

A Management Plan for
Dinner Island Ranch
Wildlife Management Area
2016 - 2026



Hendry County, Florida

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



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Jonathan P. Steverson
Secretary

August 23, 2016

Mr. Gary Cochran
Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399-1600

RE: Dinner Island Ranch Wildlife Management Area - Lease #4417

Dear Mr. Cochran:

On **August 19, 2016**, the Acquisition and Restoration Council recommended approval of the **Dinner Island Ranch Wildlife Management Area** management plan. Therefore, 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 **Dinner Island Ranch Wildlife Management Area** management plan. The next management plan update is due August 19, 2026.

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,

A handwritten signature in cursive script that reads "Joseph Wilson".

Joseph Wilson
Office of Environmental Services
Division of State Lands

**A Management Plan
for
Dinner Island Ranch Wildlife Management Area**

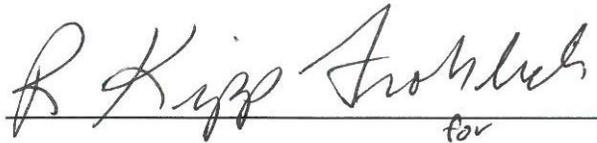
Hendry County, Florida

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



May 2016

Approved

A handwritten signature in black ink, appearing to read "R. Kipp Frohlich", is written over a horizontal line. Below the line, the word "for" is written in a smaller, cursive font.

Thomas Eason

Director, Division of Habitat and Species Conservation

THIS PAGE INTENTIONALLY BLANK

LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

Lead Agency: Florida Fish and Wildlife Conservation Commission (FWC)
 Common Name of Property: Dinner Island Ranch Wildlife Management Area
 Location: Hendry County, Florida
 Acreage Total: 21,714 acres
 Acreage Breakdown:

<u>Land Cover Classification</u>	<u>Acres</u>	<u>Percent of Total Area</u>
Pasture - improved	11,744.69	54.11%
Agriculture	2,698.84	12.43%
Depression marsh	1,938.49	8.93%
Basin marsh	1,804.37	8.31%
Mesic hammock	1,383.51	6.37%
Slough marsh	1,039.88	4.79%
Dome swamp	605.06	2.79%
Canal/ditch	229.71	1.06%
Clearing/regeneration	111.36	0.51%
Artificial pond	73.12	0.34%
Mesic flatwoods	32.34	0.15%
Pasture - semi-improved	31.78	0.15%
Developed	7.10	0.03%
Wet flatwoods	3.82	0.02%
Spoil area	1.99	0.01%

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

Lease/Management Agreement No.: 4417 (Appendix 13.1.1)

Use: Single _____ Management Responsibilities:
 Multiple X Agency FWC Responsibilities
LEAD, SUBLESSEE (Wildlife Management Area, resource protection, law enforcement)

Designated Land Use: Wildlife Management Area

Sublease (s): None

Encumbrances: List: Wetland Reserve Program easement, two cattle leases, citrus grove lease, overhead utility easement, and outstanding oil, gas, and mineral interests

Type Acquisition: Fish and Wildlife Habitat Program

Unique Features: Natural: Natural communities and associated wetlands, panther habitat

Archaeological/Historical: None documented within the DIRWMA

Management Needs: Habitat restoration and improvement; new and improved facilities for management; 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: 39,384 acres remaining in the Panther Glades Florida Forever Project (Figure 12).

Surplus Lands/Acreage: None

Public Involvement: Management Advisory Group consensus building meeting and Public Hearing (Appendix 13.4)

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

ARC Approval Date _____ BTIITF Approval Date: _____

Comments: _____

Land Management Plan Compliance Checklist

Required for State-owned conservation lands over 160 acres

Section A: Acquisition Information Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
1	The common name of the property.	18-2.018 & 18-2.021	ii, 1
2	The land acquisition program, if any, under which the property was acquired.	18-2.018 & 18-2.021	7-8
3	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	7-10
4	The legal description and acreage of the property.	18-2.018 & 18-2.021	ii, 1, 137-176
5	A map showing the approximate location and boundaries of the property, and the location of any structures or improvements to the property.	18-2.018 & 18-2.021	4-6, 91
6	An assessment as to whether the property, or any portion, should be declared surplus. <i>Provide information regarding assessment and analysis in the plan, and provide corresponding map.</i>	18-2.021	64
7	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. <i>Please clearly indicate parcels on a map.</i>	18-2.021	93-95
8	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	14-15
9	A statement of the purpose for which the lands were acquired, the projected use or uses as defined in 253.034 and the statutory authority for such use or uses.	259.032(10)	7
10	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	10-11

Section B: Use Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
11	The designated single use or multiple use management for the property, including use by other managing entities.	18-2.018 & 18-2.021	62-63
12	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	60-62
13	A description of alternative or multiple uses of the property considered by the lessee and a statement detailing why such uses were not adopted.	18-2.018	62-63
14	A description of the management responsibilities of each entity involved in the property's management and how such responsibilities will be coordinated.	18-2.018	8, 96-98
15	Include a provision that requires that the managing agency consult with the Division of Historical Resources, Department of State before taking actions that may adversely affect archeological or historical resources.	18-2.021	58, 90

16	Analysis/description of other managing agencies and private land managers, if any, which could facilitate the restoration or management of the land.	18-2.021	96-98
17	A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	259.032(10)	83-86
18	A finding regarding whether each planned use complies with the 1981 State Lands Management Plan, particularly whether such uses represent “balanced public utilization,” specific agency statutory authority and any other legislative or executive directives that constrain the use of such property.	18-2.021	62-63
19	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	736-739
20	An assessment of the impact of planned uses on the renewable and non-renewable resources of the property, including soil and water resources, and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to compensate/mitigate damage caused by such uses, including a description of how the manager plans to control and prevent soil erosion and soil or water contamination.	18-2.018 & 18-2.021	63, 87-88, 101
21	*For managed areas larger than 1,000 acres, an analysis of the multiple-use potential of the property which shall include the potential of the property to generate revenues to enhance the management of the property provided that no lease, easement, or license for such revenue-generating use shall be entered into if the granting of such lease, easement or license would adversely affect the tax exemption of the interest on any revenue bonds issued to fund the acquisition of the affected lands from gross income for federal income tax purposes, pursuant to Internal Revenue Service regulations.	18-2.021 & 253.036	62
22	If the lead managing agency determines that timber resource management is not in conflict with the primary management objectives of the managed area, a component or section, prepared by a qualified professional forester, that assesses the feasibility of managing timber resources pursuant to section 253.036, F.S.	18-021	517-532
23	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(10)	64

*The following taken from 253.034(10) is not a land management plan requirement; however, it should be considered when developing a land management plan: The following additional uses of conservation lands acquired pursuant to the Florida Forever program and other state-funded conservation land purchase programs shall be authorized, upon a finding by the Board of Trustees, if they meet the criteria specified in paragraphs (a)-(e): water resource development projects, water supply development projects, storm-water management projects, linear facilities and sustainable agriculture and forestry. Such additional uses are authorized where: (a) Not inconsistent with the management plan for such lands; (b) Compatible with the natural ecosystem and resource values of such lands; (c) The proposed use is appropriately located on such lands and where due consideration is given to the use of other available lands; (d) The using entity reasonably compensates the titleholder for such use based upon an appropriate measure of value; and (e) The use is consistent with the public interest.

Section C: Public Involvement Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
24	A statement concerning the extent of public involvement and local government participation in the development of the plan, if any.	18-2.021	16
25	The management prospectus required pursuant to paragraph (9)(d) shall be available to the public for a period of 30 days prior to the public hearing.	259.032(10)	437-485
26	LMPs and LMP updates for parcels over 160 acres shall be developed with input from an advisory group who must conduct at least one public hearing within the county in which the parcel or project is located. <i>Include the advisory group members and their affiliations, as well as the date and location of the advisory group meeting.</i>	259.032(10)	378-388
27	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	378-388
28	During plan development, at least one public hearing shall be held in each affected county. 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. <i>Include a copy of each County's advertisements and announcements (meeting minutes will suffice to indicate an announcement) in the management plan.</i>	253.034(5) & 259.032(10)	389-436
29	The manager shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan. <i>Include manager's replies to the team's findings and recommendations.</i>	259.036	3, 486-505
30	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	486-505
31	If manager is not in agreement with the management review team's findings and recommendations in finalizing the required 10-year update of its management plan, the managing agency should explain why they disagree with the findings or recommendations.	259.036	586-505

Section D: Natural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
32	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding soil types. <i>Use brief descriptions and include USDA maps when available.</i>	18-2.021	17-18, 506-516
33	Insert FNAI based natural community maps when available.	ARC consensus	21-22
34	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding outstanding native landscapes containing relatively unaltered flora, fauna and geological conditions.	18-2.021	16-17, 58

35	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding unique natural features and/or resources including but not limited to virgin timber stands, scenic vistas, natural rivers and streams, coral reefs, natural springs, caverns and large sinkholes.	18-2.018 & 18-2.021	45, 58-59
36	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	59
37	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding mineral resources, such as oil, gas and phosphate, etc.	18-2.018 & 18-2.021	59
38	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding fish and wildlife, both game and non-game, and their habitat.	18-2.018 & 18-2.021	46-57
39	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding State and Federally listed endangered or threatened species and their habitat.	18-2.021	55-57
40	The identification or resources on the property that are listed in the Natural Areas Inventory. <i>Include letter from FNAI or consultant where appropriate.</i>	18-2.021	20-45, 55-57, 534
41	Specific description of how the managing agency plans to identify, locate, protect and preserve or otherwise use fragile, nonrenewable natural and cultural resources.	259.032(10)	72-133
42	Habitat Restoration and Improvement	259.032(10) & 253.034(5)	
42-A.	Describe management needs, problems and a desired outcome and the key management activities necessary to achieve the enhancement, protection and preservation of restored habitats and enhance the natural, historical and archeological resources and their values for which the lands were acquired.	↓	72-133
42-B.	Provide a detailed description of both short (2-year planning period) and long-term (10-year planning period) management goals, and a priority schedule based on the purposes for which the lands were acquired and include a timeline for completion.		102-127
42-C.	The associated measurable objectives to achieve the goals.		102-118
42-D.	The related activities that are to be performed to meet the land management objectives and their associated measures. <i>Include fire management plans - they can be in plan body or an appendix.</i>		72-133, 542-566
42-E.	A detailed expense and manpower budget in order to provide a management tool that facilitates development of performance measures, including recommendations for cost-effective methods of accomplishing those activities.		131-133, 717-729
43	***Quantitative data description of the land regarding an inventory of forest and other natural resources and associated acreage. <i>See footnote.</i>	253.034(5)	20
44	Sustainable Forest Management, including implementation of prescribed fire management	18-2.021, 253.034(5) & 259.032(10) ↓	
44-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		72-133

44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		102-127
44-C.	Measurable objectives (see requirement for #42-C).		102-118
44-D.	Related activities (see requirement for #42-D).		72-133, 542-566
44-E.	Budgets (see requirement for #42-E).		131-133, 717-729
45	Imperiled species, habitat maintenance, enhancement, restoration or population restoration		259.032(10) & 253.034(5)
45-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	72-133
45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		102-127
45-C.	Measurable objectives (see requirement for #42-C).		102-118
45-D.	Related activities (see requirement for #42-D).		72-133
45-E.	Budgets (see requirement for #42-E).		131-133, 717-729
46	***Quantitative data description of the land regarding an inventory of exotic and invasive plants and associated acreage. <i>See footnote.</i>		253.034(5)
47	Place the Arthropod Control Plan in an appendix. If one does not exist, provide a statement as to what arrangement exists between the local mosquito control district and the management unit.	BOT requirement via lease language	730-735
48	Exotic and invasive species maintenance and control	259.032(10) & 253.034(5)	
48-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	72-133
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		102-127
48-C.	Measurable objectives (see requirement for #42-C).		102-118
48-D.	Related activities (see requirement for #42-D).		72-133
48-E.	Budgets (see requirement for #42-E).		131-133, 717-729

Section E: Water Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
49	A statement as to whether the property is within and/or adjacent to an aquatic preserve or a designated area of critical state concern or an area under study for such designation. <i>If yes, provide a list of the appropriate managing agencies that have been notified of the proposed plan.</i>	18-2.018 & 18-2.021	58-59

50	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding water resources, including water classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Water under Rule 62-302.700, F.A.C.	18-2.021	20-22, 36-45, 58-59
51	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding swamps, marshes and other wetlands.	18-2.021	20-22, 36-45, 58-59
52	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. <i>See footnote.</i>	253.034(5)	20-22
53	Hydrological Preservation and Restoration	259.032(10) & 253.034(5)	
53-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	72-133
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		102-127
53-C.	Measurable objectives (see requirement for #42-C).		102-118
53-D.	Related activities (see requirement for #42-D).		72-133
53-E.	Budgets (see requirement for #42-E).		131-133, 717-729

Section F: Historical, Archeological and Cultural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
54	**Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding archeological and historical resources. <i>Include maps of all cultural resources except Native American sites, unless such sites are major points of interest that are open to public visitation.</i>	18-2.018, 18-2.021 & per DHR's request	59, 89-90
55	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	59, 89-90
56	A description of actions the agency plans to take to locate and identify unknown resources such as surveys of unknown archeological and historical resources.	18-2.021	59, 89-90, 112-113
57	Cultural and Historical Resources	259.032(10) & 253.034(5)	
57-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	72-133
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		102-127
57-C.	Measurable objectives (see requirement for #42-C).		102-118
57-D.	Related activities (see requirement for #42-D).		72-133
57-E.	Budgets (see requirement for #42-E).		131-133, 717-729

**While maps of Native American sites should not be included in the body of the management plan, the DSL urges each managing agency to provide such information to the Division of Historical Resources for inclusion in their proprietary database. This information should be available for access to new managers to assist them in developing, implementing and coordinating their management activities.

Section G: Facilities (Infrastructure, Access, Recreation)

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
58	***Quantitative data description of the land regarding an inventory of infrastructure and associated acreage. <i>See footnote.</i>	253.034(5)	90-91
59	Capital Facilities and Infrastructure	259.032(10) & 253.034(5)	
59-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	72-133
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		102-127
59-C.	Measurable objectives (see requirement for #42-C).		102-118
59-D.	Related activities (see requirement for #42-D).		72-133
59-E.	Budgets (see requirement for #42-E).		131-133, 717-729
60	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	83-86, 90-91
61	Public Access and Recreational Opportunities	259.032(10) & 253.034(5)	
61-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	72-133
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		102-127
61-C.	Measurable objectives (see requirement for #42-C).		102-118
61-D.	Related activities (see requirement for #42-D).		72-133
61-E.	Budgets (see requirement for #42-E).		131-133, 717-729

Section H: Other/ Managing Agency Tools

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
62	Place this LMP Compliance Checklist at the front of the plan.	ARC and managing agency consensus	v-xii
63	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	iii-iv
64	If this LMP is a 10-year update, note the accomplishments since the drafting of the last LMP set forth in an organized (categories or bullets) format.	ARC consensus	65-72
65	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032(10)	72-133

66	Summary budget for the scheduled land management activities of the LMP including any potential fees anticipated from public or private entities for projects to offset adverse impacts to imperiled species or such habitat, which fees shall be used to restore, manage, enhance, repopulate, or acquire imperiled species habitat for lands that have or are anticipated to have imperiled species or such habitat onsite. 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) which are resource management, administration, support, capital improvements, recreation visitor services, law enforcement activities.	253.034(5)	131-133, 717-729
67	Cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired, include recommendations for cost-effective methods in accomplishing those activities.	259.032(10)	131-133, 717-729
68	A statement of gross income generated, net income and expenses.	18-2.018	62, 131-133, 717-729

*** = The referenced inventories shall be of such detail that objective measures and benchmarks can be established for each tract of land and monitored during the lifetime of the plan. All quantitative data collected shall be aggregated, standardized, collected, and presented in an electronic format to allow for uniform management reporting and analysis. The information collected by the DEP pursuant to s. 253.0325(2) shall be available to the land manager and his or her assignee.

Management Plan Compliance Checklist - Conservation Lands.xlsx

Table of Contents

- 1 Introduction and General Information 1
 - 1.1 Management Plan Purpose 2
 - 1.1.1 FWC Planning Philosophy 2
 - 1.2 Location 3
 - 1.3 Acquisition..... 7
 - 1.3.1 Purpose for Acquisition of the Property..... 7
 - 1.3.2 Acquisition History..... 7
 - 1.4 Management Authority 8
 - 1.5 Management Directives 8
 - 1.6 Title Interest and Encumbrances 8
 - 1.7 Proximity to Other Public Conservation Lands10
 - 1.8 Adjacent Land Uses.....14
 - 1.9 Public Involvement.....16
- 2 Natural and Historical Resources16
 - 2.1 Physiography16
 - 2.1.1 Climate16
 - 2.1.2 Topography.....17
 - 2.1.3 Soils17
 - 2.1.4 Geologic Conditions.....17
 - 2.2 Vegetation.....20
 - 2.2.1 FNAI Community Descriptions36
 - 2.2.2 Forest Resources45
 - 2.3 Fish and Wildlife Resources.....46
 - 2.3.1 Integrated Wildlife Habitat Ranking System.....53
 - 2.3.2 Imperiled Species55
 - 2.3.3 FWC Wildlife Observations and FNAI Element Occurrences56
 - 2.4 Native Landscapes58
 - 2.5 Water Resources.....58
 - 2.6 Beaches and Dunes59
 - 2.7 Mineral Resources59

2.8	Historical Resources	59
2.9	Scenic Resources.....	60
3	Uses of the Property	60
3.1	Previous Use and Development	60
3.2	Current Use of the Property.....	61
3.2.1	Visitation and Economic Benefits	62
3.3	Single- or Multiple-use Management	62
3.3.1	Analysis of Multiple-use Potential.....	63
3.3.2	Incompatible Uses and Linear Facilities	64
3.3.3	Assessment of Impact of Planned Uses of the Property	64
3.4	Acreage Recommended for Potential Surplus Review.....	64
4	Accomplished Objectives from the DIRWMA Management Plan 2005 – 2015.....	65
5	Management Activities and Intent	72
5.1	Land Management Review.....	72
5.2	Adaptive Management	72
5.2.1	Monitoring	73
5.2.2	Performance Measures.....	74
5.2.3	Implementation	74
5.3	Habitat Restoration and Improvement.....	74
5.3.1	Objective-Based Vegetation Management.....	75
5.3.2	Prescribed Fire and Fire Management.....	76
5.3.3	Habitat Restoration.....	78
5.4	Fish and Wildlife Management, Imperiled and Focal Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration	79
5.4.1	Fish and Wildlife	79
5.4.2	Imperiled and Focal Species: Wildlife Conservation Prioritization and Recovery.....	80
5.5	Exotic and Invasive Species Maintenance and Control	82
5.6	Public Access and Recreational Opportunities	84
5.6.1	Americans with Disabilities Act	84
5.6.2	Recreation Master Plan.....	84

5.6.3	Public Access Carrying Capacity	84
5.6.4	Wildlife Viewing	85
5.6.5	Hunting.....	85
5.6.6	Fishing.....	86
5.6.7	Roads and Trails.....	86
5.6.8	Camping	86
5.6.9	Geocaching.....	86
5.6.10	Environmental Education.....	87
5.7	Hydrological Preservation and Restoration.....	87
5.7.1	Hydrological Assessment	88
5.7.2	Water Resource Monitoring	88
5.8	Forest Resource Management.....	88
5.8.1	Timber Management Plan	89
5.9	Historical Resources.....	89
5.10	Capital Facilities and Infrastructure.....	90
5.11	Land Conservation and Stewardship Partnerships	93
5.11.1	Optimal Resource Boundary	93
5.11.2	Optimal Conservation Planning Boundary	93
5.11.3	Conservation Action Strategy	94
5.11.4	FWC Florida Forever Additions and Inholdings Acquisition List	94
5.12	Research Opportunities.....	96
5.13	Cooperative Management and Special Uses.....	96
5.13.1	Cooperative Management	96
5.13.2	First Responder and Military Training	96
5.13.3	Cattle Grazing.....	97
5.13.4	Citrus Grove Management.....	97
5.13.5	Apiaries.....	98
5.14	Climate Change.....	98
5.15	Soil and Water Conservation	101
6	Resource Management Goals and Objectives	102
6.1	Habitat Restoration and Improvement.....	102

6.2	Imperiled and Focal Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration	104
6.3	Other Wildlife (Game and Nongame) Habitat Maintenance, Enhancement, Restoration, or Population Restoration	105
6.4	Exotic and Invasive Species Maintenance and Control	106
6.5	Public Access and Recreational Opportunities	107
6.6	Hydrological Preservation and Restoration.....	111
6.7	Forest Resource Management.....	112
6.8	Historical Resources	112
6.9	Capital Facilities and Infrastructure.....	113
6.10	Land Conservation and Stewardship Partnerships	114
6.11	Cooperative Management and Special Uses.....	116
6.12	Climate Change.....	117
6.13	Research Opportunities.....	117
7	Schedule: Timelines for Completion of Resource Management Goals and Objectives	118
8	Resource Management Challenges and Strategies	128
9	Cost Estimates and Funding Sources	131
10	Analysis of Potential for Contracting Private Vendors for Restoration and Management Activities.....	134
11	Compliance with Federal, State, and Local Governmental Requirements	134
12	Endnotes	135
13	Appendices	137

Table of Figures

Figure 1. DIRWMA Location.....	4
Figure 2. DIRWMA Aerial Imagery.....	5
Figure 3. DIRWMA Section, Township, and Range	6
Figure 4. Nearby Conservation Land and Florida Forever Projects.....	11
Figure 5. DIRWMA Soil Type	18
Figure 6. DIRWMA Soil Depth to Water Table	19
Figure 7. DIRWMA FNAI Natural and Anthropogenic Communities.....	21
Figure 8. DIRWMA FNAI Historic Natural Communities.....	22
Figure 9. DIRWMA – FWC Integrated Wildlife Habitat Ranking System 2009.....	54
Figure 10. FWC Wildlife Observations and FNAI Element Occurrences	57
Figure 11. DIRWMA Capital Facilities and Infrastructure	91
Figure 12. DIRWMA Optimal Conservation Planning Boundary.....	95
Figure 13. DIRWMA – Sea Level Rise Potential Inundation.....	99
Figure 14. DIRWMA Project Locations.....	109

Table of Tables

Table 1. Conservation Lands in the Vicinity (15 Miles) of DIRWMA.....	13
Table 2. Florida Forever Projects in the Vicinity (15 Miles) of DIRWMA	14
Table 3. FNAI Mapped Natural Communities of DIRWMA	20
Table 4. Native Plant Species Known or Expected to Occur on DIRWMA	23
Table 5. Imperiled Plant Species Known or Expected to Occur on DIRWMA	34
Table 6. Exotic Plant Species Known or Expected to Occur on DIRWMA.....	35
Table 7. Bird Species Known or Expected to Occur on DIRWMA.....	46
Table 8. Fish Species Known or Expected to Occur on DIRWMA.....	51
Table 9. Mammal Species Known or Expected to Occur on DIRWMA	51
Table 10. Reptile and Amphibian Species Known or Expected to Occur on DIRWMA	52
Table 11. Exotic Animal Species Known or Expected to Occur on DIRWMA.....	53
Table 12. Imperiled Wildlife Species Known or Expected to Occur on DIRWMA	55
Table 13. Focal Species Occurring on or Near the DIRWMA.....	82

Management Plan Acronym Key

ADA	Americans with Disabilities Act
ARC	Acquisition and Restoration Council
CAS	Conservation Action Strategy
DACS	Department of Agriculture and Consumer Services
DEP	Department of Environmental Protection
DHR	Division of Historical Resources
DIRWMA	Dinner Island Ranch Wildlife Management Area
DOD	Department of Defense
DSL	Division of State Lands
FAC	Florida Administrative Code
FFS	Florida Forest Service
FLEPPC	Florida Exotic Pest Plant Council
FNAI	Florida Natural Areas Inventory
FS	Florida Statute(s)
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute
GIS	Geographic Information Systems
GLO	General Land Office
GPS	Geographic Positioning System
IMPP	Internal Management Policies and Procedures
IPCC	Intergovernmental Panel on Climate Change
IWHRS	Integrated Wildlife Habitat Ranking System
LAP	Landowner Assistance Program
LMR	Land Management Review
MAG	Management Advisory Group
NPS	National Park Service
NRCS	Natural Resources Conservation Service
OBVM	Objective-Based Vegetation Management
OCPB	Optimal Conservation Planning Boundary
OFW	Outstanding Florida Waters
ORB	Optimal Resource Boundary
ORV	Off-Road Vehicle
OSSF	Okaloacoochee Slough State Forest
SFWMD	South Florida Water Management District
RMP	Recreation Master Plan
SMA	Strategic Management Area
TNC	The Nature Conservancy
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WCPR	Wildlife Conservation Prioritization and Recovery
WMA	Wildlife Management Area
WRP	Wetland Reserve Program

1 Introduction and General Information

Less than 30 miles from the vast waters of Lake Okeechobee, Florida’s largest lake, the Dinner Island Ranch Wildlife Management Area (DIRWMA) conserves 21,714 acres of land within a corridor of conservation lands and projects that stretch from the Caloosahatchee River to the Big Cypress Swamp Preserve. Set in the heart of Hendry County, within a rural and remote landscape of conservation lands, ranches, and groves, the DIRWMA and other proximate conservation lands protect vital habitat for the Florida panther and many other imperiled, rare, and more common wildlife species including the Everglade snail kite, wood stork, crested caracara, and Big Cypress fox squirrel. Other imperiled wildlife species, including the eastern indigo snake and the critically endangered Florida grasshopper sparrow, have been observed on the DIRWMA but are uncommon on the area. The DIRWMA also preserves the hydrological connection with other conservation lands to the south including the Big Cypress National Preserve.

Managed by the Florida Fish and Wildlife Conservation Commission (FWC), the DIRWMA’s cypress domes, freshwater marshes, pine flatwoods, and hammocks are set within what was once a part of the historic Kissimmee River/Everglades Watershed, with slow-moving water flowing from Lake Okeechobee’s southern end south and southwest down the peninsula and eventually into the Florida Bay. However, the landscape and plant communities of the DIRWMA, along with the area’s hydrology, have been significantly altered by past human activities, including ditching, canal construction, cattle ranching, and more intensive agriculture.

As a result, the area has scattered islands of trees separated by large open fields. There is a large portion of agricultural land within the DIRWMA where cattle ranching is utilized as a management tool. Although the DIRWMA’s land is principally pasture, there are other



natural community types present throughout the area, including basin marsh, depression marsh, mesic hammock, dome swamp, slough marsh, and flatwoods.

As noted above, the natural communities of the DIRWMA are home to a unique variety of imperiled and more common wildlife. The rare and imperiled species that thrive on

the grassy flatlands of the DIRWMA include a large number of bird species, including the Florida sandhill crane and crested caracara. Many wading birds can be found on the wetter portions of the DIRWMA, including the wood stork, tricolored heron, roseate spoonbill, and

white ibis. The DIRWMA provides habitat for several mammal species as well, including the Big Cypress fox squirrel.

The DIRWMA is managed by the FWC for the conservation of imperiled and common wildlife, and for fish and wildlife-based public outdoor recreation. The FWC aims to conserve and restore natural wildlife habitat on the DIRWMA, while providing high-quality opportunities for hunting, fishing, wildlife viewing, and other fish and wildlife-based public outdoor recreation opportunities including horseback-riding, bicycling, and hiking.

1.1 Management Plan Purpose

This Management Plan serves as the basic statement of policy and direction for the management of the DIRWMA. It provides information including the past usage, conservation acquisition history, and descriptions of the natural and historical resources found on the DIRWMA. Furthermore, it identifies the FWC's future management intent, goals and associated short and long-term objectives, as well as challenges and solutions. This Management Plan has been developed to guide each aspect of the DIRWMA's management for the next ten years.

This Management Plan is submitted for review to the Acquisition and Restoration Council (ARC) acting on behalf of the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees) 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 Number 4417 (Appendix 13.1.1) and pursuant to Chapters 253 and 259, Florida Statutes (FS), and Chapters 18-2 and 18-4, Florida Administrative Code (FAC). Format and content were drafted in accordance with ARC requirements for management plans and the model plan outline provided by the staff of the DSL. Terms (Appendix 13.2) used in this Management Plan describing management activities and associated measurable goals and objectives conform to those developed for the Land Management Uniform Accounting Council Biennial Land Management Operational Report.

1.1.1 FWC Planning Philosophy

The FWC's planning philosophy includes emphasizing management recommendation consensus-building among stakeholders and input from user groups and the general public at the beginning of the planning process. The FWC engages stakeholders by convening a Management Advisory Group (MAG) and solicits additional input from user groups and the general public at a public hearing (Appendix 13.4). The FWC also engages area, district, and regional agency staff, as well as other FWC staff expertise, in developing this Management Plan, thereby facilitating area biologist and manager "ownership" of the Management Plan, and thus ensuring the development of meaningful management intent language, goals with associated measurable objectives, timelines for completion, and the identification of challenges and solution strategies for inclusion in the DIRWMA Management Plan (Sections 5 – 8).

Further management planning input is received through Land Management Reviews (LMR) conducted every five years, which include a review of the previous Management Plan, as well as a field review of the DIRWMA. The LMR report (Section 5.1, Appendix 13.5) provides FWC staff with important information and guidance provided by a diverse team of land management auditors, and communicates the recommendations of the LMR team to the FWC so they may be adequately addressed in this Management Plan, and thus guide the implementation of the LMR team recommendations on the DIRWMA.

Furthermore, the FWC maintains transparency and accountability throughout the development and implementation of this Management Plan. A “living document” concept, linking this updated Management Plan to the previous one, is accomplished by reporting on the objectives, management activities, and projects accomplished over the last planning timeframe (previous ten years; see Section 4), thereby ensuring agency accountability through time. Also, in an effort to remain adaptive for the duration of this Management Plan, continuous input and feedback will be collected from FWC staff, stakeholders, user groups, and other interested parties and individuals. As needed, amendments to this Management Plan will be presented to DSL and ARC for review and consideration.



1.2 Location

As noted above, the DIRWMA consists of 21,714 acres located in central Hendry County, 11 miles northeast of Immokalee, 20 miles southeast of LaBelle, and 20 miles southwest of Clewiston (Figures 1 and 2).

The DIRWMA is bordered by County Road 833 on the east, 16 miles south of State Road 80, and a mile north of County Road 846. Lake Okeechobee is northeast of the DIRWMA, but canals, including Crow’s Nest Canal and Deer Fence Canal, drain through the area.

The DIRWMA is located in Sections 1-30, Township 46 South, Range 31 East and Range 32 East (Figure 3). In order to minimize human disturbance, there is only one designated entrance to the DIRWMA, via Dinner Island Grade road on the eastern boundary of the area off of County Road 833. Other improved roads on the DIRWMA include the Paradise Pen Grade, Farm Field Road, and Hilliard Grade.

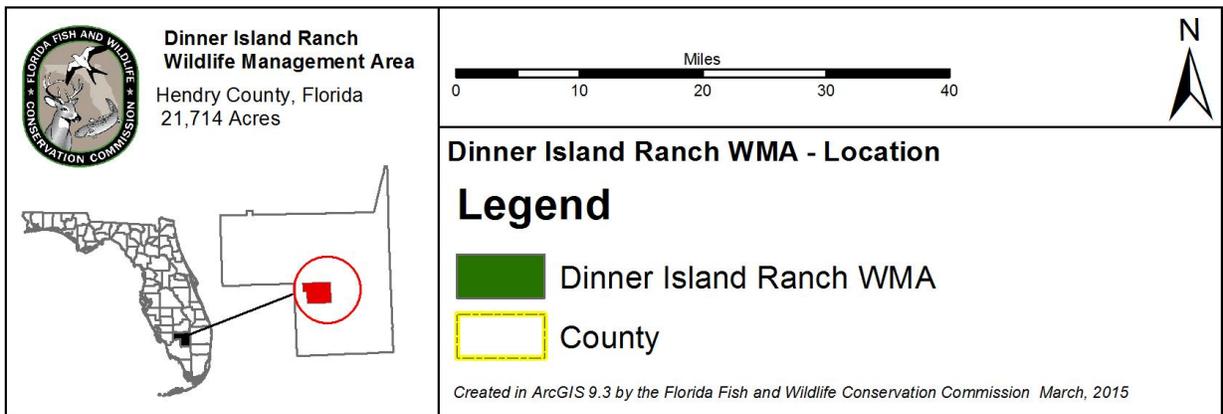
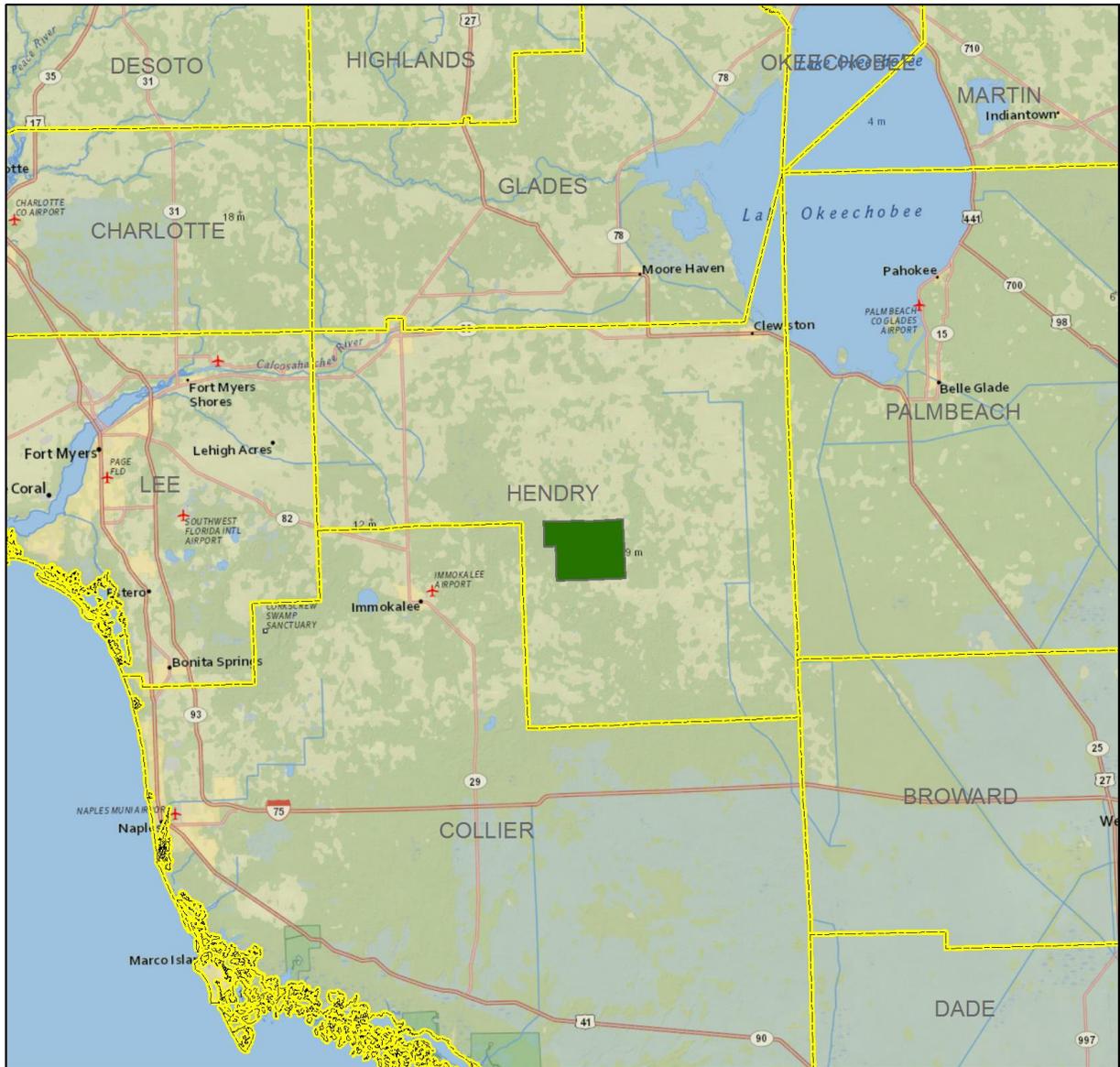


Figure 1. DIRWMA Location

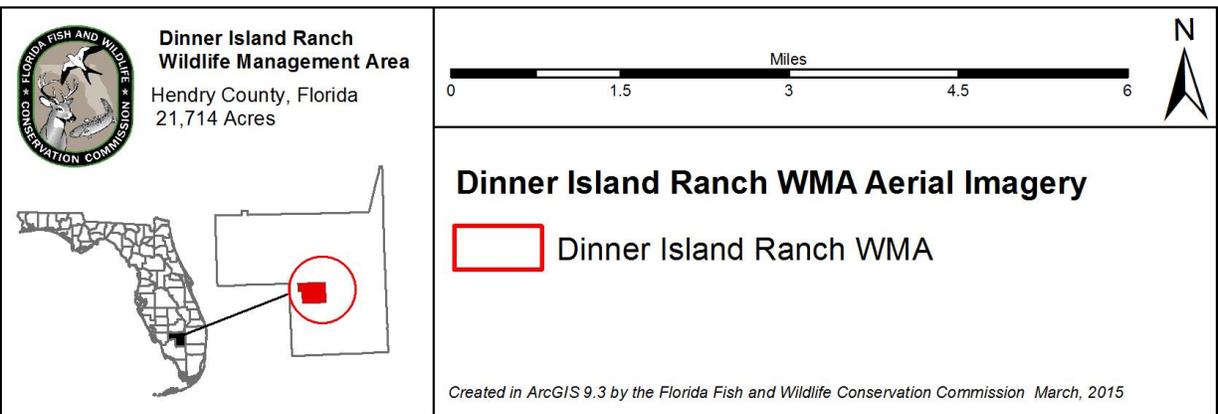
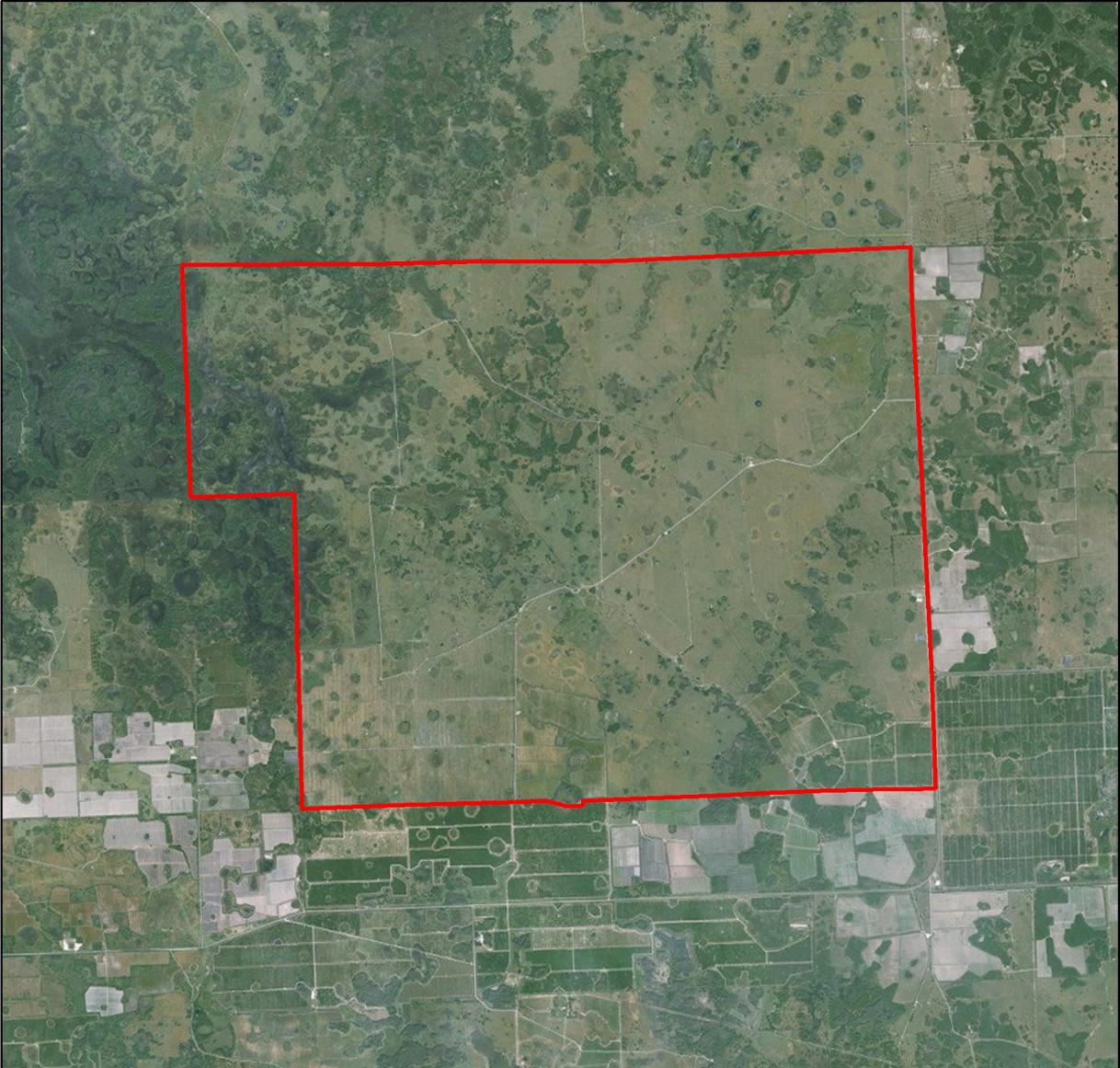


Figure 2. DIRWMA Aerial Imagery

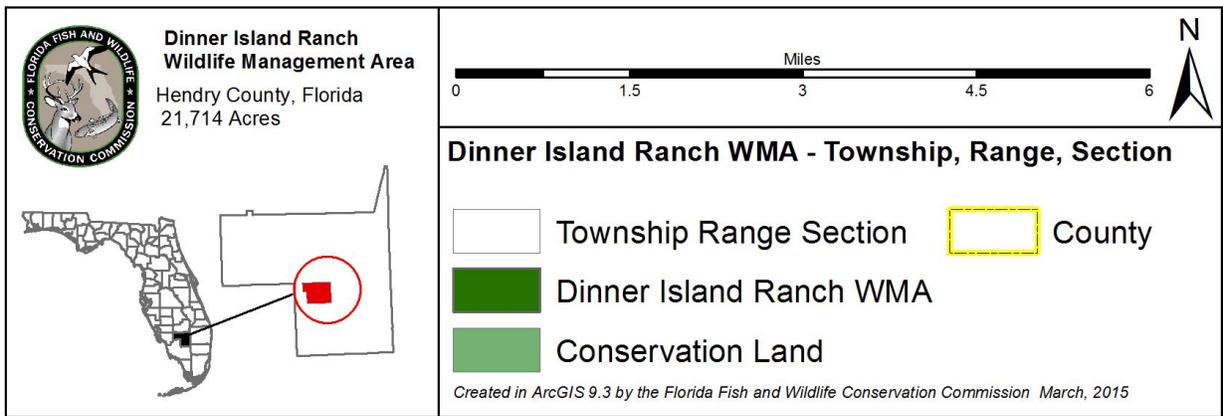
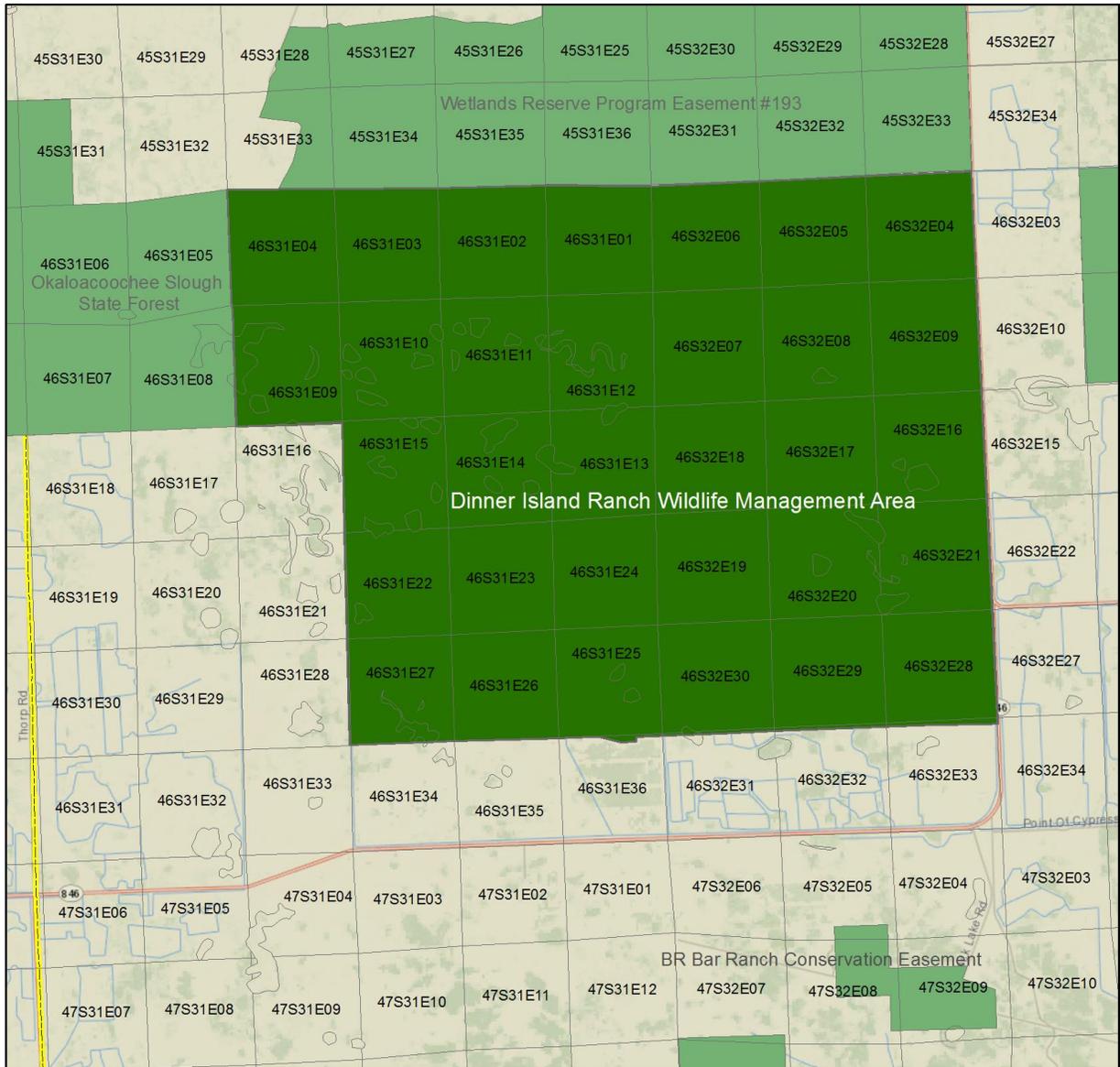


Figure 3. DIRWMA Section, Township, and Range

1.3 Acquisition

1.3.1 Purpose for Acquisition of the Property

The principal purposes for acquisition of the DIRWMA are described in the Panther Glades Florida Forever Project Five Year Plan document. The purposes for acquisition are to conserve, protect, and restore historical resources, landscapes, forests, water resources, and other elements important to ecosystem functions; to conserve, protect, and restore the characteristic biological diversity of the area's natural communities, including protection, maintenance, or enhancement of conditions for rare, threatened, and endangered species; to



develop and adapt project plans, procedures, and techniques for improved success in meeting management goals, including the Florida Panther Habitat Preservation Plan; and to establish multiple-use natural resource based recreational opportunities that are mutually compatible and consistent with the other resource conservation purposes and management goals for the area. The overarching purpose of the Panther Glades Florida Forever Project is to provide critical linkages between conservation lands for wide-ranging species, especially the Florida panther.

