 As necessary and appropriate, consult with the FFS or a professional forestry consultant regarding forest management activities.
5.6.3 On suitable sites, continue to plant longleaf pine in areas of former citrus grove, pasture of the former Equitable, Yates, and Vanosdol tracts, and in completed groundcover restoration areas.
5.6.4 As necessary and appropriate, continue to consult with the FFS or a professional forestry consultant regarding forest management activities.
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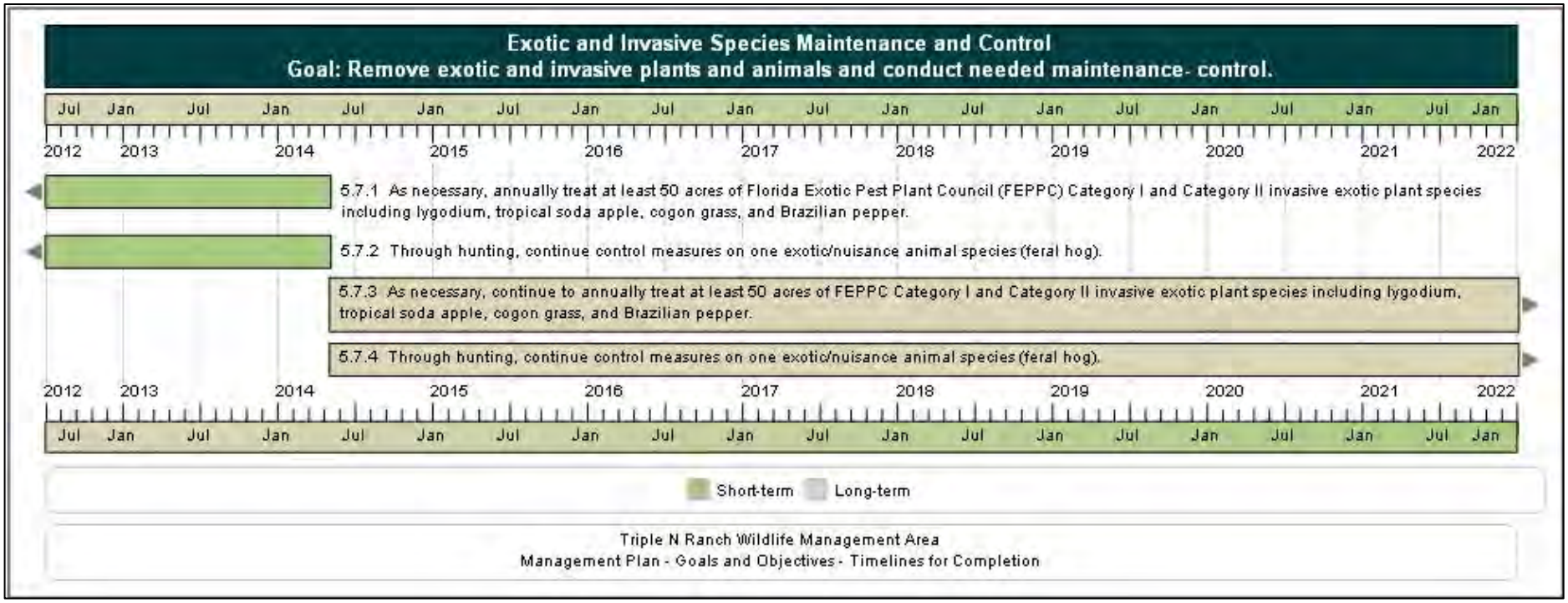
Exotic and Invasive Species Maintenance and Control
Goal: Remove exotic and invasive plants and animals and conduct needed maintenance- control.
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.7.1 As necessary, annually treat at least 50 acres of Florida Exotic Pest Plant Council (FEPPC) Category I and Category II invasive exotic plant species including lygodium, tropical soda apple, cogon grass, and Brazilian pepper.
5.7.2 Through hunting, continue control measures on one exotic/nuisance animal species (feral hog).
5.7.3 As necessary, continue to annually treat at least 50 acres of FEPPC Category I and Category II invasive exotic plant species including lygodium, tropical soda apple, cogon grass, and Brazilian pepper.
5.7.4 Through hunting, continue control measures on one exotic/nuisance animal species (feral hog).
Short-term
Long-term
