

A Management Plan for  
Chinsegut  
Wildlife and Environmental Area  
2014 - 2024



Hernando County, Florida

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

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**FLORIDA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION**

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INTERIM SECRETARY

December 2, 2014

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

**RE: Chinsegut Wildlife and Environmental Area - Lease No. 3774**

Dear Mr. Cochran:

The Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the Chinsegut Wildlife and Environmental Area management plan. The next management plan update is due December 2, 2024.

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 blue ink, appearing to read 'M. Gengenbach'.

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

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**A Management Plan  
for the  
Chinsegut Wildlife and Environmental Area**

Hernando County, Florida

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



July 2014

Approved \_\_\_\_\_

*Thomas H. Eason*

Thomas Eason  
Director, Division of Habitat and Species Conservation

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**LAND MANAGEMENT PLAN EXECUTIVE SUMMARY**

Lead Agency: Florida Fish and Wildlife Conservation Commission (FWC)

Common Name of Property: Chinsegut Wildlife and Environmental Area

Location: Hernando County, Florida

Acreage Total: 853 acres

Acreage Breakdown:

<u>Land Cover Classification</u>	<u>Acres</u>	<u>Percent of Total Area</u>
Basin marsh	69.5	8.5%
Basin swamp	10.9	1.3%
Bottomland forest	18.6	2.3%
Mesic flatwoods	7.7	0.9%
Mesic hammock	92.8	11.3%
Pasture-improved	33.0	4.0%
Pasture-semi-improved	9.0	1.1%
Ruderal	22.6	2.7%
Sandhill	103.1	12.5%
Upland hardwood forest	14.0	1.7%
Upland pine forest	441.9	53.7%

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

Lease/Management Agreement No.: 3774 (Appendix 13.1)

Use: Single  Management Responsibilities:

Multiple

Agency FWC

Responsibilities

LEAD, SUBLESSEE (Wildlife and Environmental Area, resource protection, law enforcement)

Designated Land Use: Wildlife and Environmental Area

Sublease (s): None

Encumbrances: List: Must be used for the sole purpose of environmental education, Right of way easement in favor of Hernando County.

Type Acquisition: Fish and Wildlife Habitat Program, Quitclaim deeds from U.S. government

Unique Features: May's and Burn's Prairie, Old Growth Sandhill

Archaeological/Historical: The Chinsegut Hill site, The Big Pine Tract site, The Bishop Homestead, John Korycki Bridge, Meredith Footbridge and Old 41 Bridge are documented within the CWEA..

Management Needs: Habitat restoration and improvement; public access and recreational opportunities; hydrological preservation and restoration; exotic and invasive species maintenance and control; imperiled species habitat maintenance, enhancement, and restoration.

Acquisition Needs/Acreage: Currently no parcels or acreage are on the FWC Additions and Inholdings list; However the Area adjoins Annutteliga Hammock Florida Forever Project Boundary that is recommended for Acquisition and the OCBP Shows Additional Lands Recommended for Potential Conservation (Figure 2 & Figure 9).

Surplus Lands/Acreage: None

Public Involvement: Management Advisory Group consensus building meeting and Public Hearing (Appendix 13.2)

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

ARC Approval Date \_\_\_\_\_ BTITF Approval Date: \_\_\_\_\_

Comments: \_\_\_\_\_

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## 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	1
2	The land acquisition program, if any, under which the property was acquired.	18-2.018 & 18-2.021	3
3	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	4
4	The legal description and acreage of the property.	18-2.018 & 18-2.021	2
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	8, 6
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	47
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	69,10, 72
8	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	5
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)	3-5
10	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	10, 42-43

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	46-47
12	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	5, 44-47
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	4, 60-63, 65
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	4
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	43, 77, 288
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	69-73

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)	60-63, 75-78
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	47
19	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	395
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	53-95
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	46-47
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	26, 64, 77
23	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(10)	46

\*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	12, 194-206
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)	208

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)	12, 53, 194-206
27	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	194
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)	12, 194
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	53, 214
30	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	214
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	214

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	12-47, 207, 213
33	Insert FNAI based natural community maps when available.	ARC consensus	27
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	12-44
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	12-44
36	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	43
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	43

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	12-42
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	28-42
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	23-29, 393
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)	53-60, 63-64, 71-74, 76-78
42	<b>Habitat Restoration and Improvement</b>	259.032(10) & 253.034(5)	54-58, 73
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.	↓	73-74
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.		73-94
42-C.	The associated measurable objectives to achieve the goals.		73-80
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>		73-80, 293
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.		95, 98, 378
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)	26-28
44	<b>Sustainable Forest Management, including implementation of prescribed fire management</b>		54-60, 64, 293
44-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		73-74, 77
44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	18-2.021, 253.034(5) & 259.032(10) ↓	66
44-C.	Measurable objectives (see requirement for #42-C).		73-74, 77
44-D.	Related activities (see requirement for #42-D).		56-57
44-E.	Budgets (see requirement for #42-E).		95, 378
45	<b>Imperiled species, habitat maintenance, enhancement, restoration or population restoration</b>	259.032(10) & 253.034(5)	73-74
45-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	54-60, 73-74

45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		73-74, 80-93
45-C.	Measurable objectives (see requirement for #42-C).		73-74
45-D.	Related activities (see requirement for #42-D).		64, 73
45-E.	Budgets (see requirement for #42-E).		95, 378
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)	16-23, 60, 74
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	387
48	Exotic and invasive species maintenance and control	259.032(10) & 253.034(5)	60
48-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	74-75
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		74-75
48-C.	Measurable objectives (see requirement for #42-C).		74-75, 81
48-D.	Related activities (see requirement for #42-D).		60, 74
48-E.	Budgets (see requirement for #42-E).		95-98, 378

## 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	43
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	42, 62
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	42
52	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. <i>See footnote.</i>	253.034(5)	42-43, 62
53	Hydrological Preservation and Restoration	259.032(10) & 253.034(5)	63-64
53-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	71, 76, 80
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		76
53-C.	Measurable objectives (see requirement for #42-C).		76

53-D.	Related activities (see requirement for #42-D).		62-63, 77
53-E.	Budgets (see requirement for #42-E).		95-98, 378

## 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	43-45, 77
55	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	43-45, 77, 287
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	77, 287
57	<b>Cultural and Historical Resources</b>	259.032(10) & 253.034(5)	64, 77, 287
57-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	77
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		77
57-C.	Measurable objectives (see requirement for #42-C).		77
57-D.	Related activities (see requirement for #42-D).		43-45, 77
57-E.	Budgets (see requirement for #42-E).		95, 98, 378

\*\*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)	60-63, 65-68
59	<b>Capital Facilities and Infrastructure</b>	259.032(10) & 253.034(5)	65, 66, 68
59-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	75
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		66, 75
59-C.	Measurable objectives (see requirement for #42-C).		75, 78
59-D.	Related activities (see requirement for #42-D).		60-63, 65-68, 75, 78
59-E.	Budgets (see requirement for #42-E).		95, 96, 378
60	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	46-47, 65-68

61	Public Access and Recreational Opportunities	259.032(10) & 253.034(5)	45-47
61-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	75
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		75
61-C.	Measurable objectives (see requirement for #42-C).		75
61-D.	Related activities (see requirement for #42-D).		45-47, 60-63, 66
61-E.	Budgets (see requirement for #42-E).		95, 96, 378

### 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	ii-xv
63	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	i
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	48-53
65	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032(10)	53-94
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)	95, 96, 378
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)	95, 96, 378
68	A statement of gross income generated, net income and expenses.	18-2.018	46, 95, 96, 378

\*\*\* = 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.

# Table of Contents

- 1 Introduction and General Information ..... 1
  - 1.1 Management Plan Purpose ..... 1
    - 1.1.1 FWC Planning Philosophy ..... 2
  - 1.2 Location ..... 2
  - 1.3 Acquisition ..... 3
  - 1.4 Purpose for Acquisition of the Property ..... 3
  - 1.5 Management Authority ..... 4
  - 1.6 Management Directives ..... 4
  - 1.7 Title Interest and Encumbrances ..... 4
  - 1.8 Proximity to Other Public Properties ..... 5
  - 1.9 Adjacent Land Uses ..... 5
  - 1.10 Public Involvement ..... 12
- 2 Natural and Cultural Resources ..... 12
  - 2.1 Physiography ..... 12
    - 2.1.1 Climate ..... 12
    - 2.1.2 Topography ..... 13
    - 2.1.3 Soils ..... 13
    - 2.1.4 Geologic Conditions ..... 13
  - 2.2 Vegetation ..... 16
    - 2.2.1 FNAI Natural Community Descriptions ..... 23
    - 2.2.2 Forest Resources ..... 27
  - 2.3 Fish and Wildlife Resources ..... 29
    - 2.3.1 Imperiled Species ..... 30
    - 2.3.2 FWC Wildlife Observations and FNAI Element Occurrences ..... 30
  - 2.4 Native Landscapes ..... 43
  - 2.5 Water Resources ..... 43
  - 2.6 Beaches and Dunes ..... 44
  - 2.7 Mineral Resources ..... 44
  - 2.8 Cultural Resources ..... 44
  - 2.9 Scenic Resources ..... 45
- 3 Uses of the Property ..... 45
  - 3.1 Previous Use and Development ..... 45

3.2	Current Use of the Property.....	46
3.2.1	Visitation and Economic Benefits.....	47
3.3	Single- or Multiple-use Management .....	47
3.3.1	Analysis of Multiple-use Potential.....	47
3.3.2	Assessment of Impact of Planned Uses of the Property.....	48
3.4	Acreage That Should Be Declared Surplus .....	48
4	Accomplished Objectives from the CWEA Management Plan 2002-2012.....	49
5	Management Activities and Intent .....	54
5.1	Land Management Review .....	54
5.2	Adaptive Management.....	54
5.2.1	Monitoring .....	55
5.2.2	Performance Measures.....	55
5.2.3	Implementation .....	55
5.3	Habitat Restoration and Improvement.....	55
5.3.1	Objective-Based Vegetation Management.....	56
5.3.2	Prescribed Fire and Fire Management .....	57
5.3.3	Habitat Restoration .....	58
5.3.4	Apiaries .....	58
5.4	Fish and Wildlife Management, and Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration.....	59
5.4.1	Fish and Wildlife.....	59
5.4.2	Imperiled Species - Wildlife Conservation Prioritization and Recovery .....	60
5.5	Exotic and Invasive Species Maintenance and Control.....	60
5.6	Public Access and Recreational Opportunities .....	61
5.6.1	Americans with Disabilities Act .....	61
5.6.2	Recreation Master Plan .....	62
5.6.3	Public Access Carrying Capacity.....	62
5.6.4	Wildlife Viewing.....	62
5.6.5	Hunting .....	62
5.6.6	Fishing.....	62
5.6.7	Boating.....	63
5.6.8	Hiking .....	63
5.6.9	Bicycling.....	63

5.6.10	Equestrian .....	63
5.6.11	Camping .....	63
5.6.12	Geocaching .....	63
5.6.13	Environmental Education.....	64
5.7	Hydrological Preservation and Restoration.....	64
5.7.1	Hydrological Assessment.....	64
5.7.2	Water Resource Monitoring.....	64
5.8	Forest Resource Management.....	64
5.8.1	Forest Management Plan.....	65
5.8.2	Cultural and Historical Resources.....	65
5.9	Capital Facilities and Infrastructure.....	65
5.10	Land Conservation and Stewardship Partnerships.....	70
5.10.1	Optimal Resource Boundary .....	70
5.10.2	Optimal Conservation Planning Boundary .....	70
5.10.3	Conservation Action Strategy .....	70
5.10.4	FWC Florida Forever Additions and Inholdings Acquisition List.....	71
5.11	Research Opportunities.....	71
5.12	Cooperative Management and Special Uses.....	71
5.12.1	Cooperative Management .....	71
5.12.2	First Responder and Military Training.....	72
5.13	Climate Change .....	72
5.14	Soil and Water Conservation .....	73
6	Resource Management Goals and Objectives.....	75
6.1	Habitat Restoration and Improvement.....	75
6.2	Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration .....	75
6.3	Exotic and Invasive Species Maintenance and Control.....	76
6.4	Public Access and Recreational Opportunities.....	77
6.5	Hydrological Preservation and Restoration.....	78
6.6	Forest Resource Management.....	79
6.7	Cultural and Historical Resources .....	79
6.8	Capital Facilities and Infrastructure.....	80
6.9	Land Conservation and Stewardship Partnerships.....	81

6.10	Climate Change .....	81
6.11	Research Opportunities.....	82
7	Schedule: Timelines for Completion of Resource Management Goals and Objectives .....	82
8	Resource Management Challenges and Strategies.....	96
9	Cost Estimates and Funding Sources .....	97
10	Analysis of Potential for Contracting Private Vendors for Restoration and Management Activities.....	100
11	Compliance with Federal, State, and Local Governmental Requirements.....	101
12	Endnotes.....	102
13	Appendices.....	104
13.1	Lease Agreement .....	105
13.2	Public Input.....	195
13.3	Soil Series Descriptions.....	247
13.4	Land Management Review .....	254
13.5	FWC Agency Strategic Plan.....	263
13.6	FWC Apiary Policy .....	270
13.7	Management Procedures Guidelines - Management of Archaeological and Historical Resources .....	294
13.8	CWEA Prescribed Burn Plan.....	299
13.9	Wildlife Conservation Prioritization and Recovery Species Management.....	328
13.10	Land Management Uniform Accounting Council Categories - FWC Operation Plan Fiscal Year 2013 – 2014 .....	387
13.11	Arthropod Control Plan .....	397
13.12	FNAI Data Usage Letter.....	402
13.13	Hernando County Letter of Compliance with Local Government Comprehensive Plan .....	405

## Table of Figures

Figure 1. Proximity Map, Township and Range .....	8
Figure 2. Proximity Conservation Lands and Florida Forever Projects.....	10
Figure 3. Soils Type of the CWEA.....	14
Figure 4. Soils – Depth to Water Table .....	15
Figure 5. The CWEA Natural Communities.....	28
Figure 6. FWC Integrated Wildlife Habitat Ranking System 2009 .....	31
Figure 7. FWC Wildlife Observations and FNAI Element Occurrences.....	32
Figure 8. Established Burn Unit and Infrastructure Map.....	68
Figure 9. Optimal Conservation Planning Boundary .....	74

## Table of Tables

Table 1. Florida Forever Projects in Vicinity of the CWEA.....	6
Table 2. Conservation Lands in Vicinity of the CWEA .....	6
Table 3. Rare Plant Species Found on the CWEA.....	16
Table 4. Invasive Exotic Plant Species Found on the CWEA .....	17
Table 5. Native Plant Species Found on the CWEA.....	17
Table 6. Natural Community Type Percentages Known to Occur on the CWEA.....	23
Table 7. Mammal Species documented on the CWEA.....	33
Table 8. Reptile and Amphibian Species documented on the CWEA.....	33
Table 9. Fish Species documented on the CWEA .....	35
Table 10. Bird Species documented and Likely to Occur on the CWEA .....	35
Table 11. Imperiled Wildlife Species documented on or near the CWEA .....	41
Table 12. FNAI Observations documented on the CWEA .....	41
Table 13. WCPR Focal Species for the CWEA.....	42
Table 14. Exotic Species documented on the CWEA.....	43
Table 15. Maximum Expected One Year Expenditure .....	98
Table 16. Maximum Expected Ten Year Expenditure.....	99

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# 1 Introduction and General Information

Nestled within the ancient sandhills of the Brooksville Ridge physiographic province in Hernando County, Florida, the Chinsegut Wildlife and Environmental Area (CWEA) conserves one of the few remaining stands of intact old-growth longleaf pine forests in Florida. Among its many unique and significant features, the CWEA's Big Pine tract may be the largest contiguous stand of old-growth virgin longleaf pine forests in Florida. Many of the longleaf pines are estimated to be over 200 years old and at least one tree has been aged at 236 years of age. This ancient forest provides important habitat for a diverse suite of imperiled wildlife species such as the gopher tortoise, Eastern indigo snake, red cockaded woodpecker, limpkin, wood stork and Sherman's fox squirrel, among others, along with assortment of rare plants and more common native plants and wildlife.

The CWEA is managed by the Florida Fish and Wildlife Conservation Commission (FWC) to conserve these significant unique natural features. The CWEA allows for the perpetuation and management of the longleaf pine-turkey oak community, characteristic of Florida sandhills, a rapidly diminishing natural community and the wildlife and plants that inhabit the area. Consequently, the area's old growth longleaf pine forest's wetlands and scattered hardwood hammocks are home to a wide variety of native plants and animals, including several endangered species and species of special concern making this a fitting and important area for environmental education. The CWEA also has a historical significance that will continue to influence the wildlife management and environmental education programs.



The CWEA consists of the 408 acre Chinsegut Nature Center tract and the 445 acre Big Pine tract for a total of 853 acres. The primary focus of the Chinsegut Nature Center and the CWEA is environmental and natural resource education. Many educational programs and hikes are hosted throughout the year. While the CWEA provides a variety of outdoor fish and wildlife based educational and recreational opportunities, hunting and fishing are not permitted.