The DIRWMA, as well as the Panther Glades Florida Forever Project of which it is a part, is important to many wildlife species, particularly those that require extensive areas of habitat to maintain viable populations. This project expands the contiguous area of diverse ecosystems that provide critical habitat for wide-ranging species. The ecosystem encompassed by

the DIRWMA and the larger Panther Glades Florida Forever Project is a large landscape and watershed in south-central Hendry County that includes portions of both the Big Cypress and Kissimmee Billy Strand, as well as other Florida Forever projects in the vicinity including the Caloosahatchee Ecoscape, Devil's Garden, and Half Circle L Ranch Florida Forever Projects.

1.3.2 Acquisition History

The State of Florida acquired the DIRWMA with funds from the State's Florida Forever Land Acquisition Program through two fee-simple acquisitions occurring in 2002 and 2004. In 2002, the State acquired approximately 19,667 acres from the Hilliard Brothers of Florida, LLLP. In 2004, an additional 2,047 acres were acquired from the Hilliard

Brothers, bringing the total acreage of the DIRWMA to 21,714. All the lands acquired within the DIRWMA are part of the Panther Glades Florida Forever Land Acquisition Project. The Florida Forever project area includes a total of 64,809 acres of land with multiple owners and consists of three separate tracts distributed over a north-south distance of approximately 18 miles in south central Hendry County. As of June 2014, the State has acquired 25,426 acres of the Panther Glades Florida Forever Project, with 39,384 acres remaining to be acquired in the project.

1.4 Management Authority

The FWC is the designated lead managing agency for the DIRWMA under the authority granted by Lease Number 4417 from the Board of Trustees agent, the DSL. 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, 373, 375, 378, 379, 403, 487, 870, and 597, FS. These constitutional provisions and laws provide the FWC the authority to protect, conserve, and manage the State's fish and wildlife resources.

1.5 Management Directives

The 50-year Board of Trustees' Lease Agreement Number 4417 with the FWC directs the 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 the 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."

1.6 Title Interest and Encumbrances

As State-owned lands, title to the DIRWMA is vested in the Board of Trustees (Governor and Cabinet). In July 2003, the DSL, as staff to the Board of Trustees, entered into Lease Agreement Number 4417, a 50-year lease agreement, granting the FWC management authority for the DIRWMA.

Cattle grazing is utilized as a management tool on a large portion of the DIRWMA and there are currently two cattle grazing agreements that are active on the area.

Approximately 8,393 acres of the western portion of the DIRWMA are under a cattle grazing agreement (Contract #13457) with lessee Hilliard Brothers of Florida, LLLP. This west side cattle grazing agreement was first executed in 2004 and was renewed for five years in 2009. That five year extension expired on April 8, 2014, but after a competitive bidding process and upon mutual agreement between the FWC and the Hilliard Brothers of Florida, LLLP, an additional lease renewal was granted on April 17, 2014, and is set to expire on September 29, 2016 (Appendix 13.3.1). Additionally, approximately 8,029 acres of

the eastern portion of the DIRWMA are under a cattle grazing agreement (Contract #6058) with A&M Management of Hendry County, Inc. (Appendix 13.3.2). This agreement was executed on September 29, 2006, and was extended for five years in 2011.

Both of these cattle grazing agreements are utilized as management tools to facilitate the wildlife and habitat management of the DIRWMA, and they are subject to cattle grazing plans that delineate best practices for grazing activity on the area. Further, both agreements are set to expire in 2016, at which time the FWC will evaluate the total acreage being grazed and will solicit competitive bids for the grazing on the DIRWMA.



Additionally, approximately 800 acres of the DIRWMA are under a citrus grove management contract entered into with Krause Grove Service Inc. on the southeastern portion of the DIRWMA (Appendix 13.3.3). The contract (FWC #11383) was entered into on July 26, 2012, and expires on July 25, 2027, with an optional 15 year extension.

In 2007, the BOT entered into a 50-year agreement granting an overhead utility easement to Glades Electric Cooperative, Inc., and allowing the installation and maintenance of overhead utilities on a 10-foot-wide strip of land on a portion of the DIRWMA (Contract #31689, Appendix 13.3.4).

The majority of the subsurface oil, gas, and mineral interests are also outstanding encumbrances on the DIRWMA and are held by private individuals and corporations (Appendix 13.3.5.1). At this time, these encumbrances do not appear to be an impediment to management of the area. There has been one application for seismic testing on an area of land in Collier and Hendry counties that includes three sections within the DIRWMA, which is described further in Section 2.7 of this Management Plan. Any subsequent development of oil, gas, or minerals on the area would require application for and approval of relevant state and federal permits and the restoration of the land to the satisfaction of the State and the FWC should any of these interests be developed. The FWC will continue to provide comment and input on any proposed permits regarding the development of any of these interests.

The FWC has also entered into a cost share agreement with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) for the restoration of wetlands and the establishment of an easement on the DIRWMA through the NRCS Wetland Reserve Program (WRP) (Appendix 13.3.6). This agreement established an

approximately 4,313-acre WRP easement on the DIRWMA and provided a cooperative restoration plan to restore and enhance wetlands within the area. Under the agreement, the NRCS provided 75% of the funding for the project and the FWC provided the remaining 25% of the funding.

1.7 Proximity to Other Public Conservation Lands

A wide array of conservation lands surround the DIRWMA, with the closest area being the Okaloacoochee Slough State Forest (OSSF) which shares the DIRWMA’s northwestern boundary. The Okaloacoochee Slough Wildlife Management Area is also located nearby along the northern border of the OSSF. Other conservation lands in the vicinity include conservation easements that were acquired for the restoration and protection of Florida panther habitat under the U.S. Fish and Wildlife Service’s (USFWS) Wildlife Restoration Grant Program and WRP easements acquired by the NRCS to protect and restore wetlands.

There are also conservation lands located within a 15-mile radius of the DIRWMA that are managed by the National Park Service (NPS), the DEP, the Florida Forest Service (FFS), the FWC, the South Florida Water Management District (SFWMD), and others. Nearby Florida Forever projects include Half Circle L Ranch to the west, Devil’s Garden to the north, and Panther Glades to the south. These nearby conservation lands and Florida Forever projects are displayed in Figure 4 and listed in Tables 1 and 2, respectively.

Florida Forever projects and conservation lands within a 15-mile radius of the DIRWMA contribute to the conservation of historical and natural resources within this region of Florida. Many of the conservation lands within the vicinity of the DIRWMA are owned in full-fee by a public entity. However, some of these areas fall within a less-than-fee



ownership classification where the land is owned by a private landowner while a public agency or not-for-profit organization holds a conservation easement and monitoring responsibility for the land. Other areas are simply owned by the private landowner, while public agencies or not-for-profit organizations manage the land.

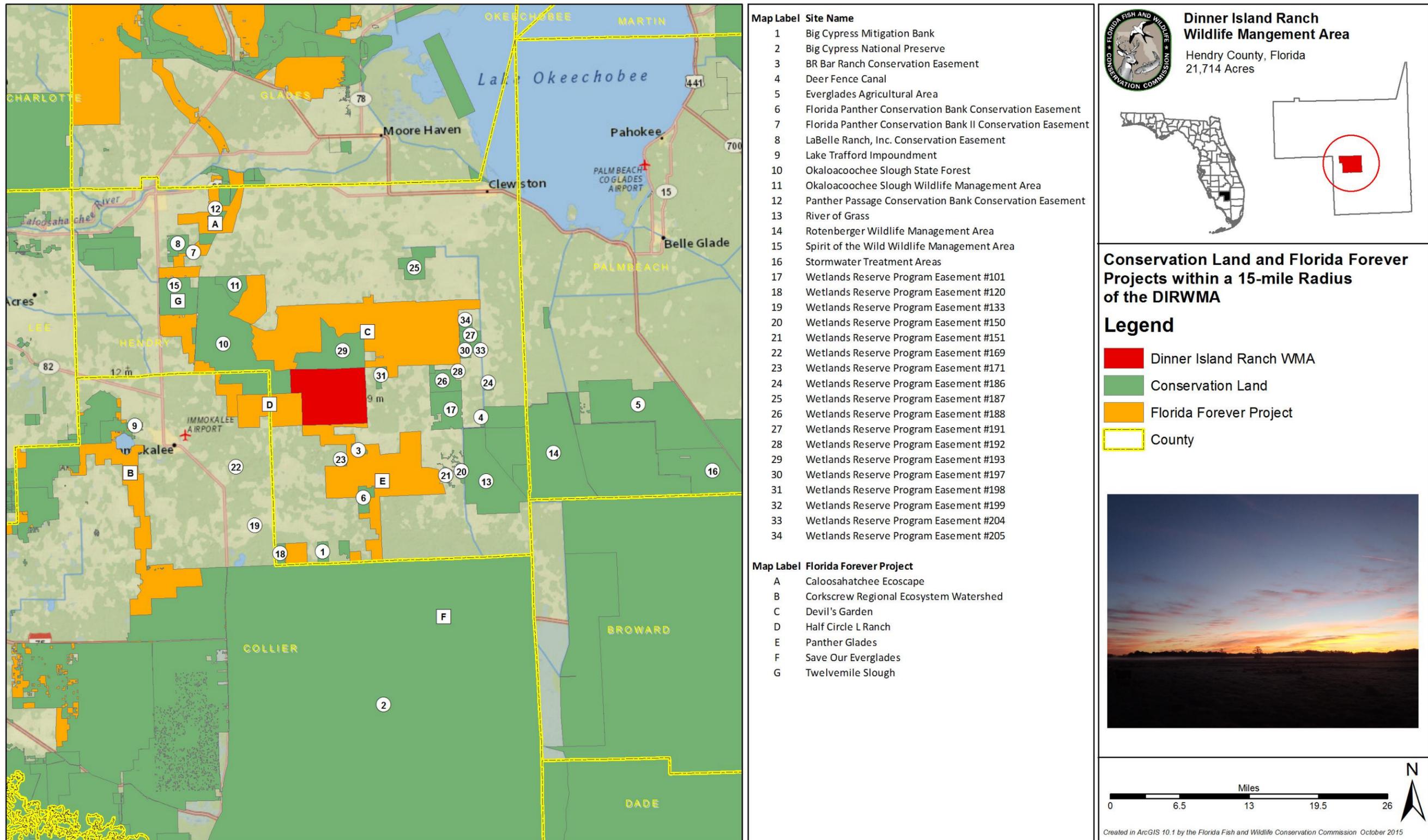


Figure 4. Conservation Land and Florida Forever Projects within a 15-Mile Radius of DIRWMA

THIS PAGE INTENTIONALLY BLANK

Table 1. Conservation Lands in the Vicinity (15 Miles) of DIRWMA

Federal Government	Managing Agency
Big Cypress National Preserve	DOI - NPS
Florida Panther Conservation Bank Conservation Easement	DOI - USFWS
Florida Panther Conservation Bank II Conservation Easement	DOI - USFWS
Wetlands Reserve Program Easement #101	DOA - NRCS
Wetlands Reserve Program Easement #120	DOA - NRCS
Wetlands Reserve Program Easement #133	DOA - NRCS
Wetlands Reserve Program Easement #150	DOA - NRCS
Wetlands Reserve Program Easement #151	DOA - NRCS
Wetlands Reserve Program Easement #169	DOA - NRCS
Wetlands Reserve Program Easement #171	DOA - NRCS
Wetlands Reserve Program Easement #186	DOA - NRCS
Wetlands Reserve Program Easement #187	DOA - NRCS
Wetlands Reserve Program Easement #188	DOA - NRCS
Wetlands Reserve Program Easement #191	DOA - NRCS
Wetlands Reserve Program Easement #192	DOA - NRCS
Wetlands Reserve Program Easement #193	DOA - NRCS
Wetlands Reserve Program Easement #197	DOA - NRCS
Wetlands Reserve Program Easement #198	DOA - NRCS
Wetlands Reserve Program Easement #199	DOA - NRCS
Wetlands Reserve Program Easement #204	DOA - NRCS
Wetlands Reserve Program Easement #205	DOA - NRCS
State of Florida	Managing Agency
BR Bar Ranch Conservation Easement	DEP - DSL
LaBelle Ranch, Inc. Conservation Easement	DEP - DSL
Okaloacoochee Slough State Forest	DACS - FFS
Okaloacoochee Slough Wildlife Management Area	FWC
Panther Passage Conservation Bank Conservation Easement	FWC
Rotenberger Wildlife Management Area	FWC
Spirit of the Wild Wildlife Management Area	FWC
Water Management District	Managing Agency
Deer Fence Canal	SFWMD
Everglades Agricultural Area	SFWMD
Lake Trafford Impoundment	SFWMD
River of Grass	SFWMD
Stormwater Treatment Areas	SFWMD

Table 1. Conservation Lands in the Vicinity (15 Miles) of DIRWMA

Private	Managing Agency
Big Cypress Mitigation Bank	Earthmark Southwest Florida Mitigation, LLC

Acronym Key	Agency Name
DACS	Florida Department of Agricultural and Consumer Services
DEP	Florida Department of Environmental Protection
DOI	United State Department of Interior
DRP	Division of Recreation and Parks
DSL	Division of State Lands
FFS	Florida Forest Service
FWC	Florida Fish and Wildlife Conservation Commission
USFWS	United States Fish and Wildlife Service
NPS	National Parks Service
NRCS	Natural Resources Conservation Service
SFWMD	South Florida Water Management District
USFS	United States Forest Service

Table 2. Florida Forever Projects in the Vicinity (15 Miles) of DIRWMA

Project Name	GIS
Caloosahatchee Ecoscape	18,454.98
Corkscrew Regional Ecosystem Watershed	67,936.47
Devil's Garden	82,994.75
Half Circle L Ranch	11,181.55
Panther Glades	64,809.40
Save Our Everglades	217,678.9
Twelvemile Slough	15,967.48

1.8 Adjacent Land Uses

As previously discussed, the DIRWMA is located in an overwhelmingly rural landscape in Hendry County, approximately 12 miles east of Immokalee and approximately 25 miles north of Interstate 75. The Big Cypress Reservation is approximately 20 miles southeast of the DIRWMA.

The 2013 U.S. Census estimates that there are 37,895 people living in Hendry County. The Bureau of Economic and Business Research's (BEBR's) medium-range population projection indicates that in the year 2025 there will be 39,700 people living in the county. The population projections for the year 2025 for the counties surrounding Hendry County according to BEBR are as follows: Broward-1,902,200; Collier-411,400; Glades-14,000; Lee-837,800; Palm Beach-1,536,600.

As listed in the Hendry County Comprehensive Land Use Plan, the lands within the DIRWMA are currently designated as public lands. The parcels within the DIRWMA are zoned as A-2, which allows agricultural use of the semi-improved pasture on the area. The parcels along the outside of the eastern edge of the DIRWMA, running parallel to County Road 833, are considered Enterprise Zones, which provide tax credits and other incentives to businesses located within the designated area.

The lands within the DIRWMA primarily have the future land use designation of Agricultural lands. The northwestern tip of the area is designated as Agricultural Conservation land, as well as the southeastern portion near County Road 833. According to the Hendry County Comprehensive Land Use Plan, the Agricultural Conservation Future Land Use category is defined similarly to the Agricultural designation, except for a restriction on industrial developments on wetlands, as well as limited non-residential development. However, the northwestern tip of the DIRWMA is also



designated by the FWC as a Florida panther Strategic Management Area (SMA), which excludes the grazing of cattle. Additionally, according to the Hendry County Rural and Agricultural Lands Study map, a portion of the western DIRWMA is considered a primary panther zone and much of the eastern DIRWMA is considered a secondary zone

The DIRWMA is also considered a Potential Regional Park, which is a designation for sizable areas used primarily for outdoor recreation including picnicking, boating, fishing, horseback riding, hiking, biking, trails, swimming, camping, and more. The Hendry County Board of County Commissioners and the Hendry-LaBelle Recreation Board encourages public access to such regional parks.

The current land use designation for areas in the vicinity of the DIRWMA is agriculture. Lands with the zoning designation of agriculture allow for farming and agricultural activities, as well as limited residential, commercial, and industrial uses. The future land use map for Hendry County shows that these lands will remain zoned agriculture, which means that these uses will continue to be allowed on the surrounding properties in the future. It is unlikely that the DIRWMA will face any significant challenges from nearby development in the foreseeable future.

1.9 Public Involvement

The FWC conducted a MAG meeting in Clewiston, Florida, on May 19th, 2015, to obtain input from both public and private stakeholders regarding management of the DIRWMA.



The results of this meeting were used by the 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 13.4.1. Further, a public hearing, as required by Chapter 259.032(10), FS, was held in Clewiston, Florida, on June 30th, 2015. The report of that hearing is also contained in Appendix 13.4.3. A website is also maintained for receipt of public input at

<http://myfwc.com/conservation/terrestrial/management-plans/develop-mps/>. Further testimony and input is received at a public hearing held by the ARC. Input received from all public involvement efforts has been considered in the development of this Management Plan.

2 Natural and Historical Resources

2.1 Physiography

2.1.1 Climate

Hendry County is located in the warm subtropical portion of the state. The temperature for Devil's Garden, near the DIRWMA, during the period of 1956 to 2012 ranged from an average annual minimum of 61.5 degrees Fahrenheit (F) to an average maximum of 85.2 degrees F. January had the lowest average temperature on record at 50.2 degrees F. July and August had the highest average temperature on record at 92.5 degrees F. The average annual temperature for the period of record was 73 degrees F.

Average total annual precipitation during the period 1956 to 2012 was 53.79 inches, during which period average rainfall was highest during the month of June (9.26 inches) and lowest in December (1.8 inches). The driest months were November (2.01 inches), December (1.8 inches), and January (2.16 inches). The wet season usually extends from June to September.

2.1.2 Topography

The DIRWMA is located in the Immokalee Rise physiographic province. The elevations in the area are between 25 and 30 feet. The lower elevations are in the southeastern portion of the DIRWMA while the higher elevations are in the northern portion. The lands within the DIRWMA are located at the end of the Okaloacoochee Slough. The topography may be characterized as gently sloping prairies and pastures with an elevation at the north end of 30 to an elevation in the southeastern portion of the area around 25 feet above mean sea level (MSL).



2.1.3 Soils

NRCS data were used to identify the DIRWMA's soil series and soil depth to water table (Figures 5-6). Thirty-seven soil map units described in the soil survey of the DIRWMA are distributed as shown in Figure 5. The three soil types that make up the largest percent of the area (11-12% each) are Rivera sand with limestone substratum, Boca sand, and Oldsmar sand. Analyses of depth to water table for map units occurring within the DIRWMA are also provided in Figure 6. The 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. Figure 5 provides aggregation data for the DIRWMA soil map units. Soil series descriptions may be found in Appendix 13.6.

2.1.4 Geologic Conditions

The geology of the DIRWMA consists of one major geological formation at the surface according to the geologic map of the State of Florida. This formation is known as Shelly sediments of Plio-Pleistocene age and covers 100% of the DIRWMA. These sediments are of Pliocene and Pleistocene age. 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. The lithology of this formation consists of limestone, sand, and clay or mud.

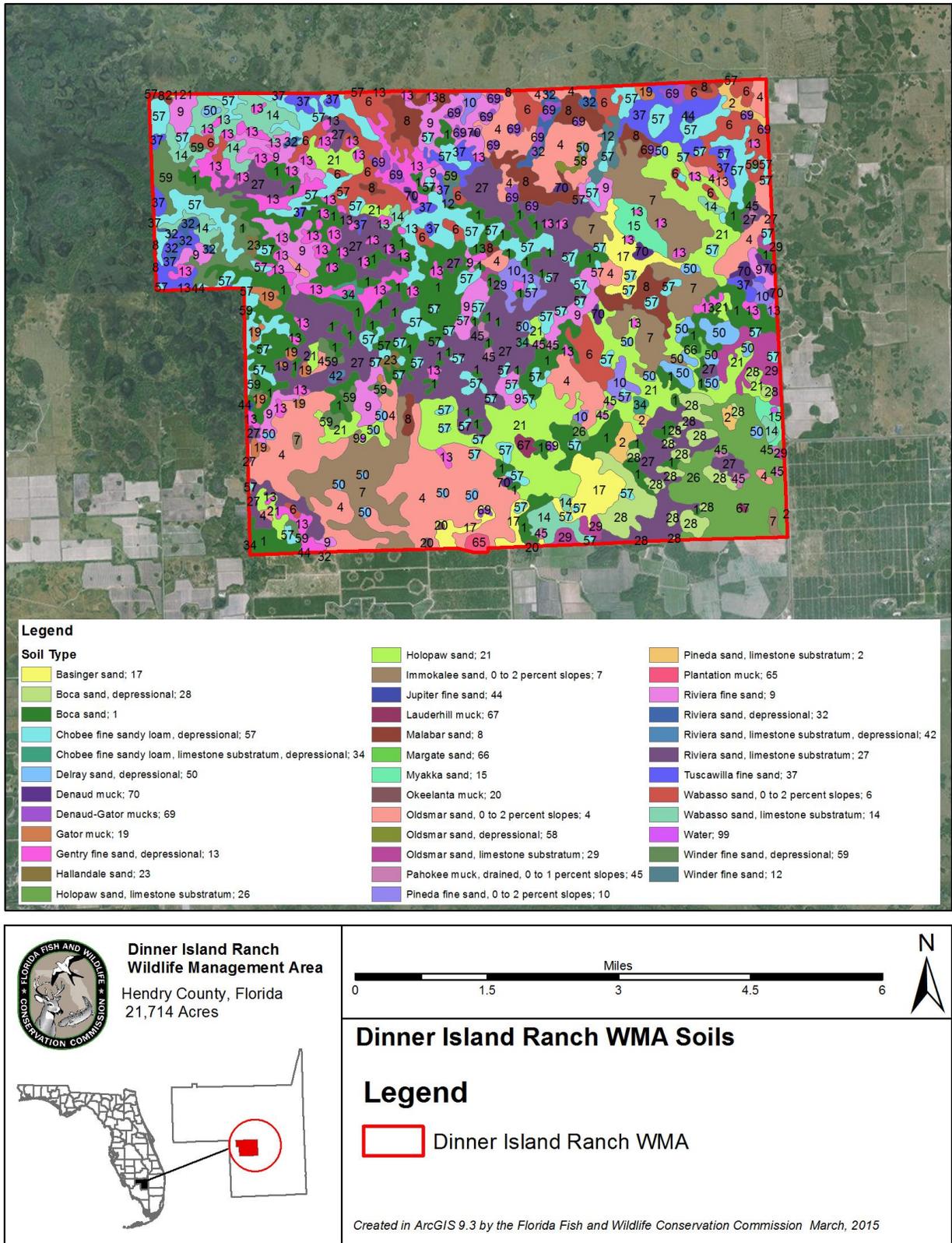


Figure 5. DIRWMA Soil Type

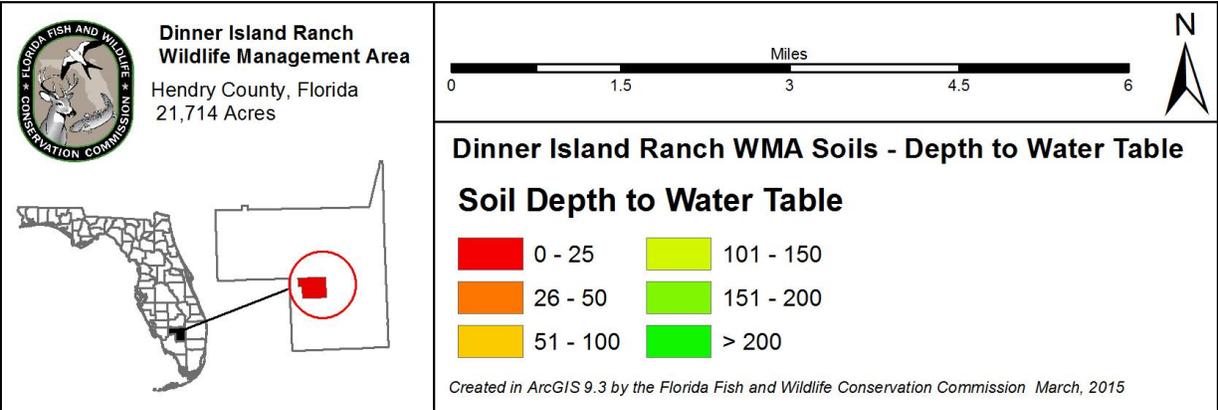
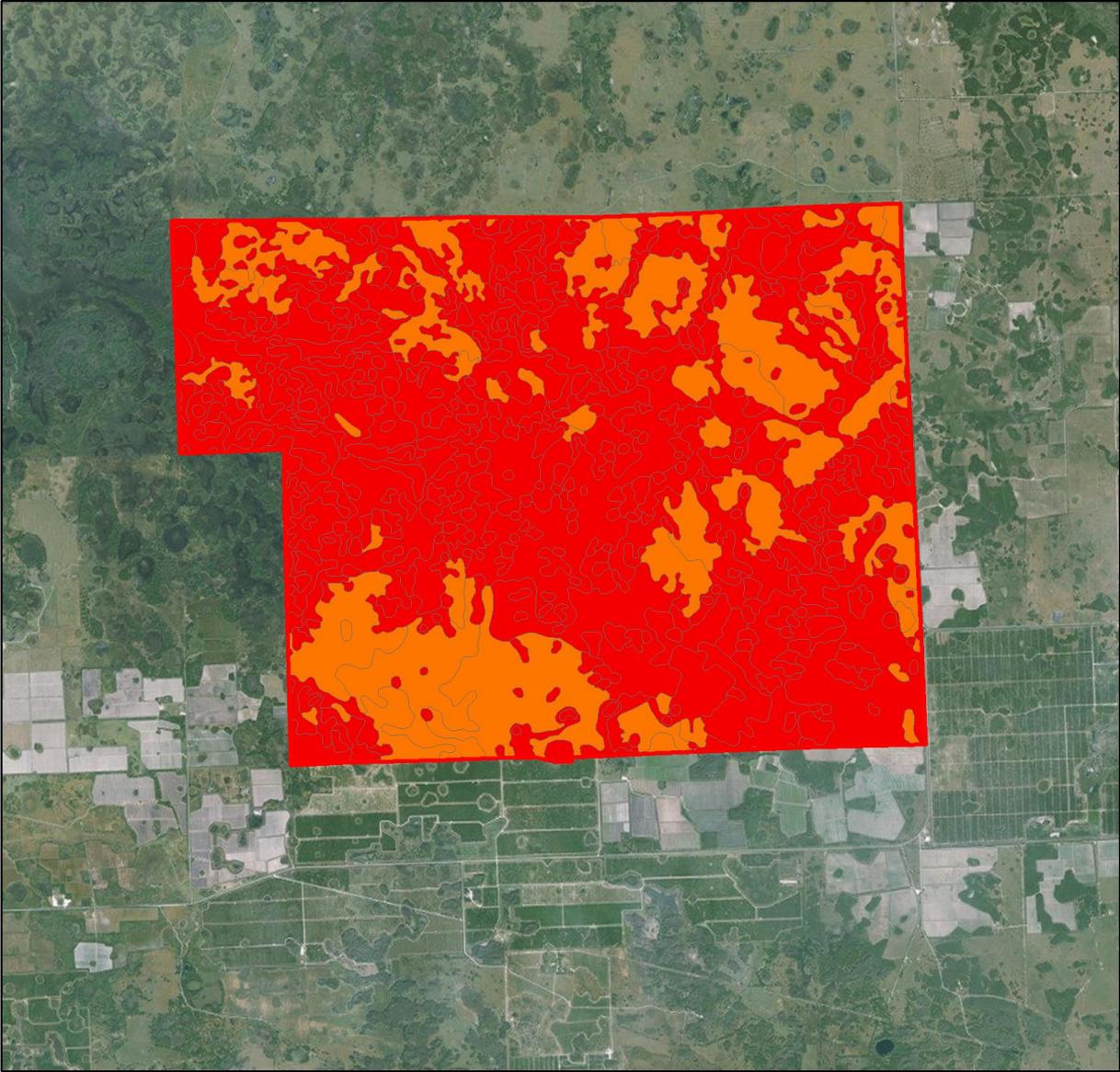


Figure 6. DIRWMA Soil Depth to Water Table

2.2 Vegetation

As noted above, the DIRWMA consists primarily of large open fields with scattered hammocks and islands of trees interspersed throughout the area. The major natural communities found on the DIRWMA are depression marsh, basin marsh, mesic hammock, and slough marsh. However, as previously discussed, there are also several altered land cover types on the DIRWMA, including large areas classified as improved pasture and agriculture. Over half (11,745 acres) of the DIRWMA is classified as improved pasture.

Through the services of the Florida Natural Areas Inventory (FNAI), the FWC initially surveyed and mapped the natural and anthropogenic communities of the DIRWMA in 2006 and remapped and recertified the natural community maps in 2015. This mapping effort identified 15 natural and anthropogenic community types existing on the DIRWMA (Table 3 and Figure 7). Additionally, utilizing historic aerial photographs and survey information of the area, the FNAI has mapped the historic natural communities on the DIRWMA (Figure 8). The mapping of historic natural communities provides the FWC with knowledge of the historic conditions of the area and is used to help guide the management and restoration of the current natural communities on the DIRWMA.

Surveys by FWC biologists and contracted FNAI staff have documented a variety of native plant species (Table 4), imperiled plant species (Table 5), and invasive/exotic plant species (Table 6) as occurring or expected to occur on the DIRWMA.

Table 3. FNAI Mapped Natural Communities of DIRWMA

Community Type	GIS Acres	Percentage
Pasture - improved	11,744.69	54.11%
Agriculture	2,698.84	12.43%
Depression marsh	1,938.49	8.93%
Basin marsh	1,804.37	8.31%
Mesic hammock	1,383.51	6.37%
Slough marsh	1,039.88	4.79%
Dome swamp	605.06	2.79%
Canal/ditch	229.71	1.06%
Clearing/regeneration	111.36	0.51%
Artificial pond	73.12	0.34%
Mesic flatwoods	32.34	0.15%
Pasture - semi-improved	31.78	0.15%
Developed	7.10	0.03%
Wet flatwoods	3.82	0.02%
Spoil area	1.99	0.01%

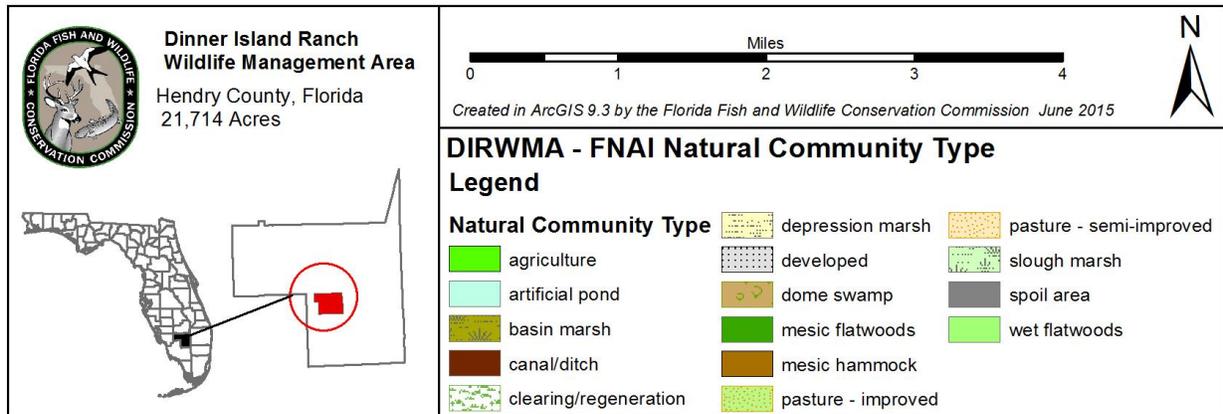
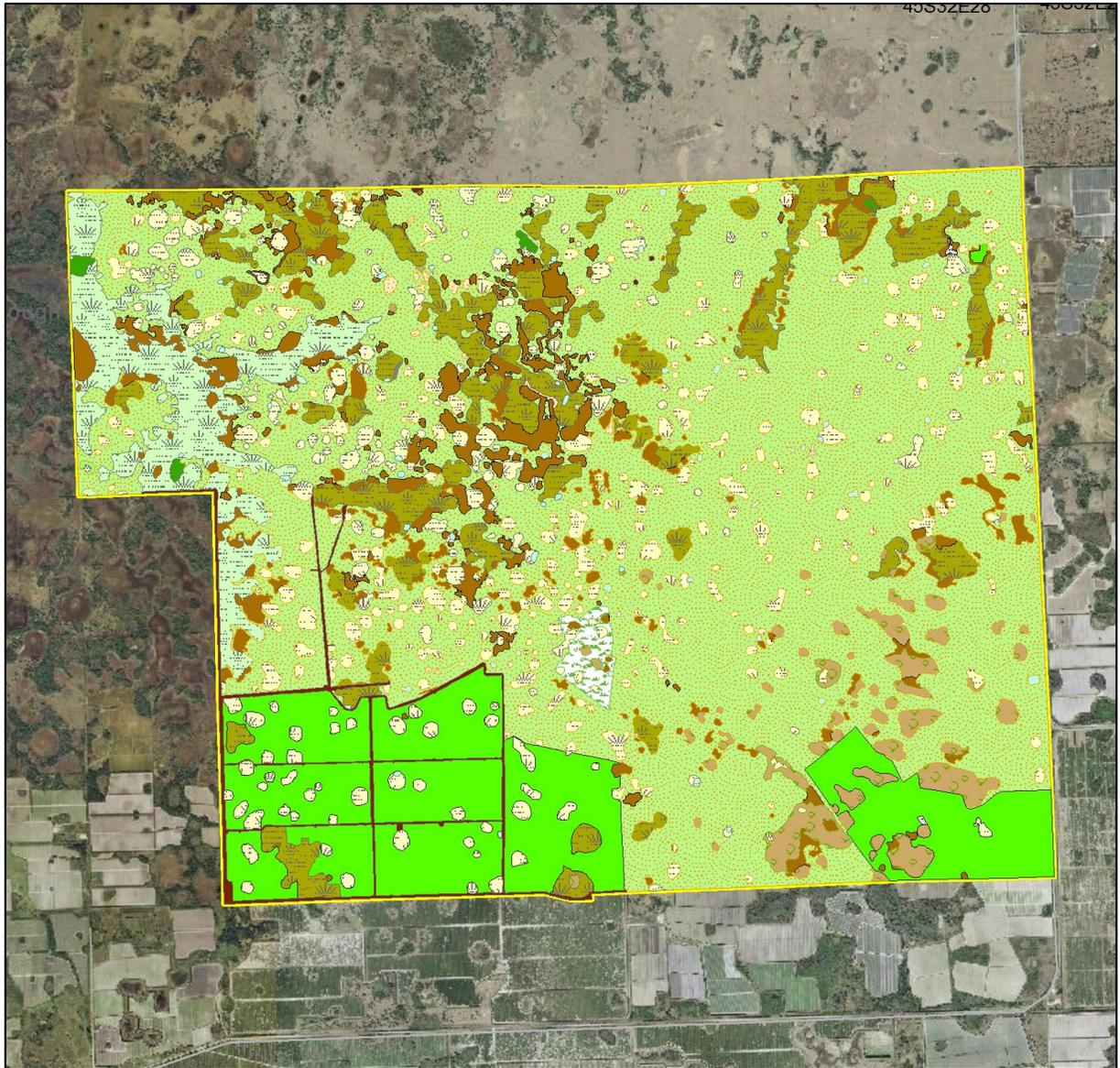