Triple N Ranch Wildlife Management Area
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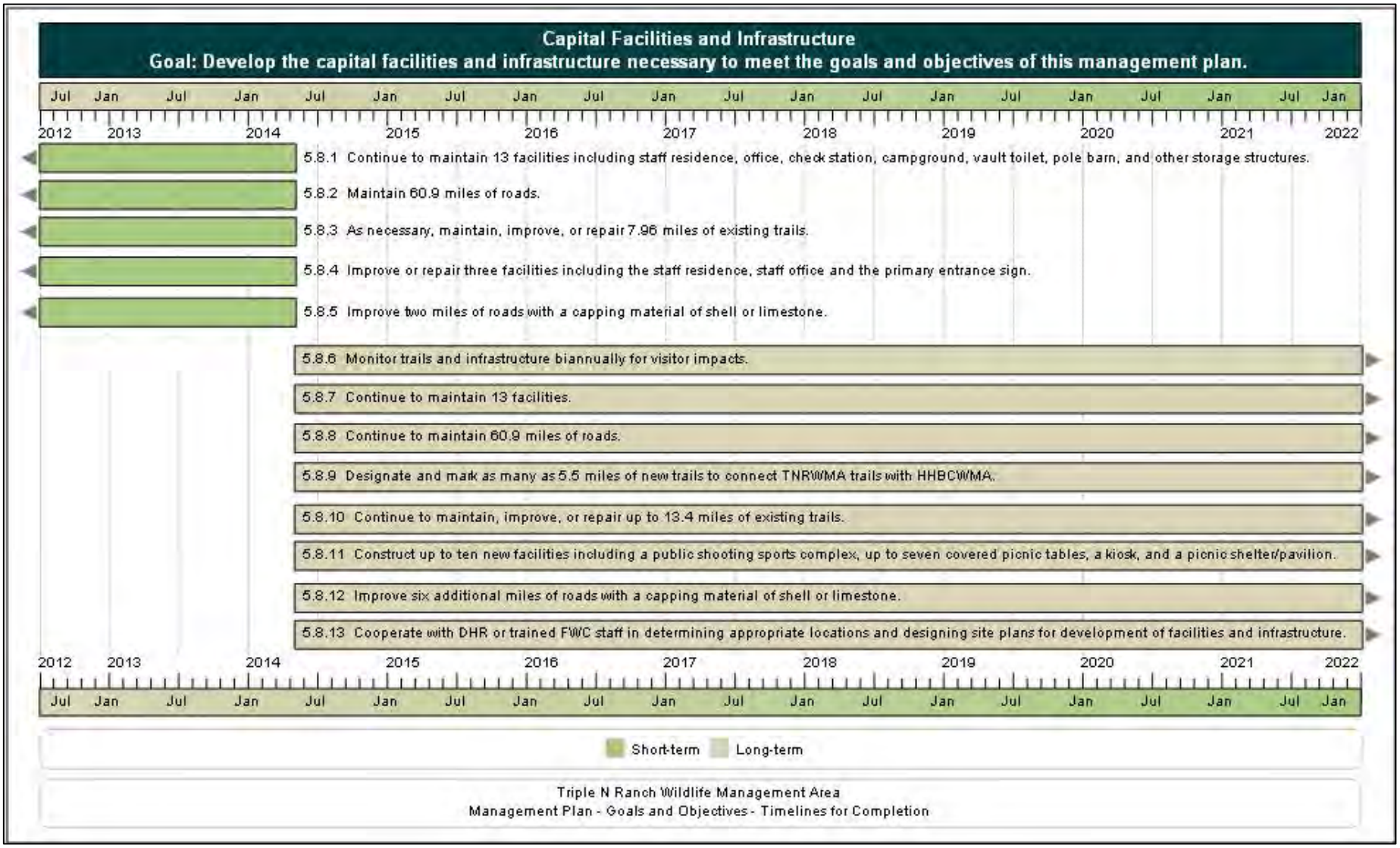
Capital Facilities and Infrastructure
Goal: Develop the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.8.1 Continue to maintain 13 facilities including staff residence, office, check station, campground, vault toilet, pole barn, and other storage structures.
5.8.2 Maintain 60.9 miles of roads.
5.8.3 As necessary, maintain, improve, or repair 7.96 miles of existing trails.
5.8.4 Improve or repair three facilities including the staff residence, staff office and the primary entrance sign.
5.8.5 Improve two miles of roads with a capping material of shell or limestone.
5.8.6 Monitor trails and infrastructure biannually for visitor impacts.
5.8.7 Continue to maintain 13 facilities.
5.8.8 Continue to maintain 60.9 miles of roads.
5.8.9 Designate and mark as many as 5.5 miles of new trails to connect TNRWMA trails with HHBCWMA.
5.8.10 Continue to maintain, improve, or repair up to 13.4 miles of existing trails.
5.8.11 Construct up to ten new facilities including a public shooting sports complex, up to seven covered picnic tables, a kiosk, and a picnic shelter/pavilion.
5.8.12 Improve six additional miles of roads with a capping material of shell or limestone.
5.8.13 Cooperate with DHR or trained FWC staff in determining appropriate locations and designing site plans for development of facilities and infrastructure.