## 1.1 Management Plan Purpose

This Management Plan serves as the basic statement of policy and direction for the management of the CWEA. It provides information including the past usage, conservation acquisition history, and descriptions of the natural and cultural resources found on the CWEA. Furthermore, it identifies FWC's future management intent, goals and associated short and long-term objectives, as well as identifying challenges and solutions. This Management Plan has been developed to guide each aspect of the CWEA'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 No. 3774 (Appendix 13.1 ) 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 DSL. Terms (Appendix 13.10) 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**

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. FWC engages stakeholders by convening a MAG and solicits additional input from user groups and the general public at a public hearing (Appendix 13.2). 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 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 CWEA Management Plan (Sections 5 – 8).

Additional management planning input is received through Land Management Reviews (LMR) conducted every five years, which includes a review of the previous Management Plan, as well as a field review of the CWEA. The LMR report (Section 5.1, Appendix 13.4) 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 FWC so they may be adequately addressed in this Management Plan, and thus guide the implementation of the LMR team recommendations on the CWEA.

Furthermore, 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**

The CWEA is made up of two separate irregular shaped parcels that are managed as one unit. The CWEA is located about six miles north of Brooksville (approximately 50 miles north of Tampa) on State Road 41, in Hernando County, Florida. The CWEA is bounded on the north by County Road (C.R.) 476, on the west by C.R.481, on the south by U.S. Highway 41, and on the east by the Natural Resource Conservation Service Plant Materials Subtropical Research Station. The entrance to the Chinsegut Nature Center is located on C.R. 476. The Big Pine Tract of the CWEA is located approximately four miles

north of Brooksville and about two miles southwest of the Chinsegut Nature Center Tract and is divided by Old Crystal River Road (Figure 1). Eighty acres of the Big Pine Tract lie west of the road and 365 acres lie to the east between Old Crystal River Road and US Highway 41. The property comprising the CWEA is located within parts of Sections 1 and 2, Township 22 South and Range 19 East, as well as within Sections 25 and 36 in Township 21 South and Range 19 East.

### 1.3 Acquisition

The CWEA has its origins in lands conveyed by the Federal government to the State of Florida. The USDA acquired the 2,082 acre Chinsegut Estate from Colonel Raymond Robins in 1932 under the Migratory Bird Conservation Act. Colonel Robins designated specific portions of this "Chinsegut Hill Sanctuary" to be for a migratory bird and wildlife refuge, forest reserve, and an agricultural experiment station.

On January 20, 1967, the Florida Game and Fresh Water Fish Commission (now FWC) approved a revocable permit with the USDA relative to 408 acres of the land, designating the area as a nature preserve. In June 1973, ownership of the 408 acres was transferred by quitclaim deed from the USDA to the FWC for continued management for wildlife management and conservation education. This area became known as the Nature Center tract of the CWEA.



The original 420 acres of the Big Pine tract of the CWEA originated from the same 2,082 acres of Robins' estate that was made surplus by the Federal government. In 1973, the United States Department of Health, Education and Welfare (now the Department of Education) deeded 420 acres, designated as a "virgin longleaf pine" forest preserve, to the University of Florida (UF) School of Forest Resources and Conservation. The main provision of this quitclaim deed was for the property to "be utilized continuously for educational purposes" for thirty years. After fourteen years, UF was unable to utilize the Big Pine tract according to the original agreement, and on May 11, 1989, the United States Department of Education (USDOE) transferred the quitclaim deed to the Board of Trustees, for use in conjunction with the Chinsegut Nature Center and in cooperation with the Hernando County School Board.

In 2009, The Nature Conservancy donated two parcels to the Board of Trustees adjacent to the Big Pine tract totaling approximately 25 acres. One parcel, of approximately six acres in size, is located adjacent to the western boundary of the original Big Pine tract. The other parcel, approximately 19 acres in size, located immediately east of the original Big Pine tract on and west side of U.S. Highway 41.

### 1.4 Purpose for Acquisition of the Property

As noted above the lands that form the CWEA were conveyed by the USDA to the FWC and from the U.S. Department of Education to the Board of Trustees for the purpose of ensuring that these unique natural lands and resources are preserved in perpetuity and to provide environmental education. In

conserving these unique natural habitats and their associated wildlife and plants, the FWC developed and operates the CWEA Nature Center to offer a wide assortment of environmental education opportunities. These environmental education programs also aid in fulfilling Florida's Environmental Education Act, passed by the Florida Legislature in 1989. This Act emphasizes the role state agencies play in creating an effective environmental education program for Florida. According to the 1987 Comprehensive Plan for Environmental Education, FWC is one of several state agencies that have responsibility for "managing and providing information about the environment." The 1989 Act identified the need to develop programs for public schools, community colleges and state universities; the need to provide appropriate in-service training for teachers; and the importance of integrating environmental education into the entire curriculum. The CWEA is a valuable tool and model that helps FWC fulfill its responsibilities as facilitators of environmental education in Florida.

The unique ecological and historical qualities and the overall accessibility to the general public make this area extremely valuable for developing and expanding environmental education programs in this region. In particular, the CWEA provides a site that is well suited for the FWC to develop unique and innovative environmental education programs focusing on wildlife habitat management.

Therefore, in keeping with the covenants of the original deeds of conveyance and the guidance of Florida's Environmental Education Act, FWC continues to manage the CWEA in accordance with the area's original purposes of acquisition, to preserve its unique natural resources and provide environmental education programs and opportunities.

### **1.5 Management Authority**

FWC is the designated lead managing agency for the CWEA under the authority granted by Lease Number 3774 from the Board of Trustees agent, 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, 372, 373, 375, 378, 403, 487, 870, and 597 and of the FS. These constitutional provisions and laws provide FWC the authority to protect, conserve, and manage the State's fish and wildlife resources.

### **1.6 Management Directives**

The 50-year Board of Trustees' Lease Agreement Number 3774 with FWC directs FWC to "manage the leased premises only for the conservation and protection of natural and historical resources and resource-based, public outdoor recreation which is compatible with the conservation and protection of these public lands, as set forth in subsection 253.023(11), FS..." The lease agreement further directs FWC to "implement applicable Best Management Practices for all activities under this lease in compliance with paragraph 18-2.018(2)(h), FAC, which have been selected, developed, or approved by lessor, lessee, or other land managing agencies for the protection and enhancement of the leased premises."

### **1.7 Title Interest and Encumbrances**

The FWC holds title (1973 quitclaim deed from the USDA,) to the 408 acre Nature Center tract. The Board of Trustees holds title (via 1989 quitclaim deed from the U.S. Department of Education, 420 acres and 25 acres via warranty deed from The Nature Conservancy, 2008) to the now 445 acre Big Pine tract.

Encumbrances on the Nature Center tract include provisions of the quitclaim deed, which maintains that the area be "continuously used only as and for the conservation of wildlife." In the event this tract is no

longer used for this purpose, the title shall revert to the United States of America. Furthermore, the title shall revert to the United States of America if the property is needed for national defense purposes.

The Big Pine tract is encumbered by a right-of-way easement in favor of the Board of County Commissioners, Hernando County, for a public road west of Crystal River Road within and along the south boundary of the tract. The 30-year environmental education requirement of the deed for the Big Pine tract from the USDOE expired in 2003.

Both tracts are encumbered by rights-of-way easements in favor of the Board of County Commissioners, Hernando County, for public roads, highways, utilities, railroads, pipelines and/or covenants, restrictions, reservations, conditions, and other agreements in place before execution of both quitclaim deeds.

In 1990, DSL, as staff to the Board of Trustees, entered into Lease Agreement Number 3774, a 50 year lease agreement, granting FWC management authority for the CWEA.

### **1.8 Proximity to Other Public Properties**

The CWEA is located in the vicinity of a large number of publicly owned conservation areas and Florida Forever projects (Figure 2). Tables 1 and 2 list the Florida Forever projects and conservation lands within a 20-mile radius of the CWEA, including lands managed by public and private entities, that conserve cultural and natural resources within this region of Florida.

Most of the conservation lands listed in Table 2 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 and being managed by a private landowner while a public agency or not-for-profit organization holds a conservation easement on the land.

### **1.9 Adjacent Land Uses**

The land within the CWEA is currently zoned as conservation lands; the parcels comprising the CWEA are accordingly listed in the Hernando County Comprehensive Land Use Plan as “Conservation.” This designation by Hernando County primarily allows for natural resource conservation and recreational uses.

The area directly surrounding the CWEA is currently zoned for Rural Development and Conservation. This designation allows for rural, agriculture and silviculture uses and natural resource conservation/preservation. Residential uses are allowed with a maximum density of one dwelling unit per ten acres. The area south of the CWEA is characterized by rural residential lots approximately 2.5 acres in size or larger.

More intensive development has occurred on much of the privately owned lands in the vicinity of the CWEA and is expected to continue according to the Future Land Use Map of Hernando County. This includes residential communities, golf courses, resorts and commercial facilities such as supermarkets, stores, gas stations and shopping centers. The corresponding zoning designations are varied and include residential, agricultural, commercial and industrial.

**Table 1. Florida Forever Projects in Vicinity of the CWEA**

<b>Project Name</b>	<b>GIS Acres</b>
Annutteliga Hammock	24,771
Battle of Wahoo Swamp	853
Crossbar/Al Bar Ranch	12,440
Florida Springs Coastal Greenway - Homosassa Reserve/Walker Property	9,901
Florida Springs Coastal Greenway - St. Martins River	26,099
Florida's First Magnitude Springs - Weekiwachee Springs	1,264
Southeastern Bat Maternity Caves - Sumter County Cave	175
Southeastern Bat Maternity Caves - Sweet Gum Cave	9

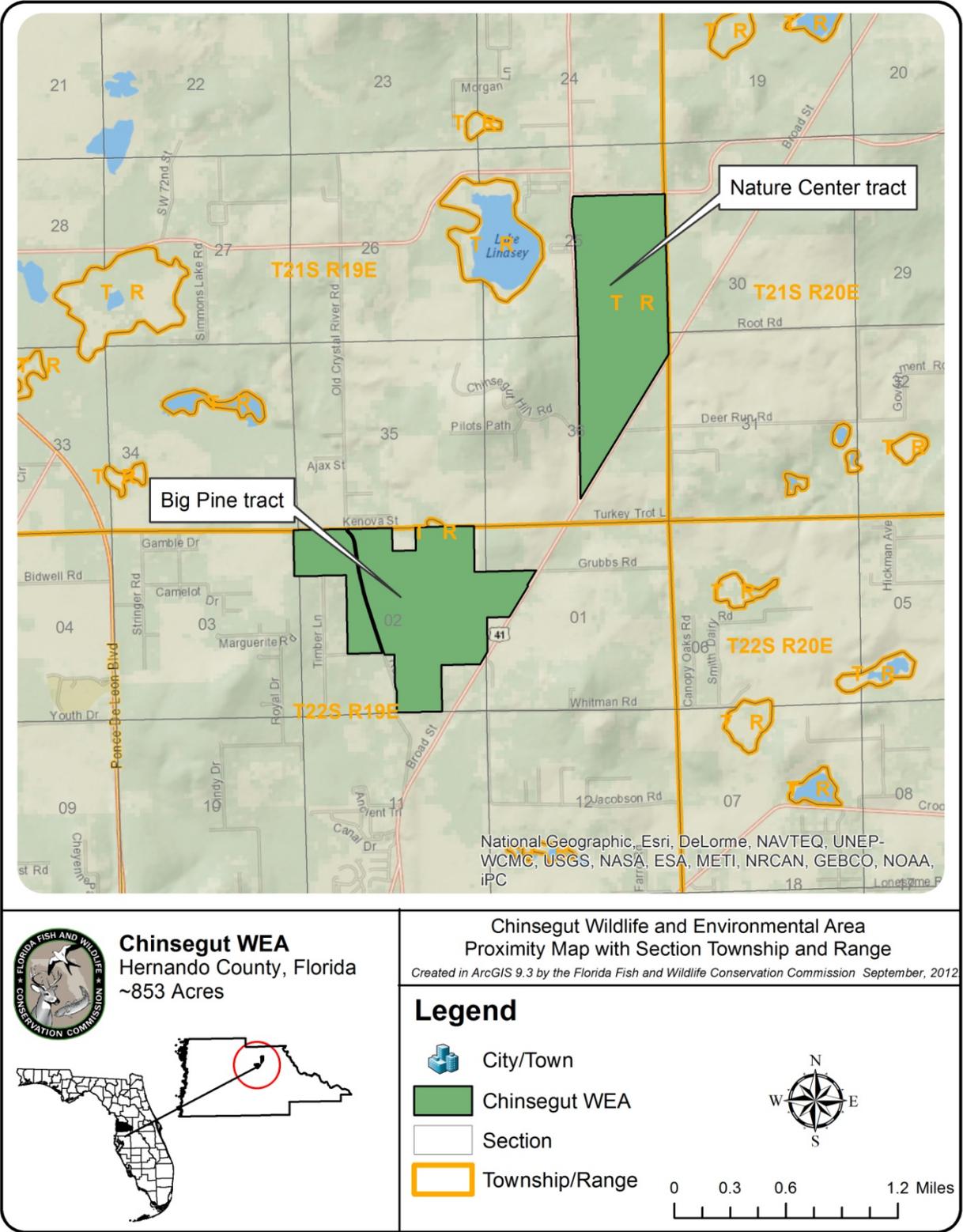
**Table 2. Conservation Lands in Vicinity of the CWEA**

<b>Federal Government</b>	<b>Managing Agency</b>
Brooksville Plant Materials Center	USDA
Chassahowitzka National Wildlife Refuge	USFWS
Crystal River National Wildlife Refuge	USFWS
Subtropical Agricultural Research Station	USDA
<b>State of Florida</b>	<b>Managing Agency</b>
Chassahowitzka WMA	FWC
Chinsegut Hill Conference Center	USF
Crystal River Preserve State Park	DEP
Dade Battlefield Historic State Park	DEP
Ellie Schiller Homosassa Springs Wildlife State Park	DEP
Fort Cooper State Park	DEP
Half Moon WMA	FWC
Janet Butterfield Brooks WEA	FWC
Perry Oldenburg WEA	FWC
Weeki Wachee Springs State Park	DEP
Withlacoochee State Forest	DACS
Withlacoochee State Trail	DEP
Yulee Sugar Mill Ruins Historic State Park	DEP
<b>Water Management District</b>	<b>Managing Agency</b>
Annutteliga Hammock	SWFWMD
Beville Ranch Conservation Easement	SWFWMD
Chassahowitzka River and Coastal Swamps	SWFWMD
Conner Preserve	SWFWMD
Cypress Creek Conservation Easement	SWFWMD
Cypress Creek Flood Detention Area	SWFWMD

**Table 2. Conservation Lands in Vicinity of the CWEA**

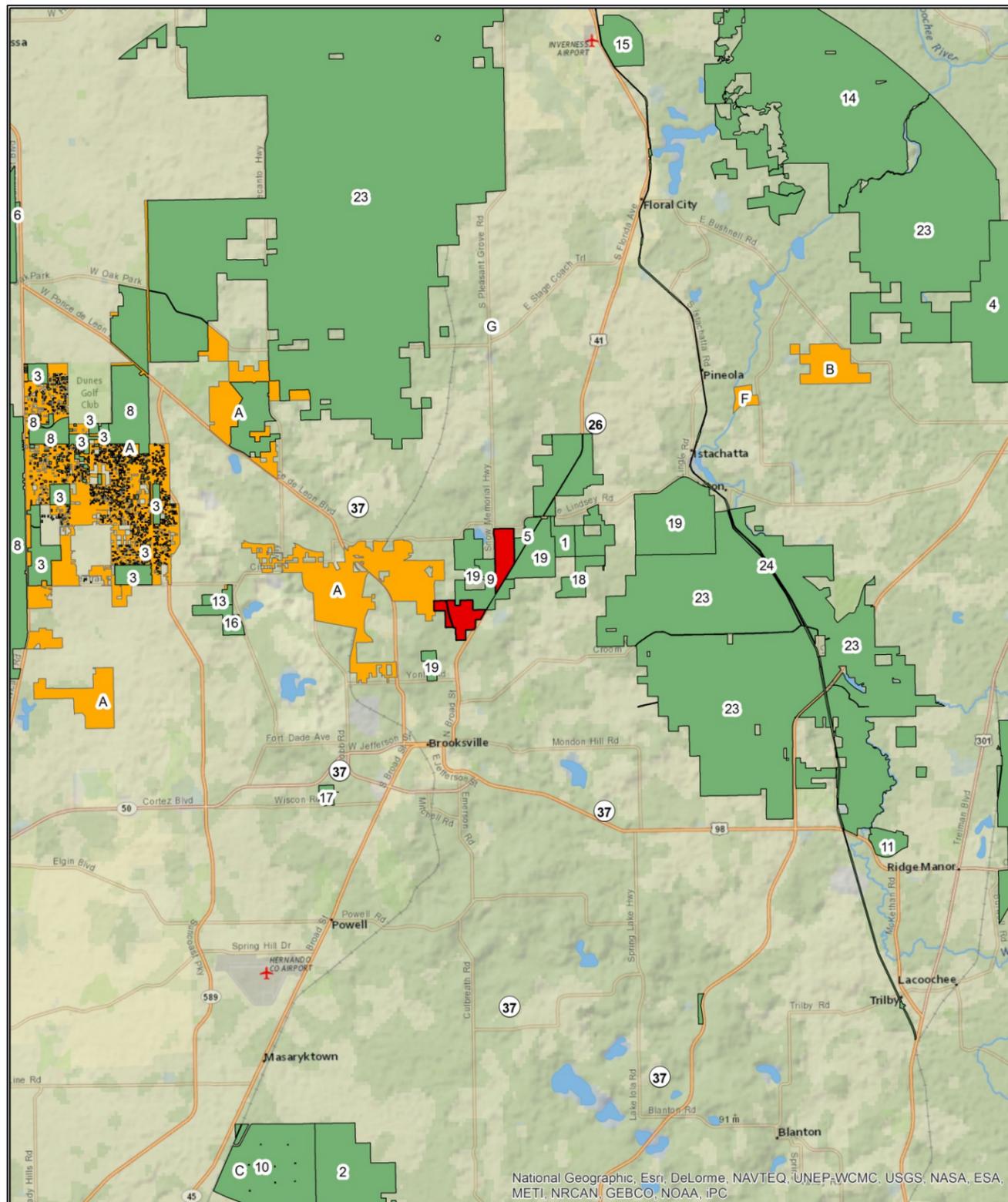
Flying Eagle Ranch	SWFWMD
Green Swamp	SWFWMD
Lake Panasoffkee	SWFWMD
Panasoffkee/Outlet Tract	SWFWMD
Potts Preserve	SWFWMD
SWFWMD Green Swamp Conservation Easements	SWFWMD
Weekiwachee Preserve	SWFWMD
<b>County/City</b>	<b>Managing Agency</b>
Al Bar Ranch	Pinellas County
Bella Verde Conservation Easement	Pasco County
Crews Lake Wilderness Park	Pasco County
Cross Bar Ranch Wellfield	Pinellas County
Cypress Lakes Preserve	Hernando County
Fickett Hammock Preserve	Hernando County
Jumping Gully Preserve	Pasco County
Peck Sink Preserve	Hernando County
Upper Pithlachascotee River Preserve	Pasco County
<b>Private/Public Conservation Organization</b>	<b>Managing Agency</b>
Ahhochee Hill Sanctuary	Florida Audubon Society, Inc.