Figure 7. DIRWMA FNAI Natural and Anthropogenic Communities

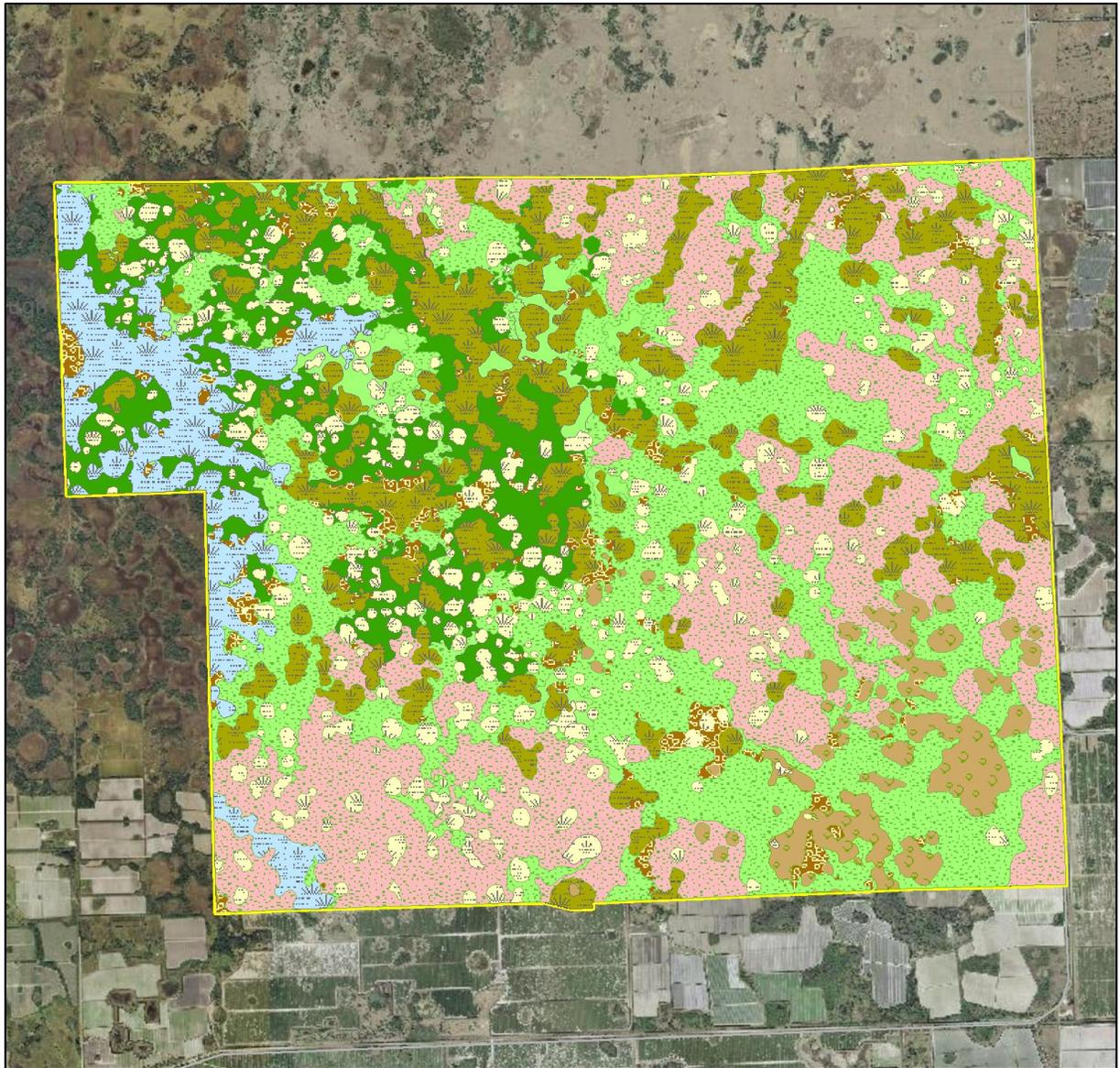


Figure 8. DIRWMA FNAI Historic Natural Communities

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Acuna's epidendrum	<i>Epidendrum blancheanum</i>
Alabama supple-jack	<i>Berchemia scandens</i>
Alligator-lily	<i>Hymenocallis palmeri</i>
Amaranth	<i>Amaranthus sp.</i>
American cupscale	<i>Sacciolepis striata</i>
Bald cypress	<i>Taxodium distichum</i>
Baldsedge	<i>Rhynchospora nitens</i>
Baldwin's coyote-thistle	<i>Eryngium baldwinii</i>
Baldwin's milkwort	<i>Polygala balduinii</i>
Baldwin's nutrush	<i>Scleria baldwinii</i>
Baldwin's spikerush	<i>Eleocharis baldwinii</i>
Ballmoss	<i>Tillandsia recurvata</i>
Banded wild-pine	<i>Tillandsia flexuosa</i>
Bantam-buttons	<i>Syngonanthus flavidulus</i>
Bay lobelia	<i>Lobelia feayana</i>
Beaked panic grass	<i>Panicum anceps</i>
Beautyberry	<i>Callicarpa americana</i>
Bedstraw	<i>Galium sp.</i>
Beggarticks	<i>Bidens alba var. radiata</i>
Big carpetgrass	<i>Axonopus furcatus</i>
Bighead rush	<i>Juncus megacephalus</i>
Black nightshade	<i>Solanum chenopodioides</i>
Black sedge	<i>Schoenus nigricans</i>
Blackeyed susan	<i>Rudbeckia hirta</i>
Blackroot	<i>Pterocaulon pycnostachyum</i>
Bladderpod, bagpod	<i>Sesbania vesicaria</i>
Bladderwort	<i>Utricularia subulata</i>
Blanket crabgrass	<i>Digitaria serotina</i>
Blazing star	<i>Liatris sp.</i>
Bloodleaf	<i>Iresine diffusa</i>
Bloodroot	<i>Lachnanthes caroliniana</i>
Blue maidencane	<i>Amphicarpum muhlenbergianum</i>
Blueheart	<i>Buchnera americana</i>
Bluejoint panicum	<i>Coleataenia tenera</i>
Bog-buttons	<i>Lachnocaulon anceps</i>
Bracken fern	<i>Pteridium aquilinum</i>
Branched hedgehyssop	<i>Gratiola ramosa</i>
Bristly greenbrier	<i>Smilax tamnoides</i>
Broadleaf carpetgrass	<i>Axonopus compressus</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Broomsedge bluestem	<i>Andropogon virginicus</i> var. <i>virginicus</i>
Broomsedge bluestem	<i>Andropogon virginicus</i>
Browne's blechum	<i>Ruellia blechum</i>
Buckthorn	<i>Sideroxylon reclinatum</i>
Bull crowngrass	<i>Paspalum scrobiculatum</i>
Bulltongue arrowhead	<i>Sagittaria lancifolia</i>
Bulrush	<i>Scirpus</i> sp.
Bushy bluestem	<i>Andropogon glomeratus</i> var. <i>pumilus</i>
Butterfly weed	<i>Asclepias tuberosa</i>
Butterweed	<i>Senecio glabellus</i>
Cabbage palm	<i>Sabal palmetto</i>
Calloose grape	<i>Vitis shuttleworthii</i>
Canadian toadflax	<i>Nuttallanthus canadensis</i>
Carolina ash	<i>Fraxinus caroliniana</i>
Carolina fimbry	<i>Fimbristylis caroliniana</i>
Carolina mosquito fern	<i>Azolla filiculoides</i>
Carolina willow	<i>Salix caroliniana</i>
Carpetweed	<i>Phyla nodiflora</i>
Chalky bluestem	<i>Andropogon virginicus</i> var. <i>glaucus</i>
Chapman's goldenrod	<i>Solidago odora</i>
Chestnutleaf falsecroton	<i>Caperonia castaneifolia</i>
Chiggery grapes	<i>Tournefortia hirsutissima</i>
Chocolateweed	<i>Melochia corchorifolia</i>
Clamshell orchid	<i>Prosthechea cochleata</i> var. <i>cochleata</i>
Climbing aster	<i>Aster carolinianus</i>
Climbing hempvine	<i>Mikania scandens</i>
Clustered diamondflower	<i>Hedyotis uniflora</i>
Clustered mille grains	<i>Oldenlandia uniflora</i>
Coastal lovegrass	<i>Eragrostis refracta</i>
Coastalplain St. John's-wort	<i>Hypericum brachyphyllum</i>
Coastalplain umbrellasedge	<i>Fuirena longa</i>
Combleaf mermaidweed	<i>Proserpinaca pectinata</i>
Common buttonbush	<i>Cephalanthus occidentalis</i>
Common carpetgrass	<i>Axonopus fissifolius</i>
Common cattail	<i>Typha latifolia</i>
Common dayflower	<i>Commelina diffusa</i>
Common duckweed	<i>Spirodela polyrhiza</i>
Common fanpetals	<i>Sida acuta</i>
Common nightshade	<i>Solanum ptychanthum</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Common ragweed	<i>Ambrosia artemisiifolia</i>
Common reed	<i>Phragmites australis</i>
Common wild pine	<i>Tillandsia fasciculata</i>
Common yellow woodsorrel	<i>Oxalis corniculata</i>
Coral bean	<i>Erythrina herbacea</i>
Corkwood	<i>Stillingia aquatica</i>
Corky-stem passion flower	<i>Passiflora suberosa</i>
Cow horn orchid	<i>Cyrtopodium punctatum</i>
Creeping bluestem	<i>Schizachyrium scoparium var. stoloniferum</i>
Creeping cucumber	<i>Melothria pendula</i>
Creeping primrosewillow	<i>Ludwigia repens</i>
Cuban jute	<i>Sida rhombifolia</i>
Cudweed	<i>Gamochaeta stagnalis</i>
Curtiss' primrosewillow	<i>Ludwigia curtissii</i>
Cut-leaf philodendron	<i>Monstera deliciosa</i>
Cutthroat grass	<i>Coleataenia longifolia ssp. abscissa</i>
Cypress witchgrass	<i>Dichanthelium dichotomum</i>
Dahoon holly	<i>Ilex cassine</i>
Dallisgrass	<i>Paspalum dilatatum</i>
Danglepod	<i>Sesbania herbacea</i>
Darrow's blueberry	<i>Vaccinium darrowii</i>
Deer-tongue	<i>Carphephorus paniculatus</i>
Delicate ionopsis	<i>Ionopsis utricularioides</i>
Denseflower knotweed	<i>Polygonum densiflorum</i>
Devil's claws	<i>Pisonia aculeata</i>
Devil's horsewhip	<i>Achyranthes aspera</i>
Dog fennel	<i>Eupatorium capillifolium</i>
Dotted duckweed	<i>Landoltia punctata</i>
Dotted smartweed	<i>Polygonum punctatum</i>
Downy maiden fern	<i>Cyclosorus dentatus</i>
Duck potato	<i>Sagittaria latifolia</i>
Dwarf St. John's-wort	<i>Hypericum mutilum</i>
Dwarf sundew	<i>Drosera brevifolia</i>
Earleaf greenbrier	<i>Smilax auriculata</i>
Early paspalum	<i>Paspalum praecox</i>
Early whitetop fleabane	<i>Erigeron vernus</i>
Egyptian paspalidium	<i>Paspalidium geminatum</i>
Elderberry	<i>Sambucus canadensis</i>
Elliott's lovegrass	<i>Eragrostis elliottii</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Elliott's yelloweyed grass	<i>Xyris elliotii</i>
Erect-leaf witchgrass	<i>Dichantherium sphaerocarpon var. floridanum</i>
Fakahatchee guzmania	<i>Guzmania monostachia</i>
Fakahatcheegrass	<i>Tripsacum dactyloides</i>
Fall panicgrass	<i>Panicum dichotomiflorum</i>
False mastic	<i>Sideroxylon foetidissimum</i>
False nettle	<i>Boehmeria cylindrica</i>
Falsefennel	<i>Eupatorium leptophyllum</i>
Fanpetal	<i>Sida sp.</i>
Fasicled beakrush	<i>Rhynchospora fascicularis</i>
Fernald's beakrush	<i>Rhynchospora fernaldii</i>
Fetterbush	<i>Lyonia lucida</i>
Fewflower milkweed	<i>Asclepias lanceolata</i>
Fewflower nutrush	<i>Scleria pauciflora</i>
Field paspalum	<i>Paspalum laeve</i>
Fine-stem lovevine	<i>Cassytha filiformis</i>
Fingergrass	<i>Eustachys petraea</i>
Firebush	<i>Hamelia patens</i>
Fireflag	<i>Thalia geniculata</i>
Fireweed	<i>Erechtites hieraciifolius</i>
Flat-topped goldenrod	<i>Euthamia caroliniana</i>
Floating heart	<i>Nymphoides aquatica</i>
Florida bellflower	<i>Campanula floridana</i>
Florida butterfly orchid	<i>Encyclia tampensis</i>
Florida dropseed	<i>Sporobolus floridanus</i>
Florida hopbush	<i>Dodonaea viscosa</i>
Florida jointail grass	<i>Mnesithea tuberculosa</i>
Florida Keys hempvine	<i>Mikania cordifolia</i>
Florida pellitory	<i>Parietaria floridana</i>
Florida swampprivet	<i>Forestiera segregata</i>
Florida tickseed	<i>Coreopsis gladiata</i>
Florida whitetop	<i>Rhynchospora floridensis</i>
Forked blue curls	<i>Trichostema dichotomum</i>
Fourleaf vetch	<i>Vicia acutifolia</i>
Fourpetal St. John's-wort	<i>Hypericum tetrapetalum</i>
Foxtail or bristlegrass	<i>Setaria parviflora</i>
Fragrant beaksedge	<i>Rhynchospora odorata</i>
Fragrant eryngo	<i>Eryngium aromaticum</i>
Frog's bit	<i>Limnobiium spongia</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Gallberry	<i>Ilex glabra</i>
Gaping panicum	<i>Panicum hians</i>
Ghost orchid	<i>Dendrophylax lindenii</i>
Giant bulrush	<i>Schoenoplectus californicus</i>
Giant leather fern	<i>Acrostichum danaeifolium</i>
Giant sword fern	<i>Nephrolepis biserrata</i>
Giant whitetop	<i>Rhynchospora latifolia</i>
Giant wild pine	<i>Tillandsia utriculata</i>
Glades morning glory	<i>Ipomoea sagittata</i>
Globe beakrush	<i>Rhynchospora globularis</i>
Golden aster	<i>Pityopsis graminifolia</i>
Golden canna	<i>Canna flaccida</i>
Golden polypody	<i>Phlebodium aureum</i>
Grassleaf lettuce	<i>Lactuca graminifolia</i>
Grassy arrowhead	<i>Sagittaria graminea</i>
Graybark grape	<i>Vitis cinerea</i>
Graytwig	<i>Schoepfia schreberi</i>
Greenvein ladiestresses	<i>Spiranthes praecox</i>
Groundsel tree	<i>Baccharis halimifolia</i>
Guinea hen weed	<i>Petiveria alliacea</i>
Gulf coast spikerush	<i>Eleocharis cellulosa</i>
Gulfdune paspalum	<i>Paspalum monostachyum</i>
Gumbo limbo	<i>Bursera simaruba</i>
Hairawn muhly	<i>Muhlenbergia capillaris</i>
Hairy bluestem	<i>Andropogon longiberbis</i>
Hairy maiden fern	<i>Thelypteris hispidula</i> var. <i>versicolor</i>
Hammock prairie-clover	<i>Dalea carnea</i> var. <i>carnea</i>
Hand fern	<i>Cheiroglossa palmata</i>
Haspan flatsedge	<i>Cyperus haspan</i>
Heartleaf groundcherry	<i>Physalis cordata</i>
Heartleaf nettle	<i>Urtica chamaedryoides</i>
Hemlock witchgrass	<i>Dichanthelium portoricense</i>
Herb-of-grace	<i>Bacopa monnieri</i>
Hidden orchid	<i>Maxillaria crassifolia</i>
Hillsboro threeawn	<i>Aristida purpurascens</i> var. <i>tenuispica</i>
Hog plum	<i>Ximenia americana</i>
Horned bladderwort	<i>Utricularia cornuta</i>
Hurricanegrass	<i>Fimbristylis cymosa</i>
Inundated beaksedge	<i>Rhynchospora inundata</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
John Charles	<i>Hyptis verticillata</i>
Jointed flatsedge	<i>Cyperus articulatus</i>
Jointed spikerush	<i>Eleocharis interstincta</i>
Largeleaf marshpennywort	<i>Hydrocotyle bonariensis</i>
Latherleaf	<i>Colubrina asiatica</i>
Leafless beaked orchid	<i>Sacoila lanceolata</i>
Leafless swallowwort	<i>Orthosia scoparia</i>
Leafy bladderwort	<i>Utricularia foliosa</i>
Leatherleaf airplant	<i>Tillandsia variabilis</i>
Leavenworth's tickseed	<i>Coreopsis leavenworthii</i>
Lemon bacopa	<i>Bacopa caroliniana</i>
Lilac tasselflower	<i>Emilia sonchifolia</i>
Live oak	<i>Quercus virginiana</i>
Long strap fern	<i>Campyloneurum phyllitidis</i>
Longleaf threeawn	<i>Aristida palustris</i>
Long-leaf violet	<i>Viola lanceolata</i>
Loosestrife	<i>Lythrum alatum</i>
Lopsided indiagrass	<i>Sorghastrum secundum</i>
Low nutrush	<i>Scleria verticillata</i>
Maidencane	<i>Panicum hemitomon</i>
Manyflower marshpennywort	<i>Hydrocotyle umbellata</i>
Many-flowered catopsis	<i>Catopsis floribunda</i>
Manyspike flatsedge	<i>Cyperus polystachyos</i>
Marlberry	<i>Ardisia escallonioides</i>
Marsh fimbry	<i>Fimbristylis spadicea</i>
Marsh mermaidweed	<i>Proserpinaca palustris</i>
Marsh seedbox	<i>Ludwigia palustris</i>
Mexican pricklypoppy	<i>Argemone mexicana</i>
Mexican tea	<i>Dysphania ambrosioides</i>
Milk pea	<i>Galactia elliotii</i>
Milkberry	<i>Chiococca alba</i>
Mistflower	<i>Conoclinium coelestinum</i>
Mock bishop's weed	<i>Ptilimnium capillaceum</i>
Mohr's thoroughwort	<i>Eupatorium mohrii</i>
Monk orchid	<i>Oeceoclades maculata</i>
Morning-glory	<i>Ipomoea sp.</i>
Muscadine grape	<i>Vitis rotundifolia</i>
Musky mint	<i>Hyptis alata</i>
Myrsine	<i>Myrsine floridana</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Needleleaf witchgrass	<i>Dichantheium aciculare</i>
Needlepod rush	<i>Juncus scirpoides</i>
Netted chain fern	<i>Woodwardia areolata</i>
Netted nutrush	<i>Scleria reticularis</i>
Nettle tree	<i>Trema micrantha</i>
Night-scented orchid	<i>Epidendrum nocturnum</i>
Northern needleleaf	<i>Tillandsia balbisiana</i>
Nuttall's thistle	<i>Cirsium nuttallii</i>
Oak mistletoe	<i>Phoradendron serotinum ssp. serotinum</i>
Painted-leaf	<i>Euphorbia cyathophora</i>
Papaya	<i>Carica papaya</i>
Partridge pea	<i>Chamaecrista fasciculata</i>
Pawpaw	<i>Asimina reticulata</i>
Peelbark St. John's-wort	<i>Hypericum fasciculatum</i>
Pennsylvania everlasting	<i>Gamochaeta pensylvanica</i>
Pennyroyal	<i>Piloblephis rigida</i>
Pepper vine	<i>Ampelopsis arborea</i>
Persimmon	<i>Diospyros virginiana</i>
Pickeralweed	<i>Pontederia cordata</i>
Piedmont primrosewillow	<i>Ludwigia arcuata</i>
Piedmont sumpweed	<i>Iva microcephala</i>
Pigeon plum	<i>Coccoloba diversifolia</i>
Pine hyacinth	<i>Clematis baldwinii</i>
Pine lily	<i>Lilium catesbaei</i>
Pinebarren flatsedge	<i>Cyperus retrorsus</i>
Pinebarron goldenrod	<i>Solidago fistulosa</i>
Pineland heliotrope	<i>Heliotropium polyphyllum</i>
Pineland pimpernel	<i>Samolus valerandi subsp. parviflorus</i>
Pineland purple	<i>Carphephorus odoratissimus var. subtropicanus</i>
Pink sundew	<i>Drosera capillaris</i>
Pipewort	<i>Eriocaulon decangulare</i>
Piriqueta	<i>Piriqueta cistoides ssp. caroliniana</i>
Pointed blue-eye-grass	<i>Sisyrinchium angustifolium</i>
Poison ivy	<i>Toxicodendron radicans</i>
Pokeweed	<i>Phytolacca americana</i>
Pond apple	<i>Annona glabra</i>
Pond cypress	<i>Taxodium distichum var. imbricarium</i>
Poor joe	<i>Diodia teres</i>
Possum grape	<i>Cissus verticillata</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Potatotree	<i>Solanum erianthum</i>
Powdery catopsis	<i>Catopsis berteroniana</i>
Prairie iris	<i>Iris hexagona</i>
Privet wild sensitive plant	<i>Senna ligustrina</i>
Procession flower	<i>Polygala incarnata</i>
Prostrate rattle-box	<i>Crotalaria rotundifolia</i>
Purple bluestem	<i>Andropogon glomeratus var. glaucopsis</i>
Purple mecardonia	<i>Mecardonia acuminata</i>
Purple thistle	<i>Cirsium horridulum</i>
Queen's-delight	<i>Stillingia sylvatica</i>
Red bay	<i>Persea borbonia</i>
Red maple	<i>Acer rubrum</i>
Red mulberry	<i>Morus rubra</i>
Redmargin zephyrlily	<i>Zephyranthes simpsonii</i>
Redtop panicum	<i>Panicum rigidulum</i>
Resurrection fern	<i>Pleopeltis polypodioides</i>
Richard's yelloweyed grass	<i>Xyris jupicai</i>
River sage	<i>Salvia misella</i>
Rose-of-plymouth	<i>Sabatia stellaris</i>
Rosy camphorweed	<i>Pluchea baccharis</i>
Rouge plant	<i>Rivina humilis</i>
Roughhair witchgrass	<i>Dichantherium strigosum var. glabrescens</i>
Roundpod St. John's-wort	<i>Hypericum cistifolium</i>
Rumex	<i>Rumex sp.</i>
Running oak	<i>Quercus pumila</i>
Rustweed	<i>Polypremum procumbens</i>
Rusty staggerbush	<i>Lyonia ferruginea</i>
Saltmarsh fingergrass	<i>Eustachys glauca</i>
Saltmarsh umbrellasedge	<i>Fuirena breviseta</i>
Saltmarsh-mallow	<i>Kosteletzkya pentacarpos</i>
Sand cordgrass	<i>Spartina bakeri</i>
Satin leaf	<i>Chrysophyllum oliviforme</i>
Savannah false pimpernel	<i>Lindernia grandiflora</i>
Savannah milkweed	<i>Asclepias pedicellata</i>
Saw greenbrier	<i>Smilax bona-nox</i>
Saw palmetto	<i>Serenoa repens</i>
Sawgrass	<i>Cladium jamaicense</i>
Scaleleaf aster	<i>Symphotrichum adnatum</i>
Scarlet milkweed	<i>Asclepias curassavica</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Seaside primrose willow	<i>Ludwigia maritima</i>
Sedge	<i>Carex</i> sp.
Semaphore thorough-wort	<i>Eupatorium mikanioides</i>
Septicweed	<i>Senna occidentalis</i>
Shaggy hedgehyssop	<i>Gratiola pilosa</i>
Shiny blueberry	<i>Vaccinium myrsinites</i>
Shoestring fern	<i>Vittaria lineata</i>
Shortbristle horned beaksedge	<i>Rhynchospora corniculata</i>
Shortleaf wild coffee	<i>Psychotria tenuifolia</i>
Shortleaf yelloweyed grass	<i>Xyris brevifolia</i>
Showy milkwort	<i>Asemeia grandiflora</i>
Shrubby primrose willow	<i>Ludwigia suffruticosa</i>
Simpson's stopper	<i>Myrcianthes fragrans</i>
Sixangle foldwing	<i>Dicliptera sexangularis</i>
Skyflower	<i>Hydrolea corymbosa</i>
Slenderfruit nutrush	<i>Scleria georgiana</i>
Small butterwort	<i>Pinguicula pumila</i>
Small purple bladderwort	<i>Utricularia resupinata</i>
Smallflower mock buckthorn	<i>Sageretia minutiflora</i>
Smallfruit primrose willow	<i>Ludwigia microcarpa</i>
Snow squarestem	<i>Melanthera nivea</i>
Soft rush	<i>Juncus effusus</i>
Sour paspalum	<i>Paspalum conjugatum</i>
South Florida bluestem	<i>Schizachyrium rhizomatum</i>
South Florida slash pine	<i>Pinus elliottii</i> var. <i>densa</i>
Southeast sunflower	<i>Helianthus agrestis</i>
Southeastern sneezeweed	<i>Helenium pinnatifidum</i>
Souther beaksedge	<i>Rhynchospora microcarpa</i>
Southern cattail	<i>Typha domingensis</i>
Southern dewberry	<i>Rubus trivialis</i>
Southern fleabane	<i>Erigeron quercifolius</i>
Southern gaura	<i>Gaura angustifolia</i>
Southern needleleaf	<i>Tillandsia setacea</i>
Southern shield fern	<i>Thelypteris kunthii</i>
Southern umbrellasedge	<i>Fuirena scirpoidea</i>
Southern watergrass	<i>Luziola fluitans</i>
Southern wood fern	<i>Dryopteris ludoviciana</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Spadeleaf	<i>Centella asiatica</i>
Spanish moss	<i>Tillandsia usneoides</i>
Spanish stopper	<i>Eugenia foetida</i>
Spider-orchid	<i>Habenaria floribunda</i>
Spikerush	<i>Eleocharis elongata</i>
Spiny sowthistle	<i>Sonchus asper</i>
Spreading beaksedge	<i>Rhynchospora divergens</i>
Spring ladiestresses	<i>Spiranthes vernalis</i>
Spurge	<i>Chamaesyce sp.</i>
Spurred butterfly pea	<i>Centrosema virginianum</i>
St. Andrew's cross	<i>Hypericum hypericoides</i>
St. Augustine grass	<i>Stenotaphrum secundatum</i>
Staggerbush	<i>Lyonia fruticosa</i>
Stiff yellow flax	<i>Linum medium var. texanum</i>
Stiff-leaved wild pine	<i>Tillandsia fasciculata</i>
Strangler fig	<i>Ficus aurea</i>
Sugarberry	<i>Celtis laevigata</i>
Sugarcane plumegrass	<i>Saccharum villosum</i>
Summer grape	<i>Vitis aestivalis</i>
Swamp bay	<i>Persea palustris</i>
Swamp dogwood	<i>Cornus foemina</i>
Swamp fern	<i>Blechnum serrulatum</i>
Swamp hibiscus	<i>Hibiscus grandiflorus</i>
Swamp laurel oak	<i>Quercus laurifolia</i>
Swamp milkweed	<i>Asclepias incarnata</i>
Swamp smartweed	<i>Persicaria hydropiperoides</i>
Swamp sunflower	<i>Helianthus angustifolius</i>
Sweet broom	<i>Scoparia dulcis</i>
Sweet shaggytuft	<i>Stenandrium dulce</i>
Sweetbay	<i>Magnolia virginiana</i>
Sweetscent	<i>Pluchea carolinensis</i>
Sword fern	<i>Nephrolepis exaltata</i>
Tall elephantsfoot	<i>Elephantopus elatus</i>
Tall threeawn	<i>Aristida patula</i>
Tall yelloweyed grass	<i>Xyris platylepis</i>
Tarflower	<i>Bejaria racemosa</i>
Ten-petal sabatia	<i>Sabatia decandra</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Thin paspalum	<i>Paspalum setaceum</i>
Tracy's beaksedge	<i>Rhynchospora tracyi</i>
Tropical flatsedge	<i>Cyperus surinamensis</i>
Twinflower	<i>Dyschoriste sp.</i>
Twistedleaf goldenrod	<i>Solidago tortifolia</i>
Variable flatsedge	<i>Cyperus difformis</i>
Variable witchgrass	<i>Dichanthelium commutatum</i>
Virginia chain fern	<i>Woodwardia virginica</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Virginia pepperweed	<i>Lepidium virginicum</i>
Viviparous spikerush	<i>Eleocharis vivipara</i>
Wand goldenrod	<i>Solidago stricta</i>
Water cowbane	<i>Oxypolis filiformis</i>
Water pimpernel	<i>Samolus ebracteatus</i>
Water-willow	<i>Justicia angusta</i>
Wax myrtle	<i>Morella cerifera</i>
West Indian chickweed	<i>Drymaria cordata</i>
White crownbeard	<i>Verbesina virginica</i>
White lobelia	<i>Lobelia paludosa</i>
White mulberry	<i>Morus alba</i>
White spikerush	<i>Eleocharis albida</i>
White stopper	<i>Eugenia axillaris</i>
White vine	<i>Funastrum clausum</i>
White waterlily	<i>Nymphaea odorata</i>
Whitemouth dayflower	<i>Commelina erecta</i>
White-top sedge	<i>Rhynchospora colorata</i>
Whorled marshpennywort	<i>Hydrocotyle verticillata</i>
Wild batchelor's button	<i>Polygala lutea</i>
Wild coffee	<i>Psychotria nervosa</i>
Wild lime	<i>Zanthoxylum fagara</i>
Willow bustic	<i>Sideroxylon salicifolium</i>
Winged primrose	<i>Ludwigia alata</i>
Winged sumac	<i>Rhus copallinum</i>
Wingleaf primrose willow	<i>Ludwigia decurrens</i>
Wiregrass	<i>Aristida stricta</i>
Wood sage	<i>Teucrium canadense</i>
Woodsgrass	<i>Oplismenus hirtellus</i>

Table 4. Native Plant Species Known or Expected to Occur on DIRWMA

Common name	Scientific Name
Wrinkled jointgrass	<i>Mnesithea rugosa</i>
Yankeeweed	<i>Eupatorium compositifolium</i>
Yellow batchelor's button	<i>Polygala rugelii</i>
Yellow helmet orchid	<i>Polystachya concreta</i>
Yellow-top flaveria	<i>Flaveria linearis</i>

Table 5. Imperiled Plant Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name	Status
Acuna's epidendrum	<i>Epidendrum blancheanum</i>	SE
Balbis' airplant	<i>Tillandsia balbisiana</i>	ST
Banded wild-pine	<i>Tillandsia flexuosa</i>	SE
Cutthroat grass	<i>Panicum abscissum</i>	SE
Delicate ionopsis	<i>Ionopsis utricularioides</i>	SE
Fakahatchee guzmania	<i>Guzmania monostachia</i>	SE
Ghost orchid	<i>Polyrrhiza lindenii</i>	SE
Giant wild pine	<i>Tillandsia utriculata</i>	SE
Hand fern	<i>Ophioglossum palmatum</i>	SE
Leafless beaked orchid	<i>Sacoila lanceolata var. lanceolata</i>	ST
Many-flowered catopsis	<i>Catopsis floribunda</i>	SE
Pale-flowered polystachya	<i>Polystachya concreta</i>	SE
Powdery catopsis	<i>Catopsis berteroniana</i>	SE
Redmargin zephyrlily	<i>Zephyranthes simpsonii</i>	ST
Satin leaf	<i>Chrysophyllum oliviforme</i>	ST
Simpson's stopper	<i>Myrcianthes fragrans</i>	ST
Soft-leaved wild pine	<i>Tillandsia variabilis</i>	ST
Stiff-leaved wild pine	<i>Tillandsia fasciculata</i>	SE

Acronym	Status
SE	State-designated Endangered
ST	State-designated Threatened

Table 6. Exotic Plant Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Air potato	<i>Dioscorea bulbifera</i>
Australian pine	<i>Casuarina equisetifolia</i>
Bahiagrass	<i>Paspalum notatum</i>
Barnyard grass	<i>Echinochloa crus-galli</i>
Bermuda grass	<i>Cynodon dactylon</i>
Brazilian pepper	<i>Schinus terebinthifolius</i>
Caesar weed	<i>Urena lobata</i>
Cogongrass	<i>Imperata cylindrica</i>
Colombian waxweed	<i>Cuphea carthagenensis</i>
Creeping beggarweed	<i>Desmodium incanum</i>
Cuban bulrush	<i>Oxycaryum cubense</i>
Day-flower	<i>Commelina diffusa</i>
Dewflower	<i>Murdannia nudiflora</i>
Ditch fimbry	<i>Fimbristylis schoenoides</i>
Gambian day-flower	<i>Commelina gambiae</i>
Guava	<i>Psidium guajava</i>
Guineagrass	<i>Megathyrsus maximus</i>
Indian cupscale	<i>Sacciolepis indica</i>
Japanese climbing fern	<i>Lygodium japonicum</i>
Japanese millet	<i>Echinochloa frumentacea</i>
Lawn orchid	<i>Zeuxine strateumatica</i>
Naked dewflower	<i>Murdannia nudiflora</i>
Napiergrass	<i>Cenchrus purpureus</i>
Old world climbing fern	<i>Lygodium microphyllum</i>
Paragrass	<i>Urochloa mutica</i>
Peruvian primrose willow	<i>Ludwigia peruviana</i>
Rosary pea	<i>Abrus precatorius</i>
Rose natalgrass	<i>Melinis repens</i>
Shrub verbena	<i>Lantana camara</i>
Sicklepod	<i>Senna obtusifolia</i>
Smooth rattlebox	<i>Crotalaria pallida</i>
Smutgrass	<i>Sporobolus indicus</i>
Sour orange	<i>Citrus aurantium</i>
Thalia lovegrass	<i>Eragrostis atrovirens</i>
Threeflower ticktrefoil	<i>Desmodium triflorum</i>
Torpedo grass	<i>Panicum repens</i>
Tropical soda apple	<i>Solanum viarum</i>
Vasey grass	<i>Paspalum urvillei</i>
Water hyacinth	<i>Eichhornia crassipes</i>

Table 6. Exotic Plant Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Water lettuce	<i>Pistia stratiotes</i>
Water spangles	<i>Salvinia minima</i>
West Indian marsh grass	<i>Hymenachne amplexicaulis</i>
Wetland nightshade	<i>Solanum tampicense</i>
Wild balsam apple	<i>Momordica charantia</i>
Wild bush bean	<i>Macroptilium lathyroides</i>
Wild taro	<i>Colocasia esculenta</i>
Wright's nut-rush	<i>Scleria lacustris</i>

2.2.1 FNAI Community Descriptions

The following are descriptions of the seven natural and eight altered or anthropogenic community types that occur on the DIRWMA. These descriptions were prepared by the FNAI and modified by the FWC.

2.2.1.1 FNAI Natural Community Descriptions

Basin Marsh (1,804 acres)

Basin marsh is an herbaceous or shrubby wetland found in an irregularly shaped, large depression. It is distinguished from depression marsh by its irregular shape and large size. It is maintained by frequent fire to prevent woody plant encroachment. The deepest areas within a basin marsh generally remain inundated year-round. Basin marsh contains zones of vegetation based on the water depth and/or the amount of peat accumulation.

On the DIRWMA, basin marshes are typically over 15 acres. The deepest zones are usually found in the center, but may be found in pockets wherever peat has built up. These areas support Carolina willow, fireflag, and sawgrass. Occasionally, large patches of Carolina ash are present, which provide roosting sites for wading birds. The shallower zone often includes shrubs of peelbark St. John's wort, Peruvian primrose willow, and groundsel tree, and the herbaceous species pickerelweed, bulltongue arrowhead, sand cordgrass, maidencane, and dotted smartweed. Trees, including pond cypress and cabbage palm are found infrequently around the edge or scattered in a few of the basin marshes. The epiphyte Spanish moss occurred occasionally when trees were present.

Disturbances to basin marsh on the DIRWMA include ditching, invasion by exotic species including torpedo grass and West Indian marsh grass, roads and off-road vehicle (ORV) trails, cattle, and hog digging. Woody shrub encroachment by shrubs such as wax myrtle and groundsel tree is apparent in some marshes, likely because of the lower water levels caused by ditches, canals and lack of fire.

The conversion of the DIRWMA to pasture and agriculture resulted in basin marshes being drained and bisected by canals, ditches, or roads. Pasture often developed or was created in the shallow connections between deeper pockets of the basin marsh and resulted in the isolation of these smaller pockets from the main marsh. These areas that were once part of a larger marsh system were identified as depression marshes on the present day map.

Depression Marsh (1,938 acres)

Depression marshes are typically small wetlands that are circular or oval in shape and dominated by herbaceous species. Hydroperiods range widely from as few as 50 days or less to more than 200 days per year. They often dry out during periods of drought, and as a result, burn more frequently than basin marshes. The substrate is usually acid sand with deepening peat toward the center. Because water depth in depression marshes usually increases toward the center, vegetation typically forms distinctive zones corresponding to depth.

On the DIRWMA, depression marshes are numerous and widespread. The canopy layer in these marshes is generally absent or sparse and shrubs are predominantly confined to the edges. Pond cypress, cabbage palm, wax myrtle, and groundsel tree are the most common species in the tree or shrub strata when these strata are present. Many marshes have a deep-water center of fireflag and occasionally Carolina willow and a band comprised of maidencane, pickerelweed, sawgrass, and dotted smartweed in the shallow areas. Some marshes contain small pockets of Carolina ash, which are favorite roosting sites for wading birds. Additional herbaceous species common to many of the marshes include lemon bacopa, Gulf Coast spikerush, largeleaf marshpennywort, and sand cordgrass. Other marshes lack pockets of willow or ash and tend to be largely herbaceous and others are mere low spots within a matrix of pasture. West Indian marsh grass, paragrass, and torpedo grass are present in most of the wetlands on the DIRWMA and dominant in many small, shallow marshes. Torpedo grass was most common in the marshes in the sugar cane fields.

Disturbances to depression marshes on the DIRWMA are numerous. Drainage by ditches and canals and invasion by exotic species, mainly West Indian marsh grass and torpedo grass, are the most serious. Woody shrub encroachment is a major problem in the southern half of the area with shrubs such as wax myrtle and groundsel tree, probably because of lower water levels caused by ditches and canals and lack of fire. Other disturbances include cattle, roads and ORV trails, and hog digging.

Dome Swamp (605 acres)

Dome swamp is an isolated, forested, depression wetland occurring within a fire-maintained community such as mesic flatwoods. These swamps are generally small, but may also be large and shallow. The characteristic dome shape is created by smaller trees

that grow in the shallower waters of the outer edge, while taller trees grow in the deeper water in the interior of the swamp. Dome swamps are most often found on flat terraces, where they develop when the overlying sand has slumped into a depression in the underlying limestone, creating a rounded depression connected to a shallow water table. In uplands with clay soils, dome swamps may occupy depressions over a perched water table. Soils in dome swamps are variable, but are most often composed of a layer of peat, which may be thin or absent at the periphery, becoming thicker toward the center of the dome.

On the DIRWMA, dome swamps occur only in the southeastern portion of the area. The canopy consists of pond cypress and infrequently cabbage palm. The subcanopy and shrub strata are generally sparse and may include wax myrtle, cabbage palm, wild lime, and Brazilian pepper. Herb cover varies from dense to sparse, with swamp fern, pickerelweed, maidencane, false nettle, largeleaf marshpennywort, Florida pellitory, and butterweed being among the most common. Epiphytes are often frequent and include northern needleleaf and stiff-leaved wild-pine. Shrubby tropical soda apple and Brazilian pepper, two Category I invasive species, are common in the dome swamps and are dominant cover in several of the domes.

Disturbances to dome swamp on the DIRWMA are numerous. Drainage by ditches and canals and invasion by exotic species, mainly Brazilian pepper and tropical soda apple are most serious. Recently, hurricanes have caused extensive tree fall in the majority of the dome swamps. Other disturbances included cattle, roads and ORV trails, and hog digging.

Land clearing in preparation for agriculture and pasture development is apparent on the 1953 aerial photography that was used as a background for drawing the historic map for the DIRWMA. This is most obvious in the southeastern portion of the property where cypress dominated communities are present. It is presumed that extensive logging of cypress took place and that areas where cypress is present today represent remnant stands and regeneration of cypress in areas that were not converted to pasture or grove. It is difficult to determine the former extent of cypress or whether a large strand swamp system once occurred in this area. Alternatively, there may have been no cypress present historically or cypress may have occurred intermittently. Cycles of drought and fire may have allowed cypress to take hold in areas that were once much wetter. General Land Office (GLO) surveyor notes of 1873 make no mention of cypress at their points within the DIRWMA. GLO descriptions for the southeastern portion of the DIRWMA include “wet boggy prairie”, “3rd rate prairie and slough lands”, “sawgrass slough”, “3rd rate wet and dry prairie”, “flag and sawgrass pond in slough at this point it becomes impracticable I relinquish line and return to the south”, and “impracticable sawgrass and willow thicket in slough”. Collier Company field notes of 1935 and map also make no mention of cypress within the DIRWMA boundaries. “Cypress” is written in a small area just outside the western boundary and “Point of cypress” is printed on the map southeast of the

southeastern corner of the DIRWMA. GLO surveyor notes for the next township to the south begin to note cypress and cypress swamp frequently in the area located just south of where the Collier Company map indicates “point of cypress”. Areas that appear to have been cleared of cypress and areas of intact cypress are identified on the historic map as dome swamps. It may be that the separate polygons identified as domes were once connected to form a large, more linear strand swamp or that a swale/slough system, devoid of cypress, that ran from the large swale-like area midway up the eastern boundary of the DIRWMA, southwest to the southern boundary.

Mesic Flatwoods (32 acres)

Mesic flatwoods is the most widespread natural community in Florida, covering the flat sandy terraces left behind by former high sea levels. Mesic flatwoods is characterized by an open canopy of tall pines and a dense, low ground layer of shrubs, grasses, and forbs. Longleaf pine is the principal canopy tree in northern and Central Florida, transitioning to predominately slash pine in South Florida. Soils are acidic, nutrient-poor, fine sands with upper layers darkened by organic matter. Drainage in this flat terrain can be impeded by a loosely cemented organic layer (spodic horizon) formed within several feet of the soil surface. The soils may be alternately xeric during dry periods, and saturated or even inundated after heavy rain events.