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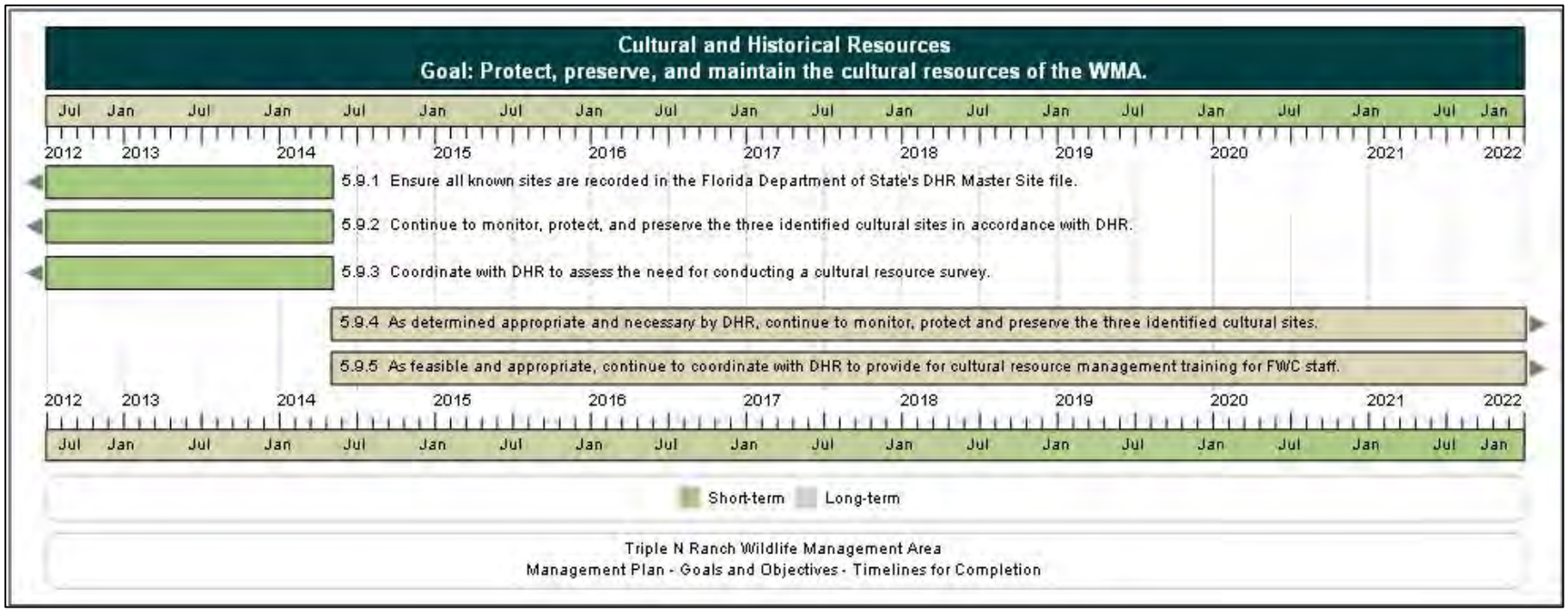
Cultural and Historical Resources
Goal: Protect, preserve, and maintain the cultural resources of the WMA.
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.9.1 Ensure all known sites are recorded in the Florida Department of State's DHR Master Site file.
5.9.2 Continue to monitor, protect, and preserve the three identified cultural sites in accordance with DHR.
5.9.3 Coordinate with DHR to assess the need for conducting a cultural resource survey.
5.9.4 As determined appropriate and necessary by DHR, continue to monitor, protect and preserve the three identified cultural sites.
5.9.5 As feasible and appropriate, continue to coordinate with DHR to provide for cultural resource management training for FWC staff.
Short-term
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Triple N Ranch Wildlife Management Area
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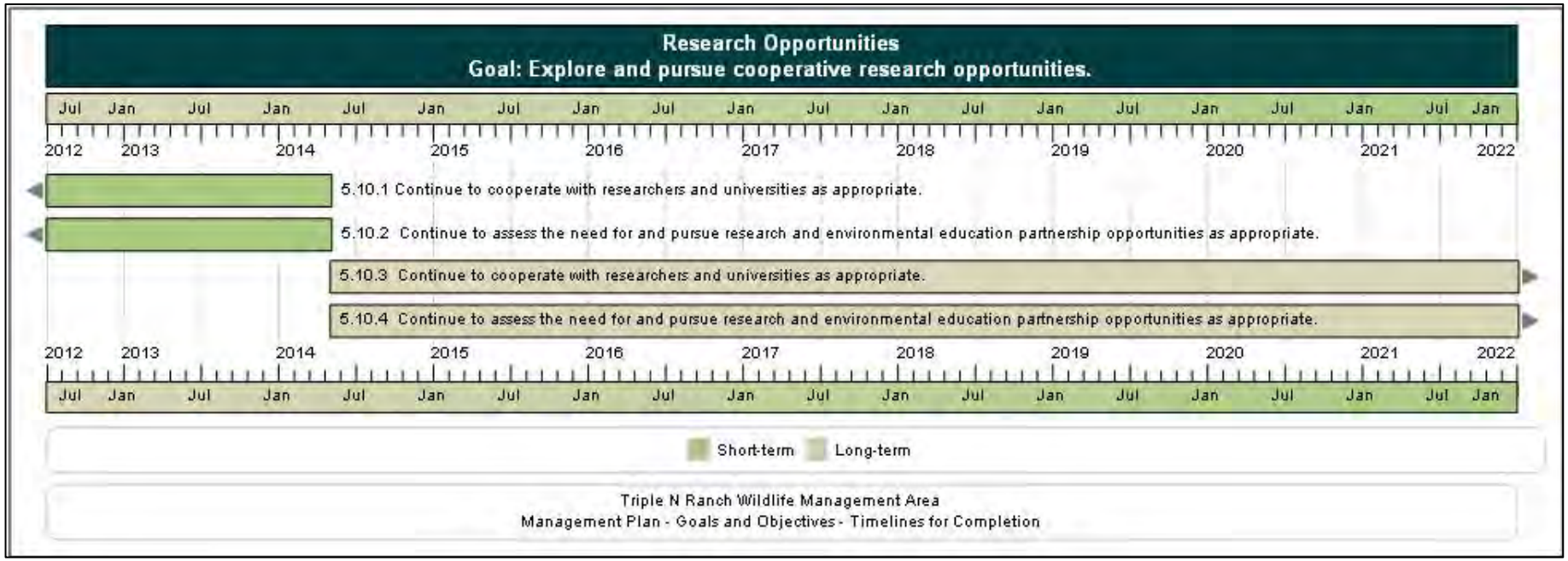
Research Opportunities
Goal: Explore and pursue cooperative research opportunities.
Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan Jul Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.10.1 Continue to cooperate with researchers and universities as appropriate.
5.10.2 Continue to assess the need for and pursue research and environmental education partnership opportunities as appropriate.