<b>Acronym Key</b>	<b>Agency Name</b>
<b>DACS</b>	Florida Department of Agriculture and Consumer Services
<b>DEP</b>	Florida Department of Environmental Protection
<b>FWC</b>	Florida Fish and Wildlife Conservation Commission
<b>SWFWMD</b>	Southwest Florida Water Management District
<b>USDA</b>	United States Department of Agriculture
<b>USF</b>	University of South Florida
<b>USFWS</b>	United States Fish and Wildlife Service



**Figure 1. Proximity Map, Township and Range**

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**Conservation Lands and Florida Forever Projects**

**Map Number Conservation Lands**

- 1 Ahhochee Hill Sanctuary
- 2 Al Bar Ranch
- 3 Annutteliga Hammock
- 4 Beville Ranch Conservation Easement
- 5 Brooksville Plant Materials Center
- 6 Chassahowitzka National Wildlife Refuge
- 7 Chassahowitzka River and Coastal Swamps
- 8 Chassahowitzka WMA
- 9 Chinsegut Hill Conference Center
- 10 Cross Bar Ranch Wellfield
- 11 Cypress Lakes Preserve (Hernando County)
- 12 Dade Battlefield Historic State Park
- 13 Fickett Hammock Preserve
- 14 Flying Eagle Ranch
- 15 Fort Cooper State Park
- 16 Janet Butterfield Brooks Preserve WEA
- 17 Peck Sink Preserve
- 18 Perry Oldenburg WEA
- 19 Subtropical Agricultural Research Station
- 20 Weeki Wachee Springs State Park
- 21 Weekiwachee Preserve
- 22 Whispering Pines Park
- 23 Withlacoochee State Forest
- 24 Withlacoochee State Trail

**Map Symbol Florida Forever Project Name**

- A Annutteliga Hammock
- B Battle of Wahoo Swamp
- C Crossbar/Al Bar Ranch
- E Florida Springs Coastal Greenway
- D Florida's First Magnitude Springs
- F Southeastern Bat Maternity Caves (Sumter County Cave)
- G Southeastern Bat Maternity Caves (Sweet Gum Cave)



**Chinsegut Wildlife and Environmental Area**

Hernando County, Florida  
~853 Acres



**Conservation Lands and Florida Forever Projects Within a 15 Mile Radius**

**Legend**

- Chinsegut WEA
- Conservation Lands
- Florida Forever Projects



Created in ArcGIS 9.3 by the Florida Fish and Wildlife Conservation Commission January, 2014.

**Figure 2. Proximity Conservation Lands and Florida Forever Projects**

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## 1.10 Public Involvement

FWC conducted a MAG meeting in Brooksville, Florida on September 19, 2012, to obtain input from both public and private stakeholders regarding management of the CWEA. Results of this meeting were used by FWC to develop management goals and objectives and to identify opportunities and strategies for inclusion in this Management Plan. A summary of issues and opportunities raised by the MAG, as well as a listing of participants, is included as Appendix 13.2. Further, a public hearing, as required by Chapter 259.032(10), FS, was held in the city of Brooksville in Hernando County on October 30, 2012. The report of that hearing is also contained in Appendix 13.2.



A website is also maintained for receipt of public input at <http://myfwc.com/conservation/terrestrial/management-plans/develop-mps/>. 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 Cultural Resources

### 2.1 Physiography

As noted earlier, the CWEA is located within the Brooksville Ridge Physiographic Province. The Brooksville Ridge occupies most of Hernando County and extends easterly from about U.S. Highway 19 to U.S. Highway 301. The Brooksville Ridge is made up of two distinct parts: the eastern/western edges and a central area.

#### 2.1.1 Climate

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

The average annual maximum temperature for the City of Brooksville during the period 1892 to 2012 was 82° Fahrenheit (F). The average minimum annual temperature for the same period was 60.8° F. Historically, the lowest average temperatures have occurred in January and the highest average temperatures have occurred in July and August. Annually, Brooksville experiences an average total rainfall of 55 inches.

### **2.1.2 Topography**

The central part of the Brooksville Ridge ranges in elevation from about 100 feet to more than 200 feet. This rolling area consists of poorly drained to well drained, sandy to clayey soils. Natural vegetation consists of pine and hardwoods. Much of this area is cleared and used for crops and pasture. Elevations within the CWEA vary. The highest point within the Big Pine tract is 159 feet above mean sea level (MSL) in the northwest corner and the land descends to 90 feet above MSL in the western portion and 70 feet above MSL in the eastern portion of this tract. Topography is similar within the Nature Center tract, where the highest point is 116 feet above MSL at the northern border, and the elevation descends to 66 feet above MSL within May's Prairie. May's Prairie, Burn's Prairie, and the two willow swamps are wet areas with elevations between 66 and 67 feet above MSL. Additional low points of elevation include at least one sinkhole on each tract and several borrow pits by the old entrance road to the Chinsegut Nature Center.

The rolling, deep, sandy ridges on both the western and eastern edges of the area are dominated by deep, sandy soils with numerous depressions and sinks. Elevations range from about 75 to 100 feet in the western part and from about 50 to 100 feet in the eastern part. Natural vegetation on these deep, sandy soils is mostly turkey oak, blue jack oak, post oak, scrub live oak, scattered longleaf pine, and an understory of pineland three-awn. In places, there are small ponds with sandy bottoms.

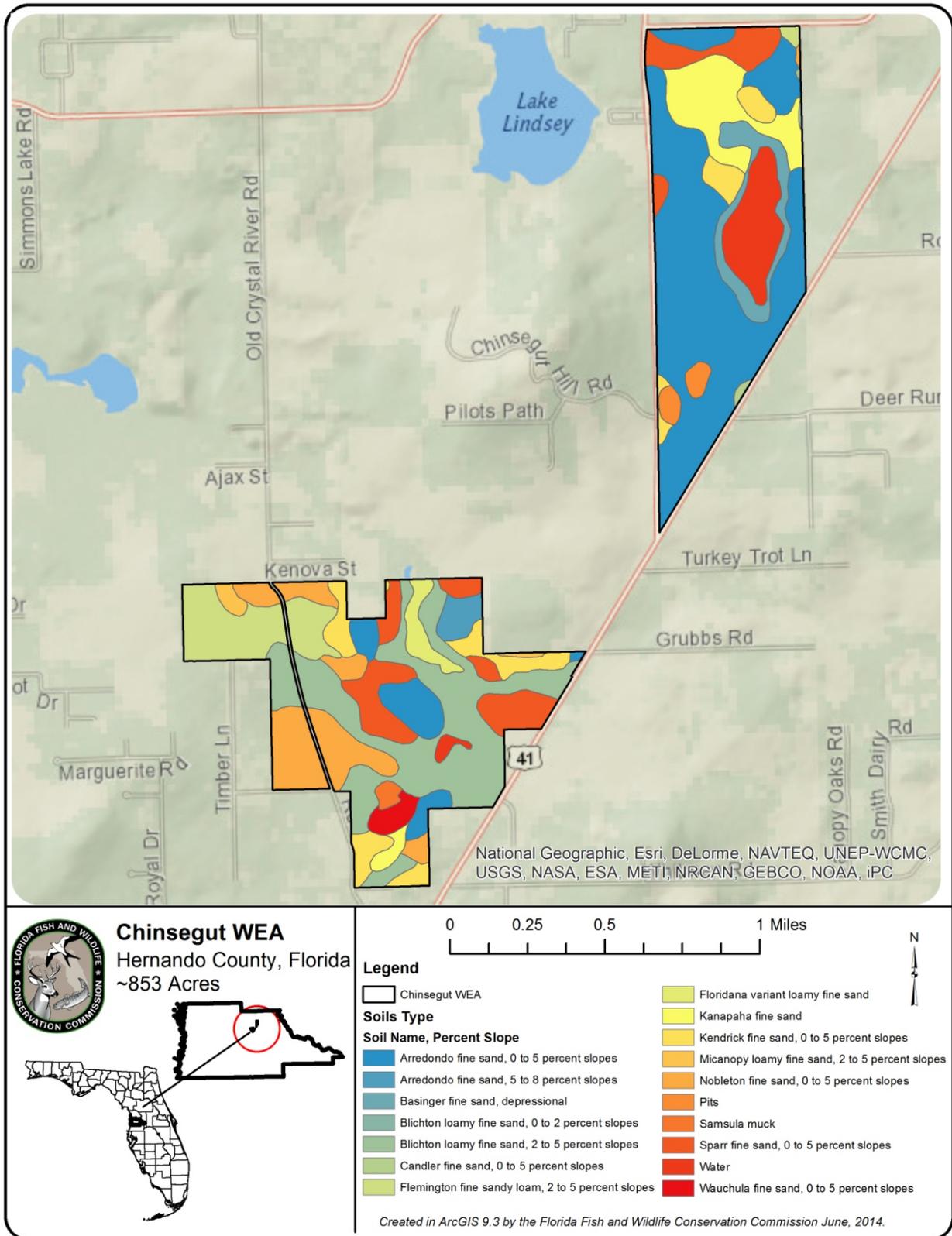
### **2.1.3 Soils**

Seventeen soil map units were identified at the CWEA based on a review of the Soil Survey of Hernando County, Florida, Soil Conservation Survey.

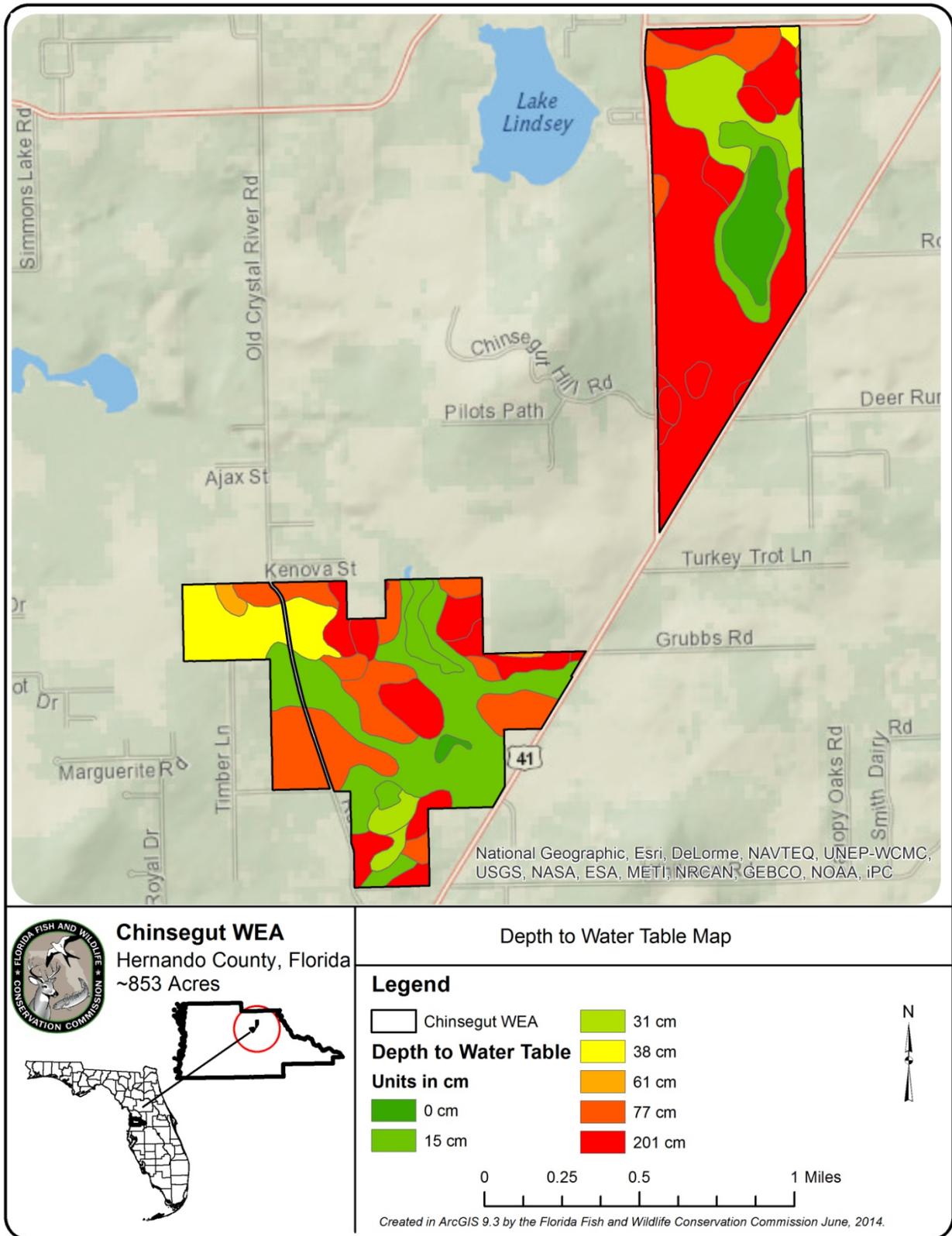
The U.S. Department of Agriculture, Natural Resource Conservation Service defines a soil map unit as: “a collection of soil areas or non-soil areas (miscellaneous areas) delineated in a soil survey.” Soil map units may contain multiple soil components, which are given names that are unique identifiers. Figure 3 provides aggregation data for the CWEA map units, including a more complete listing of attributes and soil minor components. Figure 4 provides depth to water table information for the soil types found at the CWEA

### **2.1.4 Geologic Conditions**

The Suwannee Limestone geologic formation predominately underlies the Brooksville Ridge and beneath the lands that comprise the CWEA. The Suwannee Limestone geologic formation is composed of the Peninsular Lower Oligocene carbonates crop out on the northwestern, northeastern and southwestern flanks of the Ocala Platform. The Suwannee Limestone is absent from the eastern side of the Ocala Platform due to erosion, nondeposition or both, an area referred to as Orange Island (Bryan, 1991). The Suwannee Limestone, originally named by Cooke and Mansfield (1936), consists of a white to cream, poorly to well indurated, fossiliferous, vuggy to moldic limestone (grainstone and packstone). The dolomitized parts of the Suwannee Limestone are gray, tan, light brown to moderate brown, moderately to well indurated, finely to coarsely crystalline, dolostone with limited occurrences of fossiliferous (molds and casts) beds. Silicified limestone is common in Suwannee Limestone. Fossils present in the Suwannee Limestone include mollusks, foraminifers, corals and echinoids.



**Figure 3. Soils Type of the CWEA**



**Figure 4. Soils – Depth to Water Table**

## 2.2 Vegetation

As noted above, the CWEA is composed of two separate parcels of land. Geo-rectified aerial photography from 1940 was utilized in delineating historic natural communities. Historic aerial photography gives insight into natural condition, past management and land use, but is insufficient to exactly determine historic community structure and composition of many areas. Examination of 2007 true color (Figure 5) imagery, 2004 true color DOQQs, 1999 Infrared DOQQs, 1995 Infrared DOQQs and input from the area manager helped determine the natural communities that are present on the CWEA. FWC has completed the mapping of the historic and current natural communities of the CWEA through the services of the Florida Natural Areas Inventory (FNAI) using Geographic Information System (GIS) computer software.

A total of eleven natural community types exist on the CWEA. These include basin marsh, basin swamp, bottomland forest, mesic flatwoods, mesic hammock, improved pasture, semi-improved pasture, ruderal, sandhill, upland hardwood forest, upland pine forest.