Approximately 2,000 acres of the DIRWMA were identified as mesic flatwoods on the historic map. All of this is located in the northwestern portion of the area. The most obvious and extensive flatwoods occurred on the “peninsula” that juts out into the marsh in the south part of the very northwest portion of the DIRWMA. Overall, it was difficult to determine from the 1953 photography how much clearing of pines, versus hammock or prairie, took place. Obvious clearing that occurred in the northwestern quadrant was mostly assigned to mesic flatwoods unless information from the Collier Company map or General Land Office surveyor notes indicated otherwise. The GLO notes only cover the very southern part of the area that is identified as mesic flatwoods and only one says “pine island.” The Collier Company map indicates pine on the “peninsula” and smaller pockets around the boundary to the east and one small area closer to the middle of the DIRWMA. The majority of the northwestern quadrant on the Collier Company map is labeled as “prairie with scattered pine,” which seemed to agree with the signature on the 1953 photography. From all accounts it appears that mesic flatwoods on the DIRWMA were mostly very open and restricted to the northwest portion of the area.

On the DIRWMA today, mesic flatwoods have largely been converted to improved pasture of bahiagrass. The four patches of mesic flatwoods that were identified occur in the northern half of the DIRWMA. Three of the sites have a canopy of mature to older mature South Florida slash pine. The subcanopy includes young pines, cabbage palm, and live oak. Shrub species include cabbage palm, Brazilian pepper, and at two sites, saw palmetto. The

herbaceous cover is dominated by bahiagrass, with wiregrass conspicuously absent. The northeastern most flatwoods site lacked pines but is described as “a patch of old flatwoods surrounded by hammock.” South Florida slash pine occurs predominantly in the northwestern quadrant of the DIRWMA.

Disturbances to mesic flatwoods on the DIRWMA include conversion to improved and semi-improved pasture, fire suppression, ditches and canals, roads and ORV trails, cattle, and hog digging. Invasive species found include Brazilian pepper and Caesar weed, Category I and II invasive species, respectively. Recent hurricanes uprooted and broke off a significant number of pines.

Mesic Hammock (1,384 acres)

Mesic hammock is a well-developed evergreen hardwood and/or palm forest, typically with a closed canopy of live oak. Mesic hammock may occur as “islands” on high ground within basin or floodplain wetlands, as patches of oak/palm forest in dry prairie or flatwoods communities, on river levees, or in ecotones between wetlands and upland communities. Historically, mesic hammocks were likely restricted to fire shadows, or other naturally fire-protected areas such as islands and peninsulas of lakes. Other landscape positions that can provide protection from the spread of fire are likely places for mesic hammock development, including edges of lakes, sinkholes, other depressional or basin wetlands, and river floodplains. Although mesic hammock is not generally considered a fire-adapted community, some small patches of hammock occurring as islands within marshes or prairies may experience occasional low-intensity ground fires. Mesic hammocks occur on well-drained sands mixed with organic matter and are rarely inundated. High moisture is



maintained by heavy shading of the ground layer and accumulation of litter. Where limestone is near the surface, rocky outcrops are common in mesic hammocks.

Mesic hammock was identified on the historic map of the DIRWMA mostly by recognition of a distinctive signature on the 1953 aerials and information in the 2006 data points. Several areas classified as mesic hammock on the present day map appeared to have been flatwoods on

the historic map. Areas that had little or no saw palmetto with a dense, closed canopy, and where no pines are present today were generally classified as mesic hammock. Delineating

boundaries of hammocks in the southeastern portion of the DIRWMA was sometimes problematic because of the clearing already obvious on the 1953 aerials.

Presently on the DIRWMA, mesic hammocks occur throughout the area and vary somewhat in species composition because of differences in depth of soil surface to limestone, fire frequency, and disturbance. Hammocks in areas where limestone is closer to the surface tend to harbor a greater diversity of plant species, many of them being more tropical species. The hammocks range from one-half acre to 80 acres with most being less than 10 acres in size. They occur as small isolated patches in pasture or more often, irregular or crescent shaped communities abutting a wetland. A few are located on elevated sites within a dome swamp community.

The closed canopy is typically dominated by live oak and cabbage palm. Other common canopy and subcanopy trees are gumbo limbo, sugarberry, and strangler fig. Many large gumbo limbo trees were felled by the 2005 hurricanes. South Florida slash pine is present in some of the hammocks that are located in the northwestern part of the DIRWMA. The shrub strata is well developed with devil's claws, myrsine, cabbage palm, Brazilian pepper, hog plum, and wild lime most abundant. White stopper, Spanish stopper, Simpson's stopper, and wild citrus are present in many of the hammocks, while satin leaf is present to a lesser degree. The ground cover is highly variable and frequently disturbed by hogs or cows. Ceasarweed, a Category II invasive species, occurs in most of the hammocks and is abundant in many of them. Devil's horsewhip, native to tropical Asia, is particularly weedy in many of the hammocks. Herbaceous species include scarlet milkweed, common dayflower, John Charles, fireweed, woodsgrass, butterweed, Florida pellitory, rouge plant, river sage, and downy maiden fern. Epiphytes are common and include golden polypody, resurrection fern, northern needleleaf, common wild pine, ballmoss, southern needleleaf, and shoestring fern.

Disturbances to mesic hammock on the DIRWMA include hurricanes, invasive exotic species, hog digging, ORV trails, and cattle tromping. Hurricanes in 2005 have uprooted and broken off a significant number of trees with some areas affected more than others. Mesic hammocks are highly susceptible to invasion by Brazilian pepper, Category I invasive species, and Ceasarweed, necessitating exotic species treatment and monitoring.

Slough Marsh (1,040 acres)

Slough marsh are broad, flat marshes with slow flowing water, permanently saturated and inundated for at least 180 days a year. Frequent fire limits woody encroachment and peat accumulation. They are generally dominated by emergent grasses, sedges, and herbs, and shrubs are usually infrequent but are sometimes quite abundant in limited areas. Slough marsh is often dominated by large areas of sawgrass with deeper channels typically consisting of Carolina willow, pond apple, and fireflag.

On the DIRWMA, slough marsh is located immediately within and along the western boundary of the area, north of the location of the former sugar cane fields and on its common border with OSSF. This area is sometimes referred to as Crow's Nest Slough and once probably flowed uninterrupted south and west to Okaloacoochee Slough. A high road, bordered by ditches follows the western boundary of the DIRWMA and cuts through the slough in many places, disrupting water flow. Some areas on the east side of the road consist of dense Carolina willow. Several fingers come off the main channel on its eastern side and exhibit characteristics of depression or basin marsh communities.

Shrubs include Carolina willow, chestnutleaf falsecrotton, and wax myrtle. Herbaceous species often present include herb-of-grace, sawgrass, white spikerush, southern umbrellasedge, water cowbane, bluejoint panicum, Egyptian paspalidium, dotted



smartweed, pickerelweed, fireflag, and leafy bladderwort. More extensive swaths of sawgrass and patches of willow or cattail seem to be scattered throughout the slough marsh system. Non-vascular periphyton was noted floating in some areas.

Disturbances to slough marsh include ditches and canals, ORV trails, cattle, and hogs. The natural hydrology of slough marsh on the DIRWMA has been heavily disturbed by artificial drainages, levees, and controlled water levels. All of these disrupt natural sheet flow and hydroperiod.

Wet Flatwoods (4 acres)

Wet flatwoods occur in broad, low flatlands, often in a mosaic with these communities. They are found in the ecotones between mesic flatwoods, shrub bogs, wet prairies, dome swamps, or strand swamps. Wet flatwoods are pine forests with a sparse or absent midstory and a dense groundcover of hydrophytic grasses, herbs, and low shrubs. The relative density of shrubs and herbs varies greatly in wet flatwoods. Shrubs tend to dominate where fire has been absent for a long period or where cool season fires predominate; herbs are more abundant in locations that are frequently burned. Soils and hydrology also influence the relative density of shrubs and herbs. Soils of shrubby wet flatwoods are generally poorly to very poorly drained sands. These soils generally have a

mucky texture in the uppermost horizon. Loamy sands are typical of soils in grassy wet flatwoods.

On the DIRWMA, wet flatwoods were historically intermingled with mesic flatwoods, wet prairie, basin marsh, and depression marsh. Approximately 400 acres were identified as wet flatwoods on the historic map of the DIRWMA. Areas that appeared to have relatively dense pine and saw palmetto cover on the 1953 photography were generally classified as wet flatwoods, although mesic flatwoods may be more appropriate in some cases. These areas are predominately concentrated in the northwestern part of the DIRWMA and are closely aligned with a preponderance of marshes.

Over time, wet flatwoods on the DIRWMA have almost entirely been converted to improved pasture of bahiagrass. Presently, wet flatwoods comprise only 4 acres in the northwestern section of the DIRWMA. This small area borders a depression marsh on the rather isolated peninsula that is bordered by marsh. The open canopy and subcanopy consists of South Florida slash pine. Shrubs are moderate in abundance and include wax myrtle, cabbage palm, myrsine, and Brazilian pepper. Herbs, specifically grasses such as blue maidencane, bushy bluestem, and hairawn muhly, are the dominant component of the groundcover. Vines include Virginia creeper, bristly greenbrier, and poison ivy. The herbaceous cover in the surrounding area that were probably once wet flatwoods now are dominated by bahiagrass and are not classified as wet flatwoods.

Wet flatwoods on the DIRWMA have largely been eliminated because of the conversion to improved pasture. Restoration potential will be affected by drainage ditches and canals, ORV trails and roads, invasive exotic plants such as Brazilian pepper, cattle, and hogs.

2.2.1.2 FNAI Altered Community Descriptions

Agriculture (2,699 acres)

Areas classified as agricultural areas include row crops, citrus groves, and sod fields that are generally being maintained to grow products for human or domesticated animal use. There are just under 2,700 acres classified as agriculture on the DIRWMA. Approximately 636 of the acres classified as agriculture are located in the southeast corner of the area and consist of the existing citrus groves on the area, though the citrus grove management contract between the FWC and Krause Grove Service Inc. actually encompasses a wider area of approximately 800 acres. Former sugar cane fields located in the southwest corner of the area that are no longer used for agricultural purposes account for the remaining acreage currently classified as agriculture on the DIRWMA.

Artificial Pond (73 acres)

Artificial pond is a created habitat meant for water retention, cattle ponds, etc. On the DIRWMA, there are approximately 73 acres classified as artificial ponds, which primarily consists of cow ponds spread throughout the pastures on the area.

Canal/Ditch (230 acres)

Artificial linear drainage ways are classified as canal/ditch. On the DIRWMA, there are approximately 230 acres of canals and ditches spread throughout the area, including ditches that run alongside the roads on the area.

Clearing/Regeneration (111 acres)

Clearing/regeneration areas can include dove fields, wildlife food plots, old homesites, or recent or historic clearings that have significantly altered the groundcover and/or overstory of the original natural community. There are approximately 111 acres classified as clearing/regeneration on the DIRWMA and consist almost entirely of dove fields.

Developed (7 acres)

Developed areas include check stations, ORV use areas, parking lots, buildings, maintained lawns, botanical or ornamental gardens, campgrounds, recreational, industrial, and residential areas. There are approximately 7 acres of developed land on the DIRWMA.

Pasture – Improved (11,745 acres)

Improved pasture areas are defined as natural areas that have been stripped of most or all native vegetation and replanted in pasture grasses. At the DIRWMA, this altered community accounts for 54% of the entire site. This community has heavy disturbance from cattle, clearing and exotic plant establishment. Improved pasture is widespread throughout the DIRWMA landscape. The exotic species bahiagrass and smutgrass are



dominant in areas historically classified as mesic and wet flatwoods, wet prairie, depression marsh, dry prairie, and even dome swamp.

When present, the canopy and subcanopy of the pasture areas commonly include South Florida slash pine, live oak, cabbage palm, and to a lesser degree pond cypress. In the

eastern half of the DIRWMA, clumps of oaks and palms and sometimes scattered cypress in the wetter areas are common. Shrubs are dense to non-existent and consist of wax myrtle,

cabbage palm, and occasionally saw palmetto. The herbaceous cover is mainly comprised of bahiagrass, smutgrass, and weedy species like dog fennel and yankeeweed. Smutgrass consistently has a light blue-gray reflectance on the 2004 aerials and is often found around the rim of depressions. Spadeleaf, manyflower marshpennywort, and fourleaf vetch were very common in wetter pastures. Wiregrass was not observed during the course of FNAI's field surveys.

Pasture - Semi-improved (32 acres)

Semi-improved pasture is defined as natural areas that have been stripped of a significant percentage of their native vegetation and seeded in pasture grasses, but still retain some natural structure. This altered community shares many of the same species as improved pasture but shows more affinity to the historic natural community.

On the DIRWMA, most of the bahiagrass dominated semi-improved pasture occurs in areas historically classified as mesic flatwoods and often has a canopy of South Florida slash pine. When present, the canopy and subcanopy of the pasture areas commonly include South Florida slash pine, live oak, cabbage palm, and to a lesser degree pond cypress. In the eastern half of the DIRWMA, clumps of oaks and palms and sometimes scattered cypress in the wetter areas are common. Shrubs are dense to non-existent and consist of wax myrtle, cabbage palm, and occasionally saw palmetto. The herbaceous cover is mainly comprised of bahiagrass, smutgrass, and weedy species like dog fennel and yankeeweed. Smutgrass consistently has a light blue-gray reflectance on the 2004 aerials and is often found around the rim of depressions. Spadeleaf, manyflower marshpennywort, and fourleaf vetch were very common in wetter pastures. Wiregrass was not observed during the course of FNAI's field surveys.

Spoil Area (2 acres)

Spoil areas are sites where dredge or spoil material is deposited. These areas may or may not be re-colonized by vegetation. There are less than two acres classified as spoil area on the DIRWMA.

2.2.2 Forest Resources

The DIRWMA is characterized by scattered islands of trees separated by extensive, open fields. As a result, there are only limited forest resources present on the DIRWMA. The FFS conducted a timber assessment of the DIRWMA in 2005 to evaluate the area's timber resources and to provide recommendations regarding the management of the area's timber resources and the feasibility of utilizing silvicultural techniques as a management activity on the area (Appendix 13.7). The FWC has requested an update of that assessment, which will be incorporated into the Appendix of this Management Plan once it is completed by the FFS.

The only species with commercial potential present on the area is south Florida slash pine, though the 2005 timber assessment notes that only one stand of south Florida slash pine was observed on the area.

2.3 Fish and Wildlife Resources

As previously described, the DIRWMA has a variety of natural communities and habitat types that support a wide array of imperiled, rare, and more common wildlife species. Active wildlife management practices and a diversity of habitat types make the DIRWMA an excellent place to view wildlife. The DIRWMA’s flatwoods, hammocks, marshes, and swamps, as well as some of its more altered areas including pastures and canals, provide critical habitat for resident and migratory wildlife. In addition to the 18 imperiled plant species noted in Table 5, there are 16 imperiled wildlife species documented as occurring on the DIRWMA. Those imperiled wildlife species are listed in Table 12.



The FWC also maintains an inventory of fauna occurring on or near the DIRWMA, including birds (Table 7), fish (Table 8), mammals (Table 9), and reptiles and amphibians (Table 10). Additionally, Table 11 contains an inventory of the exotic invasive wildlife species that have been documented on or near the DIRWMA. All of these species inventories will continue to be maintained and updated by FWC staff.

Table 7. Bird Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Acadian flycatcher	<i>Empidonax vireescens</i>
American bittern	<i>Botaurus lentiginosus</i>
American coot	<i>Fulica americana</i>
American crow	<i>Corvus brachyrhynchos</i>
American goldfinch	<i>Carduelis tristis</i>
American kestrel	<i>Falco sparverius</i>
American pipit	<i>Anthus rubescens</i>
American redstart	<i>Setophaga ruticilla</i>
American robin	<i>Turdus migratorius</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
American wigeon	<i>Anas americana</i>
Anhinga	<i>Anhinga anhinga</i>

Table 7. Bird Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Bald eagle	<i>Haliaeetus leucocephalus</i>
Baltimore oriole	<i>Icterus galbula</i>
Bank swallow	<i>Riparia riparia</i>
Barn owl	<i>Tyto alba</i>
Barn swallow	<i>Hirundo rustica</i>
Barred owl	<i>Strix varia</i>
Belted kingfisher	<i>Microceryle alcyon</i>
Black vulture	<i>Coragyps atratus</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Blackburnian warbler	<i>Setophaga fusca</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Blackpoll warbler	<i>Setophaga striata</i>
Black-throated blue warbler	<i>Setophaga caerulescens</i>
Black-throated green warbler	<i>Setophaga virens</i>
Blue grosbeak	<i>Passerina caerulea</i>
Blue jay	<i>Cyanocitta cristata</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
Blue-headed vireo	<i>Vireo solitarius</i>
Blue-winged teal	<i>Anas discors</i>
Blue-winged warbler	<i>Vermivora pinus</i>
Boat-tailed grackle	<i>Quiscalus major</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Brown thrasher	<i>Toxostoma rufum</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Burrowing owl	<i>Athene cunicularia</i>
Canvasback	<i>Aythya valisineria</i>
Cape May warbler	<i>Setophaga tigrina</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Cattle egret	<i>Bubulcus ibis</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Chestnut-sided warbler	<i>Setophaga pennsylvanica</i>
Chimney swift	<i>Chaetura pelagica</i>
Chipping sparrow	<i>Spizella passerina</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Cinnamon teal	<i>Anas cyanoptera</i>
Common grackle	<i>Quiscalus quiscula</i>
Common ground-dove	<i>Columbina passerina</i>
Common moorhen	<i>Gallinula chloropus</i>
Common nighthawk	<i>Chordeiles minor</i>

Table 7. Bird Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Common yellowthroat	<i>Geothlypis trichas</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Crested caracara	<i>Caracara cheriway</i>
Dickcissel	<i>Spiza americana</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Downy woodpecker	<i>Picoides pubescens</i>
Eastern bluebird	<i>Sialia sialis</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
Eastern meadowlark	<i>Sturnella magna</i>
Eastern phoebe	<i>Sayornis phoebe</i>
Eastern screech-owl	<i>Megascops asio</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>
Eastern wood-pewee	<i>Contopus virens</i>
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>
Field sparrow	<i>Spizella pusilla</i>
Fish crow	<i>Corvus ossifragus</i>
Florida grasshopper sparrow	<i>Ammodramus savannarum floridanus</i>
Florida sandhill crane	<i>Grus canadensis pratensis</i>
Fox sparrow	<i>Passerella iliaca</i>
Fulvous whistling-duck	<i>Dendrocygna bicolor</i>
Gadwall	<i>Anas strepera</i>
Glossy ibis	<i>Plegadis falcinellus</i>
Golden-winged warbler	<i>Vermivora chrysoptera</i>
Gray catbird	<i>Dumetella carolinensis</i>
Gray kingbird	<i>Tyrannus dominicensis</i>
Gray-cheeked thrush	<i>Catharus minimus</i>
Great blue heron	<i>Ardea herodias</i>
Great crested flycatcher	<i>Myiarchus crinitus</i>
Great egret	<i>Ardea alba</i>
Great horned owl	<i>Bubo virginianus</i>
Green heron	<i>Butorides virescens</i>
Green-winged teal	<i>Anas crecca</i>
Hairy woodpecker	<i>Picoides villosus</i>
Hermit thrush	<i>Catharus guttatus</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Hooded warbler	<i>Wilsonia citrina</i>
House wren	<i>Troglodytes aedon</i>
Indigo bunting	<i>Passerina cyanea</i>
Kentucky warbler	<i>Oporornis formosus</i>

Table 7. Bird Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Killdeer	<i>Charadrius vociferus</i>
King rail	<i>Rallus elegans</i>
Least bittern	<i>Ixobrychus exilis</i>
Least flycatcher	<i>Empidonax minimus</i>
Lesser scaup	<i>Aythya affinis</i>
Limpkin	<i>Aramus guarauna</i>
Lincoln's sparrow	<i>Melospiza lincolnii</i>
Little blue heron	<i>Egretta caerulea</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Long-tailed duck	<i>Clangula hyemalis</i>
Louisiana waterthrush	<i>Seiurus motacilla</i>
Magnolia warbler	<i>Setophaga magnolia</i>
Mallard	<i>Anas platyrhynchos</i>
Mottled duck	<i>Anas fulvigula</i>
Mourning dove	<i>Zenaida macroura</i>
Nashville warbler	<i>Vermivora ruficapilla</i>
Northern bobwhite	<i>Colinus virginianus</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Northern flicker	<i>Colaptes auratus</i>
Northern harrier	<i>Circus cyaneus</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Northern parula	<i>Setophaga americana</i>
Northern pintail	<i>Anas acuta</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Northern shoveler	<i>Anas clypeata</i>
Northern waterthrush	<i>Parkesia noveboracensis</i>
Orange-crowned warbler	<i>Leiothlypis celata</i>
Orchard oriole	<i>Icterus spurius</i>
Osprey	<i>Pandion haliaetus</i>
Ovenbird	<i>Seiurus aurocapilla</i>
Painted bunting	<i>Passerina ciris</i>
Palm warbler	<i>Setophaga palmarum</i>
Peregrine falcon	<i>Falco peregrinus</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Prairie warbler	<i>Setophaga discolor</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Purple gallinule	<i>Porphyrio martinica</i>
Purple martin	<i>Progne subis</i>

Table 7. Bird Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-breasted merganser	<i>Mergus serrator</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Ring-necked duck	<i>Aythya collaris</i>
Roseate spoonbill	<i>Platalea ajaja</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
Ruby-throated hummingbird	<i>Archilochus colubris</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Scarlet tanager	<i>Piranga olivacea</i>
Sedge wren	<i>Cistothorus platensis</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Shiny cowbird	<i>Molothrus bonariensis</i>
Short-tailed hawk	<i>Buteo brachyurus</i>
Snail kite	<i>Rostrhamus sociabilis</i>
Snowy egret	<i>Egretta thula</i>
Song sparrow	<i>Melospiza melodia</i>
Summer tanager	<i>Piranga rubra</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Swainson's warbler	<i>Limnothlypis swainsonii</i>
Swallow-tailed kite	<i>Elanoides forficatus</i>
Swamp sparrow	<i>Melospiza georgiana</i>
Tennessee warbler	<i>Leiothlypis peregrina</i>
Tree swallow	<i>Tachycineta bicolor</i>
Tricolored heron	<i>Egretta tricolor</i>
Turkey vulture	<i>Cathartes aura</i>
Veery	<i>Catharus fuscescens</i>
Vermilion flycatcher	<i>Pyrocephalus rubinus</i>
Virginia rail	<i>Rallus limicola</i>
Western tanager	<i>Piranga ludoviciana</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>
White ibis	<i>Eudocimus albus</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
White-eyed vireo	<i>Vireo griseus</i>

Table 7. Bird Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
White-throated sparrow	<i>Zonotrichia albicollis</i>
Wild turkey	<i>Meleagris gallopavo</i>
Wilson's snipe	<i>Gallinago delicata</i>
Wood duck	<i>Aix sponsa</i>
Wood stork	<i>Mycteria americana</i>
Wood thrush	<i>Hylocichla mustelina</i>
Worm-eating warbler	<i>Helmitheros vermivorum</i>
Yellow warbler	<i>Setophaga petechia</i>
Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>
Yellow-rumped warbler	<i>Setophaga coronata</i>
Yellow-throated vireo	<i>Vireo flavifrons</i>
Yellow-throated warbler	<i>Setophaga dominica</i>

Table 8. Fish Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
American eel	<i>Anguilla rostrata</i>
Bowfin	<i>Amia calva</i>
Brown bullhead	<i>Ameiurus nebulosus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Longnose gar	<i>Lepisosteus asseus</i>
Redbreast sunfish	<i>Lepomis auritus</i>
Yellow bullhead	<i>Ameiurus natalis</i>

Table 9. Mammal Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Big Cypress fox squirrel	<i>Sciurus niger avicennia</i>
Bobcat	<i>Lynx rufus</i>
Cotton rat	<i>Sigmodon hispidus</i>
Coyote	<i>Canis latrans</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern gray squirrel	<i>Sciurus carolinensis</i>
Florida black bear	<i>Ursus americanus floridanus</i>
Florida mouse	<i>Peromyscus polionotus</i>

Table 9. Mammal Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Florida panther	<i>Puma concolor coryi</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
North American river otter	<i>Lontra canadensis</i>
Northern yellow bat	<i>Lasiurus intermedius floridanus</i>
Opossum	<i>Didelphis virginiana</i>
Raccoon	<i>Procyon lotor</i>
Round-tailed muskrat	<i>Neofiber alleni</i>
Striped skunk	<i>Mephitis mephitis</i>
White-tailed deer	<i>Odocoileus virginianus</i>

Table 10. Reptile and Amphibian Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
American Alligator	<i>Alligator mississippiensis</i>
Black racer	<i>Coluber constrictor</i>
Coachwhip	<i>Masticophis flagellum</i>
Common garter snake	<i>Thamnophis sirtalis</i>
Common mud turtle	<i>Kinosternon subrubrum</i>
Common snapping turtle	<i>Chelydra serpentina</i>
Corn snake	<i>Pantherophis guttatus</i>
Cottonmouth	<i>Agkistrodon piscivorus</i>
Diamondback rattlesnake	<i>Crotalus adamanteus</i>
Eastern indigo snake	<i>Drymarchon couperi</i>
Eastern mud snake	<i>Farancia abacura</i>
Eastern ribbon snake	<i>Thamnophis sauritus</i>
Florida kingsnake	<i>Lampropeltis getula floridana</i>
Florida softshell turtle	<i>Apalone ferox</i>
Green anole	<i>Anolis carolinensis</i>
Green treefrog	<i>Hyla cinerea</i>
Pig frog	<i>Rana grylio</i>
Pygmy rattlesnake	<i>Sistrurus miliarius barbouri</i>
Ringnecked snake	<i>Diadophis punctatus</i>
Southern leopard frog	<i>Lithobates sphenoccephalus</i>
Southern toad	<i>Anaxyrus terrestris</i>
Squirrel treefrog	<i>Hyla squirella</i>
Yellow rat snake	<i>Pantherophis alleghaniensis</i>

Table 11. Exotic Animal Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name
Brown anole	<i>Anolis sagrei</i>
Channeled applesnail	<i>Pomacea canaliculata</i>
Cuban treefrog	<i>Osteopilus septentrionalis</i>
Eurasian collard-dove	<i>Streptopelia decaocto</i>
European starling	<i>Sturnus vulgaris</i>
Feral hog	<i>Sus scrofa</i>
Greenhouse frog	<i>Eleutherodactylus planirostris</i>
House sparrow	<i>Passer domesticus</i>
Mayan cichlid	<i>Cichlasoma urophthalmus</i>
Mozambique tilapia	<i>Tilapia mossambica</i>
Nine-banded armadillo	<i>Dasyus novemcinctus</i>
Oscar	<i>Astronotus ocellatus</i>
Red imported fire ant	<i>Solenopsis invicta</i>
Walking catfish	<i>Clarias batrachus</i>

2.3.1 Integrated Wildlife Habitat Ranking System

The FWC has developed the Integrated Wildlife Habitat Ranking System (IWHRS) as a Geographic Information Systems (GIS)-based assessment tool that incorporates a wide variety of land cover and wildlife species data. The IWHRS evaluates 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 the DIRWMA has a mean wildlife value of 5.9 (Figure 9).

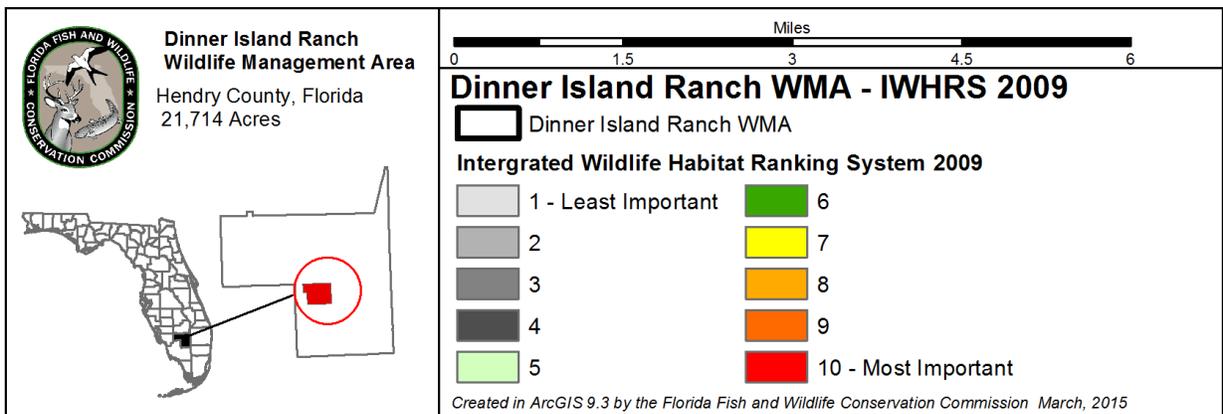
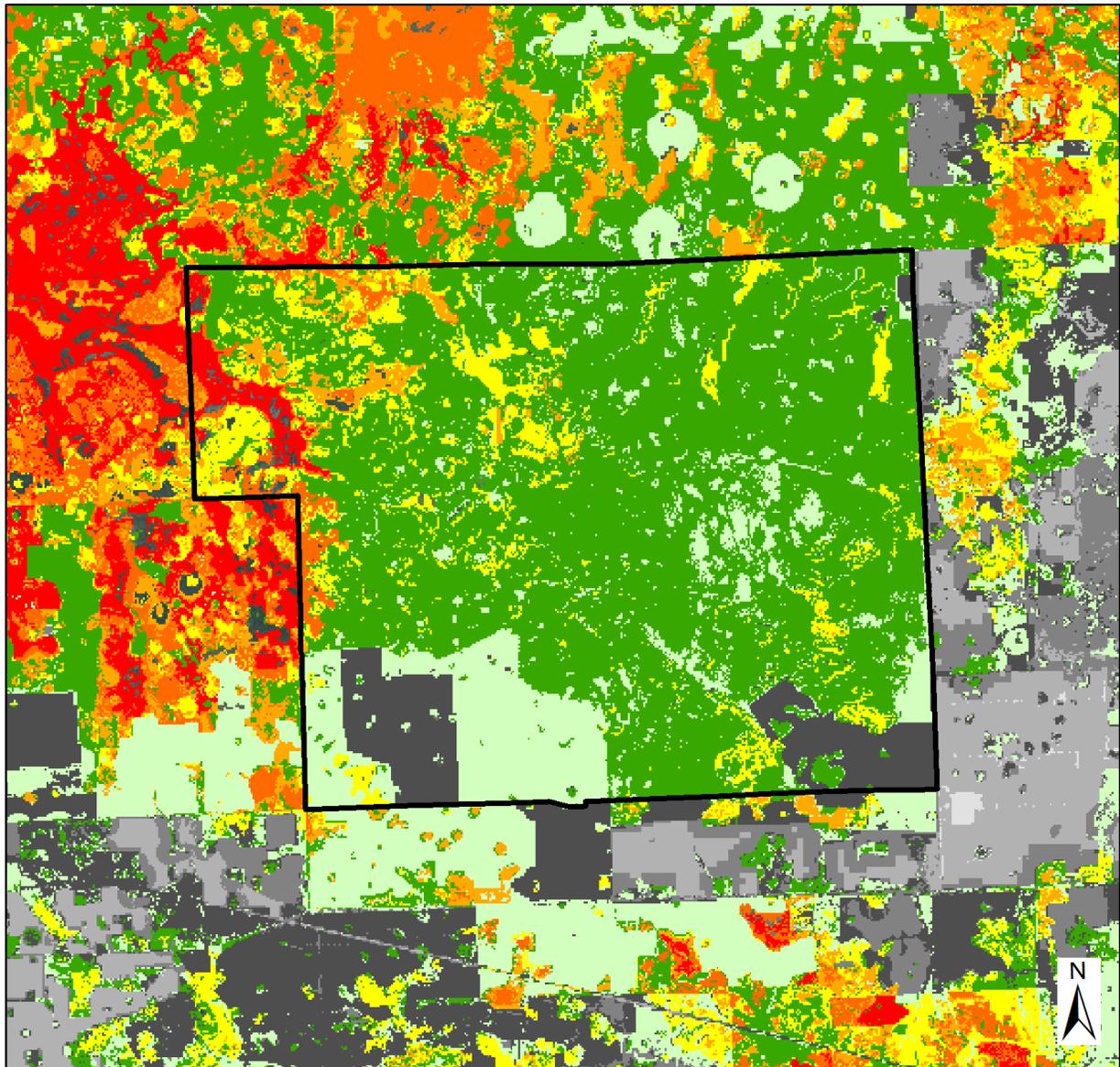


Figure 9. DIRWMA – FWC Integrated Wildlife Habitat Ranking System 2009

2.3.2 Imperiled Species

For the purposes of this Management Plan, the term “imperiled species” refers to plant and animal species that are designated as endangered, threatened, or a species of special concern by FWC, or that are designated as endangered or threatened by the USFWS. This designation is also commonly known as “listed species.” An inventory of the imperiled species documented on the DIRWMA can be found in Table 12, below. It should be noted that Florida grasshopper sparrow is included in the area’s imperiled species inventory because it was documented on the DIRWMA in the past. However, the species appears to have been extirpated from the area as a population of Florida grasshopper sparrows is not currently present on the DIRWMA despite the efforts of FWC staff to relocate individuals to the site.



On November 8, 2010, new threatened species rules approved by the FWC were implemented. 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.

Table 12. Imperiled Wildlife Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name	Status
Birds		
Burrowing owl	<i>Athene cunicularia</i>	SSC
Crested caracara	<i>Caracara cheriway</i>	FT
Florida grasshopper sparrow	<i>Ammodramus savannarum floridanus</i>	FE
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	FE
Florida sandhill crane	<i>Grus canadensis pratensis</i>	ST
Limpkin	<i>Aramus guarauna</i>	SSC
Little blue heron	<i>Egretta caerulea</i>	SSC
Roseate spoonbill	<i>Platalea ajaja</i>	SSC

Florida Fish and Wildlife Conservation Commission | Dinner Island Ranch WMA Management Plan

Table 12. Imperiled Wildlife Species Known or Expected to Occur on DIRWMA

Common Name	Scientific Name	Status
Snowy egret	<i>Egretta thula</i>	SSC
Tricolored heron	<i>Egretta tricolor</i>	SSC
White ibis	<i>Eudocimus albus</i>	SSC
Wood stork	<i>Mycteria americana</i>	FT
Reptiles		
American alligator	<i>Alligator mississippiensis</i>	SSC
Eastern indigo snake*	<i>Drymarchon couperi</i>	FT
Mammals		
Big Cypress fox squirrel	<i>Sciurus niger avicennia</i>	ST
Florida panther	<i>Puma concolor coryi</i>	FE

*Eastern indigo snake has not been directly observed on the DIRWMA, but the species has been documented on adjacent conservation land and is likely to occur on the area.

Acronym	Status
FE	Federally-designated Endangered
FT	Federally-designated Threatened
FT(S/A)	Federally-designated Threatened due to similarity of appearance
ST	State-designated Threatened
SSC	State Species of Special Concern

2.3.3 FWC Wildlife Observations and FNAI Element Occurrences

A diversity of wildlife species is found on the DIRWMA. The FNAI element occurrence records for the DIRWMA include 12 species, of which eight are imperiled. As defined by the FNAI, an “element” is any exemplary or rare component of the natural environment, such as a species, natural community, bird colony, 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. The FNAI assigns a rank to each “element” occurrence. This ranking system was developed by The Nature Conservancy (TNC) 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 shown in Figure 10. Also displayed in Figure 10 is panther location data maintained by the FWC, which displays the confirmed observations of Florida panthers on and near the DIRWMA. Appendix 13.8 contains a letter from the FNAI authorizing the FWC to utilize their database for the purpose of displaying known plant and animal resources.

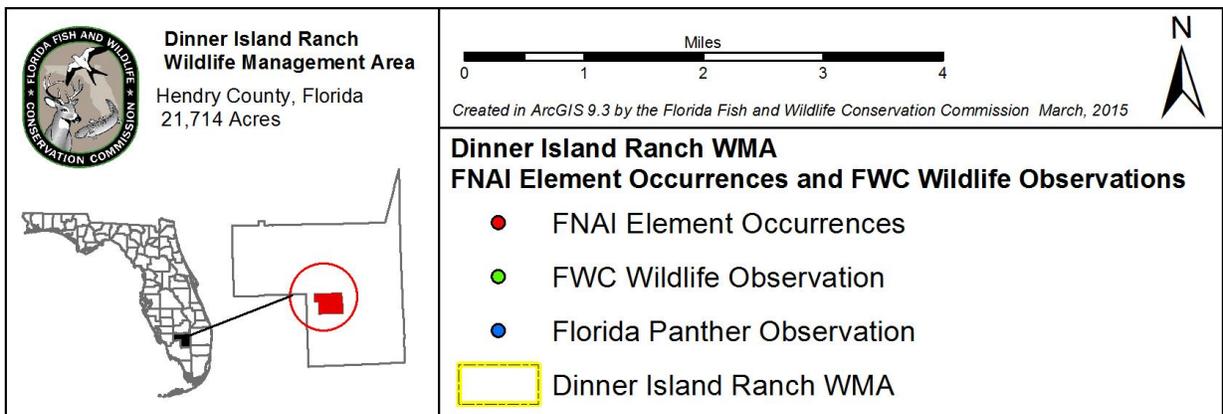
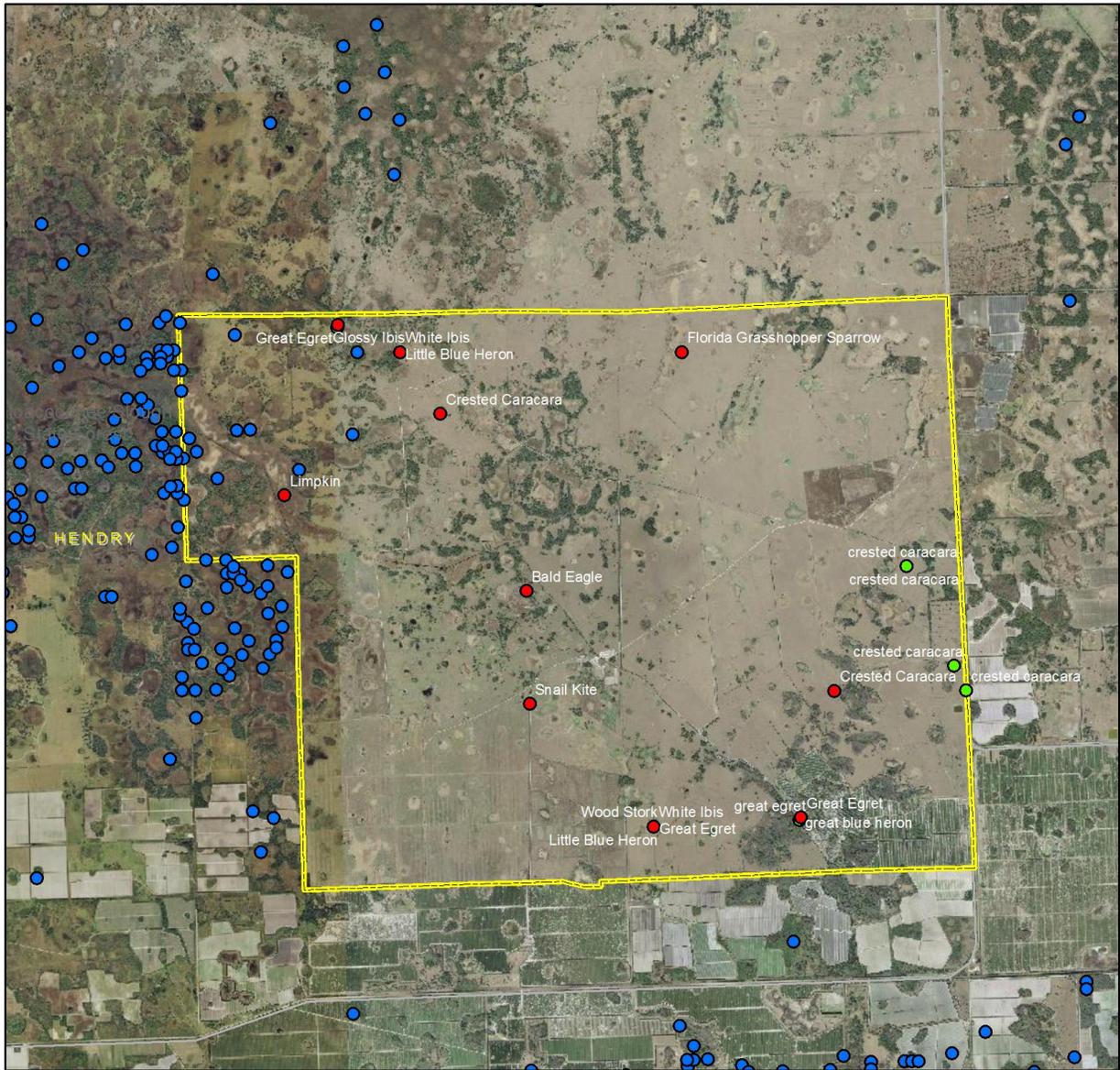


Figure 10. FWC Wildlife Observations and FNAI Element Occurrences

2.4 Native Landscapes

The predominant native landscapes on the DIRWMA include depression marsh, basin marsh, mesic hammock, and slough marsh. Other significant native landscapes include dome swamp and mesic flatwoods. Complete descriptions of the natural communities present on the DIRWMA can be found in Section 2.2.1 of this Management Plan.