5.10.3 Continue to cooperate with researchers and universities as appropriate.
5.10.4 Continue to assess the need for and pursue research and environmental education partnership opportunities as appropriate.
Short-term
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Triple N Ranch Wildlife Management Area
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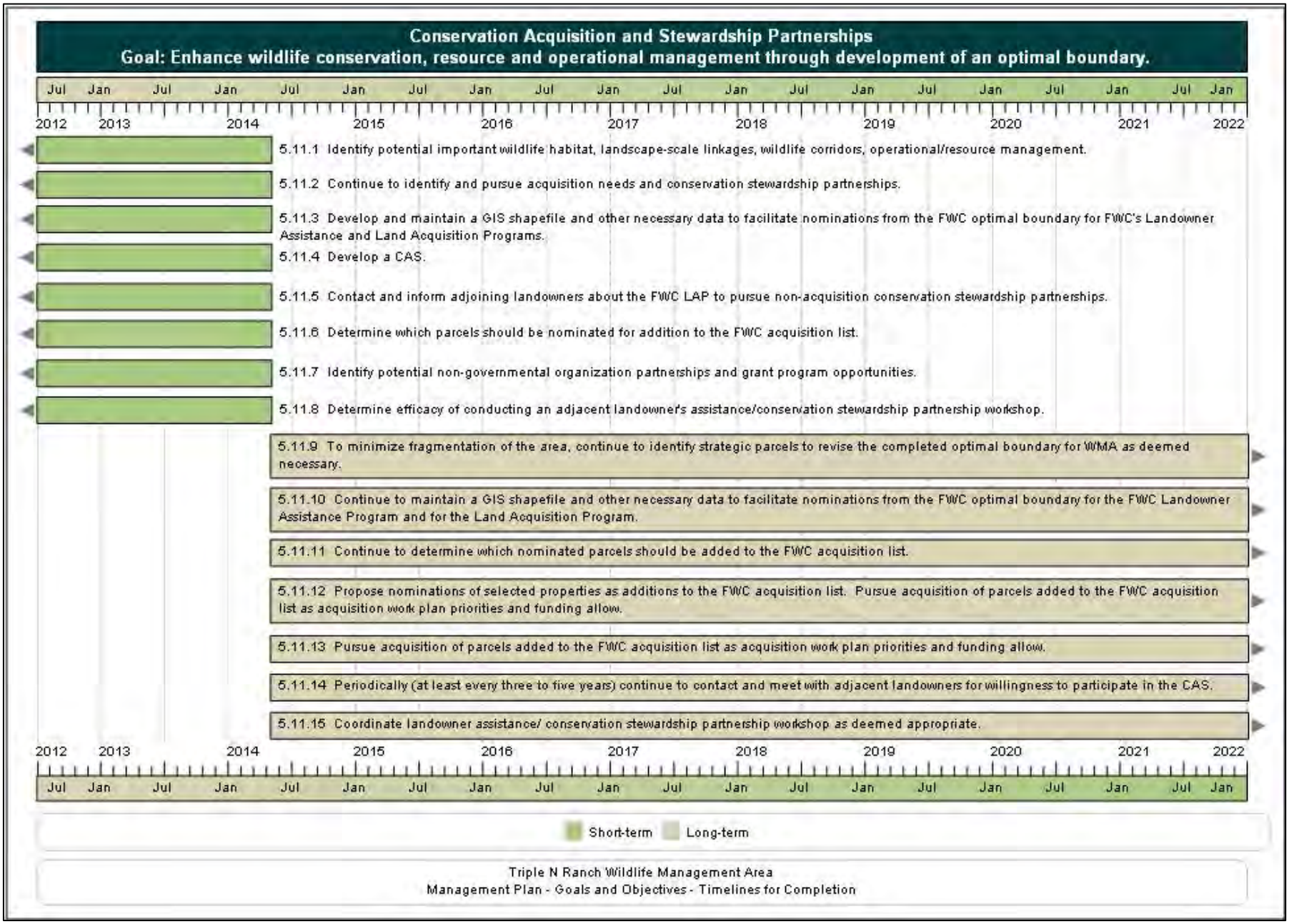
Conservation Acquisition and Stewardship Partnerships
Goal: Enhance wildlife conservation, resource and operational management through development of an optimal boundary.
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2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
5.11.1 Identify potential important wildlife habitat, landscape-scale linkages, wildlife corridors, operational/resource management.
5.11.2 Continue to identify and pursue acquisition needs and conservation stewardship partnerships.
5.11.3 Develop and maintain a GIS shapefile and other necessary data to facilitate nominations from the FWC optimal boundary for FWC's Landowner Assistance and Land Acquisition Programs.
5.11.4 Develop a CAS.
5.11.5 Contact and inform adjoining landowners about the FWC LAP to pursue non-acquisition conservation stewardship partnerships.
5.11.6 Determine which parcels should be nominated for addition to the FWC acquisition list.
5.11.7 Identify potential non-governmental organization partnerships and grant program opportunities.
5.11.8 Determine efficacy of conducting an adjacent landowner's assistance/conservation stewardship partnership workshop.
5.11.9 To minimize fragmentation of the area, continue to identify strategic parcels to revise the completed optimal boundary for WMA as deemed necessary.
5.11.10 Continue to maintain a GIS shapefile and other necessary data to facilitate nominations from the FWC optimal boundary for the FWC Landowner Assistance Program and for the Land Acquisition Program.
5.11.11 Continue to determine which nominated parcels should be added to the FWC acquisition list.
5.11.12 Propose nominations of selected properties as additions to the FWC acquisition list. Pursue acquisition of parcels added to the FWC acquisition list as acquisition work plan priorities and funding allow.
5.11.13 Pursue acquisition of parcels added to the FWC acquisition list as acquisition work plan priorities and funding allow.
5.11.14 Periodically (at least every three to five years) continue to contact and meet with adjacent landowners for willingness to participate in the CAS.
5.11.15 Coordinate landowner assistance/ conservation stewardship partnership workshop as deemed appropriate.
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Short-term
Long-term
Triple N Ranch Wildlife Management Area
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7 Resource Management Challenges and Strategies