FNAI found six rare species and a number of invasive exotic species on the CWEA. The rare species that were documented on the area are Atamasco lily, Florida mountain-mint, Florida spiny-pod, milk-vine, stalked adder's tongue, and Treat's rain-lily. Rare plant species are noted in Table 3. Invasive exotic plant species found on the CWEA are listed in Table 4.

**Table 3. Rare Plant Species Found on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Atamasco lily	<i>Zephyranthes atamasco</i>
Florida mountain-mint	<i>Pycnanthemum floridanum</i>
Florida spiny-pod	<i>Matelea floridana</i>
Treat's rain-lily	<i>Zephyranthes treatiae</i>

**Table 4. Invasive Exotic Plant Species Found on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Air-potato	<i>Dioscorea bulbifera</i>
Alligatorweed	<i>Alternanthera philoxeroides</i>
Bahiagrass	<i>Paspalum notatum</i>
Caesarweed	<i>Urena lobata</i>
Camphortree	<i>Cinnamomum camphora</i>
Centipede grass	<i>Eremochloa ophiuroides</i>
Chinaberry	<i>Melia azedarach</i>
Chinese tallowtree	<i>Sapium sebiferum</i>
Chinese wisteria	<i>Wisteria sinensis</i>
Cogongrass	<i>Imperata cylindrica</i>
Coral ardisia	<i>Ardisia crenata</i>
Crabgrass	<i>Digitaria ischaemum</i>
Elephant ear	<i>Xanthosoma sagittifolium</i>
Japanese climbing fern	<i>Lygodium japonicum</i>
Jelly palm	<i>Butia capitata</i>
Lantana	<i>Lantana camara</i>
Mexican petunia	<i>Ruellia simplex</i>
Mimosa	<i>Albizia julibrissin</i>
Natalgrass	<i>Melinis repens</i>
Paper mulberry	<i>Broussonetia papyrifera</i>
Podocarpus	<i>Podocarpus macrophyllus</i>
Rosary pea	<i>Abrus precatorius</i>
Skunkvine	<i>Paederia foetida</i>
Sword fern	<i>Nephrolepis cordifolia</i>
Torpedograss	<i>Panicum repens</i>
Tropical soda apple	<i>Solanum viarum</i>
Water-hyacinth	<i>Eichhornia crassipes</i>
Wild taro	<i>Colocasia esculenta</i>

**Table 5. Native Plant Species Found on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Adam's needle	<i>Yucca filamentosa</i>
American beautyberry	<i>Callicarpa americana</i>
American elm	<i>Ulmus americana</i>
American holly	<i>Ilex opaca</i>
Atamasco lily	<i>Zephyranthes atamasco</i>
Bald cypress	<i>Taxodium distichum</i>

**Table 5. Native Plant Species Found on the CWEA**

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<b>Common Name</b>	<b>Scientific Name</b>
Barnyardgrass	<i>Echinochloa crus-galli</i>
Bartram's airplant	<i>Tillandsia bartramii</i>
Beaked panicum	<i>Panicum anceps</i>
Beaksedge	<i>Rhynchospora</i> sp.
Adam's needle	<i>Yucca filamentosa</i>
Bedstraw	<i>Galium</i> sp.
Big carpetgrass	<i>Axonopus furcatus</i>
Black cherry	<i>Prunus serotina</i>
Blackjack oak	<i>Quercus marilandica</i>
Black root	<i>Pterocaulon pycnostachyum</i>
Black snakeroot	<i>Sanicula canadensis</i>
Bladderwort	<i>Utricularia</i> sp.
Blue beech	<i>Carpinus caroliniana</i>
Blue curls	<i>Trichostema dichotomum</i>
Blue lupine	<i>Lupinus diffusus</i>
Bluejack oak	<i>Quercus incana</i>
Bluestem palmetto	<i>Sabal minor</i>
Bracken fern	<i>Pteridium aquilinum</i>
Broomgrass bluestem	<i>Andropogon virginicus</i>
Bushy bluestem	<i>Andropogon glomeratus</i>
Butterflyweed	<i>Asclepias tuberosa</i>
Butterweed	<i>Packera glabella</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Cabbage palm	<i>Sabal palmetto</i>
Carolina willow	<i>Salix caroliniana</i>
Cat green-briar	<i>Smilax glauca</i>
Chain fern	<i>Woodwardia virginica</i>
Chapman's purpletop tridens	<i>Tridens flavus</i> var. <i>chapmanii</i>
Cherokee bean	<i>Erythrina herbacea</i>
Climbing aster	<i>Symphotrichum carolinianum</i>
Climbing hempvine	<i>Mikania scandens</i>
Clustered bushmint	<i>Hyptis alata</i>
Clusterspike false indigo bush	<i>Amorpha herbacea</i>
Coastal bedstraw	<i>Galium hispidulum</i>
Cooley's water-willow	<i>Justicia cooleyi</i>
Coral green-briar	<i>Smilax walteri</i>
Coral honeysuckle	<i>Lonicera sempervirens</i>
Creeping eryngo	<i>Eryngium prostratum</i>

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**Table 5. Native Plant Species Found on the CWEA**

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<b>Common Name</b>	<b>Scientific Name</b>
Creeping primrose willow	<i>Ludwigia repens</i>
Cypress witchgrass	<i>Dichantherium dichotomum</i>
Dahoon holly	<i>Ilex cassine</i>
Darrow's blueberry	<i>Vaccinium darrowii</i>
Deerberry	<i>Vaccinium stamineum</i>
Denseflower smartweed	<i>Polygonum densiflorum</i>
Dog fennel	<i>Eupatorium capillifolium</i>
Dogwood	<i>Cornus florida</i>
Downy phlox	<i>Phlox pilosa</i>
Dwarf dandelion	<i>Krigia virginica</i>
Dwarf pawpaw	<i>Asimina pygmaea</i>
Earleaf greenbriar	<i>Smilax auriculata</i>
Elephant's foot	<i>Elephantopus carolinianus</i>
Elliott's bluestem	<i>Andropogon gyrans</i>
Elliott's milkpea	<i>Galactia elliotii</i>
Fireweed	<i>Erechtites hieraciifolius</i>
Flatsedge	<i>Cyperus haspan</i>
Floating marsh pennywort	<i>Hydrocotyle ranunculoides</i>
Florida Indian plantain	<i>Arnoglossum floridanum</i>
Florida pellitory	<i>Parietaria floridana</i>
Florida sugar maple	<i>Acer saccharum ssp. floridanum</i>
Florida mountain-mint	<i>Pycnanthemum floridanum</i>
Florida spiny-pod	<i>Matelea floridana</i>
Florida milkvine	<i>Matelea floridana</i>
Fringe tree	<i>Chionanthus virginicus</i>
Fringed bluestar	<i>Amsonia ciliata</i>
Gallberry	<i>Ilex glabra</i>
Goldenrod	<i>Solidago odora</i>
Gopher apple	<i>Licania michauxii</i>
Green dragon	<i>Arisaema dracontium</i>
Hammock snakeroot	<i>Ageratina jucunda</i>
Hog plum	<i>Ximenia americana</i>
Hophornbeam	<i>Ostrya virginiana</i>
Incised groove-bur	<i>Agrimonia incisa</i>
Innocence	<i>Houstonia procumbens</i>
Lanceleaf greenbriar	<i>Smilax smallii</i>
Lance-leaved arrowhead	<i>Sagittaria lancifolia</i>
Laurel greenbrier	<i>Smilax laurifolia</i>

**Table 5. Native Plant Species Found on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Laurel oak	<i>Quercus laurifolia</i>
Largefruit beaksedge	<i>Rhynchospora megalocarpa</i>
Lesser duckweed	<i>Lemna minor</i>
Littleleaf buckbrush	<i>Ceanothus microphyllus</i>
Live oak	<i>Quercus virginiana</i>
Loblolly bay	<i>Gordonia lasianthus</i>
Loblolly pine	<i>Pinus taeda</i>
Long's sedge	<i>Carex longii</i>
Longleaf pine	<i>Pinus palustris</i>
Looseflower waterwillow	<i>Justicia ovata</i>
Lopsided Indiangrass	<i>Sorghastrum secundum</i>
Lyreleaf sage	<i>Salvia lyrata</i>
Magnolia	<i>Magnolia grandiflora</i>
Maidencane	<i>Panicum hemitomon</i>
Michaux's croton	<i>Croton michauxii</i>
Milkpea	<i>Galactia regularis</i>
Milkvine	<i>Matelea</i> sp.
Muscadine	<i>Vitis rotundifolia</i>
Narrow blue-eyed grass	<i>Sisyrinchium angustifolium</i>
New Jersey tea	<i>Ceanothus americanus</i>
Nuttall's thistle	<i>Cirsium nuttallii</i>
Pangolagrass	<i>Digitaria eriantha</i>
Pale meadowbeauty	<i>Rhexia mariana</i>
Parsley hawthorn	<i>Crataegus marshallii</i>
Partridgeberry	<i>Mitchella repens</i>
Partridge pea	<i>Chamaecrista fasciculata</i>
Persimmon	<i>Diospyros virginiana</i>
Pickerelweed	<i>Pontederia cordata</i>
Pignut hickory	<i>Carya glabra</i>
Pinebarren flatsedge	<i>Cyperus retrorsus</i>
Pinebarren frostweed	<i>Helianthemum corymbosum</i>
Pine-hyacinth	<i>Clematis baldwinii</i>
Pineland lobelia	<i>Lobelia homophylla</i>
Pinewoods milkweed	<i>Asclepias humistrata</i>
Poison ivy	<i>Toxicodendron radicans</i>
Pokeweed	<i>Phytolacca americana</i>
Ponyfoot	<i>Dichondra carolinensis</i>
Purple passion flower	<i>Passiflora incarnata</i>

**Table 5. Native Plant Species Found on the CWEA**

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<b>Common Name</b>	<b>Scientific Name</b>
Rabbit tobacco	<i>Pseudognaphalium obtusifolium</i>
Ragweed	<i>Ambrosia artemisiifolia</i>
Red bay	<i>Persea borbonia</i>
Red cedar	<i>Juniperus virginiana</i>
Red maple	<i>Acer rubrum</i>
Red mulberry	<i>Morus rubra</i>
Redtop panicgrass	<i>Panicum rigidulum</i>
Resurrection fern	<i>Pleopeltis polypodioides</i>
Rosy camphorweed	<i>Pluchea baccharis</i>
Roughleaf dogwood	<i>Cornus asperifolia</i>
Royal fern	<i>Osmunda regalis</i>
Running oak	<i>Quercus pumila</i>
Rustweed	<i>Polypremum procumbens</i>
Rusty blackhaw	<i>Viburnum rufidulum</i>
Rusty staggerbush	<i>Lyonia ferruginea</i>
Saltbush	<i>Baccharis halimifolia</i>
Sand blackberry	<i>Rubus cuneifolius</i>
Sand holly	<i>Ilex ambigua</i>
Sand live oak	<i>Quercus geminata</i>
Sand post oak	<i>Quercus margarettae</i>
Sarsaparilla vine	<i>Smilax pumila</i>
Sassafras	<i>Sassafras albidum</i>
Savannah panicum	<i>Phanopyrum gymnocarpon</i>
Saw palmetto	<i>Serenoa repens</i>
Sawtooth greenbriar	<i>Smilax bona-nox</i>
Sedge	<i>Cyperus sp.</i>
Sensitive briar	<i>Mimosa quadrivalvis</i>
Shiny dwarf blueberry	<i>Vaccinium myrsinites</i>
Shortleaf pine	<i>Pinus echinata</i>
Silkgrass	<i>Pityopsis graminifolia</i>
Silver croton	<i>Croton argyranthemus</i>
Slender woodoats	<i>Chasmanthium laxum</i>
Soft pipewort	<i>Eriocaulon compressum</i>
Southern arrowwood	<i>Viburnum dentatum</i>
Southern red oak	<i>Quercus falcata</i>
Southern umbrella sedge	<i>Fuirena scirpoidea</i>
Spadeleaf	<i>Centella asiatica</i>
Spanish moss	<i>Tillandsia usneoides</i>

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**Table 5. Native Plant Species Found on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Sparkleberry	<i>Vaccinium arboreum</i>
Spruce pine	<i>Pinus glabra</i>
St. Andrew's cross	<i>Hypericum hypericoides</i>
Stalked adderstongue	<i>Ophioglossum petiolatum</i>
Stiff marsh bedstraw	<i>Galium tinctorium</i>
Stinging nettle	<i>Cnidocolus stimulosus</i>
Sugarberry	<i>Celtis laevigata</i>
Summer grape	<i>Vitis aestivalis</i>
Swamp chestnut oak	<i>Quercus michauxii</i>
Swamp dock	<i>Rumex verticillatus</i>
Swamp bay	<i>Persea palustris</i>
Swamp smartweed	<i>Polygonum hydropiperoides</i>
Swamp tupelo	<i>Nyssa biflora</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Tall elephantsfoot	<i>Elephantopus elatus</i>
Tall nutrush	<i>Scleria triglomerata</i>
Thin paspalum	<i>Paspalum setaceum</i>
Toadflax	<i>Linaria canadensis</i>
Tough bully	<i>Sideroxylon tenax</i>
Trailing blackberry	<i>Rubus trivialis</i>
Treat's rain-lily	<i>Zephyranthes treatiae</i>
Trumpet creeper	<i>Campsis radicans</i>
Turkey oak	<i>Quercus laevis</i>
Variable witchgrass	<i>Dichanthelium commutatum</i>
Violet	<i>Viola sororia</i>
Virginia chain fern	<i>Woodwardia virginica</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Viviparous spikerush	<i>Eleocharis vivipara</i>
Walter's viburnum	<i>Viburnum obovatum</i>
Water lily	<i>Nymphaea odorata</i>
Water oak	<i>Quercus nigra</i>
Water spangles	<i>Salvinia minima</i>
Wax myrtle	<i>Myrica cerifera</i>
White ash	<i>Fraxinus americana</i>
Whorled pennywort	<i>Hydrocotyle verticillata</i>
Wild buckwheat	<i>Eriogonum tomentosum</i>
Wild coffee	<i>Psychotria nervosa</i>
Wild olive	<i>Osmanthus americanus</i>

**Table 5. Native Plant Species Found on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Wild petunia	<i>Ruellia caroliniensis</i>
Winged elm	<i>Ulmus alata</i>
Winged sumac	<i>Rhus copallinum</i>
Wiregrass	<i>Aristida stricta</i>
Witchgrass	<i>Panicum dichotomum</i>
Woodsgrass	<i>Oplismenus hirtellus</i>
Yankeeweed	<i>Eupatorium compositifolium</i>
Yaupon	<i>Ilex vomitoria</i>
Yellow indiagrass	<i>Sorghastrum nutans</i>
Yellow jessamine	<i>Gelsemium sempervirens</i>

**2.2.1 FNAI Natural Community Descriptions**

As previously noted, through the services of the FNAI, eleven natural community types have been identified and mapped on the CWEA. These include basin marsh, basin swamp, bottomland forest, mesic flatwoods, mesic hammock, improved pasture, semi-improved pasture, ruderal, sandhill, upland hardwood forest, and upland pine forest. Table 6 below lists community types and their percentages known to occur on the CWEA. The FNAI natural communities map is displayed in Figure 5.

**Table 6. Natural Community Type Percentages Known to Occur on the CWEA**

<b>Community Type</b>	<b>Acres</b>	<b>Percentage of Area</b>
Basin marsh	69.5	8.5%
Basin swamp	10.9	1.3%
Bottomland forest	18.6	2.3%
Mesic flatwoods	7.7	0.9%
Mesic hammock	92.8	11.3%
Pasture-improved	33.0	4.0%
Pasture-semi-improved	9.0	1.1%
Ruderal	22.6	2.7%
Sandhill	103.1	12.5%
Upland hardwood forest	14.0	1.7%
Upland pine forest	441.9	53.7%

## Natural Community Descriptions

**Basin Marsh** – Basin marsh is an herbaceous-dominated community that occurs in large, irregularly shaped depressions. Structure and species composition of the basin marsh community is highly variable, depending on water depth and fire frequency. At the Nature Center tract, the basin marsh (known as May’s Prairie) has open water in the center and emergent vegetation around the edges. Parts of the north end have been overgrown by bald cypress planted during the 1930s. The dominant plant species on the edges of the marsh are maidencane and buttonbush, and the open center has water lily. The shoreline has the woody plants wax myrtle and dahoon holly. At the Big Pine tract, the three basin marshes are covered by a thicket of Carolina willow and buttonbush. The exotic invasive plant, Chinese tallow, is found along the perimeter of these marshes. Other plants commonly found in basin marsh at the CWEA include soft pipewort, southern umbrella sedge, loose flower, water willow, smartweed, pickerelweed, beaksedge, water spangles, and chain fern.



**Basin Swamp** – Basin swamp occurs in low, irregularly shaped depressions within mesic flatwoods or mesic hammock communities with extended hydroperiods. At the Nature Center tract, basin swamp occurs around the margin of the basin marsh. This swamp was created in the 1930s when bald cypress was planted along the shoreline of May’s Prairie. The closed canopy is formed by mature bald cypress, and the subcanopy consists of occasional dahoon holly, swamp bay, and red maple. The open shrub layer consists mainly of wax myrtle. Patches of Virginia chain fern and maidencane make up the sparse herbaceous layer. Small areas of basin swamp occur around the basin marshes on the Big Pine tract. Additional species here are sweetgum and swamp tupelo.