2.5 Water Resources

The surface water hydrology of the area is characterized by a generalized north to south drainage pattern. The western portion of the DIRWMA, however, appears to once have drained to the west, toward the Okaloacoochee Slough, where it apparently contributed substantial flows to this headwater system of the Fakahatchee Strand and, ultimately, portions of the Ten Thousand Islands. At present, both the Crow's Nest Canal and the Deer Fence Canal effectively intercept this western flow and direct the surface water to the south and east. The DIRWMA contains no natural bodies of freshwater which would be considered waters of the State. The DIRWMA does not contain a first magnitude spring, nor any type of lake, nor is it designated as an aquatic preserve and is not under consideration for such designation. The underlying aquifer in the DIRWMA is the Surficial Aquifer System. This aquifer transports its water through unconsolidated sand and gravel.



All surface waters of the State are classified by the DEP according to designated uses as described in Chapter 62-302.44 FAC. The surface waters of the DIRWMA, including the C-139 basin and the Okaloacoochee Slough, are designated as Class III, and classified for fish consumption, recreation, and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Additionally, it is the policy of the DEP to afford the highest protection to Outstanding Florida Waters (OFW) and Outstanding National Resource Waters (Chapter 62-302.700 FAC). However, no portion of the DIRWMA is designated as OFW.

Additionally, there are many freshwater forested and shrub wetlands, as well as freshwater emergent wetlands on the DIRWMA. In addition to the aforementioned Okaloacoochee Slough, there are two other water resources designated as streams, the Feeder Canal and

the C-139 Canal. Over 5,000 acres of the DIRWMA are designated as wetlands in the National Wetlands Inventory, including two freshwater ponds that are approximately three acres and eight acres in size.

2.6 Beaches and Dunes

There are no beach or dune resources on the DIRWMA.

2.7 Mineral Resources

Hendry County has commercial sand, limestone, and oil production, and these resources are potentially present on the DIRWMA. Sand is produced from formations near the surface and is used in a variety of construction and industrial applications. Potential sand producing units include Fort Thompson, Caloosahatchee, and Tamiami Formations. Limestone can also be mined from these formations. General uses for limestone include crushed stone, dimension stone, and soil conditioning. The active oil fields in the vicinity are the Sunoco-Felda field in Hendry and Collier Counties and the Mid-Felda and Townsend Canal fields in Hendry County. These fields produce oil from the Sunniland Formation of Cretaceous age.

In August 2013, TOCALA, LLC, submitted an application to the DEP for a permit to perform 3D geophysical seismic testing on approximately 161 square miles in Collier and Hendry counties. The proposed project area includes 2,325 acres within the southwest portion of the DIRWMA for which the subsurface mineral rights are owned by a private entity. The FWC reviewed this application and submitted comments and recommendations regarding the proposed activities to the DEP in December 2013 (Appendix 13.3.5.2). As part of this review, the FWC requested that the applicant coordinate with FWC staff when conducting activities within the DIRWMA in order to ensure that the area's resources, as well as public hunting, recreation, and access opportunities, would not be adversely affected. Seismic testing activities under this permit began to take place on the DIRWMA in 2016.

2.8 Historical Resources

The Florida Department of State's Division of Historical Resources (DHR) Master Site File indicates there are no recorded sites present on the DIRWMA. However, there is one recorded site that is located immediately adjacent to the eastern border of the DIRWMA. That site (HN00009) is described as a prehistoric burial mound and ceramic scatter from the Glades Culture. Additionally, the Master Site File contains records for a total of 16 sites and one resource group within five miles of the boundary of the DIRWMA. As a result, there may be historical or archaeological sites on the area that have not yet been recorded in the DHR Master Site File. It is, therefore, possible that the DIRWMA contains potentially significant but as of yet undiscovered and unrecorded archaeological sites. Sections 5.9 and 6.8 of this Management Plan discuss the FWC's plans to survey for and preserve as necessary such sites.

2.9 Scenic Resources

The DIRWMA offers sweeping vistas of the area's unique south Florida landscape, which includes wide open fields and pastures dotted with hammocks and islands of trees. The DIRWMA is a part of the Great Florida Birding and Wildlife Trail and wildlife is abundant year-round throughout the area. Additionally, due to its remote location and lack of light pollution, the DIRWMA is an excellent location for star gazing and amateur astronomy.

3 Uses of the Property

3.1 Previous Use and Development

Thousands of years before Europeans arrived, Native Americans hunted, fished, and gathered wild plants throughout Florida. Evidence of Native American presence on the DIRWMA dates back to at least 800 A.D. The Calusa Indians were thought to be some of the first Native American tribes to occupy the Dinner Island/Hendry County area, southwest of Lake Okeechobee. However, the term Calusa was used by the Spanish upon their arrival in Florida to refer to most of the Native Americans living in south Florida at the time, but there is some uncertainty as to how much correlation exists between the Calusa of that colonial period and the archaeological assemblages that provide evidence of human habitation from early periods. Regardless, from 800 A.D. into the 17th century, Native American hunters and fishermen inhabited the coastal regions of southwest Florida and traveled up the Caloosahatchee River in dugout canoes to reach interior wetlands associated with Lake Okeechobee and the Kissimmee River. Though some land alteration occurred during this period, 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 livestock, primarily cattle and hogs, as well as horses 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 throughout much of the central Florida peninsula during most of the European settlement era from the 16th through 20th centuries. Use of these agricultural practices began an era of increased alteration of the natural landscape. However, it wasn't until the 19th and 20th centuries that major settlement and more extensive alteration of the landscape in the area began with the widespread use of more intensive agriculture such as row cropping, citrus production, and associated development.

During the 1920s, the town of Clewiston blossomed and the agricultural production and processing of sugar cane and citrus became important local industries. Southern Sugar, which became the U.S. Sugar Corporation in 1931, established a sugar mill in Clewiston,

although this region south of Lake Okeechobee was often impacted by severe flooding. After 2,400 residents around Lake Okeechobee died in floods from major hurricanes in 1926 and 1928, flood control in the area began in earnest. A dike was built around Lake Okeechobee and the Caloosatchee and St. Lucie rivers were dredged and channelized to create the Okeechobee Waterway, which connected the lake to the Atlantic Ocean and Gulf of Mexico. Lock-and-dam structures controlled water flow. The construction of this man-made waterway and a sprawling network of canals diverted the historic water flow to agricultural and urban uses and away from the surrounding areas and sensitive ecosystems of the Florida Everglades and Florida Bay. As a result, the hydrology of the DIRWMA and the surrounding area was significantly altered.

Today, agriculture is the base of Hendry County's economy. Sugar cane and citrus agriculture, followed by cattle and tomato farming, are the County's most important economic activities. Previous landowners converted all historic prairie and 98% of the flatwoods cover types on the DIRWMA to improved pasture. Prior to state acquisition, the DIRWMA was operated by the Hilliard family primarily as a cattle ranch; citrus farming and sugarcane production were much smaller enterprises on the property.

3.2 Current Use of the Property

Currently, the DIRWMA is managed 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 the DIRWMA each year including activities such as prescribed burning; wildlife habitat restoration and improvement; invasive exotic 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; and research related activities.

Current and anticipated resource uses of the property are diverse. Hunting continues to be a popular recreational activity on the DIRWMA. The area also offers excellent opportunities for bird

watching, especially for crested caracara and wading birds. The diversity of vegetation not only harbors a variety of bird species but also provides good opportunities for mammalian wildlife viewing. Other uses include hiking, photography, biking, sightseeing, and horseback riding.

Public use of the DIRWMA can be expected to increase as public awareness of opportunities on the area increases. The FWC administers hunts in the fall and spring for various game species including small game, deer, turkey, and feral hogs, which account for a little more than half of the user-days.

3.2.1 Visitation and Economic Benefits

Visitation and public use of the area for fish and wildlife based public outdoor recreational opportunities is the primary source of economic benefits from the DIRWMA, and contributes to the overall economy of the South Florida region. In Fiscal Year 2013-14, an estimated 23,381 people visited the DIRWMA. Primarily, as a result of this visitation and use of the area, FWC economic analysis estimates indicate that the DIRWMA generated an estimated annual economic impact of \$2,671,279 for the State and the South Florida region. This estimated annual economic impact has aided in the support or creation of an estimated 47 jobs.

Additional revenue is generated from the two cattle grazing contracts and one citrus grove management contract that are currently in place on the area (Section 1.6, Appendix 13.3). The first year of the west-side grazing contract with Hilliard Brothers of Florida, LLLP, generated over \$316,000 and the first year of the east-side grazing contract with A&M Management of Hendry County, Inc., generated over \$299,000. Subsequent revenues from the cattle grazing contracts vary year-to-year based on the number of cattle present on the area. The citrus grove management contract with Krause Grove Service Inc. yields annual revenues equal to at least 11.25% of the gross sales for all fruit sold, with the percentage increasing up to 13.25% if gross sales exceed \$4,000,000.

Further revenue generating potential of the DIRWMA will depend upon future uses described in this Management Plan. Additional revenue from environmental lands such as the DIRWMA include cattle grazing and citrus lease revenues and may include sales of various permits and recreational user fees and ecotourism activities, if such projects could be feasibly developed. The annual area regulations can be consulted to clarify the necessary and required permits, fees, and regulations. Additionally, the long-term value of ecosystem services, including the protection of air and water quality functions, are considered to be significant to local and regional land and water resources, as well as human health.

3.3 Single- or Multiple-use Management

The DIRWMA will be managed under the multiple-use concept as a Wildlife Management Area. The DIRWMA will provide fish and wildlife resource based public outdoor recreation and educational opportunities, while protecting the natural and historical resources found on the area. Any natural and historical resources of the DIRWMA will be managed under

the guidance of the 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 the DIRWMA. 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 13.9). 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 the original purpose of acquisition or one or more of the various forms of guidance available for planning and management.

	<u>Approved</u>	<u>Conditional</u>	<u>Rejected</u>
Apiaries		✓	
Astronomy	✓		
Bicycling	✓		
Cattle grazing		✓	
Citrus or other agriculture		✓	
Ecosystem services and maintenance	✓		
Ecotourism		✓	
Environmental Education	✓		
First-responder training		✓	
Fishing		✓	
Geocaching		✓	
Hiking	✓		
Horseback riding	✓		
Hunting		✓	
Linear facilities			✓
Military training		✓	
Preservation of historical resources	✓		
Primitive camping	✓		
Protection of imperiled species	✓		
Off-road vehicle use			✓
Shooting sports park		✓	
Soil and water conservation	✓		
Timber harvest	✓		
Wildlife observation	✓		

3.3.2 Incompatible Uses and Linear Facilities

Consideration of incompatible uses and linear facilities on the DIRWMA are made in accordance with the requirements of Section 253.034(10), FS, and other applicable Florida constitution, statute, rule, and policy requirements, as well as other provisions governing applications for proposed incompatible uses or linear facilities on state-owned conservation lands. Upon approval and implementation of this management plan, any proposed future uses that have been classified herein as Rejected, or other proposed future uses that are determined to be incompatible with the purposes of acquisition or other management authorizations and guidance, will be forwarded for review and approval consideration to the DEP-DSL, the ARC, and the Board of Trustees prior to any incompatible use or linear facility being authorized on the DIRWMA.

3.3.3 Assessment of Impact of Planned Uses of the Property

To communicate the 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 DIRWMA (Sections 5 -8). A detailed assessment of the benefits and potential impacts of planned uses and activities on natural and historical resources was an integral part of the development of the management activities and intent, goals and objectives, and challenges and strategies sections of this Management Plan.

3.4 Acreage Recommended for Potential Surplus Review

On conservation lands where the FWC is the lead manager, the FWC evaluates and identifies recommended areas for a potential surplus designation by the DSL, the ARC, and the Board of Trustees. This evaluation consists of GIS modeling and analysis, aerial photography interpretation, analysis of fish and wildlife resources, a review of resource and operational management needs, and a review of public access and recreational use of the area. Also, the FWC considers recommendations for surplus lands as they relate to Florida's "No Net Loss of Hunting Lands" legislation (Ch. 379.3001 F.S.), as well as surplus restrictions for lands acquired through the Federal Aid in Wildlife Restoration Act (Pittman-Robertson) or through other federal grant programs.

The evaluation of the DIRWMA by the FWC has determined that all portions of the area are being managed and operated for the original purposes of acquisition, and remain integral to the continued conservation of important fish and wildlife resources, and continue to provide beneficial fish and wildlife resource based public outdoor recreational opportunities. Therefore, no portion of the DIRWMA is recommended for potential surplus review.

4 Accomplished Objectives from the DIRWMA Management Plan 2005 – 2015

This section is dedicated to reporting the extent to which the Objectives described in the DIRWMA Management Plan 2005 – 2015 (pages 27 - 31) were successfully completed. Accomplishments for the DIRWMA during the previous planning timeframe are discussed in more comprehensive detail throughout **Section 5 Management Activities and Intent** of this Management Plan.

The following **Resource Management Goals and Objectives** from the 2005 – 2015 DIRWMA Management Plan describe the planned activities for the DIRWMA during this period. The degree to which the FWC was able to accomplish the planned activities during this period is reflected as **Percent Accomplished** for each associated Objective.

Objectives Accomplished from the 2005 Dinner Island Ranch Management Plan

Goals and Objectives	Percent Accomplished
Goal 1: Control public use and access to protect the Florida Panther and its habitat.	
Objective 1: In order to minimize human disturbance, limit access to one main entrance (ongoing). <i>Comment: Only one public entrance to the area has been established off of CR 838 to provide public access and limit disturbance.</i>	100%
Objective 2: By 2005 , complete an assessment of the most sensitive habitat areas for the Florida panther within DIRWMA. <i>Comment: FWC has established panther SMAs through its WCPR program (1,438 acres), located in Management Units 1 and 2 west.</i>	100%
Objective 3: By 2006 , develop and implement a public use plan that will address the panther habitat assessment; the plan should address hunting, camping, fishing, OHV activities, wildlife viewing, equestrian activities, and ecotourism. <i>Comment: The DIRWMA WCPR Strategy addresses the assessment of panther habitat, as well as other imperiled and focal species, which FWC will take into consideration in the development of a Recreation Master Plan (RMP) as part of the update to the DIRWMA management plan that will address all the recreational needs and issues for the area.</i>	0%
Goal 2: Complete assessments and monitoring criteria for listed species indigenous to DIRWMA.	

<p>Objective 1: Continue field observations for listed species including red-cockaded woodpecker, gopher tortoise, burrowing owl, and crested caracara (ongoing). <i>Comment: FWC continues to monitor imperiled and focal species as recommended in the DIRWMA WCPR Strategy. Additionally, the red-cockaded woodpecker has not been documented on the area and, given the habitat conditions present on the area, is currently not expected to occur on the DIRWMA.</i></p>	100%
<p>Objective 2: By 2005, complete an American alligator population assessment survey, and establish a schedule for annual nest surveys (ongoing). <i>Comment: FWC completed an American alligator survey in 2004 and determined that annual nest surveys were not necessary for the area at this time considering the limited potential habitat on the area compared to other habitats in the vicinity.</i></p>	100%
<p>Objective 3: By 2005, complete a survey of sandhill crane and wading bird populations, and establish an ongoing monitoring protocol. <i>Comment: FWC has conducted a survey and FWRI has established a monitoring protocol for sandhill cranes and wading bird populations on the area.</i></p>	100%
<p>Objective 4: By 2007, perform a bald eagle habitat assessment in the old-growth pines found in the northwest quadrant of the property. <i>Comment: FWC completed a bald eagle assessment on the area. FWC conducts state-wide surveys of bald eagle nests and monitors one nest on the area.</i></p>	100%
<p>Objective 5: By 2007, complete a crested caracara population assessment survey, and establish a monitoring protocol for periodic population assessment (ongoing). <i>Comment: FWC has conducted an assessment and established a monitoring protocol for crested caracara on the area.</i></p>	100%
<p>Goal 3: Enhance and maintain upland and wetland communities to meet water management standards and provide high quality habitats and conditions for fish and wildlife species indigenous to DIRWMA.</p>	
<p>Objective 1: In accordance with the panther habitat assessment, implement a hog removal program that balances habitat needs with recreational opportunities (ongoing). <i>Comment: FWC, in coordination with the ongoing panther habitat assessment, has established hog hunting seasons during archery, muzzleloading gun, general gun, family hunt, and small game seasons with a daily bag limit of one hog and no size limits.</i></p>	100%
<p>Objective 2: In accordance with the C-139 Basin Study, cooperate with SFWMD to develop hydrological management objectives that restore or enhance fish and wildlife habitats (ongoing).</p>	100%

<p><i>Comment: FWC continues to coordinate and cooperate with the SFWMD on hydrological management objectives for the area and has established a monthly water level monitoring protocol.</i></p>	
<p>Objective 3: By 2005, establish a protocol for removal of exotic vegetation, including Brazilian pepper, tropical soda apple, and smutgrass. <i>Comment: FWC has documented the exotic vegetation on the area and treatment is ongoing.</i></p>	100%
<p>Objective 4: Contract with Florida Natural Areas Inventory (FNAI) to identify historic and current vegetative community types pursuant to objective-based vegetation management by 2006. <i>Comment: FNAI mapped the natural communities on the area in 2006 and the natural community maps were recertified in 2015. A rare plant survey was conducted in conjunction with this mapping effort.</i></p>	100%
<p>Objective 5: In accordance with vegetation management objectives for DIRWMA, begin implementation of a restoration effort for citrus groves by 2006. <i>Comment: Due to the high costs associated with restoration of citrus groves relative to restoration of other altered habitats on the area such as improved and semi-improved pastures and the substantial amount of habitats on the area requiring restoration, the FWC determined it was more cost-effective to continue to manage the citrus groves through contract for citrus production and use the revenues generated from the citrus contract to initiate management and restoration efforts on the remainder of the area at this time. Consequently, the citrus grove on the area is under lease until 2027, at which point restoration will be considered.</i></p>	0%
<p>Objective 6: By 2006, begin to implement efforts to restore natural vegetative communities to areas impacted by past agricultural practices (improved pastures) on the eastern portion of DIRWMA. <i>Comment: FWC has implemented restoration efforts on the eastern portion of the DIRWMA, including mowing, prescribed fire, cattle exclusion, and ground cover restoration. Currently, the FWC's ability to implement ground cover restoration on the entirety of the improve pasture acreage is limited by the prohibitive cost of ground cover restoration relative to other, more cost-effective management practices.</i></p>	100%
<p>Objective 7: With the assistance of the Division of Forestry, complete a timber management plan that is compatible with wildlife and ecosystem management objectives by 2007. <i>Comment: FFS completed a timber assessment for the area in 2005; however, only one strand of old-growth pine was located on the area. Consequently, the area does not currently contain sufficient stands of timber to warrant a timber management plan.</i></p>	100%

<p>Objective 8: Develop quantifiable vegetative management objectives by 2008. <i>Comment: FWC has established an OBVM program on the area which includes development of management objectives and monitoring protocols.</i></p>	100%
<p>Objective 9: Based on historic vegetative analysis and vegetative management objectives developed for DIRWMA, begin implementation of a ground cover and reforestation effort on areas disturbed by past agricultural practices by 2009. <i>Comment: FNAI mapped the current and historic natural communities on the area in 2006. FWC initiated ground cover restoration 100 acres on the eastern portion of the DIRWMA and reforestation efforts on two management units in the northwest portion of the DIRWMA.</i></p>	100%
<p>Goal 4: Provide high quality ecotourism and recreational opportunities for the DIRWMA.</p>	
<p>Objective 1: Continue to plant dove fields on approximately 100 acres of improved (bahiagrass) pastures to provide quality dove hunting opportunities (ongoing). <i>Comment: FWC maintains dove fields on approximately 200 acres of the DIRWMA.</i></p>	100%
<p>Objective 2: Continue to maintain wild turkey management strategies consistent with producing a quality turkey hunting experience (ongoing). <i>Comment: FWC coordinates with the agency's Wild Turkey program and the National Wild Turkey Federation to conduct habitat enhancement for wild turkeys.</i></p>	100%
<p>Objective 3: Continue to maintain deer management strategies consistent with producing a quality white-tailed deer hunting experience (ongoing). <i>Comment: FWC conducts annual population and recruitment aerial surveys for white-tailed deer. In addition, FWC has established a statewide deer management unit protocol that establishes deer management practices for each region throughout the state.</i></p>	100%
<p>Objective 4: Continue to participate in the Big O Birding Festival (ongoing). <i>Comment: FWC participates in this festival annually.</i></p>	100%
<p>Objective 5: By 2005, determine the feasibility of making DIRWMA a stop on both the Big Water Heritage Trail and the Great Florida Birding Trail. <i>Comment: The DIRWMA is now an established stop on the Great Florida Birding Trail, but is not at this time on the Big Water Heritage Trail.</i></p>	100%

Objective 6: By 2005 , contact Sunshine State Horse Council for an assessment of potential equestrian trail riding opportunities. <i>Comment: FWC attempted to contact the Affiliated Horse Owners of Florida (formerly Sunshine State Horse Council). Horseback riding is permitted on all named and numbered roads/trails on the area.</i>	100%
Objective 7: By 2005 , contact the Florida Trail Association for an assessment of potential hiking trail opportunities. <i>Comment: FWC has assessed the hiking trail opportunities on the area and will implement hiking opportunities on the area as feasible.</i>	0%
Objective 8: By 2007 , develop an assessment and management recommendations for improvement of fishing and frogging opportunities within the area. <i>Comment: FWC has completed the assessment and fishing and frogging opportunities are provided in canals, cow ponds, and ditches on the area.</i>	100%
Objective 9: By 2009 , develop a Recreation Master Plan for DIRWMA, to include enhancements and signage for recreation/educational programs. <i>Comment: FWC developed and implemented a public access improvement plan for the area that included enhancements and signage, and a RMP will be developed during the upcoming planning cycle.</i>	50%
Objective 10: By 2010 , in cooperation with the Hendry County Economic Development Coordinator, develop an appropriate promotional plan for the recreational and educational opportunities offered at DIRWMA. <i>Comment: FWC cooperates with Hendry County to promote the area on the Hendry County website. In addition, FWC promotes the DIRWMA and other areas statewide through the Office of Public Access and Wildlife Viewing Services.</i>	100%
Goal 5: Assess existing facilities and infrastructure to determine their adequacy for ongoing management and recreational use of the area.	
Objective 1: Continue to maintain primary roads in all-weather condition for public access, and evaluate the secondary road and trail system to facilitate management and limited public access within the area (ongoing). <i>Comment: FWC maintains the main roads annually in good condition for year-round access and the secondary roads as needed.</i>	100%
Objective 2: Continue to develop GIS data in order to facilitate natural resource planning and identify other physical features on the area (ongoing). <i>Comment: FWC has developed and maintains GIS data generated from the development of OBVM, WCPR, Optimal Resource Boundary (ORB), Optimal Conservation Planning Boundary (OCPB), facilities, infrastructure, and natural community maps.</i>	100%

Objective 3: Based on management needs and the results of the C-139 Basin Study replace, repair, or remove culverts and water control structures (ongoing). <i>Comment: FWC has cooperated with the SFWMD to replace, repair, or remove culverts and water control structures as necessary and feasible.</i>	100%
Objective 4: By 2005 , complete the assessment necessary to prioritize the removal of interior cattle fencing. <i>Comment: FWC has completed the assessment and initiated removal of extraneous fences. Approximately 22.6 miles of interior fencing were removed during the FY 2014/2015 by contract.</i>	100%
Objective 5: By 2005 , assess infrastructure needs, including equipment, storage, housing, roads, fencing and gates, wells, culverts, crossings, signage, etc. <i>Comment: FWC assesses the infrastructure condition and needs on the area annually.</i>	100%
Objective 6: By 2005 , develop at least one primitive camping area accessible by special use permit, with water, fishing opportunities, and fire rings. <i>Comment: FWC has developed two primitive campsites on the DIRWMA, Hammock Camp and Kowechobe Camp. However, camping is not currently administered through a special use permit system, though the FWC anticipates including the DIRWMA in its permitting system during the 2016/2017 fiscal year.</i>	100%
Objective 7: By 2006 , complete known necessary repairs on equipment storage buildings, pole barns, and office. <i>Comment: FWC has completed the necessary repairs and continues to assess infrastructure repair needs annually.</i>	100%
Objective 8: By 2007 , relocate the existing check station and hunt camp to an appropriate location closer to CR 833. <i>Comment: FWC relocated the check station to a location near CR 833 and relocated the campsites.</i>	100%
Goal 6: Assure an Optimum Planning Boundary and Optimum Resource Boundary for DIRWMA by continuing to identify and designate appropriate lands for conservation and acquisition.	
Objective 1: To minimize fragmentation of the area, continue to identify strategic parcels necessary to complete an Optimum Planning Boundary for DIRWMA (ongoing). <i>Comment: FWC will develop an ORB and OCPB in the updated management plan for the area.</i>	100%
Objective 2: Maintain a GIS shapefile, and other necessary data to facilitate nominations for FWC's Optimum Resource Boundary and Land Acquisition Program (ongoing).	100%

<p><i>Comment: FWC maintains GIS shapefiles for the DIRWMA ORB and OCPB as well as any areas recommended for inclusion on the FWC Florida Forever acquisition list.</i></p>	
<p>Goal 7: Identify and protect archaeological, historic, and other cultural resources.</p>	
<p>Objective 1: Continue to keep the location of undisturbed cultural sites as proprietary information, available only to agency personnel charged with protection (ongoing). <i>Comment: Currently, no historical sites have been identified on the area.</i></p>	<p>100%</p>
<p>Objective 2: When conducting restoration or construction activities, request assistance from the DHR to prevent destructive disturbance of cultural sites (ongoing). <i>Comment: FWC continues to cooperate and comply with DHR requirements for such ground disturbing activities.</i></p>	<p>100%</p>
<p>Objective 3: By 2005, send the area biologist to participate in the DHR cultural resource protection training, concerning the provisions of Chapter 267, FS (ongoing). <i>Comment: FWC will ensure that area staff continues to receive DHR Archaeological Resource Management (ARM) training.</i></p>	<p>100%</p>
<p>Objective 4: By 2006, request assistance from DHR to locate and map cultural sites within the area for reference by managers and other agency personnel. <i>Comment: FWC has consulted with DHR and DHR has recommended that FWC contract with a private archaeological firm to complete an assessment of the area.</i></p>	<p>100%</p>
<p>Goal 8: Develop education and outreach efforts to address public education needs, as well as interpretation of natural and cultural history.</p>	
<p>Objective 1: By 2005, through coordination with the DOF, develop a DIRWMA public education program addressing prescribed burning education and smoke management. <i>Comment: FWC maintains a kiosk on the area that provides information on prescribed burning and continues to coordinate with FFS (formerly DOF) to enhance public education regarding the benefits of prescribed fire and smoke management.</i></p>	<p>100%</p>

<p>Objective 2: By 2009, develop a Recreation Master Plan for DIRWMA, to include enhancements and signage for recreation/educational programs.</p> <p><i>Comment: FWC developed and implemented a public access improvement plan for the area that included enhancements and signage, and a RMP will be developed during the upcoming planning cycle.</i></p>	<p>100%</p>
--	-------------

5 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 historical resources. In general, the FWC management intent for the DIRWMA 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 the FWC’s intent to provide quality fish and wildlife resource based public outdoor recreational opportunities on the DIRWMA. The 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, as noted earlier, the management activities described in this section are in compliance with those of the Conceptual State Lands Management Plan.

5.1 Land Management Review

The 2016 LMR of the DIRWMA (Appendix 13.5) found that the FWC was managing the area in accordance with its original purposes for acquisition. The recommendations of the 2016 LMR, as well as the 2011 LMR, were considered and addressed in the development of this Management Plan, including the development of management intent language, goals and objectives, and the identification of management challenges and the development of solution strategies (Sections 5 – 8).

5.2 Adaptive Management

Adaptive management is "learning by doing";¹ it is the adjustment or modification of conservation actions to achieve a desired conservation goal. In practice, adaptive management is a rigorous process that includes sound planning and experimental design with a systematic evaluation process that links monitoring to management.^{1,2} Adaptive management requires flexibility for implementation, but should be fitted over a fundamentally sound, well-planned design.

An adaptive management process produces the strongest inference and most reliable results when experimental design components are incorporated into the monitoring process. Adaptive management is most rigorously applied in an active format when components of experimental design (i.e., controls, replication, and randomization) are included in the

monitoring process.^{2, 3} Incorporating valid statistical analyses of results will further enhance the value of the adaptive management process. However, in some situations, rigorous experimental design procedures can be relaxed without invalidating monitoring results. In a passive format, adaptive management can involve applying a conservation action at a site, observing the results and adjusting the action in the future if warranted.^{2, 3}

Proposed adaptive management, monitoring and performance measures are developed through literature reviews and FWC staff meetings. Overall, a results-based approach is incorporated into this Management Plan, for which effective monitoring is an integral component. The FWC will monitor conservation actions, species, habitats, and major threats to the conservation of the natural and historical resources of the DIRWMA.

5.2.1 Monitoring

A well-developed monitoring protocol is also one of the principal, required criteria for the management of the DIRWMA. Monitoring and performance measures are important, but often overlooked elements of conservation planning. Monitoring provides the critical link between implementing conservation actions and revising management goals.

Monitoring is the systematic, repeated measurement of environmental characteristics to detect changes, and particularly trends, in those characteristics. Monitoring provides



essential feedback, the data needed to understand the costs, benefits, and effectiveness of planned conservation actions and the management projects undertaken to address them.²

For natural communities, monitoring protocols are established through the FWC's Objective-Based Vegetation Management (OBVM, Section 5.3.1) program, which monitors how specific vegetative attributes are responding to

FWC management. For imperiled and focal fish and wildlife species, monitoring protocols are established through the FWC's Wildlife Conservation Prioritization and Recovery (WCPR, Section 5.4.2) program. FWC staff may monitor additional fish and wildlife species when deemed appropriate. Exotic and invasive plant and animal species (Section 5.5) are also monitored as needed and appropriate. Recreational uses are monitored through the FWC Public Access and Wildlife Viewing Services and work in conjunction with the establishment and adjustment of public access carrying capacities (Section 5.6.3). Historical resources (Section 5.9) are monitored with guidance from the DHR.

5.2.2 Performance Measures

Performance measures include qualitative or quantitative measures used to provide an estimate or index of the characteristic of interest, and to chart the overall progress of conservation actions towards specific goals. Successful monitoring programs and their associated performance measures provide natural resource professionals with valuable feedback on the effectiveness of conservation actions and make it possible to implement a more flexible adaptive management approach. An adaptive management approach ultimately will be more efficient and effective when it tracks inputs, incorporates an effective monitoring program that integrates performance measures, and evaluates results against desired goals.

5.2.3 Implementation

The DIRWMA Management Plan serves as the guiding framework to implement this adaptive management process. It serves as the underpinning for the integration of management programs (OBVM, WCPR, Public Access and Wildlife Viewing, Recreation Master Plans, etc.) underway to accomplish needed conservation actions that are planned to manage the natural resources of the DIRWMA, and resolve conservation threats to fish and wildlife and the habitats they occupy. Based on evaluations of project results, the conservation actions are revised as necessary, and the adaptive management process is repeated.

5.3 Habitat Restoration and Improvement

On the DIRWMA, the FWC will focus on managing for native habitat diversity, emphasizing maintenance of high-quality natural communities, and restoration of disturbed areas. Restoration may be achieved on disturbed areas by the re-introduction of fire, restoring historic hydrological conditions, and/or the use of mechanical or chemical forest management techniques as appropriate. Retention of the native old growth component of forests where possible, while also providing for natural regeneration, remains an important consideration. The FWC will continue to manage, protect, and enhance the native communities on the DIRWMA, including depression marsh, basin marsh, mesic hammock, slough marsh, and dome swamp. On disturbed upland sites, including the DIRWMA's significant acreage of agriculture, semi-improved pasture, and improved pasture, the FWC intends to initiate ground cover and natural community restoration based on available resources and the development and implementation of a habitat restoration strategy for the area.

As described above, the FWC has completed natural community mapping of the DIRWMA through the services of the FNAI. This information will be used to guide and prioritize management and restoration efforts on the area.

5.3.1 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. The FWC uses OBVM to monitor how specific vegetative attributes are responding to FWC management.

The first step in implementing OBVM is to map the current, and in most cases the historic natural communities, on the managed area using the FNAI Natural Community Classification. The FWC contracts with the FNAI to provide these mapping services, and plans to have natural community maps recertified on most areas on a five-year basis. A natural community, as defined by the 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. 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. Through OBVM monitoring, the FWC collects data on a number of specific vegetation attributes that provide insight about the condition of the natural community. Because the FWC is interested in the overall effect of management on the natural communities, OBVM data is analyzed at the natural community level.



Measurable habitat management objectives referred to as 'desired future conditions' are established for each actively managed natural community. Desired future conditions are the acceptable range of values for quantifiable vegetation attributes, such as basal area, shrub height and cover, and ground cover. The FWC collaborated with the FNAI to identify 'reference sites' for each actively managed natural community and applied the OBVM monitoring methodology at these reference sites to determine what attribute values occur in a high-quality community (<http://www.fnai.org/reference-natural-communities.cfm>). FWC staff considers the reference site attribute values when setting area-specific desired future conditions for natural communities.

Vegetation monitoring samples the selected attributes, with the results being compared to the established desired future conditions. All monitoring performed under OBVM is completed using the program's Standard Operating Procedures.

Consistent, long-term monitoring of managed natural communities will quantify changes in habitat conditions, provide information on the cumulative effects of management activities, and measure progress towards meeting management objectives for desired habitat conditions. Measured changes in vegetation condition are intended to be used to inform future land management actions.

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 important operational information on a natural community'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. By comparing natural community mapping products through the years, managers can track progress in moving altered communities to functioning natural communities.

Currently, the DIRWMA includes approximately 14,475 acres of substantially altered habitats (semi-improved pasture, improved pasture, and agriculture) that were developed on the area prior to acquisition by the State for conservation. Consequently, the extent, costs, and other challenges associated with restoring the area's altered habitats are substantial. For these reasons, as noted above, the FWC has determined that it is necessary to develop a habitat restoration strategy for the DIRWMA that will include, among other elements, a prioritization strategy for implementing restoration activities on the area. Thus, Section 6.1 includes an objective for the completion and implementation of such a habitat restoration strategy.

5.3.2 Prescribed Fire and Fire Management

Periodic spring and summer fires occurred in fire-adapted communities under natural conditions. Plant species composition reflects the frequency and intensity of these fires. In the absence of fire, fallow fields on former longleaf sites follow a successional pattern through mixed pine-hardwood forests to an exclusively hardwood community rather than to the original plant community. The plant species composition may differ slightly on poorer soils of the slash pine flatwoods, but the dominant role of fire in controlling hardwoods is equally important in either ecosystem.

Site preparation for row crops and later improved pasture, drainage, and lack of fire have all combined to alter the plant species composition of the area resulting in a loss of fuel and inhibiting the return to a more "natural" fire management regime. Site-specific combinations of prescribed fire, mechanical and chemical vegetation control, reforestation,

and restoration of natural water regimes are likely necessary components of an effort to restore the area to historic natural communities.

The FWC employs a fire management regime to increase both species and habitat diversity and will continue a prescribed burning program on the DIRWMA in accordance with vegetative management objectives. As fire moves across a landscape, some areas carry fire better than others. Areas with higher vegetative fuel loads typically burn more evenly and with greater intensity. Areas with lower vegetative fuel loads or wetland areas inundated with water typically will not carry fire as evenly, and usually burn at a lower intensity.



Employing a burning program with different burning frequencies, intensities, and seasonality (dormant season vs. growing season) of prescribed burns create habitat diversity and a mosaic of vegetation patterns. This mosaic is designed to have both frequently burned and infrequently burned aspects.

On some areas, prescribed burning is limited by the buildup of mid-story brush and a lack of pyrogenic groundcover fuels. This condition

creates unsuitable habitat for many wildlife species. Mechanical control of brush on upland sites by roller chopping, logging, shredding, or incidentally by equipment during commercial thinning operations, can reduce shading and encourage the grasses and forbs that are necessary to sustain prescribed fire.

Single drum (with standard, not offset blades), one-pass roller chopping can be a valuable management tool, enabling the use of prescribed fires in areas heavily invaded by dense woody vegetation. However, roller chopping may damage the herbaceous ground cover. Therefore, its application will be limited to situations where burning can only be accomplished by first reducing woody vegetation by mechanical means.

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

The transitional areas between two adjacent but different vegetative cover types, such as forests and wetlands, are known as ecotones. With the possible exception of wildfire suppression, mechanical soil disturbance in ecotones will be avoided in order to protect

habitats for important rare species that often occur between flatwoods and riparian drainages. The creation of firebreaks is avoided when possible in these zones. Additionally, fires are allowed to burn into the edges of marshes, swamps and other wetlands in order to maintain these habitats. Once fuel loads have been reduced and a more open appearance has returned, vegetative management objectives will likely dictate a fire return interval that averages 1-4 years, preferably during the spring and early summer months.

In addition to the general prescribed fire management guidelines described above, the area-specific Prescribed Fire Plan (Appendix 13.10) will be updated for the DIRWMA. This plan will include, but not be limited to, delineation of burn management units, detailed descriptions of prescribed fire methodology, safety, and smoke management guidelines. Upon completion, the updated DIRWMA Prescribed Fire Plan will be implemented to facilitate habitat improvement on the area.

The DIRWMA is also unique in that many of the area's remnant fire-adapted natural communities are scattered throughout the fields and pastures in very small, disparate acreages. This has inhibited prescribed burning and the maintenance of all of the area's fire-adapted natural communities within the desired fire-return interval. However, Sections 6 and 8 of this Management Plan contain provisions to address this challenge and to begin maintaining all of the fire-adapted natural community acreage on the DIRWMA within specified fire-return intervals.

5.3.3 Habitat Restoration

Significant habitat restoration and maintenance activities have taken place throughout the DIRWMA over the course of the previous management planning period beginning in 2005. The FWC established a 1,438-acre Florida panther SMA in Management Units 1 and 2 (Figure 14), located in the northwest corner of the DIRWMA. In establishing and managing the Florida panther SMA, the FWC conducted habitat restoration activities including reforestation, revegetation, and the exclusion of cattle to encourage the regrowth of the dense understory vegetation preferred by Florida panthers for denning and nesting. Additionally, the FWC has initiated ground cover restoration on approximately 151 acres in the southeastern portion of the DIRWMA (Figure 14). In conjunction with this ground cover restoration effort, the FWC has conducted other habitat restoration activities including mowing and cattle exclusion. The FWC has also implemented a prescribed fire regime on the DIRWMA and has initiated the maintenance of many of the area's fire-adapted natural communities within specified fire return intervals.

Additionally, the FWC has cooperated with the SFWMD to implement hydrological restoration on the DIRWMA, which has aided habitat restoration on the area. This hydrological restoration effort is described in more detail in Section 5.7. As discussed in Section 1.6 and further described in Section 5.7, the FWC has also implemented wetland restoration through the WRP easement on the DIRWMA in cooperation with the NRCS.

5.4 Fish and Wildlife Management, Imperiled and Focal Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration

5.4.1 Fish and Wildlife

Due to the variety of natural communities located on the DIRWMA, a diversity of associated wildlife can be found on the area, including rare, imperiled, common game, and non-game species. In managing for wildlife species, an emphasis will be placed on conservation, protection and management of natural communities. As noted above, natural communities important to wildlife include depression marsh, basin marsh, mesic hammock, and slough marsh. Natural communities that are less represented on the DIRWMA, but which are still important to wildlife, include dome swamp and mesic flatwoods. The DIRWMA's altered areas, including pastures and canals, are also utilized by resident and migratory wildlife.

The size and natural community diversity of the DIRWMA creates a habitat mosaic for a wide variety of wildlife species. Resident wildlife will be managed for optimum richness, diversity and abundance. In addition to resident wildlife, the DIRWMA provides resources critical to many migratory birds including waterfowl, passerines, raptors, and others. Habitats important to migratory species will be protected, maintained, or enhanced.

The FWC intends to manage game populations on a sustained-yield basis to ensure 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. However, due to the limited size of the area, some of the hunting opportunities may be regulated through a limited entry hunt program to ensure the persistence of viable game species populations, as well as hunter safety and satisfaction. The potential for conflicts among recreational activities and user groups will also be considered and continually monitored.

Wildlife management emphasis is placed on documenting the occurrence and abundance of rare and imperiled species on the property. The FWC will continue to update the area's inventories for certain species, with emphasis on rare and imperiled fish and wildlife species. Monitoring of wildlife species will continue as an ongoing effort for the area.

Concurrent with ongoing species inventory and monitoring activities, management practices on the DIRWMA are designed to restore, enhance, or maintain rare and imperiled

species and their habitats. This will be further augmented by following approved Federal and FWC species recovery plans, guidelines, and other scientific recommendations for these species. Guided by these recommendations, land management activities including prescribed burning and timber stand improvements will address rare and imperiled species requirements and habitat needs. Section 5.4.2 below provides further information on the FWC's comprehensive species management strategy for rare and imperiled wildlife and their respective habitats.

5.4.2 Imperiled and Focal 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 on FWC-managed areas. Restoring the form and function of Florida's natural communities is the foundation of this management philosophy. The FWC uses OBVM to monitor how specific vegetative parameters are responding to FWC management, and 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 the 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 that the FWC manages.



The WCPR program helps the 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. By providing FWC managers with information on actions they should undertake, the FWC intends for the strategy to assure the presence and persistence of Florida's endangered and threatened fish and wildlife species (see http://myfwc.com/media/1515251/Threatened_Endangered_Species.pdf), as well as select focal species found on the area.

In summary, for FWC-managed areas, the WCPR program helps assess imperiled and focal wildlife species needs and opportunities, prioritize what the 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, the FWC will facilitate fulfilling the needs of focal and imperiled wildlife species on the DIRWMA. In the long-term, by implementing these strategies on FWC-managed lands and continuing to assess wildlife species' needs, the FWC will continue to play an integral role in aiding the recovery of imperiled species and preventing the future imperilment of declining wildlife species.