7.1 Challenge: Regional ATV/ORV recreation sites are limited and levels of unlawful use of regional conservation areas is increasing.

7.1.1 Strategy: Coordinate with local and regional agencies, counties, ATV/ORV stakeholders, and other entities to identify and develop appropriate regional locations for this recreational activity offsite of TNRWMA.

7.2 Challenge: While currently at minimal levels, unauthorized access, illegal dumping, vandalism, poaching, and unauthorized off-road vehicle (ORV) use may pose an increased threat in the future.

7.2.1 Strategy: Continue to provide area-wide security through FWC law enforcement patrols.

7.3 Challenge: The efforts to market the value of TNRWMA to the community and as an ecotourism destination are currently insufficient.

7.3.1 Strategy: Explore opportunities and partnerships to market TNRWMA as a recreation and ecotourism destination.

8 Cost Estimates and Funding Sources

The following represents the actual and unmet budgetary needs for managing the lands and resources of TNRWMA. This cost estimate was developed using data developed by FWC and other cooperating entities, and is based on actual costs for land management activities, equipment purchase and maintenance, and for development of fixed capital facilities. Funds needed to protect and manage the property and to fully implement the recommended program are derived primarily from the Land Acquisition Trust Fund and from State Legislative appropriations. However, private conservation organizations may be cooperators with the agency for funding of specific projects. Alternative funding sources, such as monies available through mitigation, may be sought to supplement existing funding.

The cost estimate below, although exceeding what FWC typically receives through the appropriations process, is consistent with the direction taken by current operational planning for TNRWMA. Cost estimate categories are those currently recognized by FWC and the Land Management Uniform Accounting Council. More information on these categories, as well as the Fiscal Year 2011 operational plan showing detailed cost estimates by activity and categories of expenditures, may be found in Appendix 13.15.

Triple N Ranch WMA Management Plan Cost Estimate

Maximum expected one year expenditure

Resource Management		Priority schedule:
Exotic Species Control	$24,821	Immediate (annual)
Prescribed Burning	$34,857	Intermediate (3-4 years)
Cultural Resource Management	$451	Other (5+ years)
Timber Management	$0	
Hydrological Management	$51,051	
Other	$90,712	
Subtotal	**$201,891**	
Administration		
General Administration	**$4,204**	
Support		
Land Management Planning	$6,679	
Land Management Reviews	$1,051	
Training/Staff Development	$10,513	
Vehicle Purchase	$75,000	
Vehicle Operation and Maintenance	$57,334	
Other	$1,262	
Subtotal	**$151,839**	
Capital Improvements		
New Facility Construction	$5,150,000	
Facility Maintenance	$47,267	
Subtotal	**$5,197,267**	
Visitor Services/Recreation		
Info./Education/Operations	**$6,144**	
Law Enforcement		
Resource Protection	**$11,407**	
Total	**$5,572,751***	

*Total is based on FWC's current staffing ratio of approximately one full-time employee (FTE) per 5,000 acres of managed area. Three FTE positions are optimal to fully manage the area covered by this plan. All land management funding is dependent on annual legislative appropriations.

Triple N Ranch WMA Management Plan Cost Estimate

Ten-year projection

Resource Management		Priority schedule:
Exotic Species Control	$284,543	Immediate (annual)
Prescribed Burning	$399,596	Intermediate (3-4 years)
Cultural Resource Management	$1,528	Other (5+ years)
Timber Management	$0	
Hydrological Management	$585,246	
Other	$1,039,908	
Subtotal	**$2,310,821**	
Administration		
General Administration	**$48,194**	
Support		
Land Management Planning	$76,571	
Land Management Reviews	$3,642	
Training/Staff Development	$36,418	
Vehicle Purchase	$344,366	
Vehicle Operation and Maintenance	$657,268	
Other	$14,462	
Subtotal	**$1,132,727**	
Capital Improvements		
New Facility Construction	$5,150,000	
Facility Maintenance	$541,862	
Subtotal	**$5,691,862**	
Visitor Services/Recreation		
Info./Education/Operations	**$70,430**	
Law Enforcement		
Resource Protection	**$130,763**	
Total	**$9,384,797**	

*Total is based on FWC's current staffing ratio of approximately one full-time employee (FTE) per 5,000 acres of managed area. Three FTE positions are optimal to fully manage the area covered by this plan. All land management funding is dependent on annual legislative appropriations.