**Bottomland Forest** – Bottomland forest is a deciduous, or mixed deciduous/evergreen, closed-canopy forest on terraces and levees within riverine floodplains and in shallow depressions. Found in situations intermediate between swamps and uplands, the canopy may be quite diverse with both deciduous and evergreen hydrophytic to mesophytic trees. Dominant species include sweetgum, spruce pine, loblolly pine, laurel oak, water oak, live oak, swamp chestnut oak, and sugarberry. More flood tolerant species that are often present include American elm and red maple, as well as occasional swamp tupelo and bald cypress. Evergreen bay species such as loblolly bay are often mixed in the canopy and understory in

acidic or seepage systems. The understory is either dense shrubs with little ground cover, or open, with few shrubs and a groundcover of ferns, forbs, and grasses. Ground cover is also variable in composition and abundance, often with species overlap between herbaceous species suited to either mesic or hydric conditions.

**Mesic Flatwoods** – Mesic flatwoods is an upland forest community with an open pine canopy and understory composed of varying mixtures of shrub and grasses. On the Nature Center tract, this community covers a small area near the northern edge of May’s Prairie. The open canopy of longleaf pine shades an almost solid short shrub layer of saw palmetto, gallberry, beautyberry, rusty staggerbush, shiny blueberry, and wax myrtle. The herbaceous groundcover is sparse. Dominant species are bracken fern, bluestem, and low panicgrass. The exotic invasive plant, camphor, is common rising above the abundant saw palmetto.



**Mesic Hammock** – Mesic hammock is an upland forest community of evergreen broadleaved trees occurring in naturally fire-protected areas. At the CWEA, this community occurs at the edges of the basin marsh. The canopy is dominated by live oak, sweetgum, and laurel oak. The understory is often nearly solid saw palmetto. The sparse ground layer may have occasional clumps of grasses such as panicum. An unusually diverse mesic hammock is at the northeastern corner of May’s Prairie in the Nature Center tract. This hammock borders a shallow swale, that drains down to the basin marsh. The vegetation includes hydric species such as parsley hawthorn, narrow blue-eyed grass, and Walter’s viburnum. The state-listed Treat’s rain lily was found as one small clump.



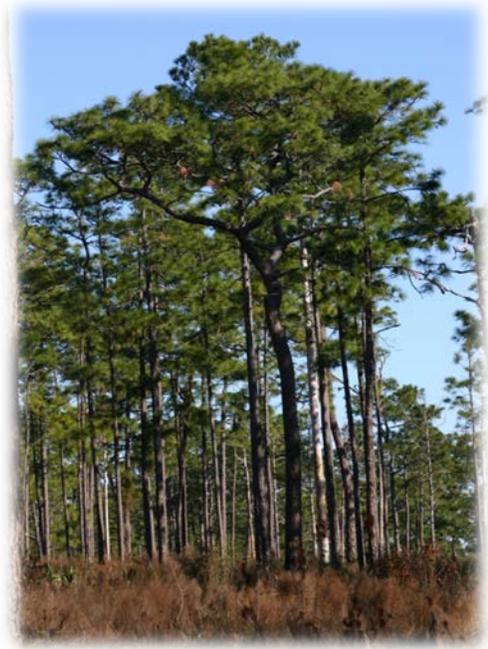
**Improved Pasture**– Improved pasture is dominated by planted non-native or domesticated native forage species and evidence of current or recent pasture activity and/or cultural treatments. Improved pastures have been cleared of their native vegetation. Most improved pastures in Florida are planted with Bahia grass and to a lesser extent with Bermuda grass or pangolagrass. Weedy native species are often common in improved pastures in Florida and include dog fennel, many species of flat sedge, crab grasses, and rustweed among many others.

**Semi-improved Pasture**– Semi-improved pasture is dominated by a mix of planted non-native or domesticated native forage species and native groundcover, due to an incomplete conversion to pasture, not regeneration. Semi-improved pastures have been cleared of a significant percentage of their native vegetation and planted in non-native or domesticated native forage species, but still retain scattered patches of native vegetation with natural species composition and structure among the pastured areas.

The planted areas are usually dominated by bahiagrass and can resemble improved pastures. Seeding of bahiagrass can also occur within areas of native groundcover.

**Ruderal**– Ruderal communities are areas where the natural community has been overwhelmingly altered as a result of human activity.

**Sandhills**– Sandhill occurs on rolling hills with deep, often yellowish, well-drained sands. These are open, xeric communities dominated by widely spaced longleaf pine trees with a sparse midstory of deciduous oaks and a moderate to dense groundcover of grasses, herbs, and low shrubs. The midstory trees and low shrubs can be sparse to dense, depending on fire history, and typically include turkey oak, bluejack oak, sand live oak, sand post oak, sparkleberry, dwarf huckleberry, pricklypear, and gopher apple. The diverse herbaceous groundcover is often dominated by wiregrass, with other grasses and herbs including pineywoods dropseed, lopsided indiagrass, and a variety of forbs with many species of legumes and asters.



At the CWEA, sandhill occurs on the south end of the Nature Center tract, and also as small inclusions within the more extensive upland pine communities. These areas have mature canopy of longleaf pine. On the Nature Center tract, the majority of the sandhill has a midstory of sand live oak, turkey oak, bluejack oak, and sand post oak. The open shrub layer includes sparkleberry, deerberry, and gopher apple. Herbaceous species include locally abundant wiregrass, bluestem grass, stinging nettle, wild buckwheat, milkpea, blue lupine, silkgrass, bracken fern, lopsided Indian grass, blue curls, and beargrass. In a few areas, moderately dense hardwoods replace the diverse herbaceous layer.

**Upland Hardwood Forest** – An upland forest community is found on richer soils with a diverse mixture of deciduous and evergreen hardwood species in the canopy and subcanopy. Small remnant areas of upland pine forest occur at several locations on the Big Pine tract. The best example is at the northern end, west of Old Crystal River Road. Pines are conspicuously absent from this community. The canopy has very large pignut hickory, live oak, southern magnolia, swamp chestnut oak, Florida sugar maple, sweetgum, and laurel oak. The subcanopy is composed of young canopy species plus cabbage palm, American holly, blue beech, and winged elm. The open shrub layer contains yaupon, cabbage palm, and scattered small clumps of wild coffee. Woodsgrass, partridgeberry, and tall nutrush are common in the herbaceous layer. The exotic pest plant skunk vine is common but not vigorous due to canopy shading; it is usually found on the ground and climbing over the shrubs.

**Upland Pine Forest** – Upland pine is a widely spaced pine forest with a sparse to moderate shrub layer and a dense, species-rich groundcover of grasses and herbs, occurring on gently rolling terrain. Soils are generally higher in loam or clay than soils of similar sandhills. The canopy is usually dominated by longleaf pine, and at the southern end of the range, there may be an intermittent subcanopy layer of smaller pines, and hardwoods including blackjack oak, flowering dogwood, bluejack oak, sassafras, laurel

oak, winged sumac, common persimmon, and sand post oak. Though typically present as low shrubs and occasional midstory trees, these species can form a dense midstory in areas that have experienced a lack of fire for many years. Shrub cover can vary from sparse to dense, and includes low-growing species such as dwarf huckleberry, running oak, gallberry, and Darrow's blueberry. Wiregrass is often dominant, but a high diversity of grasses and forbs may be present.

At the CWEA, upland pine occurs on most of the Big Pine tract and the northern section of the Nature Center tract. Much of the upland area is presently covered by old growth longleaf pines towering above a growth of dense hardwoods, primarily laurel oak, sweetgum, water oak, southern magnolia, pignut hickory, and live oak. Other shrubs include roughleaf dogwood, southern arrowwood, beautyberry, wax myrtle, cabbage palm, and sparkleberry. Herbaceous vegetation is mainly comprised of weedy species such as witchgrass, variable panicgrass, fireweed, sedge, and bracken fern, as well as patches of exotic invasives including camphor, Chinese tallow, skunk vine, and cogon grass. The vines yellow jessamine, muscadine grape, greenbriers, and Virginia creeper are frequent.



A few upland pine areas of the CWEA have a well-developed herbaceous layer that includes wiregrass. These occur in the center of the Big Pine tract, and north of the education center on the Nature Center tract.

### **2.2.2 Forest Resources**

A timber assessment on the CWEA will be conducted by the Florida Forest Service (FFS). The management of timber resources will be considered in the context of the Timber Assessment and the overall land management goals and activities. If FWC determines that a more comprehensive Forest Management Plan needed to guide the overall management of the areas forest resources, FWC will contract with a professional forester to develop the Forest Management Plan (FMP).

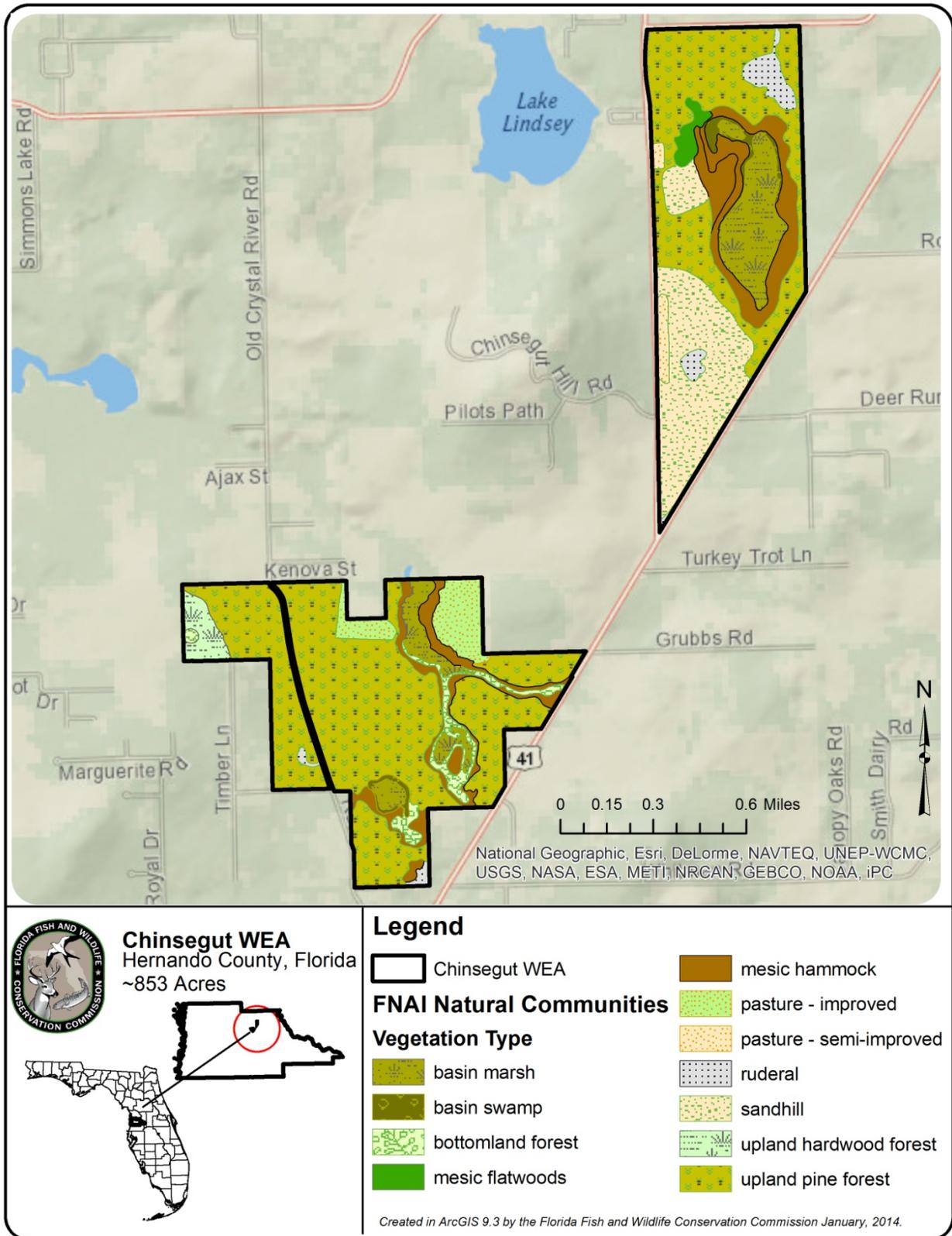


Figure 5. The CWEA Natural Communities

### 2.3 Fish and Wildlife Resources

Due to the unique character of the areas old-growth forest and variety of natural communities, a diversity of associated wildlife including rare and imperiled species and common game and non-game species can be found on the CWEA Tables 7-13.

In managing for wildlife species, FWC will place an emphasis on conservation, protection and management of natural communities. The area's actively managed natural communities include upland pine forest, sandhill, mesic hammock, and basin marsh. Additional natural communities include bottomland forest, upland hardwood forest, basin swamp, and mesic flatwoods. The occurrence and abundance of rare and imperiled species on the property are recorded. Following species inventory work, management practices are designed to restore, enhance or maintain imperiled species habitats. The diversity of the CWEA creates a habitat mosaic that enhances conditions for a variety of wildlife species. Resident wildlife will be managed for optimum diversity and abundance.



In addition to resident wildlife, the CWEA provides foraging and breeding grounds to many migratory birds including waterfowl, passerines, raptors and others. The northern shoreline of May's Prairie provides nesting habitat for wading birds. Habitats important to migratory species will be protected, maintained or enhanced. FWC will continue to update inventories for certain species with emphasis on rare and imperiled fish and wildlife species. Inventory and monitoring of wildlife species will continue as an ongoing effort for the area.

Rare and imperiled species and their habitats will be managed by following approved Federal and FWC recovery plans, guidelines and other scientific recommendations. Land management activities including prescribed burning and timber stand improvements will take into account imperiled species requirements and habitat needs. Potential for negative impacts from recreational activities will also be considered and monitored.

The FWC has developed a GIS-based assessment tool that incorporates a wide variety of land cover and wildlife species data. This tool, the Integrated Wildlife Habitat Ranking System (IWHRS), ranks the Florida landscape on a scale of zero to ten 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 CWEA has a high mean wildlife value of 7 (Figure 6).

### 2.3.1 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 U.S. Fish and Wildlife Service. This designation is also commonly known as “listed species.”

Table 11 lists the imperiled wildlife species that have been documented as occurring on or in the vicinity of the CWEA.



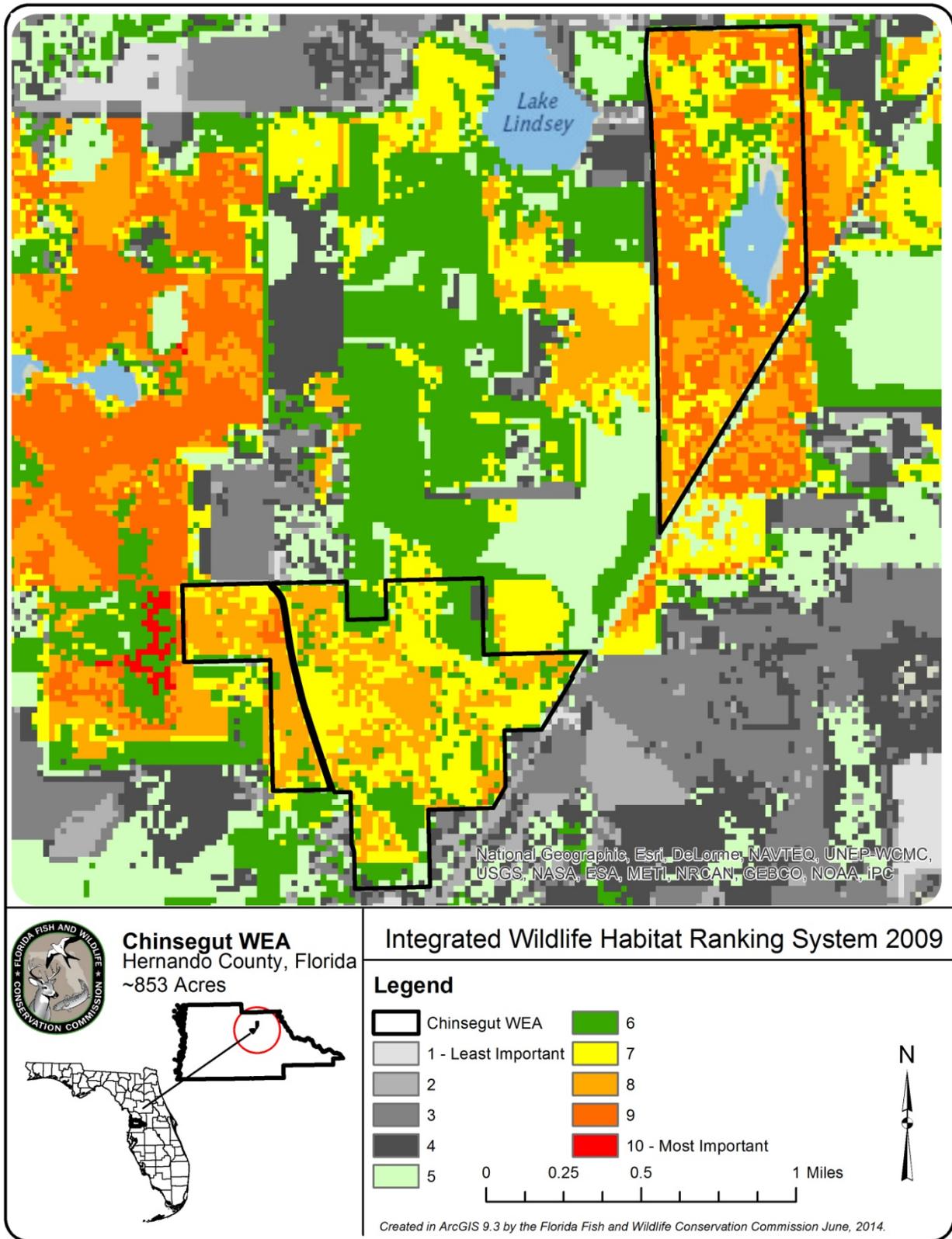
On November 8, 2010, new threatened species rules approved by the FWC were implemented. All federally listed species that occur in Florida will now be included on Florida’s list as federally-designated Endangered or federally-designated Threatened species. In addition, the state has implemented a listing 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.