The FWC held a WCPR workshop for the DIRWMA in May 2010. After incorporating input from a review by experts, an FWC WCPR Species Management Strategy (WCPR Strategy) for the DIRWMA was initially reviewed and approved in December 2010 and then updated and revised in August 2014. Using statewide landcover-based habitat models, the



DIRWMA WCPR Strategy identifies 16 focal species and one group of species (wading birds) as having potential habitat on the DIRWMA (Table 13). Although models identified potential habitat for gopher tortoises, it was identified as a limited opportunity species, because the DIRWMA contains very limited habitat and no documented occurrences for this species. Of the focal species identified as having habitat on the area, the DIRWMA WCPR Strategy provides measurable

objectives and recommends some level of monitoring for Bachman's sparrow, crested caracara, Florida grasshopper sparrow, and wading birds. In addition, the WCPR Strategy includes a SMA on the DIRWMA with recommended habitat considerations for the Florida panther. The WCPR Strategy also recommends monitoring for Florida sandhill crane when a survey method is identified.

Table 13. Focal Species Occurring on or Near the DIRWMA

Common Name	Scientific Name	Status
American swallow-tailed kite	<i>Elanoides forficatus</i>	
Bachman's sparrow	<i>Aimophila aestivalis</i>	
Big Cypress fox squirrel	<i>Sciurus niger avicennia</i>	ST
Burrowing owl	<i>Athene cunicularia</i>	SSC
Cooper's hawk	<i>Accipiter cooperii</i>	
Crested caracara	<i>Caracara cheriway</i>	FT
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	FE
Florida black bear	<i>Ursus americanus floridanus</i>	
Florida grasshopper sparrow	<i>Ammodramus savannarum floridanus</i>	FE
Florida mottled duck	<i>Anas fulvigula</i>	
Florida panther	<i>Puma concolor coryi</i>	FE
Florida sandhill crane	<i>Grus canadensis pratensis</i>	ST
Gopher tortoise*	<i>Gopherus polyphemus*</i>	ST
Limpkin	<i>Aramus guarauna</i>	SSC
Northern bobwhite	<i>Colinus virginianus</i>	
Southern bald eagle	<i>Haliaeetus leucocephalus</i>	
Wading birds	<i>(Multiple spp.)</i>	

*Limited opportunity species

5.5 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 or II plants on the DIRWMA. Control technologies 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.

Exotic and invasive plant species known to occur on the DIRWMA and treated annually by the FWC include Japanese climbing fern, old world climbing fern, tropical soda apple, cogongrass, air potato, Australian pine, and Brazilian pepper. Exotic and invasive plant species have been identified as occurring at varying densities on approximately 21,714 acres of the DIRWMA. However, the FWC's methodology for determining the number of acres "infested" with invasive exotic plants only represents a cumulative acreage, and does not reflect the degree of the invasive exotic occurrence. The degree of infestation among areas identified with invasive exotic plant occurrences often varies substantially by species, level of disturbance, environmental conditions, and the status of ongoing eradication and control efforts. The FWC will continue to focus treatments on areas identified as having invasive exotic plant occurrences, as well as treating any new occurrences as they are identified through continued monitoring.

During the previous management planning cycle, an aggressive exotic plant species control and removal program was implemented on the DIRWMA utilizing both mechanical and chemical treatments, with an average of approximately 3,000 acres of exotics treated each year from 2010 to 2014.

Additionally, the FWC will continue efforts to control the introduction of exotic and invasive species, as well as pests and pathogens, on the DIRWMA by inspecting any vehicles and equipment brought onto the area by contractors and requiring that they be free of vegetation and dirt. If vehicles or equipment used by contractors are found to be contaminated, they will be referred to an appropriate location to clean the equipment prior to being allowed on the area. This requirement is included in every contract for contractors who are conducting any operational or resource management work on the area. In this way, the FWC implements a proactive approach to controlling the introduction of exotic pests and pathogens to the area.

An exotic animal species of concern on the DIRWMA is the feral hog. These animals have high reproductive rates, and when populations reach high densities, feral hogs can



significantly degrade natural communities through foraging activity (rooting and digging).

Signs of feral hog damage to natural communities at the DIRWMA have been documented and the FWC will continue to monitor for signs of additional resource damage. The FWC will consult with other regional natural resource managing agencies and private landowners to coordinate feral hog control measures as necessary. Hog populations are

controlled by hunts during the archery, muzzleloading gun, general gun and special wild hog gun seasons. Trapping is another measure that may be implemented to augment ongoing feral hog control efforts and to further reduce the natural community damage and degradation caused by this species.

Other exotic animal species that are found or have the potential to be found on the area include red imported fire ant, brown anole, Cuban treefrog, and greenhouse frog. The FWC will continue to conduct measures to control and monitor exotics species on the area as outlined in Section 6.4 of this Management Plan.

5.6 Public Access and Recreational Opportunities

5.6.1 Americans with Disabilities Act

When public facilities are developed on areas managed by FWC, every effort is made to comply 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 ADA⁴ where:

1. Compliance will cause harm to historical resources, 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.

5.6.2 Recreation Master Plan

The FWC has adopted a comprehensive approach to the planning and administration of fish and wildlife resource based public outdoor recreational opportunities for the DIRWMA. To accomplish this, the FWC will work with recreational stakeholders and the general public to develop a Recreation Master Plan (RMP) for the DIRWMA that will be used to further design and develop appropriate infrastructure that will support the recreational use of the area by the general public. This RMP will include planning for parking, trail design, and area resource interpretation. The RMP will be appended to this Management Plan upon completion.

5.6.3 Public Access Carrying Capacity

Baseline carrying capacities for 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 through this process are used as a tool to help plan and develop public access, wildlife viewing, and fish and wildlife resource based public outdoor recreation opportunities. Based on an analysis of the overall approved uses and supported public access user opportunities, and the anticipated

proportional visitation levels of the various user groups, the FWC has determined that the DIRWMA can currently support 628 visitors per day.

It is important to note that public access carrying capacities are not developed to serve as a goal for expanding the public use of a particular area to match the established carrying capacity. Rather, they are developed to establish maximum thresholds for public use of the



respective area in order to protect the natural and historical resources on the DIRWMA and to ensure that visitors will have a high-quality visitor experience. The public access carrying capacity will be periodically reevaluated, and additional capacity may be contemplated as part of the RMP development and implementation process.

5.6.4 Wildlife Viewing

The DIRWMA is home to a variety of resident wildlife found within its basin swamps, mesic hammocks, depression marshes, other natural communities, and pastures. The DIRWMA's large acreage and mix of wetlands and uplands produce outstanding wildlife viewing opportunities, and the area is part of the Great Florida Birding and Wildlife Trail. Additionally, wildlife viewing opportunities are projected to increase upon the completion of planned improvements for public access and wildlife viewing outlined in Section 6.5 of this Management Plan.



5.6.5 Hunting

Hunting opportunities at the DIRWMA include seasons for archery, small game, general gun, muzzleloading gun, spring turkey, youth turkey, migratory bird, dove, and family hunts. An evaluation of the hunting opportunities offered on the DIRWMA is performed periodically by the FWC. Additional information about the current hunting opportunities and regulations on the area may be found at <http://myfwc.com/media/2530711/Dinner-Island.pdf>.

5.6.6 Fishing

Fishing is authorized year-round at the DIRWMA. However, fishing opportunities on the DIRWMA are relatively limited due to the small number of appropriate water bodies on the area.

5.6.7 Roads and Trails

Currently, the DIRWMA offers over 31 miles of improved and unimproved roads. In addition, Section 6.5 of this Management Plan proposes to design and develop a wildlife viewing loop using existing improved roads on the area.

5.6.7.1 Hiking

Hiking is a popular activity on the DIRWMA, and the area's unimproved roads offer excellent opportunities to hike and view the scenery and abundant wildlife. Hiking is available on the area year-round but is considered best during the late fall through spring to coincide with annual bird migrations.

5.6.7.2 Bicycling

Bicycling is permitted on the roads throughout the DIRWMA. Off-road bicycles are most appropriate as many of the area's roads are unimproved. As with hiking, bicycling is available on the area year-round but is considered best during the late fall through spring to coincide with annual bird migrations.

5.6.7.3 Equestrian

Horseback riding is permitted on the DIRWMA, except during the archery, muzzleloading gun, general gun, family hunt, and spring turkey seasons. Horses are allowed only on the area's named or numbered roads.

5.6.8 Camping

Camping is permitted year round at the DIRWMA, but is restricted to designated camping areas only. There are two designated camping areas on the DIRWMA, the Hammock Campground and Kowechobe Campground.



5.6.9 Geocaching

Geocaching, also known as Global Positioning System (GPS) Stash Hunt and 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.

5.6.10 Environmental Education

The FWC will assess the need for and pursue research and environmental education partnership opportunities as appropriate. The FWC will develop and conduct periodic environmental education and outreach programs and will continue to identify opportunities to provide and/or expand as feasible interpretive and educational programs. The FWC will continue to identify partnerships that could provide for environmental educational programs and outreach opportunities.

5.6.10.1 Interpretation

Interpretive facilities on the DIRWMA include two informational kiosks and an area brochure. Additionally, Section 6 of this Management Plan includes plans to develop a new kiosk and driving loop on the area.

5.7 Hydrological Preservation and Restoration

As described in Section 2.5 of this Management Plan, the surface water hydrology of the DIRWMA is characterized by a generalized north to south drainage pattern and the area contains significant hydrological resources, including freshwater forested and shrub wetlands. However, the historic hydrology of the area has been altered over time by a variety of factors, including the construction of canals and the conversion of natural communities into altered landcover types. As a result, hydrological restoration is an important component of the overall management and restoration of the DIRWMA.



In accordance with the C-139 Basin Study, the FWC cooperates with the SFWMD to develop hydrological management objectives to restore or enhance the hydrological functions and the fish and wildlife habitat of the DIRWMA. Beginning in 2013 and concluding in 2014, the FWC undertook a hydrologic restoration project in collaboration with the SFWMD. As part of this project, the FWC and the SFWMD designed and installed a new weir, refurbished the risers

and gates at five other weirs, and removed sediment from canals in the vicinity of these structures.

Also, as described in Section 1.6 of this Management Plan, the FWC has cooperated with the NRCS on the implementation and management of approximately 4,313 acres of WRP easements on the DIRWMA (Figure 14). As part of the FWC's agreement with the NRCS, enhancement and restoration efforts have taken place on approximately 2,006 acres of wetlands. These efforts included land contouring, filling of ditches and borrow pits, installation of culverts and water control structures, mechanical vegetation control, planting of native vegetation and ground cover restoration, and exotic plant species control.

The FWC will continue to work to restore natural water regimes on the area as appropriate and feasible. Further hydrologic restoration will be guided by a site-specific hydrological assessment, as discussed below.

5.7.1 Hydrological Assessment

The FWC will conduct or obtain an onsite hydrological and risk assessment to identify further potential hydrology restoration needs in addition to those already completed, as described above, on the DIRWMA. To maintain and enhance natural hydrological functions, the FWC will maintain and install low-water crossings and culverts as appropriate.

5.7.2 Water Resource Monitoring

Currently, the FWC cooperates with the DEP and the SFWMD for the monitoring of surface and ground water quality and quantity. In cooperation with the SFWMD, the FWC has established a monthly water level monitoring protocol on the area. In addition, the FWC will continue to cooperate with the SFWMD and the DEP to develop and implement any additional surface water quality and quantity monitoring protocols for the DIRWMA. In this capacity, the FWC will primarily rely on the expertise of the SFWMD and the DEP to facilitate these monitoring activities. As necessary, the FWC may independently conduct or contract for water resource monitoring, as guided by the DEP and the SFWMD.

5.8 Forest Resource Management

A Timber Assessment of the timber resources of the DIRWMA was conducted by the FFS in 2005. The FWC has requested an updated Timber Assessment of the DIRWMA, which will be appended to this Management Plan upon completion. The management of timber resources will be considered in the context of the Timber Assessment and the overall land management goals and activities.

Hydrological restoration and the reintroduction of prescribed burning are the most important factors in re-establishment of natural communities and the enhancement of wildlife habitats in these areas. Degraded or disturbed bottomland hardwood sites will be

encouraged to reforest naturally with native wetland oaks, hardwoods, and other appropriate native plant species.

Pursuant to OBVM management goals, the FWC will continue to manage timber resources for the benefit of wildlife and natural community restoration. Management activities



including the use of timber thinning and harvesting may be utilized. However, the limited amount and current density of pine forests on the DIRWMA generally preclude the need for such timber thinning activities on the area at the present time. 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. Planting trees on these selected sites is used to increase the rate of reforestation and to ensure diversity. Forested wetlands are managed for stands with old growth characteristics. Snags will be protected to benefit cavity-nesting species.

In addition, as described above, the FWC will prepare and begin implementation of a DIRWMA habitat restoration strategy which will seek to restore altered areas to their historic natural community types. This habitat restoration strategy may including reforestation, harvesting, and prescribed burning activities based on restoration and maintenance needs of the natural communities and other goals established for management of the DIRWMA

5.8.1 Timber Management Plan

As discussed above, the FFS conducted a Timber Assessment of the DIRWMA in 2005 and an update to that Timber Assessment has been requested. The FWC will manage timber resources on the DIRWMA in accordance with the recommendations of the Timber Assessment.

However, given the limited amount of timber resources currently present on the area, a formal timber management plan is not necessary for management of the timber resources on the DIRWMA due to the fact that the FWC only develops timber management plans on those areas where the extent and type of timber resources warrant development of such a plan.

5.9 Historical Resources

Procedures outlined by the DHR will be followed to preserve any historical sites found on the DIRWMA. The FWC will consult with the DHR or a private surveyor in an attempt to locate any historical features on the area. In addition, the FWC will ensure management staff has DHR Archaeological Resources Monitoring training. The FWC will refer to and

Florida Fish and Wildlife Conservation Commission | Dinner Island Ranch WMA Management Plan

follow the DHR's Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties for management of these resources, and prior to any facility development or other ground disturbing activities. Furthermore, as appropriate and necessary, the FWC will contact professionals from the DHR for assistance prior to any ground-disturbing activity on the DIRWMA.

As discussed in Section 2.8 of this Management Plan, the DHR Master Site File currently indicates there are no known historic sites on the DIRWMA. However, there is one recorded site that is located immediately adjacent to the eastern border of the DIRWMA and the Master Site File contains records for a total of 16 sites and one resource group within five miles of the DIRWMA. As a result, it is distinctly possible that the DIRWMA contains potentially significant but as of yet undiscovered and unrecorded archaeological sites. The FWC will submit any subsequently located historic sites on the DIRWMA to the DHR for inclusion in their Master Site File.

5.10 Capital Facilities and Infrastructure

The 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 resource based public outdoor recreation. For these reasons, planned capital facilities and infrastructure will focus on improving access, recreational potential, hydrology, or other resource and operational management objectives.

There are currently 23 facilities on the DIRWMA, including an office/shop/staff housing complex, two campgrounds, a check station, and an entrance and parking area, as well as over 31 miles of improved and unimproved roads. Additionally, there are water control structures located throughout the canals on the area. The infrastructure and facilities present on the DIRWMA are displayed in Figure 11, below.

As described in Section 2.4.1 of this Management Plan, for any public facilities that are developed on areas managed by the FWC, every effort is made to comply with the Americans with Disabilities Act (Public Law 101-336).

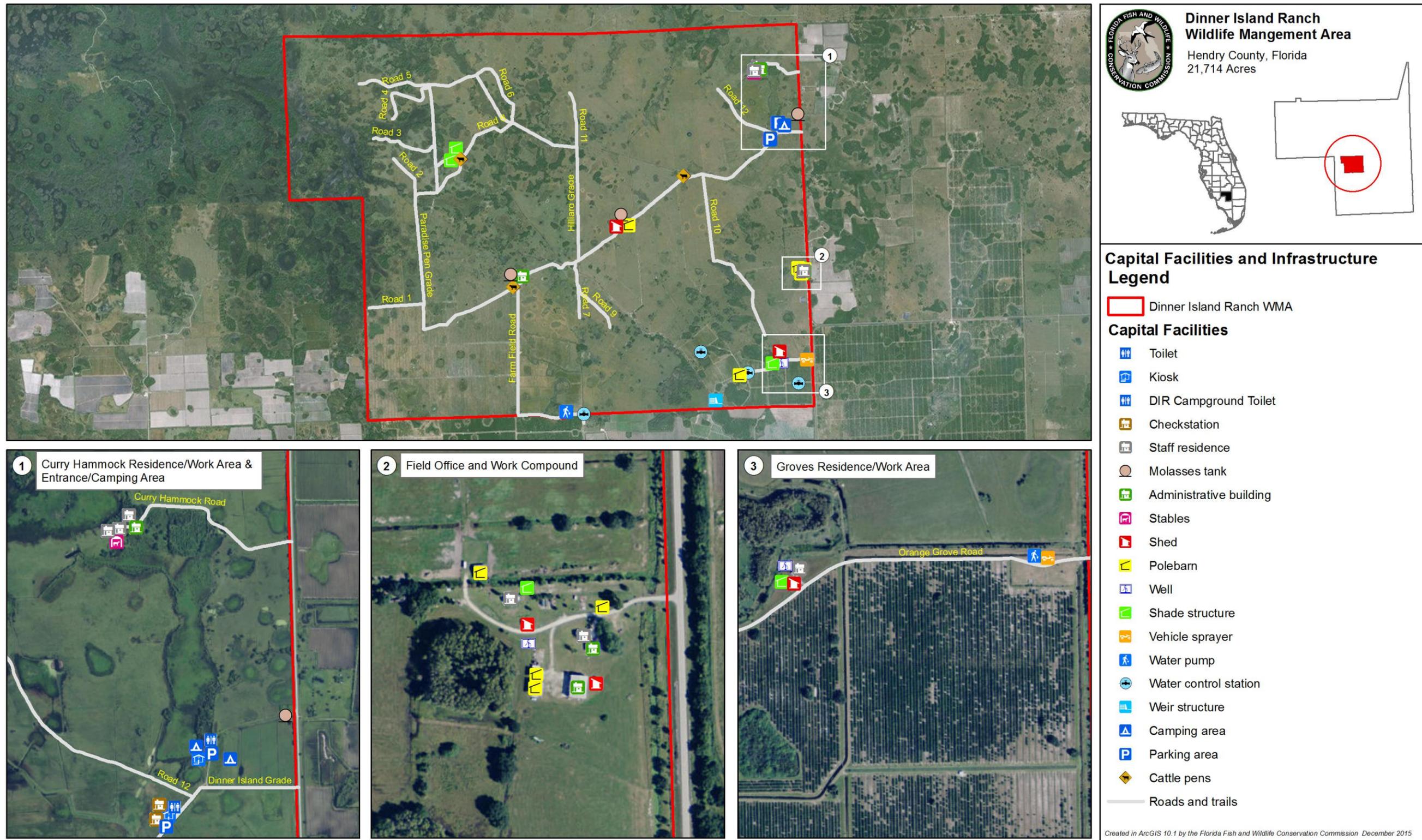


Figure 11. DIRWMA Capital Facilities and Infrastructure

THIS PAGE INTENTIONALLY BLANK

5.11 Land Conservation 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 play an integral role in this effort as does ongoing land conservation, either through fee-simple or less-than-fee conservation easements. In combination, this tiered model helps the FWC to further the regional conservation of important fish and wildlife habitats through a proactive, comprehensive, and cooperative approach towards conservation.

5.11.1 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 an FWC-managed area is contained while eliminating urban areas or lands that have already been conserved or protected.

5.11.2 Optimal Conservation Planning Boundary

The second tier is known as the OCPB. The OCPB combines the regional natural resources identified in the DIRWMA 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 historical resources.



The DIRWMA OCPB provides the basis for development of a broader CAS for the DIRWMA.

Although the OCPB provides the basis for potential future voluntary, willing-seller conservation acquisitions, it is designed to function primarily as a conservation planning boundary and does not constrain or otherwise restrict the use and development of the properties contained within the boundary. The DIRWMA 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. The OCPB for the DIRWMA is shown in Figure 12, below.

5.11.3 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 may include:

- FWC Landowner Assistance Program
- FWC conservation planning
- FWC Additions and Inholdings Program Land Conservation Work Plan
- Forest Stewardship Program proposals
- Florida Forever project proposals and boundary modifications
- Conservation easements
- Federal or State grant conservation proposals
- Regional or local conservation proposals
- Local, state, and federal planning proposals
- Non-governmental organization conservation 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 likely find it offered within FWC's Landowner Assistance Program (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/> .

5.11.4 FWC Florida Forever Additions and Inholdings Acquisition List

Currently, there are no parcels included on the FWC Florida Forever Additions and Inholdings list for the DIRWMA. However, 39,384 acres of the Panther Glades Florida Forever project remain to be acquired. Conservation of the Panther Glades Florida Forever Project is essential for optimal management of the DIRWMA. Additionally, upon completion of the CAS, additions to the FWC Florida Forever Additions and Inholdings acquisition list may be recommended.

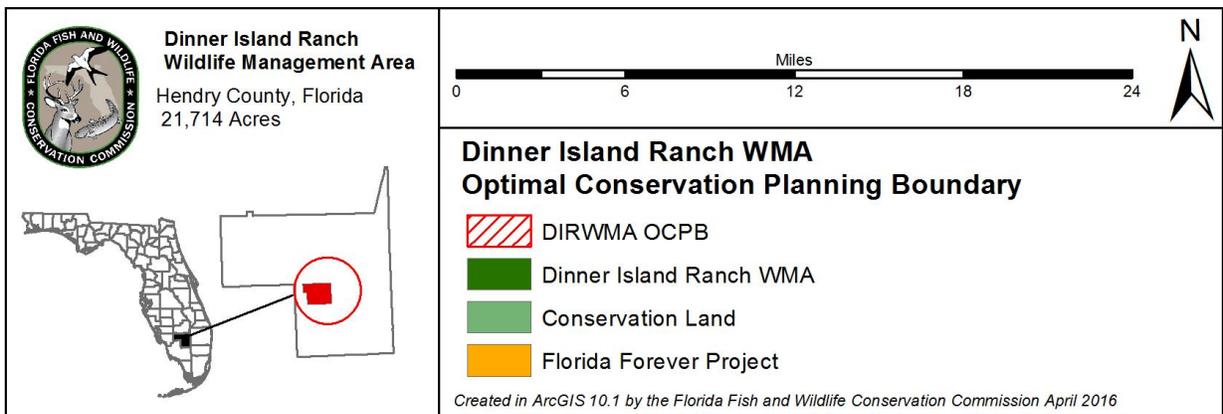
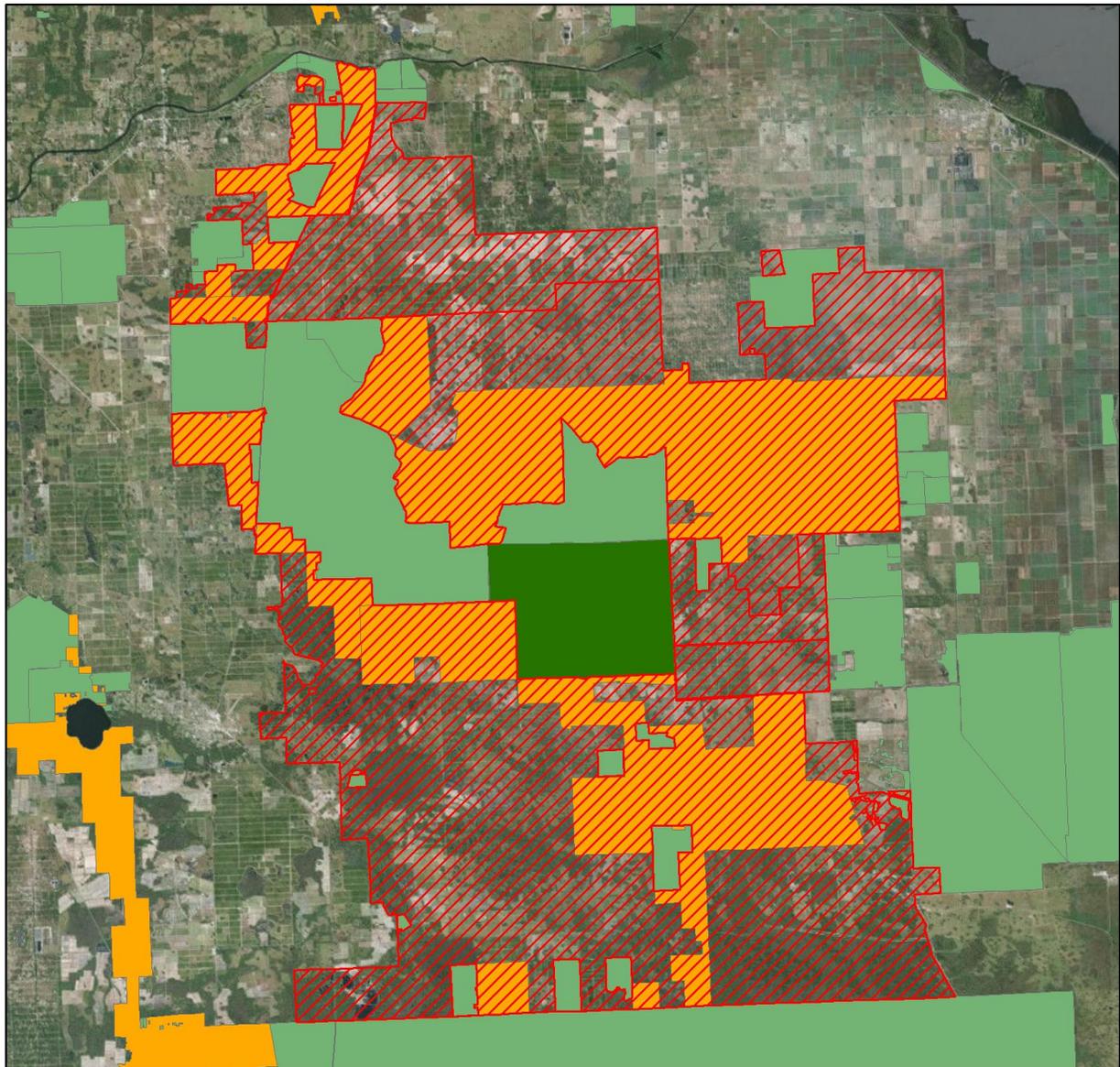


Figure 12. DIRWMA Optimal Conservation Planning Boundary

5.12 Research Opportunities

The FWC intends to cooperate with researchers, universities, and others as feasible and appropriate. For the DIRWMA, 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 the DIRWMA must have prior approval by FWC.

5.13 Cooperative Management and Special Uses

5.13.1 Cooperative Management

The FWC is responsible for the overall management and operation of the DIRWMA as set forth in the lease agreement with the Board of Trustees. In keeping with the lease agreement, and in order to conduct its management operations in the most effective and efficient manner, the FWC cooperates with other agencies to achieve management goals and objectives described in this Management Plan.

These include cooperating with the DHR to ensure the requirements of the Management Procedures Guidelines - Management of Archaeological and Historical Resources document (Appendix 13.12) are followed with regard to any ground-disturbing activities. In addition, the FFS assists the FWC by providing technical assistance on forest resource management. The FWC further cooperates with the FFS on the management of the shared border between the DIRWMA and the FFS-managed OSSF. Also, the FWC cooperates and consults with the SFWMD regarding management of the DIRWMA's water resources and the overall hydrological restoration efforts on the area. The FWC cooperates with both the SFWMD and the DEP for the monitoring and management of both ground and surface water resources and the overall management of the DIRWMA.

Additionally, as described in Section 5.7 of this Management Plan, the FWC also cooperates with the NRCS regarding the management of approximately 4,313 acres of WRP easements on the DIRWMA. In accordance with the agreement, the FWC and the NRCS have completed a cooperative effort to restore and enhance approximately 2,006 acres of wetlands on the area (Appendix 13.3.6). Additionally, the FWC cooperates with the NRCS regarding the management of cattle grazing on the DIRWMA to ensure that the terms of the cattle grazing plans are fulfilled.

5.13.2 First Responder and Military Training

First-responder (public governmental police department or agency, fire, and emergency medical service personnel) training and military training are conditionally allowed on the DIRWMA. Such activities are considered allowable uses only when undertaken intermittently for short periods of time, and in a manner that does not impede the

management and public use of the DIRWMA, and causes no measurable long-term impact to the natural resources of the area. Additionally, FWC staff must be notified and approve the training through issuance of a permit prior to any such training taking place on the DIRWMA. Any first-responder or military training that is not low-impact, intermittent, and occasional would require an amendment to this management plan, and therefore will be submitted by the FWC to the DSL and the ARC for approval consideration prior to authorization.

5.13.3 Cattle Grazing

As previously discussed, cattle grazing took place on the DIRWMA for a long time prior to state acquisition of the property. Presently, cattle grazing is utilized as a management tool on a large portion of the DIRWMA through two separate cattle grazing leases. As described in Section 1.6 of this Management Plan, approximately 8,393 acres of the western



portion of the DIRWMA are under a cattle grazing agreement with lessee Hilliard Brothers of Florida, LLLP, and approximately 8,029 acres of the eastern portion of the DIRWMA are under a cattle grazing agreement with A&M Management of Hendry County, Inc. (Appendix 13.3.1 and 13.3.2). As previously discussed, these cattle grazing agreements generate significant revenues for the State of Florida (Section 3.2.1).

Both cattle grazing agreements are subject to Prescribed Grazing Plans which ensure that cattle grazing is used as a tool to assist in the management of wildlife habitat and allows for grazing to be adjusted in order to address management and resource concerns. These Prescribed Grazing Plans set forth cattle stocking rates and grazing systems in order to manage wildlife habitat, maintain stable and desired plant communities, and maintain or improve water quality on the area.

Both cattle grazing agreements are set to expire in 2016, at which time the FWC will review the acreage being grazed and will solicit competitive bids for any proposed future grazing of those areas of the DIRWMA.

5.13.4 Citrus Grove Management

Due to the prohibitively high cost associated with restoration of the DIRWMA's citrus grove acreage relative to the cost of restoring other altered habitats on the area, the FWC has determined that it is more cost-effective for the time being to manage the citrus groves on the area through contract for citrus production. The revenues generated from this citrus contract can then be used to fund continuing resource and operational management of the area. As a result, approximately 800 acres on the southeastern portion of the DIRWMA are currently under a citrus grove management contract entered into with Krause Grove

Service Inc. (Appendix 13.3.3). This contract was entered into on July 26, 2012, and expires on July 25, 2027, with an option to extend the contract for another 15 years. The FWC will consider restoration of the DIRWMA's citrus groves upon the expiration of the current contract in 2027, during the next management planning cycle.

5.13.5 Apiaries

Currently, the only apiaries present on the DIRWMA are utilized for agricultural purposes in the citrus grove on the area. Use of apiaries is conditionally approved for the DIRWMA and is deemed to be consistent with the area's 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 (Appendix 13.9). Location, management, and administration of apiaries on the DIRWMA will be guided by the FWC Apiary Policy (Appendix 13.11). An Apiary Site Assessment (Appendix 13.11.1) for the DIRWMA identifies three sites as suitable for potential apiaries outside of the citrus grove.

5.14 Climate Change

Because of Florida's unique ecology and topography, any potential impacts as a result of climate change may be particularly acute and affect multiple economic, agricultural, environmental, and health sectors across the state. The impact of climate change on wildlife and habitat may already be occurring, from eroding shorelines and coral bleaching to increases in forest fires and saltwater intrusion into inland freshwater wetlands.

The Intergovernmental Panel on Climate Change (IPCC), a multi-national scientific body, reports that climate change is likely proceeding at a rate where there will be unavoidable impacts to humans, wildlife, and habitat. Given current levels of heat-trapping greenhouse gas emissions, shifts in local, regional, and national climate patterns including changes in precipitation, temperature, increased frequency and intensity of extreme weather events, rising sea levels, tidal fluctuations, and ocean acidification are projected. The current trend of global temperature increase has appeared to accelerate in recent decades, and continued greenhouse gas emissions may result in projected global average increases of 2 – 11.5° F by the end of the century.⁵

This apparent change in global climate has the potential to disrupt natural processes; in some areas, climate change may cause significant degradation of ecosystems that provide services such as clean and abundant water, sustainable natural resources, protection from flooding, as well as hunting, fishing and other recreational opportunities. Consequently, climate change is a challenge not only because of its likely direct effects, but also because of its potential to amplify the stress on ecosystems, habitats, and species from existing threats such as exponential increases in surface and ground water use, habitat loss due to increased urbanization, introduction of invasive species, and fire suppression.

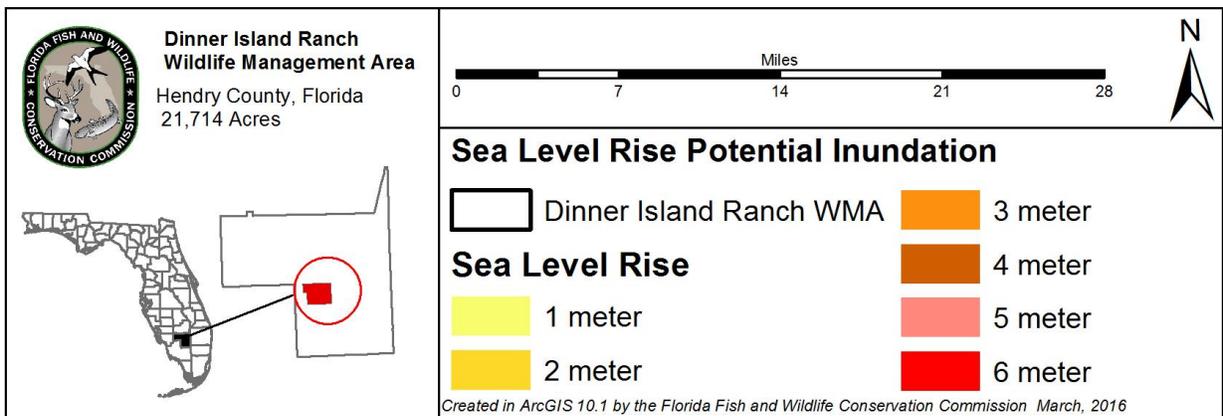
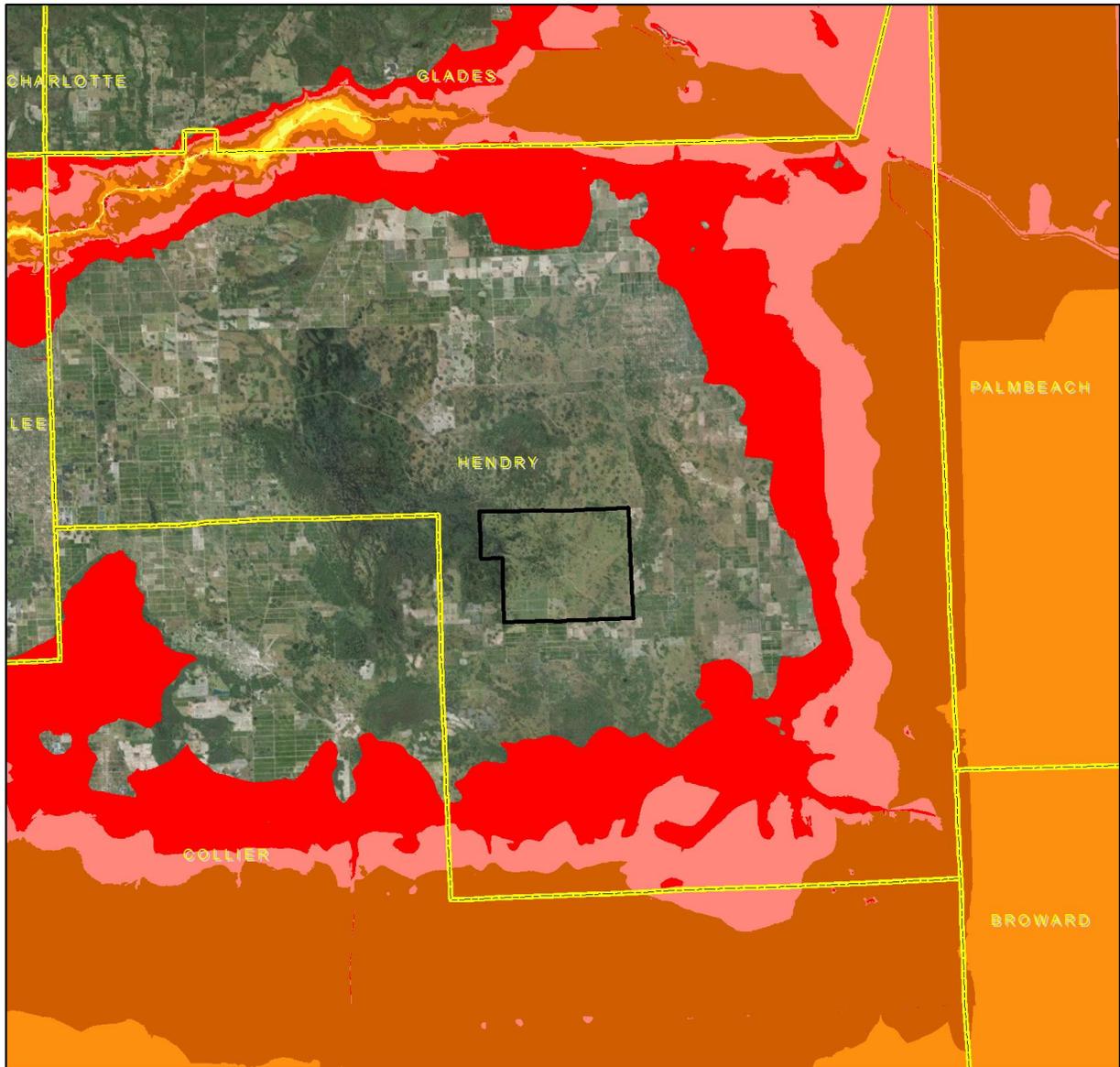


Figure 13. DIRWMA – Sea Level Rise Potential Inundation

Potential impacts that may be occurring as a result of climate change include: change in the timing of biological processes, such as flowering, breeding, hibernation, and migration;^{6, 7, 8} more frequent invasions and outbreaks of exotic invasive species;⁹ and loss of habitat in coastal areas due to sea level rise.¹⁰ Some species are projected to adjust to these conditions through ecological or evolutionary adaptation, whereas others are projected to exhibit range shifts as their distributions track changing climatic conditions. Those species that are unable to respond to changing climatic conditions are projected to go extinct. Some estimates suggest that as many as 20% - 30% of the species currently assessed by the IPCC are at risk of extinction within this century if global mean temperatures exceed increases of 2.7 – 4.5° F.¹¹ A number of ecosystems are projected to be affected at temperature increases well below these levels.

At this time, the potential effects of climate change on Florida's conservation lands are just beginning to be studied and are not yet well understood. For example, the FWC has begun a process for currently developing climate change adaptation strategies for monitoring, evaluating, and determining what specific actions, if any, may be recommended to ameliorate the projected impacts of climate change on fish and wildlife resources, native



vegetation, and the possible spread of exotic and invasive species. Currently, the FWC is continuing its work on the development of these potential adaptation strategies. However, as noted above, the effects of climate change may become more frequent and severe within the time period covered by this Management Plan.

For these reasons, there is a continuing need for increased information and research to enable adaptive management to cope with potential long-term climate change impacts. The most immediate actions that the FWC can take are to work with partners to gather the best scientific data possible for understanding natural processes in their current state, model possible impacts and subsequent changes from climate change, develop adaptive management strategies to enhance the resiliency of natural communities to adapt to climate change, and formulate criteria and monitoring for potential impacts when direct intervention may be necessary to protect a species. To this end, when appropriate, the FWC will participate in organizations such as the Peninsular Florida Land Conservation Cooperative or similar organizations so that the FWC continues to gain understanding and share knowledge of key issues related to potential climate change. In addition, the FWC will consider the need for conducting vulnerability assessments to model the potential effects of climate change, especially sea level rise and storm events, on imperiled species and their habitats on FWC-managed land.

Current projections of potential inundation from sea level rise indicate that the DIRWMA is not likely to be inundated even with sea level rise up to six meters (Figure 13). However, much of the land surrounding the DIRWMA is projected to be inundated if sea level rise reaches four to six meters. Other elements of climate change that may potentially affect the DIRWMA include saltwater intrusion from sea level rise, more frequent and more potent storm events, alteration of vegetation reproductive cycles, changes in migratory bird patterns, and changes in the fire regime. Though not likely to affect the DIRWMA directly, the results of a Sea Level Affecting Marsh Model for conservation lands along the Gulf and Atlantic coasts of Florida indicates a variety of habitats that may potentially be impacted. Low-lying coastal habitats, such as salt marsh and hardwood swamp natural communities, are projected to face the most direct and dramatic impacts of climate change, particularly from a projected rising sea level and from the projected increased frequency and intensity of coastal storms.^{12, 13, 14, 15} The effects of sea level rise in the recent past have been observed on publically-owned conservation lands located along the coast where cabbage palms have been dying on coastal islands due to salinity increases.

The potential loss of habitat may result in the loss of species using that habitat, including migrating and nesting birds. Storm events also cause considerable physical damage to native vegetation along vulnerable shorelines, impacting nesting habitat for sea life and shorebirds. The projected rise in sea levels may decrease the availability and abundance of prey for wading birds that forage in shallow waters on the expansive tidal flats of the Gulf and Atlantic coasts. Climate change may amplify and hasten these effects, potentially at rates that exceed the normal resiliency of plant communities to recover, shift, or adapt accordingly.^{16, 17} Projected salt water intrusion into the subsurface freshwater lens from potential sea level rise and saltwater inundation of surface freshwaters from storm surges may alter coastal ecosystems and freshwater marshes, possibly resulting in more salt-tolerant aquatic plant communities.