9 Analysis of Potential for Contracting Private Vendors for Restoration and Management Activities

The following management and restoration activities have been considered for outsourcing to private entities. Items selected as "approved" below are those that FWC either does not have in-house expertise to accomplish or which can be done at less cost by an outside provider of services. Those items selected as "conditional" items are those that could be done either by an outside provider or by the agency at virtually the same cost or with the same level of competence. Items selected as "rejected" represent those for which FWC has in-house expertise and/or which the agency has found it can accomplish at less expense than through contracting with outside sources:

	Approved	Conditional	Rejected
• Dike and levee maintenance		✓	
• Exotic species control		✓	
• Mechanical vegetation treatment		✓	
• Public contact and educational facilities development		✓	
• Prescribed burning		✓	
• Timber harvest activities	✓		
• Vegetation inventories	✓		
• Road development and maintenance		✓	
• Wildlife inventories		✓	

10 Accomplished Objectives from 2001 Management Plan

Resource Management Goals and Objectives	Percent Accomplished
Goal 1: Maintain the integrity of Triple N Ranch native ecosystems.	
Objective 1: In cooperation with the Division of Forestry, complete a forest resource assessment **by 2001**.	100%
Objective 2: Contract with FNAI, or a qualified provider, for a complete depiction of FNAI natural communities on Triple N Ranch, including community descriptions and GIS maps, by 2003.	100%
Objective 3: Coordinate with SJRWMD to complete a hydrological assessment of all newly-acquired properties (**Ongoing**).	0%
Comment: FWC determined that performing a hydrological assessment only on newly acquired properties was inadequate. FWC has an objective in this current management plan to coordinate with the SJRWMD to conduct a comprehensive hydrological assessment of TNRWMA.	
Objective 4: Continue to use prescribed fire (see Appendix XIII), cattle grazing, chemical and mechanical means to manage native ground cover and to control exotic plant species (**Ongoing**).	100%
Objective 5: Continue to maintain snags, stumps and other ecosystem components having value to cavity-dependent wildlife species (**Ongoing**).	100%
Objective 6: Continue to recommend control of feral hog populations by allowing liberal hog harvests and hog hunting opportunities (**Ongoing**).	100%
Goal 2: **Continue to offer quality-oriented hunts**	

on Triple N Ranch.	
Objective 1: Implement annual special-opportunity deer hunts on the Triple N Ranch WMA **by 2001**.	100%
Objective 2: Maintain 18 acres of existing food plots and 35 acres of existing wildlife openings to improve hunting experiences and wildlife viewing opportunities (**ongoing**). On newly-acquired property, create 20 acres of wildlife openings and 10 acres of food plots on previously disturbed sites **by 2002**.	100%
Objective 3: Continue to implement strategies necessary to achieve a quality small game area with emphasis on bobwhite quail.(**Ongoing**)	100%
Objective 4: Continue to monitor deer and turkey populations through wildlife surveys to support harvest strategies (**Ongoing**).	100%
Objective 5: Continue user surveys to monitor hunter satisfaction related to special-opportunity hunts (**Ongoing**).	100%
Goal 3: Ensure long-term viability for listed species.	
Objective 1: Conduct a systematic survey for red-cockaded woodpecker and Florida grasshopper sparrow on Triple N Ranch **by 2003**. *Comment: Determined survey was not necessary due to Triple N Ranch not being in historic range of Florida grasshopper sparrow.*	50%
Objective 2: Conduct a systematic gopher tortoise survey on Triple N Ranch **by 2005**.	100%
Objective 3: Conduct a herpetological survey and inventory to identify listed species unknown on the area **by 2005**. *Comment: FWC determined that conducting baseline inventory for herpetological species was insufficient. FWC will incorporate survey and monitoring protocols*	0%