### 2.3.2 FWC Wildlife Observations and FNAI Element Occurrences

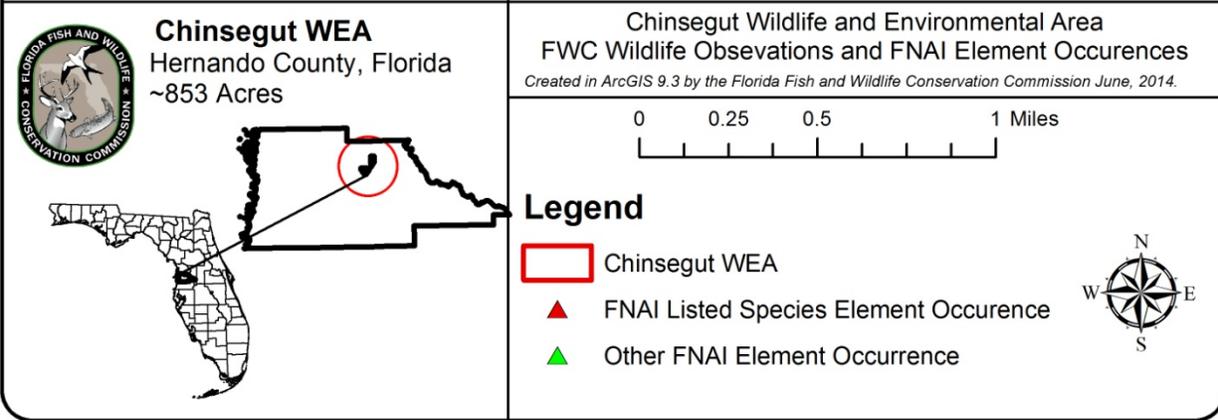
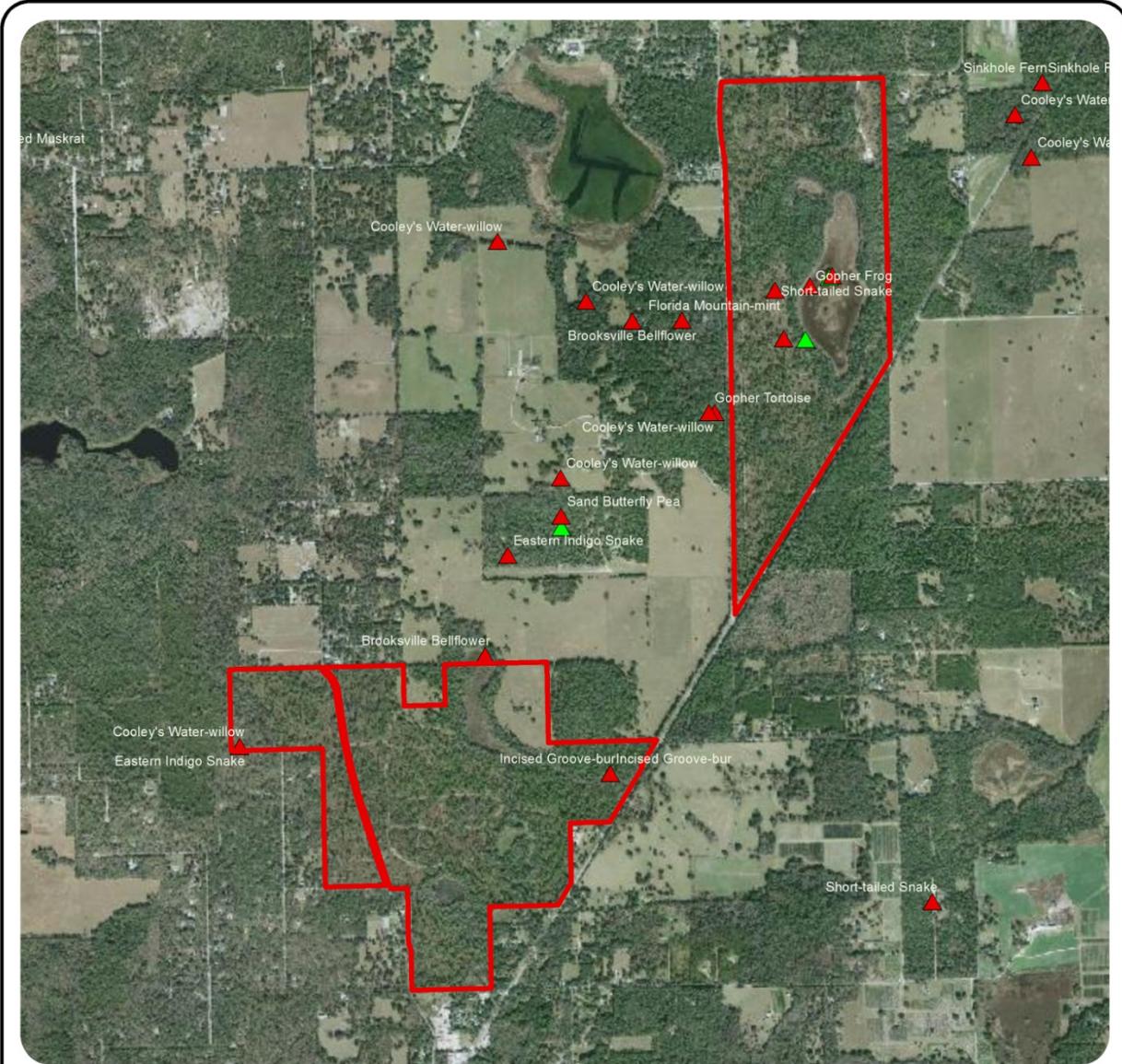
Geographic information system data maintained by FWC (Wildlife Observations) and FNAI (Element Occurrences) indicate that the CWEA has documented occurrences of wildlife and a diverse assemblage of animal species (Figure 7, Table 11).

An FWC Wildlife Conservation Prioritization and Recovery (WCPR) Species Management Strategy was completed for the CWEA in March 2013. Of the 60 focal species, 18 were modeled to have potential habitat on the CWEA (Table 13). One focal species group, the wading birds, was added because of potential habitat on this tract. See Section 5.4.2 for a detailed description of the WCPR program. Observed fish and wildlife species are listed in Tables 7 – 10.





**Figure 6. FWC Integrated Wildlife Habitat Ranking System 2009**



**Figure 7. FWC Wildlife Observations and FNAI Element Occurrences**

**Table 7. Mammal Species documented on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Armadillo	<i>Dasyus novemcinctus</i>
Bobcat	<i>Lynx rufus</i>
Cotton mouse	<i>Peromyscus gossypinus</i>
Eastern cottontail rabbit	<i>Sylvilagus floridanus</i>
Florida mouse	<i>Podomys floridanus</i>
Golden mouse	<i>Ochrotomys nuttalli</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Gray squirrel	<i>Sciurus carolinensis</i>
Hispid cotton	<i>Sigmodon hispidus</i>
House mouse	<i>Mus musculus</i>
Pine vole	<i>Microtus pinetorum</i>
Raccoon	<i>Procyon lotor</i>
Sherman's fox squirrel	<i>Sciurus niger shermani</i>
Southeastern bat	<i>Myotis austroriparius</i>
Southern flying squirrel	<i>Glaucomys volans</i>
Virginia opossum	<i>Didelphis virginiana</i>
White-tailed deer	<i>Odocoileus virginianus</i>

**Table 8. Reptile and Amphibian Species documented on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
American alligator	<i>Alligator mississippiensis</i>
Eastern indigo snake	<i>Drymarchon couperi</i>
Barking treefrog	<i>Hyla gratiosa</i>
Box turtle	<i>Terrapene carolina</i>
Bullfrog	<i>Lithobates catesbeianus</i>
Central Florida crowned snake	<i>Tantilla relicta neilli</i>
Corn snake	<i>Pantherophis guttatus</i>
Eastern coral snake	<i>Micrurua fulvius</i>
Eastern diamondback rattlesnake	<i>Crotalus adamenteus</i>
Easter garter snake	<i>Thamnophis sirtalis sirtalis</i>
Eastern narrowmouth toad	<i>Gastrophryne carolinensis</i>
Eastern tiger salamander	<i>Ambystoma t. tigrinum</i>
Eastern spadefoot toad	<i>Scaphiopus holbrookii</i>
Florida banded water snake	<i>Nerodia fasciata pictiventris</i>
Florida brown snake	<i>Storeria victa</i>
Florida cricket frog	<i>Acris gryllus dorsalis</i>

<b>Common Name</b>	<b>Scientific Name</b>
Florida mud turtle	<i>Kinosternon subrubrum steindachneri</i>
Florida scarlet snake	<i>Cemophora coccinea coccinea</i>
Florida softshell	<i>Apalone ferox</i>
Gopher frog	<i>Rana captio</i>
Gopher tortoise	<i>Gopherus polyphemus</i>
Green anole	<i>Anolis carolinensis</i>
Green treefrog	<i>Hyla cinerea</i>
Green water snake	<i>Nerodia floridana</i>
Greenhouse frog	<i>Eleutherodactylus planirostris</i>
Ground skink	<i>Scincella lateralis</i>
Little grass frog	<i>Pseudacris ocularis</i>
Narrow-striped dwarf siren	<i>Pseudobranchius axanthus axanthus</i>
North Florida swamp snake	<i>Seminatrix pygaea pygaea</i>
Oak toad	<i>Anaxyrus quercicus</i>
Peninsula cooter	<i>Pseudemys concinna floridana</i>
Peninsula ribbon snake	<i>Thamnophis sauritus sackenii</i>
Peninsular crowned snake	<i>Tantilla relicta relicta</i>
Pig frog	<i>Lithobates grylio</i>
Pine woods snake	<i>Rhadinaea flavilata</i>
Pinewoods treefrog	<i>Hyla femoralis</i>
Eastern ribbon snake	<i>Thamnophis sauritus</i>
Six-lined racerunner	<i>Cnemidophorus sexlineatus</i>
Short-tailed snake	<i>Lampropeltis extenuata</i>
Southeastern five-lined skink	<i>Eumeces inexpectatus</i>
Southern black racer	<i>Coluber constrictor priapus</i>
Southern fence lizard	<i>Sceloporus undulatus undulatus</i>
Southern leopard frog	<i>Lithobates sphenoccephalus utricularius</i>
Southern ringneck snake	<i>Diadophis punctatus punctatus</i>
Southern toad	<i>Anaxyrus terrestris</i>
Spring peeper	<i>Pseudacris crucifer</i>
Squirrel treefrog	<i>Hyla squirella</i>
Striped crayfish snake	<i>Regina alleni</i>
Tiger salamander	<i>Ambystoma tigrinum</i>
Yellow ratsnake	<i>Pantherophis alleghaniensis</i>

**Table 9. Fish Species documented on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Bluegill	<i>Lepomis macrochirus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Mosquitofish	<i>Gambusia affinis</i>
Redear sunfish	<i>Lepomis punctatus</i>
Shellcracker	<i>Lepomis microlophus</i>
Warmouth	<i>Lepomis gulosus</i>

**Table 10. Bird Species documented and Likely to Occur on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
American avocet	<i>Recurvirostra americana</i>
American bittern	<i>Botaurus lentiginosus</i>
American black duck	<i>Anas rubripes</i>
American coot	<i>Fulica americana</i>
American crow	<i>Corvus brachyrhynchos</i>
American goldfinch	<i>Spinus tristis</i>
American kestrel	<i>Falco sparverius sparverius</i>
American oystercatcher	<i>Haematopus palliatus</i>
American redstart	<i>Setophaga ruticilla</i>
American robin	<i>Turdus migratorius</i>
American swallow-tailed kite	<i>Elanoides forficatus</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
American wigeon	<i>Anas americana</i>
Anhinga	<i>Anhinga anhinga</i>
Bachman's sparrow	<i>Peucaea aestivalis</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Bank swallow	<i>Riparia riparia</i>
Barn swallow	<i>Hirundo rustica</i>
Barred owl	<i>Strix varia</i>
Bay-breasted warbler	<i>Setophaga castanea</i>
Belted kingfisher	<i>Megaceryle alcyon</i>
Black skimmer	<i>Rynchops niger</i>
Black tern	<i>Chlidonias niger</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>
Black-necked stilt	<i>Himantopus mexicanus</i>
Blackpoll warbler	<i>Setophaga striata</i>

<b>Common Name</b>	<b>Scientific Name</b>
Black-throated blue warbler	<i>Setophaga caerulescens</i>
Black-throated green warbler	<i>Setophaga virens</i>
Black-whiskered vireo	<i>Vireo altiloquus</i>
Blue grosbeak	<i>Passerina caerulea</i>
Blue jay	<i>Cyanocitta cristata</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
Blue-winged teal	<i>Anas discors</i>
Boat-tailed grackle	<i>Quiscalus major</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Bonaparte's gull	<i>Chroicocephalus philadelphia</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Broad-winged hawk	<i>Buteo platypterus</i>
Brown thrasher	<i>Toxostoma rufum</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Brown-headed nuthatch	<i>Sitta pusilla</i>
Canada goose	<i>Branta canadensis</i>
Canvasback	<i>Aythya valisineria</i>
Cape May warbler	<i>Setophaga tigrina</i>
Carolina chickadee	<i>Poecile carolinensis</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Caspian tern	<i>Hydroprogne caspia</i>
Cattle egret	<i>Bubulcus ibis</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Cerulean warbler	<i>Setophaga cerulea</i>
Chestnut-sided warbler	<i>Setophaga pensylvanica</i>
Chimney swift	<i>Chaetura pelagica</i>
Chipping sparrow	<i>Spizella passerina</i>
Chuck-will's-widow	<i>Antrostomus carolinensis</i>
Clapper rail	<i>Rallus longirostris</i>
Cliff swallow	<i>Petrochelidon pyrrhononta</i>
Common barn owl	<i>Tyto alba</i>
Common grackle	<i>Quiscalus quiscula</i>
Common ground dove	<i>Columbina passerina</i>
Common loon	<i>Gavia immer</i>
Common moorhen	<i>Gallinula chloropus</i>
Common nighthawk	<i>Chordeiles minor</i>
Common snipe	<i>Gallinago gallinago</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>

<b>Common Name</b>	<b>Scientific Name</b>
Downy woodpecker	<i>Picoides pubescens</i>
Dunlin	<i>Calidris alpina</i>
Eared grebe	<i>Podiceps nigricollis</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 wild turkey	<i>Meleagris gallopavo</i>
Eastern wood pewee	<i>Contopus virens</i>
European starling	<i>Sturnus vulgaris</i>
Field sparrow	<i>Spizella pusilla</i>
Fish crow	<i>Corvus ossifragus</i>
Forster's tern	<i>Sterna forsteri</i>
Gadwall	<i>Anas strepera</i>
Glossy ibis	<i>Plegadis falcinellus</i>
Gray catbird	<i>Dumetella carolinensis</i>
Gray-cheeked thrush	<i>Catharus minimus</i>
Great blue heron	<i>Ardea herodias</i>
Great egret	<i>Ardea alba</i>
Great horned owl	<i>Bubo virginianus</i>
Great-crested flycatcher	<i>Myiarchus crinitus</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>
Green-backed heron	<i>Butorides virescens</i>
Green-winged teal	<i>Anas crecca</i>
Gull-billed tern	<i>Gelochelidon nilotica</i>
Herring gull	<i>Larus argentatus</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Hooded warbler	<i>Setophaga citrina</i>
Horned grebe	<i>Podiceps auritus</i>
House sparrow	<i>Passer domesticus</i>
House wren	<i>Troglodytes aedon</i>
Indigo bunting	<i>Passerina cyanea</i>
Kentucky warbler	<i>Geothlypis formosa</i>
Killdeer	<i>Charadrius vociferus</i>
King rail	<i>Rallus elegans</i>
Laughing gull	<i>Leucophaeus atricilla</i>
Least bittern	<i>Ixobrychus exilis</i>
Least sandpiper	<i>Calidris minutilla</i>
Least tern	<i>Sternula antillarum</i>
Lesser scaup	<i>Aythya affinis</i>