To address the potential impacts of climate change on the DIRWMA, Goals and Objectives have been developed as a component of this Management Plan (Section 6.12). Depending on the recommendations of the adaptive management strategies described above, additional specific goals and objectives to mitigate potential climate change impacts may be developed for the DIRWMA Management Plan in the future.

5.15 Soil and Water Conservation

Soil disturbing activities will be confined to areas that have the least likelihood of experiencing erosion challenges. On areas that have been disturbed prior to acquisition, an assessment 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.

6 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 in order to achieve an overall desired future outcome for the DIRWMA. The objectives listed within each management goal offer more specific management guidance and measures, and are considered the necessary steps to be completed to accomplish the management goals. Many of the objectives listed have specific end-of-the-calendar-year 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.

6.1 Habitat Restoration and Improvement

Goal: Improve extant habitat and restore disturbed areas.

Short-term

- 6.1.1 Conduct prescribed burning on approximately 500 acres of fire-adapted natural communities (mesic/wet flatwoods, basin and depression marsh, and slough marsh) per year.
- 6.1.2 Maintain approximately 1,000 acres of fire-adapted communities (21%) within a 3 - 20 year target fire return interval for two years.
- 6.1.3 Continue to conduct prescribed burning on the area's pastures as necessary to maintain fire-adapted natural communities and for enhancement of wildlife habitat.
- 6.1.4 Update the area's prescribed burn plan.
- 6.1.5 Conduct habitat improvement on approximately 151 acres per year including mowing and prescribed burning (Figure 14).
- 6.1.6 Conduct habitat restoration activities including planting native shrubs and trees on approximately 100 acres per year as needed within the Florida panther SMA (Figure 14).
- 6.1.7 Continue implementing OBVM on the area.
- 6.1.8 Develop a habitat restoration strategy for the area.
- 6.1.9 Continue cattle grazing as a management tool on pasture dominated units to maintain low fuel-loads in historically wet/dry prairie communities until other land management resources or plans are available.
- 6.1.10 Contract to remove interior fencing and structures that are no longer necessary in order to improve access to management units, to reduce safety hazards during prescribed burning, and to reduce exotic invasive plant species growing along these

fence lines.

Long-term

- 6.1.11 Increase prescribed burning to 950 acres of fire-adapted natural communities (mesic/wet flatwoods, basin and depression marsh, and slough marsh) per year.
- 6.1.12 Increase prescribed burning in order to maintain approximately 4,809 acres of fire-adapted communities (100%) within a target fire return interval, including 5 years for basin marsh, 5 years for depression marsh, 4 years for mesic flatwoods, 5 years for slough marsh, and 4 years for wet flatwoods.
- 6.1.13 Continue to conduct prescribed burning on the area's pastures as necessary to maintain fire-adapted natural communities and for enhancement of wildlife habitat.
- 6.1.14 Implement the updated prescribed burn plan for the area.
- 6.1.15 Continue implementing OBVM.
- 6.1.16 Continue to conduct habitat improvement including mowing and prescribed burning on 151 acres per year (Figure 14).
- 6.1.17 Continue to conduct habitat restoration activities including planting native shrubs and trees on approximately 100 acres per year as needed within the Florida panther SMA (Figure 14).
- 6.1.18 Begin implementation of the habitat restoration strategy to restore native plant communities on the area as feasible.
- 6.1.19 Continue cattle grazing as a management tool on pasture dominated units to maintain low fuel-loads in historically wet/dry prairie communities until other land management resources or plans are available.
- 6.1.20 Contract to remove interior fencing and structures that are no longer necessary in order to improve access to management units, to reduce safety hazards during prescribed burning, and to reduce exotic invasive plant species growing along these fence lines.
- 6.1.21 Back-fill cow ponds on areas where cattle grazing is no longer utilized.

6.2 Imperiled and Focal Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration

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

Short-term

- 6.2.1 Continue to implement the WCPR strategy for the area.
- 6.2.2 Monitor the following 22 imperiled and focal species as outlined in the WCPR strategy: swallow-tailed kite, Bachman's sparrow, burrowing owl, Cooper's hawk, crested caracara, Florida grasshopper sparrow, Florida mottled duck, Florida sandhill crane, limpkin, northern bobwhite, snail kite, southern bald eagle, wading birds (white ibis, great egret, snowy egret, little blue heron, tricolored heron, wood stork, roseate spoonbills, and reddish egret), Big Cypress fox squirrel, Florida black bear, and Florida panther.
- 6.2.3 Continue to collect opportunistic imperiled and focal wildlife species occurrence data.
- 6.2.4 Continue to exclude cattle from Management Unit 1 and the western portion of Management Unit 2 to allow regrowth of dense understory vegetation preferred by Florida panthers for denning and resting (Figure 14).
- 6.2.5 Continue reforestation efforts in Management Units 1 and 2 for Florida panthers (Figure 14).
- 6.2.6 Conduct crested caracara nesting surveys for all suitable nesting habitat on the DIRWMA over the course of three years, and repeat once completed.
- 6.2.7 Conduct wading bird colony surveys as feasible.
- 6.2.8 Continue to monitor the bald eagle nest on the area annually.

Long-term

- 6.2.9 Continue to implement the WCPR strategy.
- 6.2.10 Update the WCPR strategy by 2021 and implement the updated WCPR strategy.
- 6.2.11 Continue to monitor 22 imperiled and focal species: swallow-tailed kite, Bachman's sparrow, burrowing owl, Cooper's hawk, crested caracara, Florida grasshopper sparrow, Florida mottled duck, Florida sandhill crane, limpkin, northern bobwhite, snail kite, southern bald eagle, wading birds (white ibis, great egret, snowy egret, little blue heron, tricolored heron, wood stork, roseate spoonbills, and reddish egret), Big Cypress fox squirrel, Florida black bear, and Florida panther.

- 6.2.12 Continue to collect opportunistic imperiled and focal wildlife species occurrence data.
- 6.2.13 Continue to exclude cattle from Management Unit 1 and the western portion of Management Unit 2 to allow regrowth of dense understory vegetation preferred by Florida panthers for denning and resting (Figure 14).
- 6.2.14 Continue reforestation efforts in Management Units 1 and 2 for Florida panthers (Figure 14).
- 6.2.15 Continue to conduct crested caracara nesting surveys for all suitable nesting habitat on the DIRWMA over the course of three years, and repeat once completed.
- 6.2.16 Continue to monitor the bald eagle nest on the area annually.

6.3 Other Wildlife (Game and Nongame) Habitat Maintenance, Enhancement, Restoration, or Population Restoration

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

Short-term

- 6.3.1 Continue to conduct population and recruitment surveys for white-tailed deer.
- 6.3.2 Continue to collect biological harvest data at check station.
- 6.3.3 Continue to collect opportunistic wildlife occurrence data.
- 6.3.4 Continue to prepare and plant dove fields.

Long-term

- 6.3.5 Continue to conduct population and recruitment surveys for white-tailed deer.
- 6.3.6 Continue to collect biological harvest data at check station.
- 6.3.7 Continue to collect opportunistic wildlife occurrence data.
- 6.3.8 Continue to prepare and plant dove fields.

6.4 Exotic and Invasive Species Maintenance and Control

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

Short-term

- 6.4.1 Conduct herbicide treatments on approximately 2,000 acres of FLEPPC Category I and Category II invasive exotic plant species per year.
- 6.4.2 Continue annual herbicide treatments on FLEPPC Category I and Category II exotic plant species in Management Units 1 and 2 to improve habitat in the Florida panther SMA.
- 6.4.3 Continue maintenance herbicide treatments on all exotic plant species within approximately 151 acres of the current ground cover restoration area as feasible (Figure 14).
- 6.4.4 Implement control measures on one exotic and nuisance animal species (feral hog) through hunting and trapping, as feasible.
- 6.4.5 Continue opportunistic monitoring for exotic animal species, including Burmese pythons and Nile monitors.

Long-term

- 6.4.6 Continue annual maintenance herbicide treatments on approximately 2,000 acres of FLEPPC Category I and Category II invasive exotic plant species.
- 6.4.7 Continue annual herbicide treatments on FLEPPC Category I and Category II exotic plant species in Management Units 1 and 2 to improve habitat in the Florida panther SMA.
- 6.4.8 Continue maintenance herbicide treatments on all exotic plant species within approximately 151 acres of the current ground cover restoration area as feasible (Figure 14).
- 6.4.9 Continue to implement control measures on one exotic and nuisance animal species (feral hog) through hunting and trapping, as feasible.
- 6.4.10 Continue opportunistic monitoring for exotic animal species, including Burmese pythons and Nile monitors.

6.5 Public Access and Recreational Opportunities

Goal: Provide public access and recreational opportunities.

Short-term

- 6.5.1 Maintain public access and recreational opportunities to allow for a recreational carrying capacity of 628 visitors per day.
- 6.5.2 Monitor roads (improved and unimproved) annually for visitor impacts.
- 6.5.3 Using existing improved roads, develop a wildlife viewing driving loop on the area (Figure 14).
- 6.5.4 Continue to provide a website, bird list, three-panel kiosk, single-panel kiosk, and area brochure for interpretation and education.
- 6.5.5 Continue to support the DIRWMA as a stop on the Great Florida Birding Trail.
- 6.5.6 Develop one new interpretive/education program (driving loop map).
- 6.5.7 Continue to provide hunting opportunities for deer, turkey, alligator, youth turkey, family, dove, small game and feral hogs.
- 6.5.8 Continue to provide bank fishing opportunities on appropriate water bodies on the area.
- 6.5.9 Develop a Recreation Master Plan (RMP) for the area.
- 6.5.10 Cooperate with other agencies, Hendry County, stakeholders, and regional landowners to investigate regional recreational opportunities including linking hiking, and multi-use trail systems between adjacent public areas.
- 6.5.11 Continue to identify partnerships that could provide for environmental educational programs and outreach.
- 6.5.12 Continue to produce and provide the area hunting and regulations brochure.
- 6.5.13 Continue to provide hiking, biking, camping, horseback riding, wildlife viewing, fishing, and frogging opportunities.
- 6.5.14 Develop a rack card-style recreation guide for the area.

Long-term

- 6.5.15 Continue to maintain public access and recreational opportunities to allow for a recreational carrying capacity of 628 visitors per day.

- 6.5.16 Maintain the wildlife viewing driving loop on the area (Figure 14).
- 6.5.17 Continue to provide a website, bird list, three-panel kiosk, single-panel kiosk, driving loop map, and area brochure for interpretation and education.
- 6.5.18 Continue to support the DIRWMA as a stop on the Great Florida Birding Trail.
- 6.5.19 Develop one new interpretive/education program, a kiosk on the driving loop.
- 6.5.20 Implement the RMP for the area.
- 6.5.21 Monitor roads (improved and unimproved) annually for visitor impacts.
- 6.5.22 Reassess recreational opportunities every three years.
- 6.5.23 Continue to provide hunting opportunities for deer, turkey, alligator, youth turkey, family, dove, small game and feral hogs.
- 6.5.24 Continue to provide bank fishing opportunities on appropriate water bodies on the area.
- 6.5.25 Continue to cooperate with other agencies, Hendry County, stakeholders, and regional landowners to investigate regional recreational opportunities including linking hiking, and multi-use trail systems between adjacent public areas.
- 6.5.26 Continue to identify partnerships that could provide for environmental educational programs and outreach.
- 6.5.27 Continue to produce and provide the area hunting and regulations brochure and bird list brochure.
- 6.5.28 Continue to provide hiking, biking, camping, horseback riding, wildlife viewing, fishing, and frogging opportunities.
- 6.5.29 Continue to provide a rack card-style recreation guide for the area.

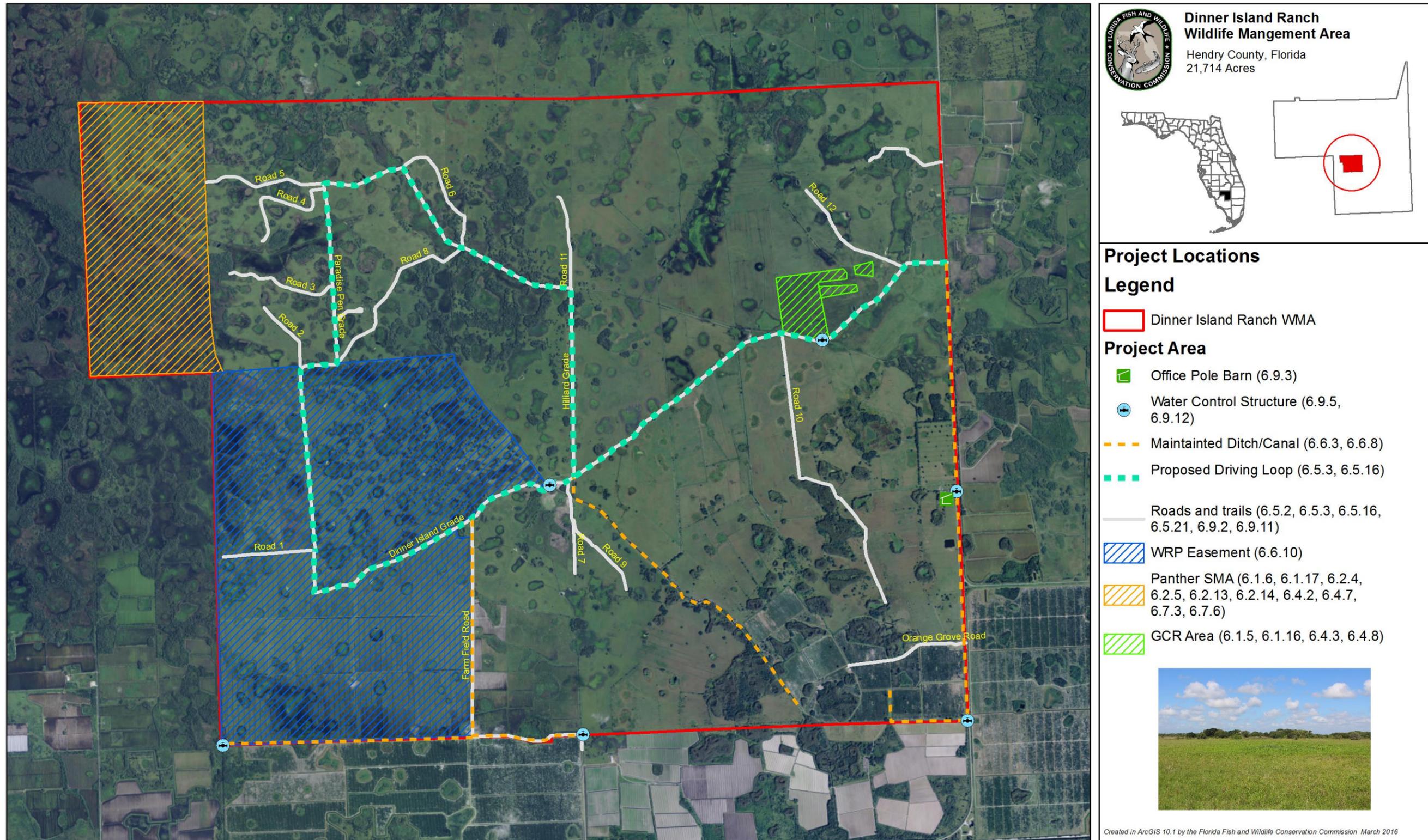


Figure 14. DIRWMA Project Locations

THIS PAGE INTENTIONALLY BLANK

6.6 Hydrological Preservation and Restoration

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

Short-term

- 6.6.1 Conduct a Hydrology Assessment of the area to identify potential hydrology restoration activities, excluding the WRP project area which has already been assessed.
- 6.6.2 Continue to cooperate with the SFWMD for the monitoring of surface and ground water quality and quantity through C-139 Basin Best Management Practices.
- 6.6.3 Continue to maintain canals and ditches on the area as necessary and appropriate (Figure 14).
- 6.6.4 Continue to monitor and manage water levels at six water control structures as appropriate.

Long-term

- 6.6.5 As recommended by the Hydrology Assessment, install and maintain low-water crossings and culverts as appropriate to maintain and enhance natural hydrological functions.
- 6.6.6 Implement hydrological restoration as recommended by the Hydrology Assessment for the area as feasible and appropriate.
- 6.6.7 Continue to cooperate with the SFWMD for the monitoring of surface and ground water quality and quantity through C-139 Basin Best Management Practices.
- 6.6.8 Continue to maintain canals and ditches on the area as necessary and appropriate (Figure 14).
- 6.6.9 Continue to monitor and manage water levels at six water control structures as appropriate.
- 6.6.10 As appropriate and feasible, continue to improve natural hydrologic condition and functions on approximately 4,313 acres of the WRP Easement on the area (Figure 14 and Appendix 13.3.6).

6.7 Forest Resource Management

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

Short-term

- 6.7.1 Cooperate with the FFS to complete an updated Timber Assessment.
- 6.7.2 Consult with the FFS or a professional forestry consultant regarding forest management activities as appropriate.
- 6.7.3 Conduct reforestation efforts on approximately 100 acres per year within the Florida panther SMA on the area (Figure 14).

Long-term

- 6.7.4 Continue to consult with the FFS or a professional forestry consultant regarding forest management activities as appropriate.
- 6.7.5 As recommended by the habitat restoration strategy, conduct reforestation efforts within historically forested communities throughout the DIRWMA.
- 6.7.6 Continue to conduct reforestation efforts as needed on approximately 100 acres per year within the Florida panther SMA on the area (Figure 14).

6.8 Historical Resources

Goal: Protect, preserve and maintain historical resources.

Short-term

- 6.8.1 Ensure all known sites are recorded in the DHR Master Site file.
- 6.8.2 Coordinate with the DHR to design a historical resource survey.
- 6.8.3 Cooperate with the DHR and utilize trained FWC staff in designing site plans for development of infrastructure.
- 6.8.4 Continue to follow the DHR's Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties for the management of historical resources.
- 6.8.5 Coordinate with the DHR to ensure that FWC staff receive Archaeological Resource Management training.

Long-term

- 6.8.6 Continue to ensure all known sites are recorded in the DHR Master Site file.
- 6.8.7 Conduct a historical resources survey for the area.
- 6.8.8 Continue to cooperate with the DHR and utilize trained FWC Staff in designing site plans for development of infrastructure.
- 6.8.9 Cooperate with the DHR to manage and maintain any historical resources on the area.
- 6.8.10 Continue to coordinate with the DHR to ensure that FWC staff receive Archaeological Resource Management training.
- 6.8.11 Continue to follow the DHR's Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties for the management of historical resources.

6.9 Capital Facilities and Infrastructure

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

Short-term

- 6.9.1 Continue to maintain 23 facilities, including the office/shop/staff housing complex, Curry Hammock Complex, Hammock Campground, Kowechobe Campground, check station, Ranch Complex, and Orange Grove Complex (Figure 11).
- 6.9.2 Maintain 31.6 miles of improved and unimproved roads (Figures 11 and 14).
- 6.9.3 Construct a security fence around the equipment barn on the area (Figure 14).
- 6.9.4 Monitor roads (improved and unimproved) and infrastructure annually for visitor impacts (Figure 11 and 14).
- 6.9.5 Maintain water control structures on the area as necessary and appropriate (Figures 11 and 14).
- 6.9.6 Clearly identify and mark the boundaries of numbered roads throughout the area.
- 6.9.7 Maintain the boundary line along the OSSF through control of encroaching vegetation to establish clear prescribed burning lines and boundary management lines.

Long-term

- 6.9.8 Monitor roads (improved and unimproved) and infrastructure annually for visitor impacts (Figure 11 and 14).
- 6.9.9 Construct a kiosk and covered picnic table on the proposed wildlife viewing loop.
- 6.9.10 Continue to maintain 23 facilities, including the office/shop/staff housing complex, Curry Hammock Complex, Hammock Campground, Kowechobe Campground, check station, Ranch Complex, and Orange Grove Complex (Figure 11).
- 6.9.11 Continue to maintain 31.6 miles of improved and unimproved roads (Figures 11 and 14).
- 6.9.12 Continue to maintain water control structures on the area as necessary and appropriate (Figures 11 and 14).
- 6.9.13 Continue to clearly identify and mark the boundaries of numbered roads throughout the area.
- 6.9.14 Continue to maintain the boundary line along the OSSF through control of encroaching vegetation to establish clear prescribed burning lines and boundary management lines.

6.10 Land Conservation and Stewardship Partnerships

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

Short-term

- 6.10.1 Identify potential important wildlife habitat, landscape-scale linkages, wildlife corridors, and operational/resource management needs.
- 6.10.2 Identify and develop conservation stewardship partnerships.
- 6.10.3 Identify and pursue conservation acquisition needs.
- 6.10.4 Develop and maintain a GIS shapefile and other necessary data to facilitate nominations from the FWC OCPB and for FWC's LAP and Land Acquisition Programs.
- 6.10.5 Develop a Conservation Action Strategy.
- 6.10.6 Contact and inform adjoining landowners about the FWC LAP to pursue non-acquisition conservation stewardship partnerships.

- 6.10.7 Determine which parcels should be added to the FWC acquisition list.
- 6.10.8 Identify potential non-governmental organization partnerships and grant program opportunities.
- 6.10.9 Determine efficacy of conducting an adjacent landowner's assistance/conservation stewardship partnership workshop.
- 6.10.10 Identify potential conservation easements donations.
- 6.10.11 Evaluate and determine if any portions of the DIRWMA are no longer needed for conservation purposes, and therefore may be designated as surplus lands.

Long-term

- 6.10.12 To minimize fragmentation of the area, continue to identify strategic parcels to revise the completed OCPB for the DIRWMA as appropriate and necessary.
- 6.10.13 Continue to identify and develop conservation stewardship partnerships.
- 6.10.14 Continue to identify and pursue conservation acquisition needs.
- 6.10.15 Continue to maintain a GIS shapefile and other necessary data to facilitate nominations from the FWC OCPB and for the FWC LAP and Land Acquisition Program.
- 6.10.16 Continue to propose nominations of selected properties as additions to the FWC acquisition list.
- 6.10.17 Continue to pursue acquisition of parcels added to the FWC acquisition list as acquisition work plan priorities and funding allow.
- 6.10.18 As feasible, continue to periodically contact and meet with adjacent landowners for willingness to participate in the Conservation Action Strategy, and coordinate landowner assistance/conservation stewardship partnership workshops as deemed appropriate.
- 6.10.19 Coordinate and conduct landowner assistance/conservation stewardship partnership workshop(s) as necessary and appropriate.
- 6.10.20 Continue to identify potential conservation easements donations.
- 6.10.21 Continue to evaluate and determine if any portions of the DIRWMA are no longer needed for conservation purposes, and therefore may be designated as surplus lands.

6.11 Cooperative Management and Special Uses

Goal: Provide access and use of the DIRWMA to current cooperative managers and continue collaborative management efforts.

Short-term

- 6.11.1 Coordinate and cooperate with Department of Defense military branches and first-responders to allow for training opportunities for military personnel and other initiatives as appropriate and compatible with the management and conservation of the DIRWMA.
- 6.11.2 Continue to cooperate with adjacent private landowners for road access, prescribed burning, exotic species control, and other management issues as needed.
- 6.11.3 Continue to cooperate with the cattle lessees to allow cattle grazing in accordance with the NRCS grazing plan for the DIRWMA.
- 6.11.4 Continue to cooperate with the citrus grove lessee to maintain the citrus grove.
- 6.11.5 Continue to cooperate with the NRCS for compliance with the WRP Easement conditions and the cattle grazing plans.
- 6.11.6 Continue to cooperate with the SFWMD on hydrological restoration efforts for the area and on C-139 Basin hydrological restoration efforts.
- 6.11.7 Continue to cooperate with the FFS on prescribed burning and management of the boundary with the OKSSF.

Long-term

- 6.11.8 Continue to coordinate and cooperate with Department of Defense military branches and first-responders to allow for training opportunities for military personnel and other initiatives as appropriate and compatible with the management and conservation of the DIRWMA.
- 6.11.9 Continue to cooperate with adjacent private landowners for road access, prescribed burning, exotic species control, and other management issues as needed.
- 6.11.10 Continue to cooperate with the cattle lessees to allow cattle grazing in accordance with the NRCS grazing plan for the DIRWMA.
- 6.11.11 Continue to cooperate with the citrus grove lessee to maintain the citrus grove.
- 6.11.12 Continue to cooperate with the NRCS for compliance with the WRP Easement conditions and the cattle grazing plans.

6.11.13 Continue to cooperate with the SFWMD on hydrological restoration efforts for the area and on C-139 Basin hydrological restoration efforts.

6.11.14 Continue to cooperate with the FFS on prescribed burning and management of the boundary with the OKSSF.

6.12 Climate Change

Goal: Develop appropriate adaptation strategies in response to projected climate change effects and their potential impacts on natural resources, including fish and wildlife, and the operational management of the DIRWMA.

Long-term

6.12.1 Coordinate with the FWC-FWRI Climate Change Adaptation Initiative to identify potential impacts of projected climate change on fish and wildlife resources and operational management of the DIRWMA.

6.12.2 Develop and implement appropriate climate change monitoring protocols and management strategies for the DIRWMA.

6.12.3 Incorporate appropriate climate change adaptation strategies into the WCPR for the DIRWMA.

6.12.4 As appropriate, update the DIRWMA Prescribed Fire Plan to incorporate new scientific information regarding projected climate change, such as increased frequency of drought, on the fire regime of the DIRWMA's fire-adapted habitats.

6.12.5 As science, technology, and climate policy evolve, educate natural resource management partners and the public about the agency's policies, programs and efforts to study, document and address potential climate change; assess the need to incorporate public education about climate change into the FWC's public education curriculum.

6.13 Research Opportunities

Goal: Explore and pursue cooperative research opportunities.

Short-term

6.13.1 Continue to cooperate with University of Florida researchers on bat species research on the area.

6.13.2 Continue to cooperate with the NRCS on natural resource inventorying research.

6.13.3 Continue to cooperate with the Florida Museum of Natural History on ongoing

insect research on the area.

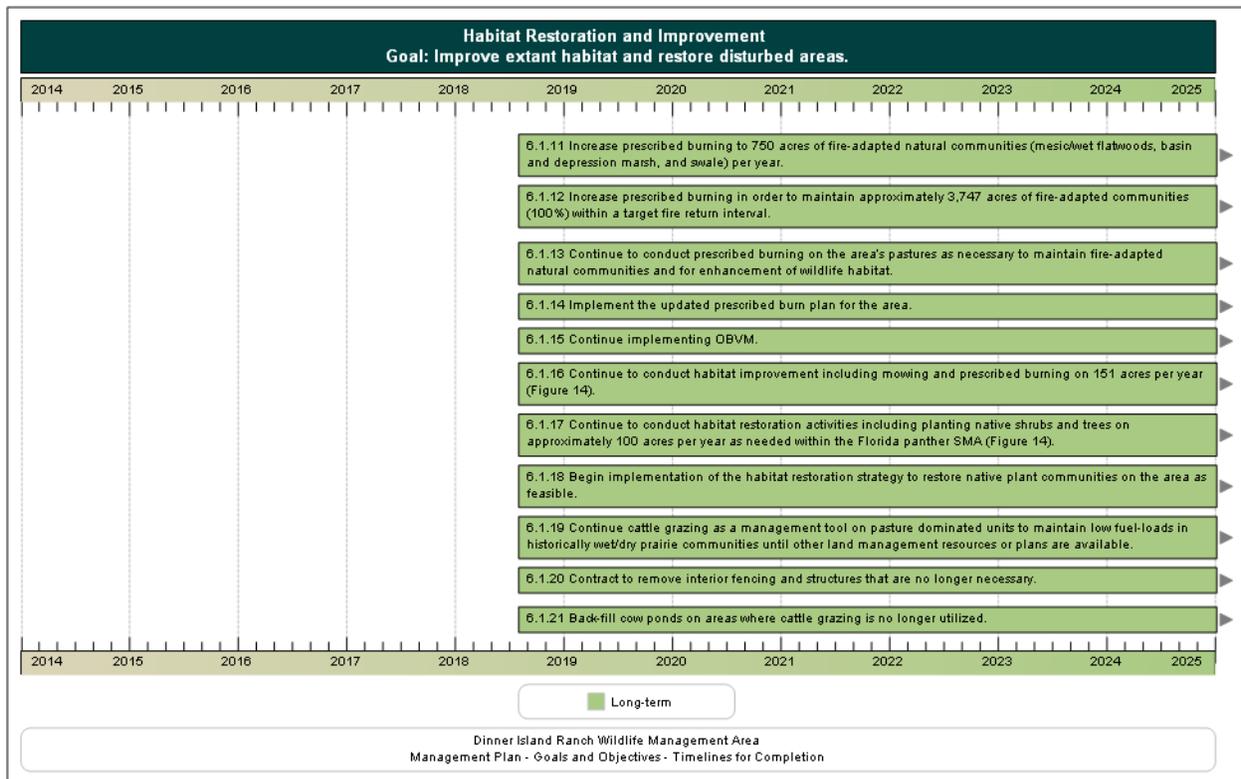
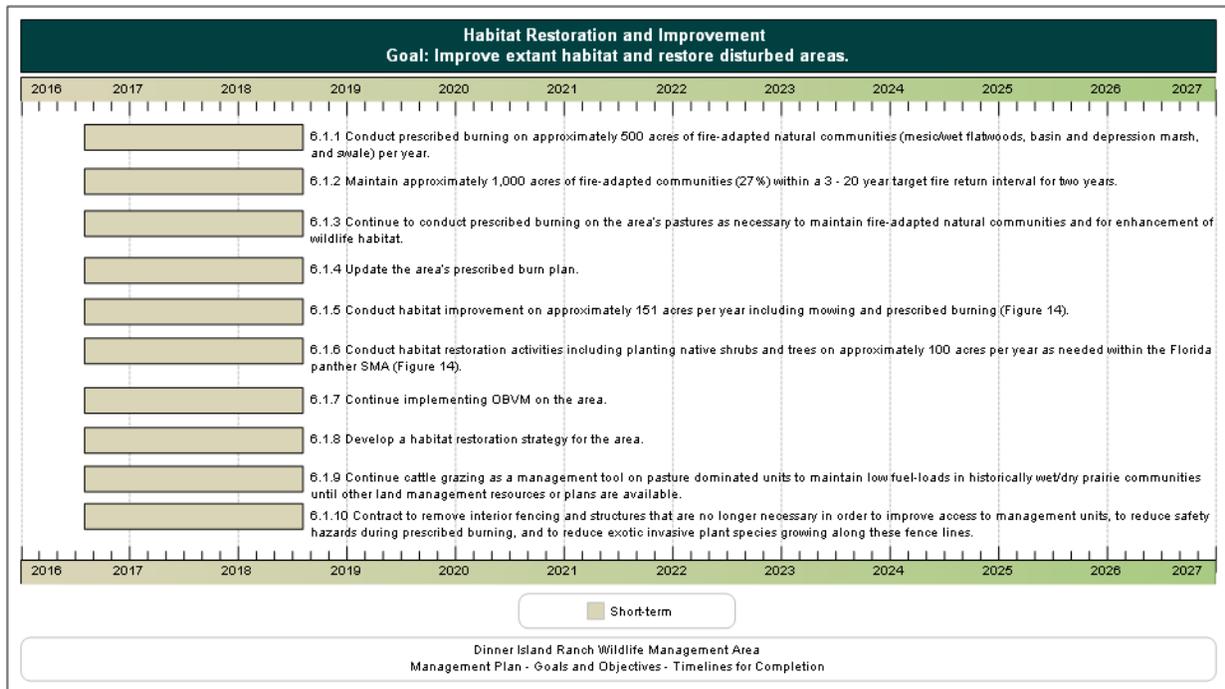
- 6.13.4 Continue to cooperate with the Florida Museum of Natural History on the capture and removal of live and dead conditional non-native reptiles.

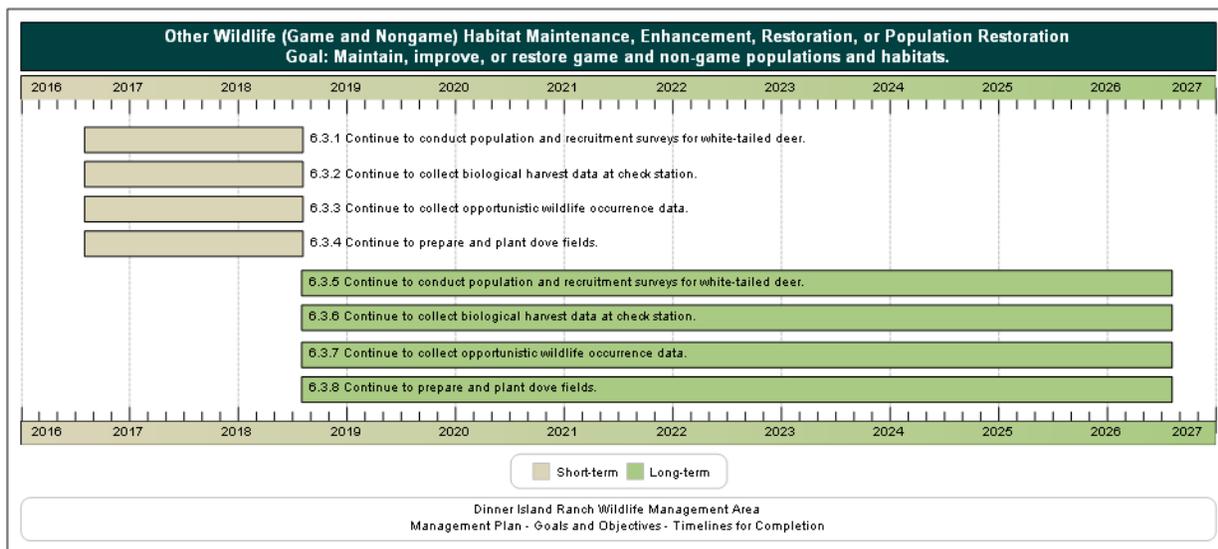
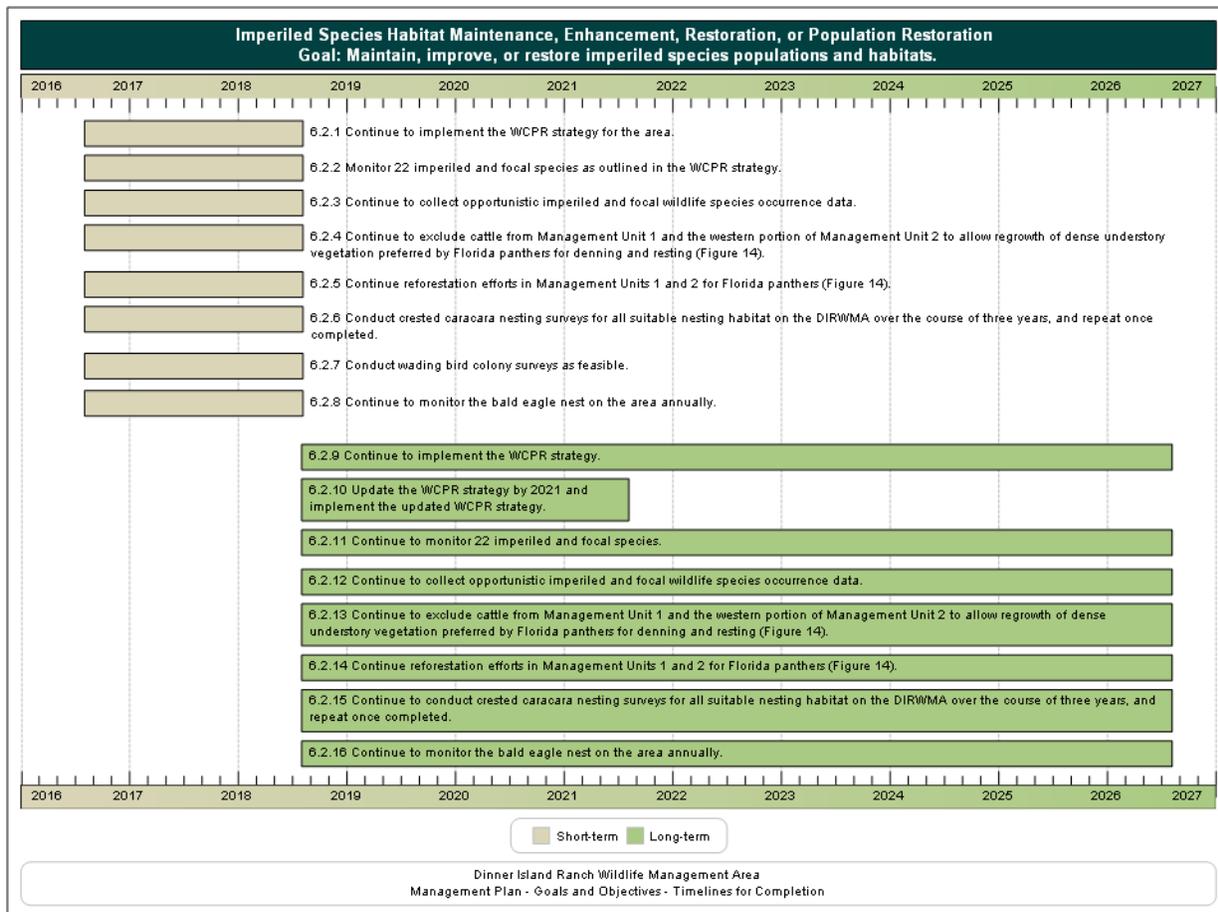
Long-term

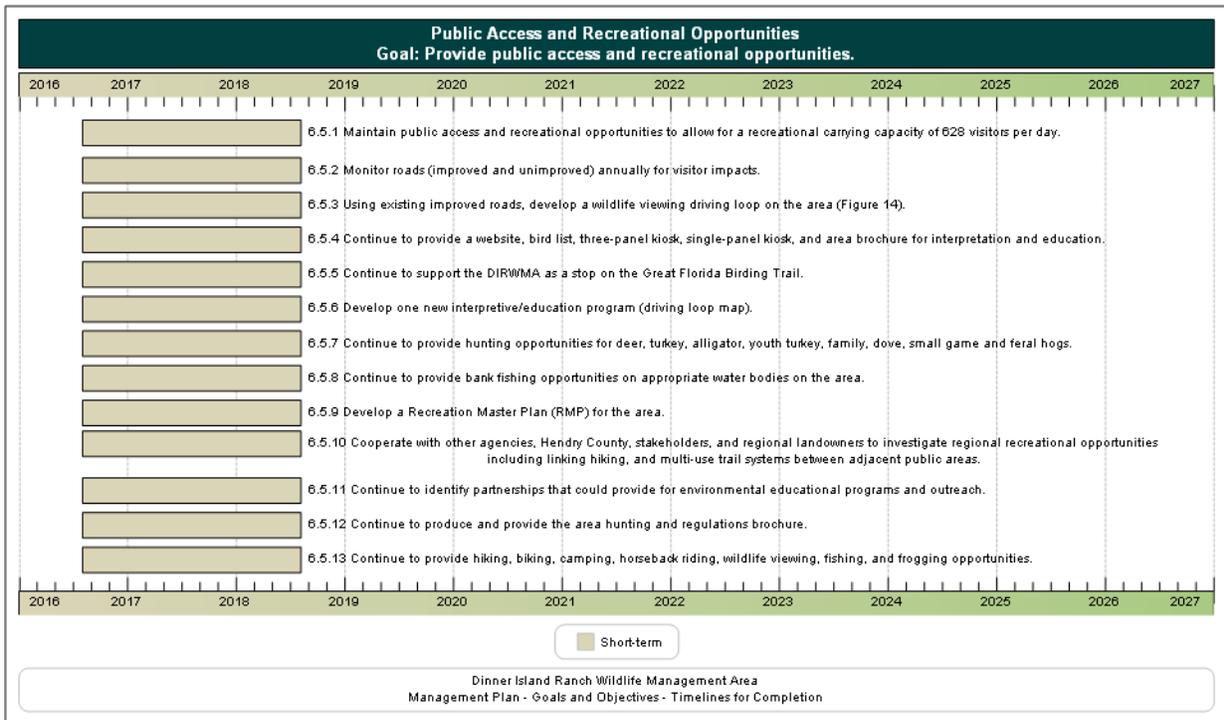
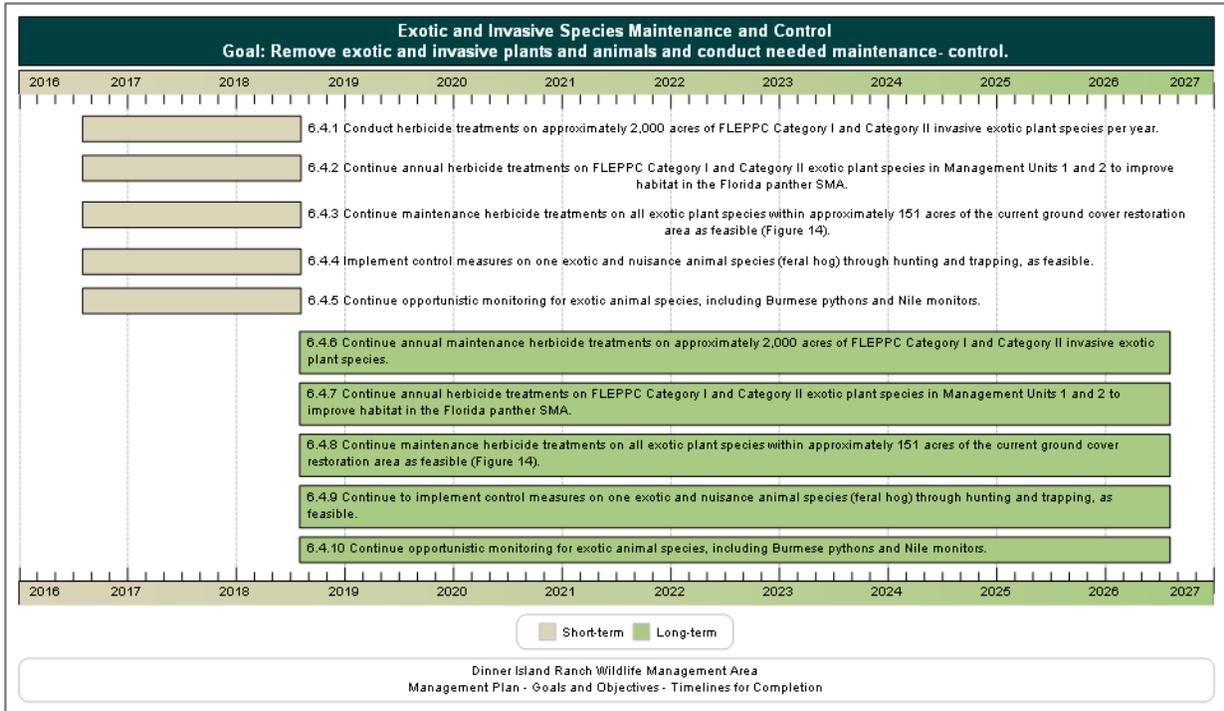
- 6.13.5 Continue to cooperate with University of Florida researchers on bat species research on the area.
- 6.13.6 Continue to cooperate with the NRCS on natural resource inventorying research.
- 6.13.7 Continue to cooperate with the Florida Museum of Natural History on ongoing insect research on the area.
- 6.13.8 Continue to cooperate with the Florida Museum of Natural History on the capture and removal of live and dead conditional non-native reptiles.
- 6.13.9 Explore and pursue cooperative research opportunities through universities, the FWRI, and other entities.
- 6.13.10 Continue to cooperate with researchers, universities, and others as appropriate.
- 6.13.11 Continue to assess the need for and pursue research and environmental education partnership opportunities as appropriate.