in its WCPR strategy for the TNRWMA.	
Objective 4: Continue to implement specific management strategies for known listed species on the area **by 2005**.	100%
Goal 4: Develop programs, facilities and infrastructure to adequately support management, resource protection and recreational uses on the area.	
Objective 1: Establish a power line and well at the existing equipment shed on the McNamara tract **by 2001**.	100%
Objective 2: Renovate the McNamara house to provide an on-site residence for the area biologist [and thus site security] **by 2002**.	100%
Objective 3: Improve access to the area by developing a new temporary parking area for all recreational users on a previously disturbed site off Highway 192 **by 2001**.	100%
Objective 4: Assess the need for additional firebreaks on newly-acquired properties **by 2001**; if new lines are needed, contact FNAI and Division of Historical Resources for site assessments (**Ongoing**).	100%
Objective 5: Coordinate with regional education specialists to identify and develop environmental education opportunities for the area **by 2001.**	100%
Objective 6: Contact the Florida Trail Association to determine the feasibility and desirability of establishing a hiking trail on the area **by 2001**.	100%
Objective 7: Contact the Osceola County Wagon Train and Trail Ride to determine the feasibility and desirability of establishing equestrian trails on the area **by 2001**.	100%
Objective 8: **By 2002**, develop kiosk information and other forms of communication necessary to inform users of recreational opportunities on the area.	100%
Objective 9: Following acquisition of new properties,	

submit a request for a new position to achieve the FWC staffing standard **by 2002**.	100%
Objective 10: Construct fencing necessary to secure new acquisitions **by 2002**.	100%
Objective 11: Improve hunter campground by planting trees, establishing campsites, and other improvements (e.g. fire ring and picnic tables) to enhance the hunter experience **by 2002.**	100%
Objective 12: Construct an equipment shed and office facility, either by renovating existing facilities or constructing new facilities, **by 2003**.	100%
Objective 13: Complete Loop Road, improve the road to McNamara house and Donovan Crews Road **by 2005**.	100%
Goal 5: Manage and Protect the Cultural Resources of Triple N Ranch.	
Objective 1: **By 2002**, request the Division of Historical Resources to conduct an inventory of cultural resources on Triple N Ranch. *Comment: It was determined that a survey had already been conducted in 1996.*	100%
Goal 6: **Facilitate and conduct monitoring projects to determine optimal management and protection of ecosystems comprising Triple N Ranch.**	
Objective 1: Establish photo-plots in all of Triple N Ranch managed community types **by 2001**.	100%
Objective 2: Develop an economic and environmental analysis comparing retention and maintenance of citrus groves to the restoration of the groves to native ecosystem **by 2001**.	100%
Objective 3: In cooperation with the Adaptive Management Section, continue to monitor the effects of cattle grazing on native plant communities (**Ongoing**)	100%
Objective 4: In cooperation with the Adaptive	

Management Section, investigate the feasibility of additional monitoring projects to address resource management problems or issues [e.g., management of scrub and dry prairie habitats, the effects of horseback riding activities on native groundcover] (**Ongoing**)	100%
Objective 5: Utilize results from the Adaptive Management Section's monitoring projects (as well as those from other sources) in Triple N Ranch management program (**Ongoing**).	100%

11 Compliance with Federal, State, and Local Governmental Requirements

All FWC personnel are governed by the agency's Internal Management Policies and Procedures Manual (IMPP). The IMPP Manual provides internal guidance regarding many subjects affecting the responsibilities of agency personnel including personnel management, safety issues, uniforms and personal appearance, training, as well as accounting, purchasing, and budgetary procedures.

When public facilities are developed on areas managed by FWC, every effort is made to comply with Public Law 101 - 336, the Americans with Disabilities Act. As new facilities are developed, the universal access requirements of this law are followed in all cases except where the law allows reasonable exceptions (e.g., where handicap access is structurally impractical or where providing such access would change the fundamental character of the facility being provided).

Uses planned for TNRWMA are in compliance with the Conceptual State Lands Management Plan and its requirement for "balanced public utilization," and are in compliance with the mission of FWC as described in its Agency Strategic Plan (Appendix 13.7). Such uses also comply with the authorities of the FWC as derived from Article IV, Section 9 of the Florida Constitution as well as the guidance and directives of Chapters 253, 259, 327, 370, 372, 373, 375, 378, 403, 487, 597, and 870 FS.

The FWC has developed and utilizes an Arthropod Control Plan for TNRWMA in compliance with Chapter 388.4111 F.S. (Appendix 13.16). This plan was developed in cooperation with the local Osceola County arthropod control agency. This plan is also in conformance with the Local Government Comprehensive Plan as approved and adopted for Osceola County, Florida, (Appendix 13.17).

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