<b>Common Name</b>	<b>Scientific Name</b>
Lesser yellowlegs	<i>Tringa flavipes</i>
Limpkin	<i>Aramus guarauna</i>
Little blue heron	<i>Egretta caerulea</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>
Louisiana waterthrush	<i>Parkesia motacilla</i>
Magnificent frigatebird	<i>Fregata magnificens</i>
Magnolia warbler	<i>Setophaga magnolia</i>
Mallard	<i>Anas platyrhynchos</i>
Marbled godwit	<i>Limosa fedoa</i>
Marian's marsh wren	<i>Cistothorus palustris marianae</i>
Merlin	<i>Falco columbarius</i>
Mottled duck	<i>Anas fulvigula</i>
Mourning dove	<i>Zenaida macroura</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 oriole	<i>Icterus galbula</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>Oreothlypis 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>
Pectoral sandpiper	<i>Calidris melanotos</i>
Peregrine falcon	<i>Falco peregrinus</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Pine siskin	<i>Spinus pinus</i>
Pine warbler	<i>Setophaga pinus</i>
Piping plover	<i>Charadrius melodus</i>
Prairie warbler	<i>Setophaga discolor</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Purple finch	<i>Haemorhous purpureus</i>

<b>Common Name</b>	<b>Scientific Name</b>
Purple gallinule	<i>Porphyrio martinicus</i>
Purple martin	<i>Progne subis</i>
Red knot	<i>Calidris canutus</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-breasted merganser	<i>Mergus serrator</i>
Red-cockaded woodpecker	<i>Picoides borealis</i>
Reddish egret	<i>Egretta rufescens</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Redhead	<i>Aythya americana</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-billed gull	<i>Larus delawarensis</i>
Ring-necked duck	<i>Aythya collaris</i>
Rock dove	<i>Columba livia</i>
Roseate spoonbill	<i>Platalea ajaja</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
Royal tern	<i>Thalasseus maximun</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
Ruby-throated hummingbird	<i>Archilochus colubris</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Ruddy turnstone	<i>Arenaria interpres</i>
Rufous-sided towhee	<i>Pipilo erythrophthalmus</i>
Rusty blackbird	<i>Euphagus carolinus</i>
Sanderling	<i>Calidris alba</i>
Sandwich tern	<i>Thalasseus sandvicensis</i>
Saltmarsh sparrow	<i>Ammodramus caudacutus</i>
Scarlet tanager	<i>Piranga olivacea</i>
Scott's seaside sparrow	<i>Ammodramus maritimus peninsulae</i>
Semipalmated plover	<i>Charadrius semipalmatus</i>
Semipalmated sandpiper	<i>Calidris pusilla</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Short-billed dowitcher	<i>Limnodromus griseus</i>
Short-tailed hawk	<i>Buteo brachyurus</i>
Smooth-billed ani	<i>Crotophaga ani</i>
Snowy egret	<i>Egretta thula</i>
Snowy plover	<i>Charadrius nivosus</i>
Solitary sandpiper	<i>Tringa solitaria</i>
Solitary vireo	<i>Vireo solitarius</i>

<b>Common Name</b>	<b>Scientific Name</b>
Song sparrow	<i>Melospiza melodia</i>
Sora	<i>Porzana carolina</i>
Southeastern American kestrel	<i>Falco sparverius paulus</i>
Spotted sandpiper	<i>Actitis macularius</i>
Summer tanager	<i>Piranga rubra</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Swamp sparrow	<i>Melospiza georgiana</i>
Tennessee warbler	<i>Oreothlypis peregrina</i>
Tree swallow	<i>Tachycineta bicolor</i>
Tri-colored heron	<i>Egretta tricolor</i>
Tufted titmouse	<i>Baeolophus bicolor</i>
Turkey vulture	<i>Cathartes aura</i>
Upland sandpiper	<i>Bartramia longicauda</i>
Veery	<i>Catharus fuscescens</i>
Vesper sparrow	<i>Pooecetes gramineus</i>
Western kingbird	<i>Tyrannus verticalis</i>
Western sandpiper	<i>Calidris mauri</i>
Whimbrel	<i>Numenius phaeopus</i>
Whip-poor-will	<i>Antrostomus vociferus</i>
White ibis	<i>Eudocimus albus</i>
White-eyed vireo	<i>Vireo griseus</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>
Willet	<i>Tringa semipalmata</i>
Wilson's phalarope	<i>Phalaropus tricolor</i>
Wilson's plover	<i>Charadrius wilsonia</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 sapsucker	<i>Sphyrapicus varius</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Yellow-breasted chat	<i>Icteria virens</i>
Yellow-crowned night heron	<i>Nycticorax violacea</i>
Yellow-rumped warbler	<i>Setophaga coronata</i>
Yellow-throated vireo	<i>Vireo flavifrons</i>
Yellow-throated warbler	<i>Setophaga dominica</i>

**Table 11. Imperiled Wildlife Species documented on or near the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>
American alligator	<i>Alligator mississippiensis</i>	FT(S/A)
Eastern indigo snake	<i>Drymarchon couperi</i>	FT
Florida mouse	<i>Podomys floridanus</i>	SSC
Gopher frog	<i>Rana captio</i>	SSC
Gopher tortoise	<i>Gopherus polyphemus</i>	ST
Little blue heron	<i>Egretta caerulea</i>	SSC
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	SSC
Short-tailed snake	<i>Lampropeltis extenuata</i>	ST
Southeastern American kestrel	<i>Falco sparverius paulus</i>	ST
Snowy egret	<i>Egretta thula</i>	SSC
Tricolored heron	<i>Egretta tricolor</i>	SSC
Wood stork	<i>Mycteria americana</i>	FT

<b>Acronym Key</b>	<b>Status</b>
FE	Federally Endangered
FT	Federal Threatened
FT(S/A)	Federally-designated Threatened Species due to Similarity of Appearance
SSC	State Species of Special Concern
ST	State Threatened

**Table 12. FNAI Observations documented on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
American alligator	<i>Alligator mississippiensis</i>
Blue purse-web spider	<i>Sphodros abboti</i>
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>
Eastern indigo snake	<i>Drymarchon couperi</i>
Gopher frog	<i>Rana captio</i>
Gopher tortoise	<i>Gopherus polyphemus</i>
Incised groove-bur	<i>Agrimonia incisa</i>
Short-tailed snake	<i>Lampropeltis extenuata</i>
Tiger salamander	<i>Ambystoma tigrinum</i>

**Table 13. WCPR Focal Species for the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>
American swallow-tailed kite	<i>Elanoides forficatus</i>	NL
Bachman’s sparrow	<i>Peucaea [Aimophila] aestivalis</i>	NL
Brown-headed nuthatch	<i>Sitta pusilla</i>	NL
Cooper’s hawk	<i>Accipiter cooperii</i> *	NL
Eastern indigo snake	<i>Drymarchon couperi</i>	FT
Florida black bear	<i>Ursus americanus floridanus</i> *	NL
Florida mouse	<i>Podomys floridanus</i> <sup>A, B</sup>	SSC
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	SSC
Florida sandhill crane	<i>Grus canadenses pratensis</i> <sup>C</sup>	ST
Gopher frog	<i>Rana capito</i> <sup>C</sup>	SSC
Gopher tortoise	<i>Gopherus polyphemus</i> <sup>A, B</sup>	ST
Limpkin	<i>Aramus guarauna</i> *	SSC
Northern bobwhite	<i>Colinus virginianus</i>	NL
Red-cockaded woodpecker	<i>Picoides borealis</i> *	FE
Sherman’s fox squirrel	<i>Sciurus niger shermani</i>	SSC
Southeastern American kestrel	<i>Falco sparverius paulus</i> <sup>A, B, D</sup>	ST
Southern bald eagle	<i>Haliaeetus leucocephalus</i>	NL
Striped newt	<i>Notophthalmus perstriatus</i>	NL
Wading birds	<i>Multiple spp.</i> <sup>C</sup>	NL

<b>Acronym Key</b>	<b>Status</b>
FE	Federally Endangered
NL	Not Listed
SSC	Species of Special Concern
ST	State Threatened

<b>Superscript</b>	<b>Meaning</b>
A	Species for which a measurable objective is identified
B	Species for which some level of monitoring is recommended
C	Species for which a SMA is recommended
D	Species for which species management is recommended
*	Limited opportunity species

**Table 14. Exotic Species documented on the CWEA**

<b>Common Name</b>	<b>Scientific Name</b>
Cuban green anole	<i>Anolis porcatus</i>
Cuban treefrog	<i>Osteopilus septentrionalis</i>
<b>Common Name</b>	<b>Scientific Name</b>
Hog	<i>Sus scrofa</i>
Mediterranean gecko	<i>Hemidactylus turcicus</i>

## 2.4 Native Landscapes

A total of nine natural community types exist on the CWEA. These communities include basin marsh, basin swamp, bottomland forest, mesic flatwoods, mesic hammock, sandhill, upland hardwood forest, and upland pine forest. The clay laden soils, karst topography with limestone at or near the soil surface, natural fire exclusion, and southern and northern limits of many plant species all combine in this area of the state to form a unique assemblance of rare and imperiled plant and animal species. One of the primary purposes of the Annatteliga Hammock Florida Forever Project which adjoins the CWEA is to further preserve this unique hammock community. A complete description of the vegetative communities is provided in Section 2.2.1.

## 2.5 Water Resources

Surface waters in the State of Florida are characterized under five classifications. Class I includes surface water bodies used for potable water supplies. Class II includes surface water bodies used for shellfish propagation and harvesting areas. Class III contains all surface water bodies utilized for recreation and propagation and maintenance of a healthy well balanced population of fish and wildlife. Class IV includes all surface water bodies utilized for agricultural water supplies. Class V includes all surface water bodies used for navigation, utility, and industrial use. All rivers, creeks, swamps, bogs, and all other surface water features in Hernando County are classified as Class III Freshwater or Marine water and should follow the Class III Freshwater or Marine Water Criteria as established in Chapter 62-302.400 of the Florida Administrative Code (FAC) (FDEP, 1996). Outstanding waters and outstanding national resource waters found in Hernando County include the CWEA, Chassahowitzka Wildlife Refuge and the Chassahowitzka Wildlife Management Area. All waters in National Parks, State Parks, preserves, memorials, wildlife refuges, and wilderness areas are classified as Outstanding Florida Waters as established in Chapter 62-302.700, FAC. Two watersheds are present throughout Hernando County: the Crystal-Pithlachascotee and Withlacoochee. The CWEA is encompassed within the Crystal-Pithlachascotee watershed. The Crystal-Pithlachascotee watershed (Hydrogeologic Unit Code 03100207) does not include any surface waters listed in the Florida 1998 Section 303(d) list of waters not meeting water quality standards or not supporting their designated uses.

The wetlands of the CWEA are Class III waters according to the DEP. Periodic dry spells are characteristic of depression marsh and wet prairie communities, but past and current hydrological conditions (consumptive and weather related) in this region of Florida appear to be altering these wetlands. An October 1966 report indicates that the water surface of May's Prairie once covered 43 acres, and spread two miles long and 1/4 mile wide during the wet season. Although water levels averaged from

4-5 feet deep in 1966, an August 1980 report describes water depths of 1-3 feet. Aerial photographs and historical evidence suggest a similar trend occurring in the marshes of the Big Pine tract.

A dike was built approximately 50 years ago in an effort to block the natural drainage of water from May's Prairie into a sinkhole at the northwestern edge of the wetland. The dike may still hold waters during the rainy season. However, water levels drop below the level of the dike during the dry season, causing the dike to be ineffective against water seepage through soils that have rapid permeability.

Regardless of decreasing water levels, the isolated wetlands in the CWEA are important to migratory and resident avian, mammalian and herpetological species. The periodic dry spells limit fish populations, but provide benefits to reptiles, amphibians, wading birds, and many aquatic insects. Rare species, such as the tiger salamander require wetlands that are devoid of fish populations. The sinkholes provide temporary wetlands that are particularly important to migrating birds. In addition, the CWEA wetlands provide a valuable educational resource to encourage citizens to support the conservation of wetlands throughout Florida.

The CWEA is not located within an aquatic preserve or a designated area of critical State concern, nor is it under consideration for such designation. There are two aquifer systems in Hernando County in the vicinity of the CWEA: the Surficial Aquifer System and the Floridan Aquifer System. The Surficial Aquifer System is the uppermost aquifer system in Hernando County found where sands overlie the limestones and dolomites of the Floridan Aquifer. The thickness of the Surficial Aquifer is highly variable due to large variations in the thickness of the sands. The Surficial Aquifer may overlie the Floridan Aquifer, or they may be separated by clays or other relatively impermeable units.

Recharge to the Surficial Aquifer is entirely from local rainfall, except in those areas where it is connected to the Floridan Aquifer. The Floridan Aquifer is the principle source of water in Hernando County for potable use as well as for irrigation. The Floridan Aquifer is composed of limestones and dolomites of Tertiary age and includes Lake City limestone, Avon Park Limestone, Ocala Group limestones, Suwannee Limestone, St. Marks Formation, and any hydrologically connected limestones or dolomites of the Hawthorn Formation. Recharge of the Floridan Aquifer occurs from the overlying Surficial Aquifer in areas where it is in direct contact with the Floridan Aquifer or through leaky confining beds between the Floridan and the Surficial Aquifer. Recharge can occur where the limestone is exposed at the surface or is overlain by a thin veneer of sand, and where there are lakes, sinks and rivers.

## **2.6 Beaches and Dunes**

There are no known beaches or dunes within the CWEA.

## **2.7 Mineral Resources**

The only geologic unit present at the CWEA is Oligocene. The major mineral resources of Hernando County which have been, or potentially could be, economically important are limestone and sand. Limestone, sand and gravel are mined for use in construction and various other industrial purposes.

## **2.8 Cultural Resources**

The Department of State, Division of Historical Resources (DHR) provides FWC recent data on occurrences of Florida's cultural resources. There are three archeological sites and three historic bridges

presently mapped or recorded by DHR for the CWEA. The DHR observations are broken down into five categories: archeological sites, resource groups, historical structures, historic bridges and historic cemeteries. There are no resource groups, historical structures or historic cemeteries noted on the CWEA.

The Chinsegut Hill site (HE00532) is a homestead that was once part of a larger village. This homestead was the home of Colonel Raymond Robins, an economic advisor to five U.S. Presidents. The Big Pine Tract site (HE00317) consists of a diffuse scatter of stone flakes, some of which have been heat treated, found along a nature trail. The Bishop Homestead (HE00318) includes remains of a building or buildings that were occupied during the 1850s. The surrounding property was used to grow sugarcane. The site currently contains historic ceramics, bricks and some metal.

The historic bridges noted on the CWEA are John Korycki Bridge (site HE00549), Meredith Footbridge (site HE00548) and Old 41 Bridge (site HE00550). All Master Site recordings, assessments and preservation strategies will be coordinated with DHR.

## **2.9 Scenic Resources**

The CWEA contains a diverse variety of natural communities. Among the scenic resources at the CWEA is the rolling sandhill topography of the 430-acre Big Pine Tract. This tract is one of the largest contiguous tracts of old-growth longleaf pine in Florida. The CWEA contains a diverse variety of natural communities. May's prairie, another scenic resource, is a unique area that changes from wet to dry seasonally, and is laden with a variety of grasses, sedges and wild flowers. This creates a mix of ecotypes that fosters plant diversity. The diverse convergence of habitats allows for a unique mixture of plant species that is rare in the state.

## **3 Uses of the Property**

### **3.1 Previous Use and Development**

Prior to European settlement, the landscape of Florida was settled and used by a variety of aboriginal peoples whose culture relied mainly on hunting, fishing and subsistence agriculture. According to the DHR, aboriginal people began to inhabit the land in Florida approximately 12,000 years ago. Historical research indicates that thousands of years ago, Native Americans were mining the limestone formations in Florida for chert, a flint-like stone that was chipped into tools. These early people lived by hunting small and large animals and gathering wild plants.

The climate was much drier than today, the portion of the Florida peninsula above sea level was much larger, and the springs, lakes, rivers, and wetlands that greeted Spanish explorers nonexistent. Instead there were open grassy prairies, scrub oaks, and pine forests. Water holes were critical to the survival of people and the animals—mammoths, horses, and bison—they hunted. Though some land alteration occurred, only minor alteration of the landscape is thought to have taken place until the advent of European settlement beginning with the Spanish occupation



of Florida in the sixteenth century.

Along with more advanced agricultural practices, the Spanish and other settlers brought live stock, primarily cattle and hogs, to Florida. This began an era of broad use of the landscape for agriculture. Rangeland cattle grazing and other agricultural practices began to be utilized in a more systematic way and occurred throughout much of the central Florida peninsula through most of the European settlement era from the 16<sup>th</sup> through the 20<sup>th</sup> centuries. Use of these agricultural practices began an era of increased alteration of the natural landscape. However, it wasn't until the 19<sup>th</sup> and 20<sup>th</sup> centuries that major settlement and more extensive alteration of the landscape in the area began with the widespread use of agriculture and associated development

The CWEA was once part of 6,000 acres of land originally conveyed from the United States government to Colonel Pearson of South Carolina in 1842. The land was sold to Colonel F. H. Ederington in 1852. In the late 1800s the CWEA was home to the Bishop family. A chimney and two cisterns, remnants of their homestead, remain on the area today. In the early 1900s turpentine was extracted from the pine trees, some of which still bear the scars.