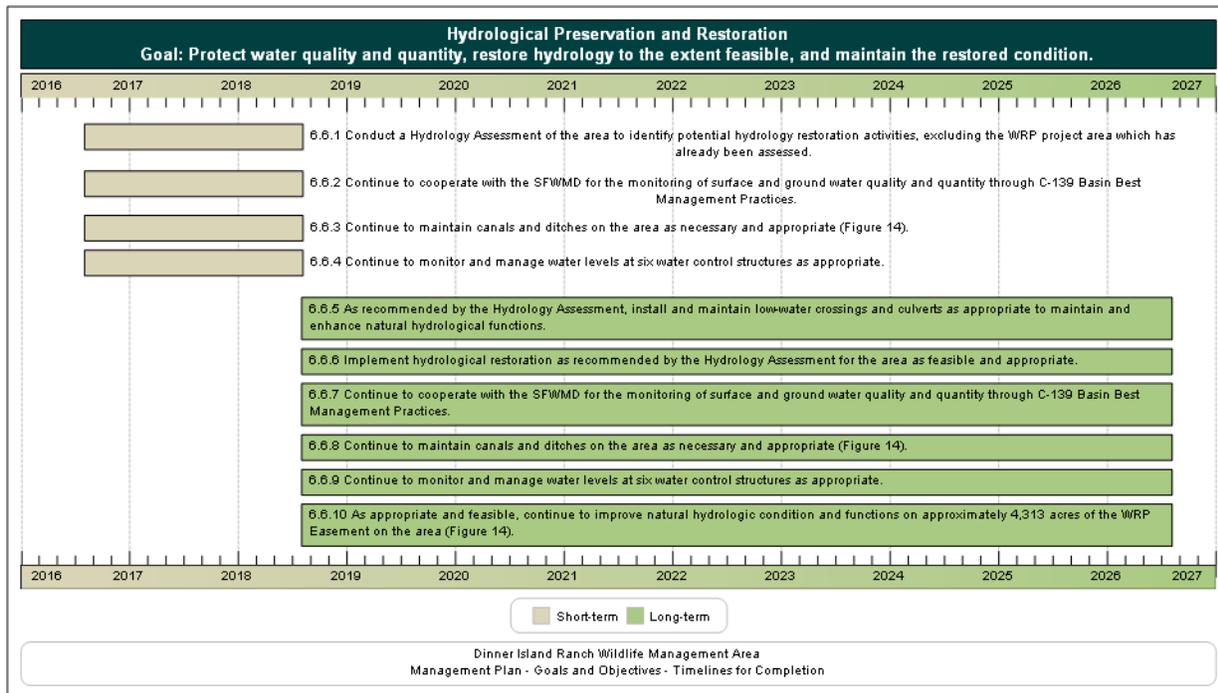
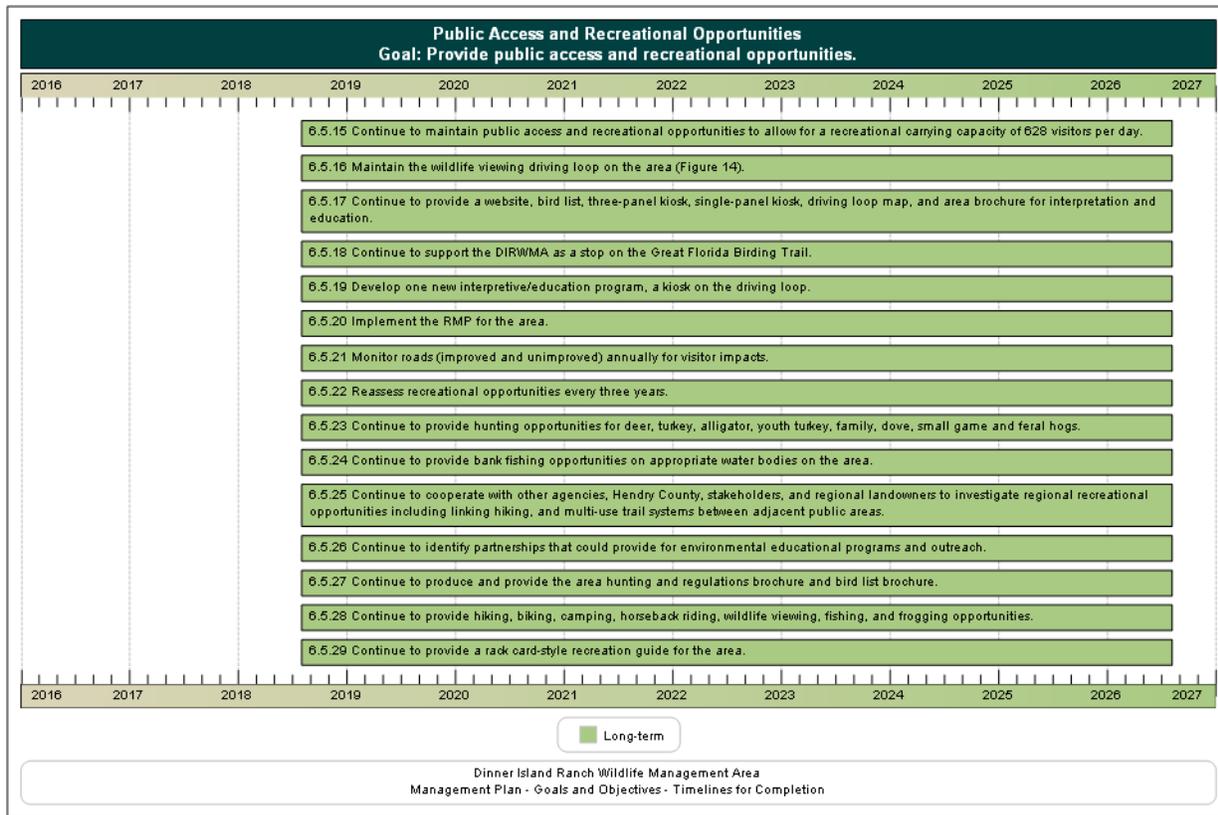
7 Schedule: Timelines for Completion of Resource Management Goals and Objectives

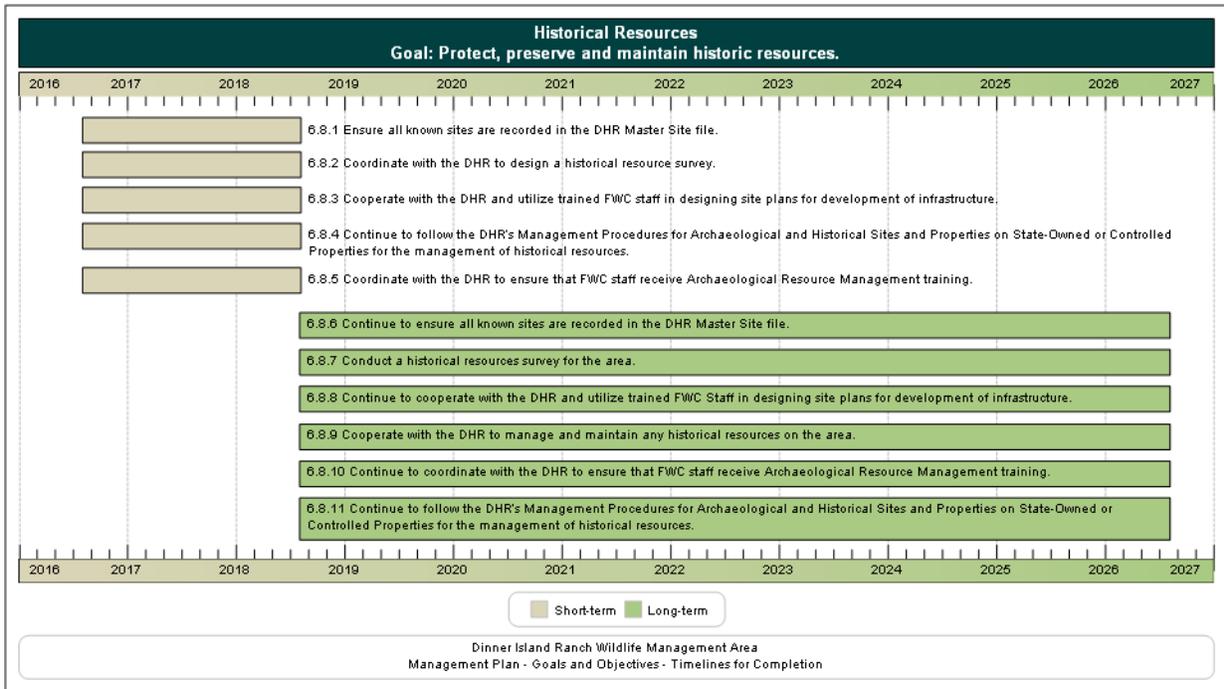
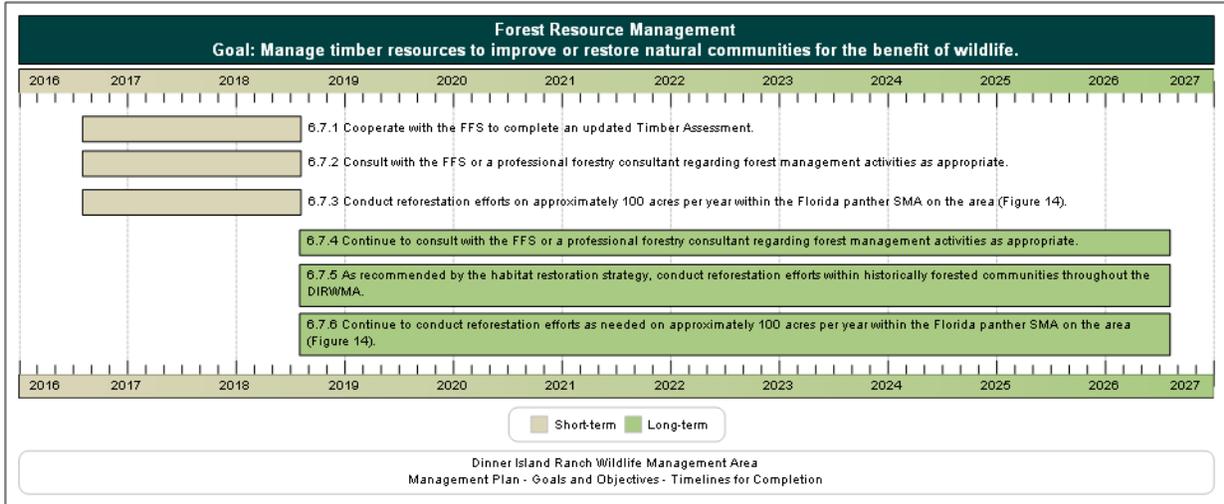
The following section presents the short- and long-term goals and objectives for the management of the DIRWMA graphically in a timeline format. These timelines directly reflect the short- and long-term goals and objectives presented above in Section 6.

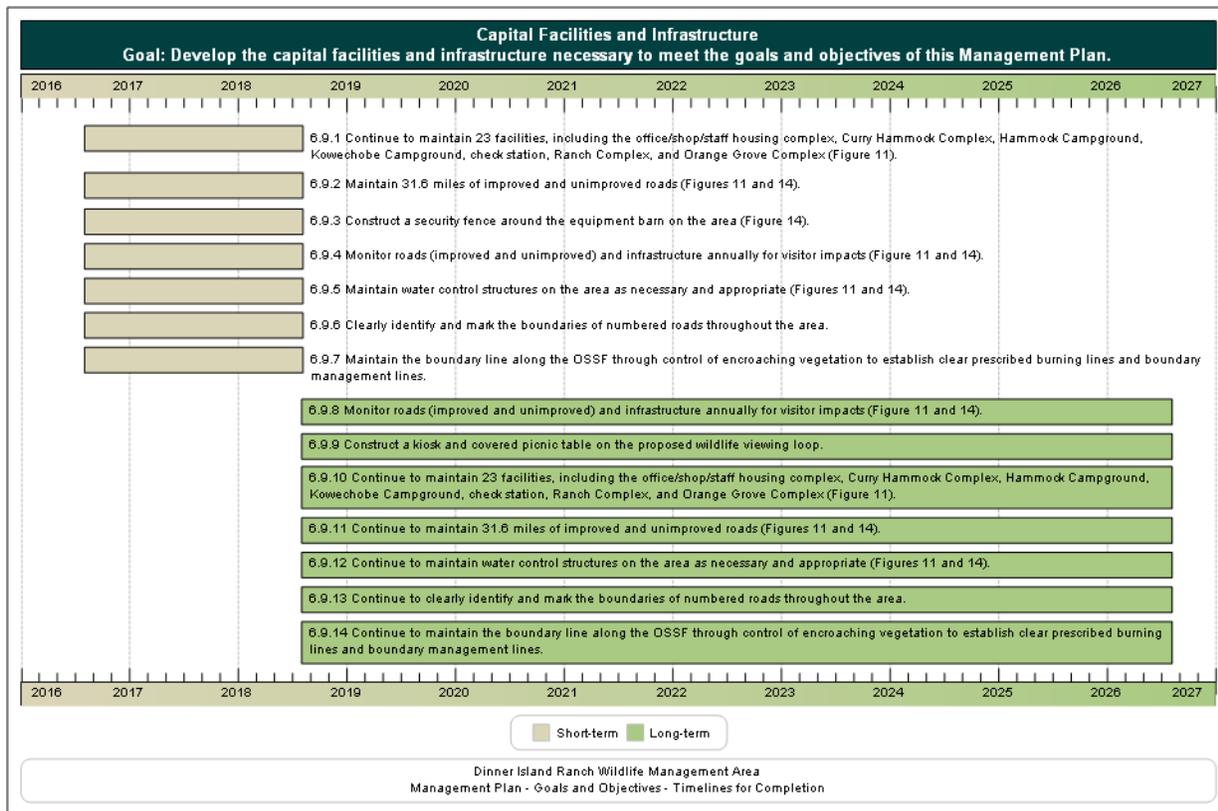


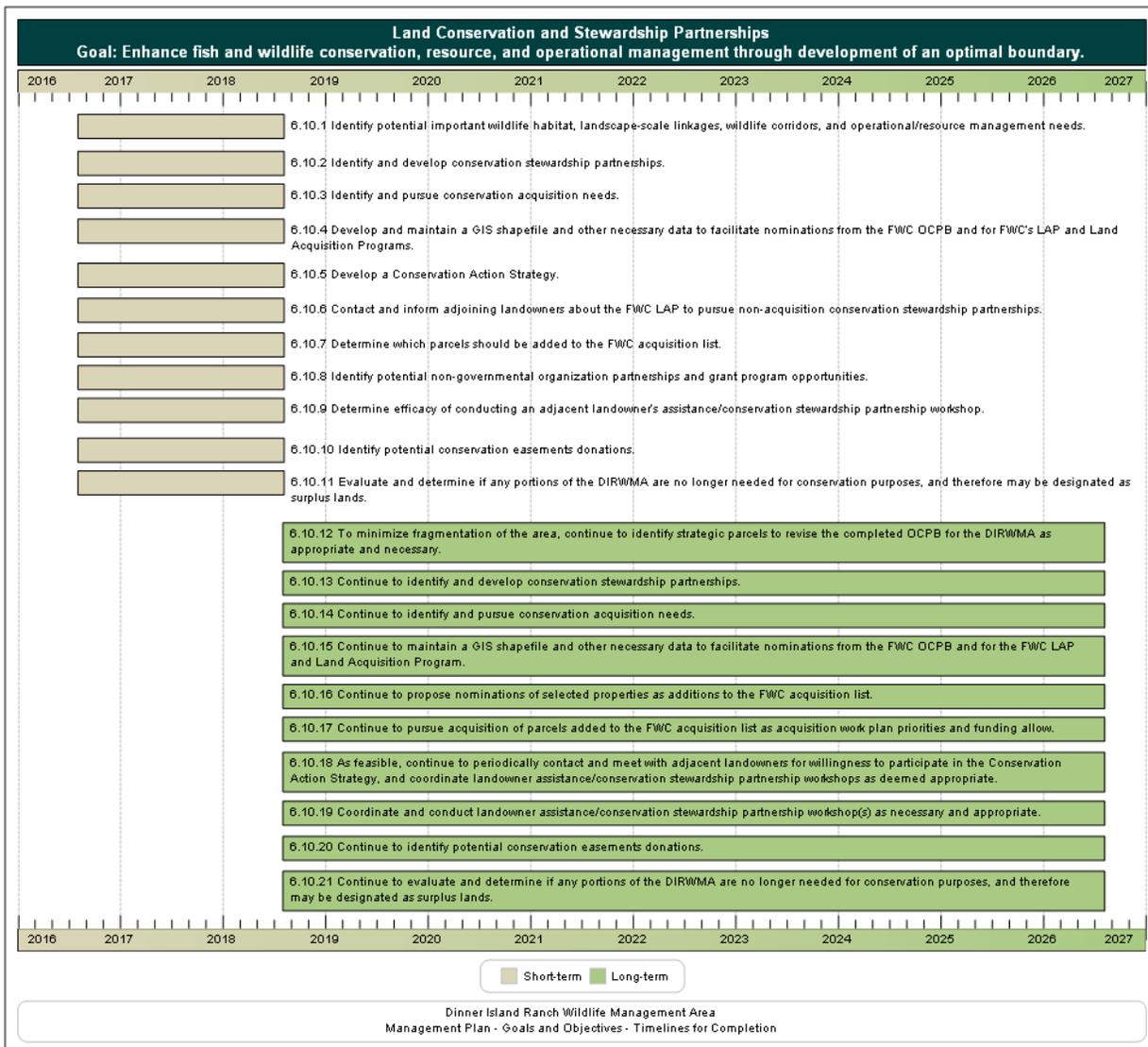


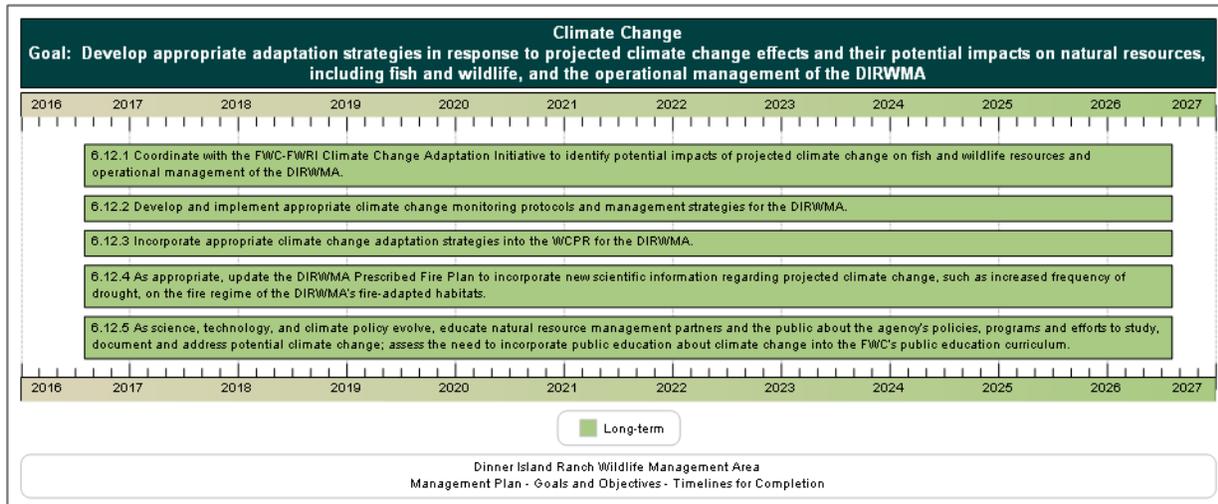
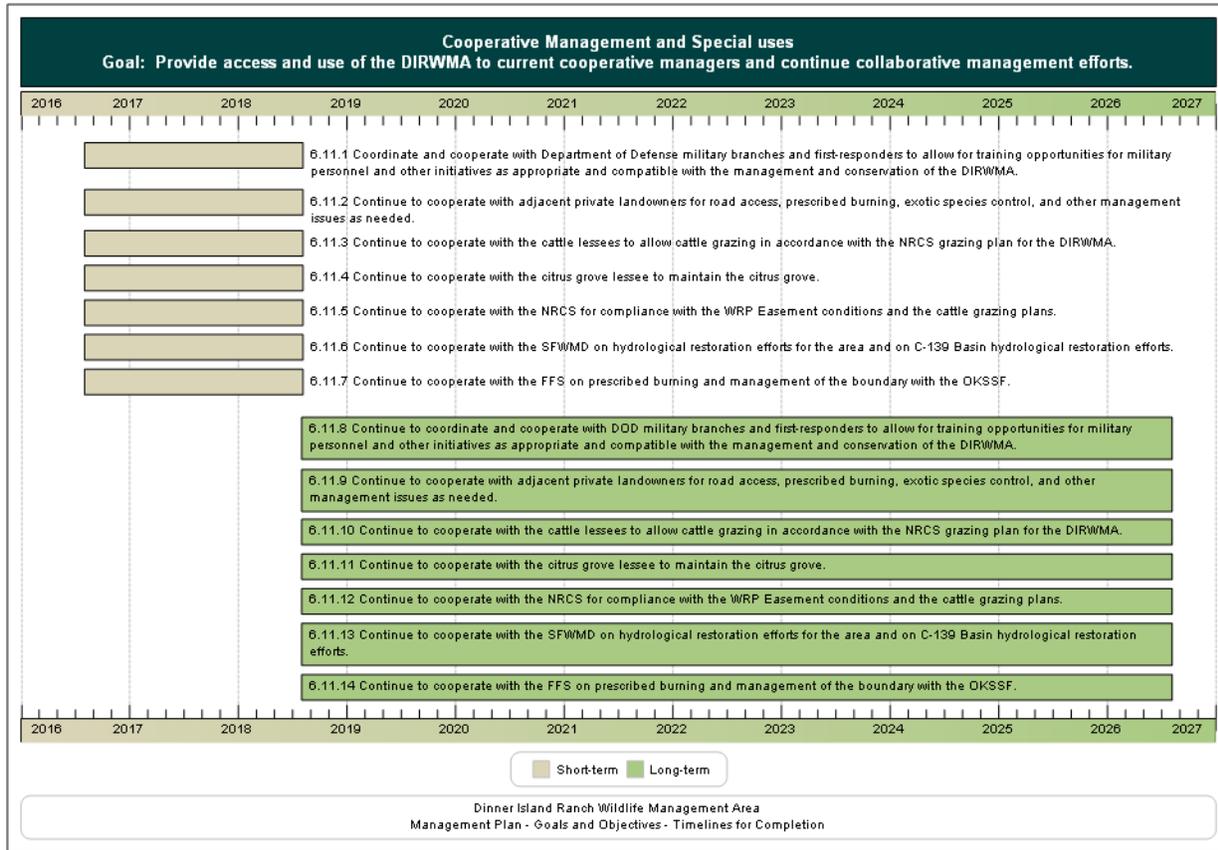


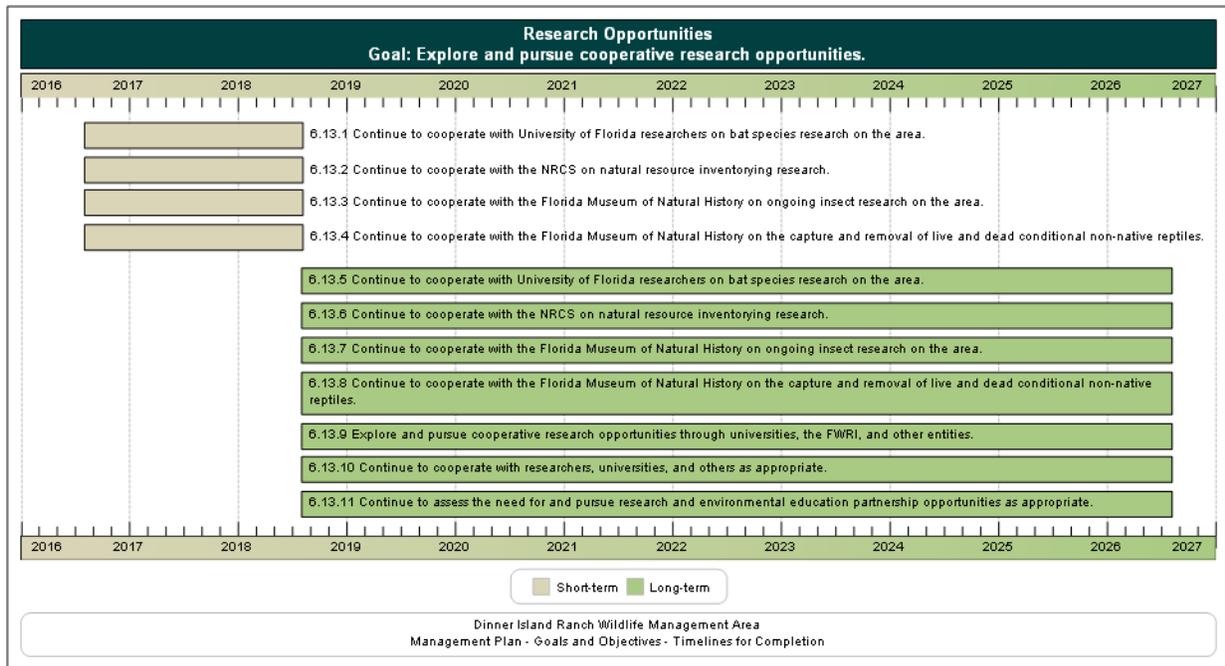












8 Resource Management Challenges and Strategies

The following section identifies and describes further management needs and challenges associated with the DIRWMA and provides solution strategies that will address these challenges. These specific challenges may not be fully addressed in the broader goals and objectives section above, and are thereby provided here.

8.1 Challenge: Remnant fire-adapted natural communities on the DIRWMA are scattered throughout the entire area in very small disparate acreages, which inhibits prescribed burning and the maintenance of those communities within prescribed fire return intervals.

- 8.1.1 Strategy: Contract prescribed burning and/or mowing to private contractors to increase area staff's ability to meet fire return interval goals and other objectives.
- 8.1.2 Strategy: Increase coordination with cattle lessees regarding grazing rotation and mowing plans annually and monthly to ensure adequate fuel-load in pastures within planned prescribed burn units.
- 8.1.3 Strategy: Prioritize burn units with greater concentrations of fire-adapted natural communities.
- 8.1.4 Strategy: Coordinate with adjacent landowners when conducting prescribed burns that border private property.

8.2 Challenge: Peak water levels in the summer are unmanageable along the eastern boundary, causing water to back onto the area and private lands south of the DIRWMA. Manipulating water control structures along this boundary to retain more water is not possible as water continues to flood over gates. Potential for another levee breach along the southern boundary or water flowing across road crossings exists if the ditches are at maximum holding capacity during a storm event.

- 8.2.1 Strategy: Coordinate with the SFWMD on snail kite nesting periods and Deer Fence Canal structure closures and openings.
- 8.2.2 Strategy: In cooperation with the citrus grove lessee, improve above ground impoundments to retain excess water during the wet season and ensure that the lessee is maintaining the canals in the vicinity of the grove.
- 8.2.3 Strategy: Continue to implement vegetation and sediment removal along White Farm Canal, Farm Field Road, and the eastern boundary canal along County Road 833.

8.2.4 Strategy: Conduct a hydrological assessment for the remainder of the area and seek resources to initiate long term management recommendations.

8.3 Challenge: Currently there are densities of exotic species on adjacent lands providing an extensive source of seed that disperses throughout and onto the DIRWMA.

8.3.1 Strategy: Coordinate with the local Cooperative Invasive Species Management Area, FWC's Uplands Invasive Plant Management Section, the FFS, FWC's LAP, and private organizations to obtain resources to control and manage exotic invasive plants on adjacent properties and the area.

8.3.2 Strategy: Cooperate with adjacent landowners on exotic species control and on obtaining funding to aid in exotic species management on adjacent private lands.

8.4 Challenge: There are some problems associated with use of the campgrounds, including dumping and littering, public users living in the campground for extended periods rather than camping short-term, and public users cutting down trees and branches in the campground to use as firewood.

8.4.1 Strategy: Coordinate with FWC law enforcement to assist with control of litter, natural resource use, and vandalism on the DIRWMA.

8.4.2 Strategy: Explore feasibility of amending area rules to adopt a camping permit system.

8.4.3 Strategy: Add signage to campground kiosk to notify public users of area campground uses and regulations.

8.5 Challenge: Currently, Road 6 is established through a wetland and causes habitat degradation.

8.5.1 Strategy: Explore the feasibility of limiting access to the wetland portion of Road 6 to ensure it is accessible only by FWC staff for management purposes.

8.6 Challenge: Substantial monoculture of semi-improved pasture and ruderal areas have replaced historical natural communities and continue to be an extensive habitat restoration undertaking due to the resources required. While grazing continues to be used as a management tool, reducing

available grazing acreage requires a management plan and acreage reductions have not remained consistent year to year. A developed strategy to eliminate pasture grasses in a larger context has not been fully addressed or investigated and will continue to be an on-going restoration effort.

8.6.1 Strategy: Reduce cattle grazing acreage commensurate with the habitat restoration strategy when it is developed.

8.6.2 Strategy: Secure resources required to improve or restore habitat to validate reduction of grazing before attempting to remove large parcels.

8.6.3 Strategy: Pursue grants and additional funding to aid in the implementation of the habitat restoration strategy.

8.7 Challenge: Currently the mineral rights within much of the DIRWMA are held by owners other than the Board of Trustees, which may potentially impact the public access, fish and wildlife resources, and management of the area if exploration and development of those mineral rights were to occur on the DIRWMA.

8.7.1 Strategy: Explore the potential of acquiring the mineral rights within the DIRWMA.

8.7.2 Strategy: Continue to cooperate and consult with permitting agencies including the DEP on any possible development of those mineral rights to mitigate any potential adverse impacts on the resources of the DIRWMA.

8.8 Challenge: Currently there is insufficient habitat on the DIRWMA to maintain wide-ranging species like the Florida panther.

8.8.1 Strategy: Continue to recommend completion of adjacent and nearby Florida Forever acquisition projects such as the Panther Glades, Half Circle L Ranch, Caloosahatchee Ecoscape, Corkscrew Ecosystem, Everglades, Twelve Mile Slough, and Devil's Garden Florida Forever projects.

8.8.2 Strategy: Continue to work with private landowners to enhance conservation stewardship efforts on surrounding private lands.

9 Cost Estimates and Funding Sources

The following represents the actual and unmet budgetary needs for managing the lands and resources of the DIRWMA. This cost estimate was developed using data developed by the 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. Additional revenues are generated from two cattle grazing contracts and one citrus grove management contract currently in place on the area.

The cost estimate below, although exceeding what the FWC typically receives through the appropriations process, is estimated to be what is necessary for optimal management, and is consistent with the current and planned resource management and operation of the DIRWMA. Cost estimate categories are those currently recognized by the FWC and the Land Management Uniform Accounting Council. More information on these categories, as well as the Fiscal Year 2016 operational plan showing detailed cost estimates by activity and categories of expenditures, may be found in Appendix 13.15.

Dinner Island Ranch WMA Management Plan Cost Estimate
Maximum expected one year expenditure

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority</u>	<u>Priority schedule:</u>
Exotic Species Control	\$807,733	(1)	(1) Immediate (annual)
Prescribed Burning	\$51,135	(1)	(2) Intermediate (3-4 years)
Cultural Resource Management	\$14,564	(1)	(3) Other (5+ years)
Timber Management	\$0	(1)	
Hydrological Management	\$189,545	(1)	
Other (Restoration, Enhancement, Surveys, Monitoring, etc.)	\$407,569	(1)	
Subtotal	\$1,470,546		
<u>Administration</u>			
General administration	\$19,935	(1)	
<u>Support</u>			
Land Management Planning	\$31,682	(1)	
Land Management Reviews	\$4,042	(3)	
Training/Staff Development	\$0	(1)	
Vehicle Purchase	\$166,129	(2)	
Vehicle Operation and Maintenance	\$66,439	(1)	
Other (Technical Reports, Data Management, etc.)	\$3,992	(1)	
Subtotal	\$272,284		
<u>Capital Improvements</u>			
New Facility Construction	\$27,298	(2)	
Facility Maintenance	\$206,021	(1)	
Subtotal	\$233,319		
<u>Visitor Services/Recreation</u>			
Info./Education/Operations	\$17,082	(1)	
<u>Law Enforcement</u>			
Resource protection	\$19,832	(1)	
Total	\$2,033,000	*	

* Based on the characteristics and requirements of this area, 5 FTE positions would be optimal to fully manage this area. All land management funding is dependent upon annual legislative appropriations.

Dinner Island Ranch WMA Management Plan Cost Estimate

Ten-year projection

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority</u>	<u>Priority schedule:</u>
Exotic Species Control	\$7,096,830	(1)	(1) Immediate (annual)
Prescribed Burning	\$449,274	(1)	(2) Intermediate (3-4 years)
Cultural Resource Management	\$127,962	(1)	(3) Other (5+ years)
Timber Management	\$0	(1)	
Hydrological Management	\$1,665,367	(1)	
Other (Restoration, Enhancement, Surveys, Monitoring, etc.)	\$3,580,949	(1)	
Subtotal	\$12,920,382		
<u>Administration</u>			
General administration	\$175,155	(1)	
<u>Support</u>			
Land Management Planning	\$278,364	(1)	
Land Management Reviews	\$11,570	(3)	
Training/Staff Development	\$0	(1)	
Vehicle Purchase	\$584,617	(2)	
Vehicle Operation and Maintenance	\$583,736	(1)	
Other (Technical Reports, Data Management, etc.)	\$35,074	(1)	
Subtotal	\$1,493,361		
<u>Capital Improvements</u>			
New Facility Construction	\$78,851	(2)	
Facility Maintenance	\$1,810,122	(1)	
Subtotal	\$1,888,973		
<u>Visitor Services/Recreation</u>			
Info./Education/Operations	\$150,088	(1)	
<u>Law Enforcement</u>			
Resource protection	\$174,249	(1)	
Total	\$16,802,207	*	

* Based on the characteristics and requirements of this area, 5 FTE positions would be optimal to fully manage this area. All land management funding is dependent upon annual legislative appropriations.

10 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. It has been determined that 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

- | | 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 | | | ✓ |

11 Compliance with Federal, State, and Local Governmental Requirements

The operational functions of FWC personnel are governed by the agency’s Internal Management Policies and Procedures (IMPP) Manual. 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 the 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 the DIRWMA 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 the FWC as described in its Agency Strategic Plan (Appendix 13.9). 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, 379, 403, 870, 373, 375, 378, 487, and 597 FS.

The FWC has developed and utilizes an Arthropod Management Plan for the DIRWMA in compliance with Chapter 388.4111 F.S. (Appendix 13.16). This plan was developed in cooperation with the local Hendry County arthropod control agency. This plan was also submitted to the Hendry County Planning Department for review and every effort has been made to ensure that the plan is in compliance with the Local Government Comprehensive Plan as approved and adopted for Hendry County, Florida (Appendix 13.17).

12 Endnotes

- ¹ Aldridge, C. L., M. S. Boyce and R. K. Baydack. 2004. Adaptive management of prairie grouse: how do we get there? *Wildlife Society Bulletin* 32:92-103.
- ² Wilhere, G. F. 2002. Adaptive management in Habitat Conservation Plans. *Conservation Biology* 16:20-29.
- ³ Walters, C. J. and R. Hilborn. 1978. Ecological optimization and adaptive management. *Annual Review of Ecology and Systematics* 9:157–188.
- ⁴ Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas, Final Report (1999).
- ⁵ Karl, T. R., J. M. Melillo, and T. C. Peterson (Eds.). 2009. *Global Climate Change Impacts in the United States*. Cambridge University Press. New York, NY.

- ⁶ McCarty, J. P. 2001. Ecological consequences of recent climate change. *Conservation Biology* 15:320-331.
- ⁷ Walther, G. R., E. Post, P. Convey, A. Menzel, C. Parmesan, T. J. . Beebee, J. M. Fromentin, O. Hoegh-Guldberg, and F. Bairlein. 2002. Ecological responses to recent climate change. *Nature* 416:389–395.
- ⁸ Parmesan, C. 2006. Ecological and evolutionary responses to recent climate change. *Annual Review of Ecology, Evolution, and Systematics* 37:637-669.
- ⁹ Logan, J. A., and J. A. Powell. 2009. Ecological consequences of climate change altered forest insect disturbance regimes. In *Climate Warming in Western North America: Evidence and Environmental Effects* (F. H. Wagner, Ed.). University of Utah Press, Salt Lake City, UT.
- ¹⁰ Stevenson, J. C., M. S. Kearney, and E. W. Koch. 2002. Impacts of sea level rise on tidal wetlands and shallow water habitats: A case study from Chesapeake Bay. *American Fisheries Society Symposium* 32:23-36.
- ¹¹ IPCC. 2007b. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK.
- ¹² Emanuel, K.A. 1987. The Dependence of Hurricane Intensity on Climate. *Nature* 326: 483-485.
- ¹³ Emanuel, K.A. 2005. Increasing Destructiveness of Tropical Cyclones Over the Past 30 Years.
- ¹⁴ Webster et al. 2005; Webster, P. J., et al. 2005. Changes in Tropical Cyclone Number, Duration, and Intensity, in a Warming Environment. *Science* 309: 1844–1846.
- ¹⁵ Mann, M.E. and K.A. Emanuel. 2006. Atlantic Hurricane Trends Linked to Climate Change. *Eos Trans. AGU* 87: 233-244.
- ¹⁶ Stanton, E.A. and F. Ackerman. 2007. *Florida and Climate Change: The Costs of Inaction*. Tufts University Global Development and Environment Institute and Stockholm Environment Institute–US Center, Tufts University, Medford, MA.
- ¹⁷ Clough, J.S. 2008. *Application of the Sea-Level Affecting Marshes Model (SLAMM 5.0) to Crystal River NWR*. Warren Pinnacle Consulting, Inc. for U.S. Fish and Wildlife Service. 46 pp.

13 Appendices

The appendix to the DIRWMA Management Plan is not included in this online version, in part due to the size of the appendices, which total more than 600 pages. Any individual appendix document, as well as the entire compiled appendix, is available upon request. Please contact FWC Land Conservation and Planning at (850) 487-7063 to request copies of these appendix documents.

Below is a list of the Appendix to the DIRWMA Management Plan:

13.1 Lease Agreements

13.1.1 Lease Number 4417

13.1.2 Amendment 1 to Lease Number 4417

13.1.3 Establishment Order

13.2 Definitions of Management Plan Terms

13.3 Titles Interests and Encumbrances

13.3.1 Contract #13457 – West Side Cattle Grazing Agreement with Hilliard Brothers of Florida, LLP

13.3.2 Contract #6058 – East Side Cattle Grazing Agreement with A&M Management of Hendry County, Inc.

13.3.3 Contract #11383 – Citrus Grove Management Contract with Krause Grove Service Inc.

13.3.4 Contract #31689 – Overhead Utility Easement Agreement with Glades Electric Cooperative, Inc.

13.3.5 Subsurface Mineral Resources

13.3.6 Wetland Reserve Program – Cost Share Agreement with NRCS for Wetland Restoration and WRP Easement Activities

13.4 Public input

13.4.1 Management Advisory Group Meeting Results

13.4.2 Public Hearing Notice, Advertisements, and Press Release

13.4.3 Public Hearing Report

13.4.4 Management Prospectus

- 13.5 Land Management Review Report
- 13.6 Soil Series Descriptions
- 13.7 DIRWMA Timber Assessment
- 13.8 FNAI Element Occurrence Data Usage Letter
- 13.9 FWC Agency Strategic Plan
- 13.10 DIRWMA Prescribed Burn Plan
- 13.11 FWC Apiary Policy
 - 13.11.1 DIRWMA Apiary Assessment
- 13.12 Management Procedures Guidelines - Management of Archaeological and Historical Resources
 - 13.12.1 DHR Guidelines for Ground Disturbing Activities
- 13.13 WCPR Species Management Strategy
- 13.14 DIRWMA Recreation Master Plan
- 13.15 Land Management Uniform Accounting Council Categories – Operation Plan Fiscal Year 2016
- 13.16 Arthropod Management Plan
- 13.17 Hendry County Review for Compliance with Local Comprehensive Plan