In 1904, 2,082 acres, including the current Nature Center tract, were purchased by Colonel Raymond Robins, whose colorful career included gold mining and advising five presidents and whose wife Margaret was a tireless worker for women's suffrage. Robins named the land and its residence Chinsegut. An Alaskan Inuit word, Chinsegut means "spirit of lost things." Robins expanded the translation to "the place where things of true value that have been lost may be found again."

In 1932, Robins deeded his estate to the USDA under the Migratory Bird Conservation Act. It was Robins' wish that Chinsegut be preserved for the "inspiration and education of the next generation." In 1967, the USDA allowed the Commission to operate 408 acres as a nature preserve and for outdoor education. This area was acquired by FWC in 1973.

In 1973, the Big Pine Tract was designated as "virgin longleaf pine" and deeded from the USDA to the University of Florida in a quitclaim deed. In 1989, the Big Pine tract was transferred from the UF to FWC to use in conjunction with the Nature Center. The house is now part of Chinsegut Hill Conference and Retreat Center operated by the University of South Florida.



### **3.2 Current Use of the Property**

Currently, the CWEA 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 CWEA 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; archeological and historic resources monitoring and protection; and research related activities.

Due to the proximity of population centers in Hernando County, public use can be expected to increase as public awareness of opportunities increases. Annual use of the CWEA is estimated to be 6,615 user-days for all activities combined.

Current and anticipated resource uses of the property are varied. The Chinsegut Nature Center hosts many educational programs and hikes throughout the year. The area also offers excellent opportunities for viewing white-tailed deer and bird watching, especially for wading birds. Other uses include hiking, photography, and sightseeing. All uses of the area must conform to the original purpose of acquisition as outlined above.

### **3.2.1 Visitation and Economic Benefits**

Visitation and educational use of the area for fish and wildlife based public outdoor educational opportunities is the primary source of economic benefits from the CWEA, and contribute to the overall economy for the West-Central region of Florida. In Fiscal Year 2012-13, an estimated 6,615 people visited the CWEA. Primarily, as a result of visitor use, FWC economic analysis estimates indicate that the CWEA generated an estimated annual economic impact of \$ 1,292,504.85 for the State and region. This estimated annual economic impact has helped to create or support an estimated eight jobs.

Further revenue generating potential of the CWEA will depend upon future uses described in this Management Plan. Additional revenue from environmental lands such as the CWEA might 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 values of ecosystem services to local and regional land and water resources from air and water quality functions of the area, among others, and to human health, are considered to be significant.

## **3.3 Single- or Multiple-use Management**

The CWEA will be managed under the multiple-use concept as a Wildlife and Environmental Area. The CWEA will provide fish and wildlife resource based public outdoor recreation and educational opportunities, while protecting the natural and cultural resources found on the area. Any natural and cultural resources on the CWEA will be managed under the guidance of ARC, the Conceptual State Lands Management Plan, 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 CWEA. Uses classified as “Approved” are considered to be in accordance with the purposes for acquisition, the Conceptual State Lands Management Plan and the FWC agency mission, goals and objectives as expressed in the Agency Strategic Plan (Appendix 13.5). 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			✓
Military training			✓
Linear facilities			✓
Preservation of cultural sites	✓		
Preservation of historical sites	✓		
Primitive camping			✓
Protection of imperiled species	✓		
Off-road vehicle use			✓
Shooting Sports Park			✓
Soil and water conservation	✓		
Timber harvest	✓		
Wildlife observation		✓	

### 3.3.2 Assessment of Impact of Planned Uses of the Property

To communicate FWC’s planned uses and activities, specific management intentions, long- and short-term goals and with associated objectives, identified challenges, and solution strategies have been developed for the CWEA (Sections 5 -8). A detailed assessment of the benefits and potential impacts of planned uses and activities on natural and cultural resources was an integral part of the development of the management activities and intent, goals, objectives, challenges, and strategies sections of this Management Plan.

### 3.4 Acreage That Should Be Declared Surplus

On conservation lands where FWC is the lead manager, FWC evaluates and identifies recommended areas for a potential surplus designation by DSL, 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. FWC also 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 CWEA by FWC has determined that all portions of the area are being managed and operated to meet the original purposes of acquisition and to conform to title provisions. Furthermore, the CWEA remains essential for education and the conservation and sustainability of fish and wildlife within this region of Florida. For these reasons, none of the lands currently located within the CWEA meet the criteria for a potential surplus designation.

#### 4 Accomplished Objectives from the CWEA Management Plan 2002-2012

The following Resource Management Goals and Objectives are from the CWEA Management Plan 2002 – 2012. Planned activities for CWEA during this period were detailed in the Objectives listed below. The degree to which the FWC was able to accomplish the planned activities during this period is reflected as Percent Accomplished with each associated objective. Accomplishments for the CWEA during the previous planning timeframe are further discussed in more comprehensive detail throughout Section 5 Management Activities and Intent of this management plan.

<b>Objectives Accomplished from the 2002 Chinsegut WEA Management Plan</b>	
<b>Goals and Objectives</b>	<b>Percent Accomplished</b>
<b>Goal 1: Manage and maintain native communities to promote distribution, abundance, and diversity of native plant and animal species.</b>	
Objective 1: Continue to monitor CWEA breeding bird populations by conducting annual point count surveys ( <b>ongoing</b> ).	100%
Objective 2: Continue to conduct an annual mammalian scent station survey ( <b>ongoing</b> ). <i>Mammalian scent station survey protocol is no longer used by FWC.</i>	0%
Objective 3: Continue to use volunteer assistance to annually update the plant species occurrence inventory ( <b>ongoing</b> ).	100%
Objective 4: Continue to coordinate with the DOF to locate and treat southern pine beetle infestations ( <b>ongoing</b> ).	100%
Objective 5: Continue to control cogongrass by the use of prescribed fire and herbicide applications ( <b>ongoing</b> ).	100%
Objective 6: In order to protect listed amphibian and reptile species, prohibit intentional fish introductions into ponds of May’s or Burn’s Prairies ( <b>ongoing</b> ).	100%

Objective 7: By <b>2002</b> , initiate an aggressive eradication effort for exotic invasive plant species including skunkvine, airpotato, Chinese tallow, rosary pea, and coral ardesia (this objective addresses checklist finding #3 of the 2000 Land Management Review of CWEA).	100%
Objective 8: To monitor water levels, install staff gauges in May's and Burn's Prairies by <b>2003</b> (this objective addresses checklist finding #2 of the 2000 Land Management Review of CWEA).	100%
Objective 9: By <b>2004</b> , develop quantified management objectives for sandhill community management (this objective addresses checklist finding #1 of the 2000 Land Management Review of CWEA). .	100%
Objective 10: Pursuant to sandhill plant community management objectives, remove encroaching hardwoods on 250 acres using prescribed fire, mechanical, and chemical treatments, by <b>2004</b> (this objective addresses checklist finding #1 of the 2000 Land Management Review of CWEA).	100%
Objective 11: Continue to monitor reptile and amphibian species occurrences, updating the current inventory by <b>2006</b> .	100%
Objective 12: Delineate management units and develop quantifiable vegetation management objectives for these management units by <b>2007</b> (this objective addresses checklist finding #1 of the 2000 Land Management Review of CWEA).	100%
<b>Goal 2: Coordinate management and educational activities with adjacent landowners, cooperating agencies and organizations (i.e., FWC Office of Information Services, DACS Florida Forest Service, Hernando County School system, County Agricultural Extension 4-H, U.S. Department of Education (USDOE), The Nature Conservancy, University of South Florida, USDA, Hernando Audubon, and the Florida Native Plant Society).</b>	
Objective 1: By means of posting and media advertisements, continue to notify adjacent landowners and the community of planned prescribed burns ( <b>ongoing</b> ).	100%
Objective 2: Continue to coordinate with DOF regarding prescribed fire, sandhill plant community management, southern pine beetle treatment, and environmental education programs (this objective addresses checklist finding #1 of the 2000 Land Management Review of CWEA) ( <b>ongoing</b> ).	100%
Objective 3: Continue to coordinate volunteer assistance to enhance both environmental education programs and land management activities ( <b>ongoing</b> ).	100%

Objective 4: Continue to encourage adjacent landowners to cooperate in exotic plant species control efforts (this objective addresses checklist finding #3 of the 2000 Land Management Review of CWEA)(ongoing).	100%
Objective 5: To encourage use by the Hernando County School system as required by the USDOE deed agreement, and if a suitable funding source can be identified, install a vault toilet restroom facility near the main entrance of the Big Pine tract (USDOE approval required) by <b>2003</b> .	100%
Objective 6: Continue to comply with requirements of the USDOE Quitclaim Deed agreement through its expiration in <b>2003</b> .	100%
<b>Goal 3: Develop an optimum boundary for the CWEA by continuing to identify, purchase and establish land tracts necessary for agency resource management and environmental education objectives.</b>	
Objective 1: Continue to maintain a GIS shapefile, acreage, and other necessary data to facilitate nominations for the Inholdings and Additions Program ( <b>ongoing</b> ).	100%
Objective 2: Using GPS and GIS technologies, update area boundary maps by <b>2002</b> (this objective addresses recommendation #1 and checklist finding #4 of the 2000 Land Management Review of CWEA).	100%
<b>Goal 4: Control public access to provide security and natural resource protection.</b>	
Objective 1: Coordinate with FWC law enforcement regarding scheduled activities, especially for groups of 25 or more ( <b>ongoing</b> ).	100%
Objective 2: By <b>2002</b> , replace 3 gates with full-sized gates at the main entrances of the Chinsegut Nature Center and Big Pine tracts.	100%
Objective 3: To the extent available funding will allow, replace perimeter fencing with a five-foot fence by <b>2004</b> . <i>The perimeter fencing was replaced using FWC standards for fencing.</i>	100%
<b>Goal 5: Continue to provide a strong environmental education program focusing on wildlife species and habitat management.</b>	
Objective 1: Host at least one Project WILD teacher workshop annually ( <b>ongoing</b> ).	100%
Objective 2: Continue to host four environmental education-related community events annually ( <b>ongoing</b> ). <i>Due to lack of funding and staff resources, the number of community events was decreased.</i>	95%

Objective 3: Conduct at least 45 environmental education sessions for school and community groups annually ( <b>ongoing</b> ).	100%
Objective 4: Design environmental education programs to include seasonal themes, and to promote the values and methods of hunting and fishing ( <b>ongoing</b> ).	100%
Objective 5: Maintain two butterfly gardens to provide educational opportunities for the study of insects ( <b>ongoing</b> ).	100%
Objective 6: Conduct at least two archery education workshops annually ( <b>ongoing</b> ).	100%
Objective 7: To monitor the effectiveness of the environmental education program, initiate an evaluation form for interested visitors by <b>2002</b> .	100%
Objective 8: To address safety concerns and enhance nature tour (trail) programs, seek funding to replace the existing wooden boardwalk by <b>2003</b> .	100%
Objective 9: Seek funding to construct a kiosk and interpretive signage on the Big Pine tract by <b>2003</b> (this objective addresses recommendation #2 of the 2000 Land Management Review of CWEA).	100%
Objective 10: By <b>2003</b> , propose an additional OPS staff position to assist with expanded environmental education programs and land management activities (this objective addresses checklist finding #5 of the 2000 Land Management Review of CWEA).	100%
Objective 11: Seek funding to design and construct an outdoor pavilion to improve meeting facilities for large groups by <b>2004</b> .	100%
<b>Goal 6: Provide adequate infrastructure to manage resources and provide public use programs.</b>	
Objective 1: To encourage use by the Hernando County School system, as required by the USDOE deed agreement, and if a suitable funding source can be identified, install a vault toilet restroom facility near the main entrance of the Big Pine tract (USDOE approval required) by <b>2003</b> (this objective addresses recommendation #2 of the 2000 Land Management Review of CWEA).	100%
Objective 2: By <b>2002</b> , replace 3 gates with full-sized gates at the main entrances of the Chinsegut Nature Center and Big Pine tracts.	100%

Objective 3: If a suitable funding source can be secured, install additional water fountains and restroom facilities at the Nature Center at the standard necessary to accommodate school and community groups numbering up to 100 individuals by <b>2006</b> . <i>Funding was not available to complete the objective.</i>	0%
Objective 4: Seek funding to construct an outdoor pavilion to improve meeting facilities for large groups by <b>2003</b> .	100%
Objective 5: To eliminate safety concerns and enhance nature tour (trail) programs, seek funding to replace the existing wooden boardwalk by <b>2003</b> .	100%
Objective 6: Seek funding to update or replace existing entrance and informational signs to meet current standards by <b>2003</b> .	100%
Objective 7: Seek funding to construct a kiosk and interpretive signage on the Big Pine tract by <b>2003</b> (this objective addresses recommendation #2 of the 2000 Land Management Review of CWEA).	100%
Objective 8: By <b>2003</b> , install an ADA-approved wheelchair access at the Nature Center building.	100%
Objective 9: By <b>2004</b> , replace three culverts, and upgrade the Nature Center driveway and parking area with graded limerock.	100%
Objective 10: To the extent available funding will allow, replace perimeter fencing with a five-foot fence by <b>2004</b> . <i>The perimeter fencing was replaced using FWC standards for fencing.</i>	100%
Objective 11: If a suitable funding source can be secured, expand the Nature Center meeting room facilities to accommodate 100 visitors by <b>2006</b> . <i>Adequate funding was not available to accomplish this objective.</i>	0%
<b>Goal 7: Continue to identify and protect archaeological, historic, and cultural resources.</b>	
Objective 1: Continue to identify, monitor and protect cultural resources ( <b>ongoing</b> ).	100%
Objective 2: In cooperation with the Department of State, Division of Historical Resources, complete a survey for cultural sites by <b>2004</b> . <i>After coordination with DHR, an additional archeological survey was not determined to be warranted.</i>	0%

## **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 cultural resources. In general, the FWC management intent for the CWEA is to restore and maintain natural communities in a condition that sustains ecological processes and conserves biological diversity, especially fish and wildlife resources. In conjunction with this primary emphasis, it is FWC's intent to provide good fish and wildlife resource-based public outdoor recreational opportunities on the CWEA. 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, the management activities described in this section are in compliance with those of the Conceptual State Lands Management Plan.

### **5.1 Land Management Review**

Pursuant to Chapter 259.036, F.S., the DEP-DSL is required to "cause periodic management reviews to be conducted" on Board of Trustees conservation lands to determine if they "are being managed for the purposes for which they were acquired and in accordance with a land management plan adopted pursuant to s. 259.032."

The recommendations of 2000 Land Management Review (Appendix 13.4) were considered and addressed in the drafting of this Management Plan. This includes the development of management intent language, goals and objectives, and identification of management challenges and development of solution strategies (Sections 4 -7).

### **5.2 Adaptive Management**

Adaptive management is "learning by doing".<sup>1</sup> 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.<sup>1,2</sup> 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.<sup>2,3</sup> 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.<sup>2,3</sup>

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. FWC will monitor conservation actions, species, habitats, and major threats to the conservation of the natural and cultural resources of the CWEA.

### **5.2.1 Monitoring**

A well-developed monitoring protocol is also one of the principal, required criteria for the management of the CWEA. Monitoring and performance measures are important, but are 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.<sup>2</sup>

For natural communities, monitoring protocols are established through FWC's Objective-Based Vegetation Management (OBVM), (Section 5.3.1) program, which monitors how specific vegetative parameters are responding to FWC management. For imperiled and focal fish and wildlife species, monitoring protocols are established through FWC's WCPR (Section 5.4.2) program. Additional select common and game fish and wildlife species may be monitored by FWC staff as appropriate. Exotic and invasive plant and animal species (Section 5.5) are also monitored as needed. Recreational uses are monitored through FWC's Office of Public Access and Wildlife Viewing Services (formerly the Office of Recreation Services) (OPAWVS) program, and work in conjunction with the establishment and adjustment of public access carrying capacities (Section 5.6.3). Cultural and historical resources (Section 5.8.2) 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 CWEA 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, OPAWVs, Recreation Master Plans, etc.) underway to accomplish needed conservation actions that are planned to manage the natural resources of the CWEA, 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 CWEA, 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, while also providing for natural regeneration, remains an important consideration. The CWEA has high-quality native communities including basin marsh, basin swamp, bottomland forest,

mesic flatwoods, mesic hammock, sandhill, upland hardwood forest, and upland pine forest that FWC will continue to manage and protect. On disturbed upland sites, FWC intends to initiate ground cover and natural community restoration.

FNAI has conducted surveys and mapped the current and historic vegetative communities on the CWEA. 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. 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. FWC contracts with 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 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.

At the same time, 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. 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.

Initial mapping and vegetation sampling provides FWC staff with baseline data indicating natural community structure, distribution, and condition on the area. Comparing the subsequent monitoring results to desired future conditions, provides key operational information on a 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.

### **5.3.2 Prescribed Fire and Fire Management**

Periodic spring and summer fires occurred in fire-adapted communities under natural conditions in Florida. 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.

Timber removal, site preparation, drainage, and lack of fire have all combined to alter the plant species composition of the area resulting in a loss of fuel and the inhibition of natural fire regimes. Site-specific combinations of prescribed fire, mechanical and chemical vegetation control, reforestation, and restoration of natural water regimes are likely necessary actions needed to restore the area to more natural conditions.

The FWC employs a fire management regime to increase both species and habitat diversity and will continue a prescribed burning program on the CWEA 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 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), can create habitat diversity and a mosaic of vegetation patterns. This mosaic is designed to contain both frequently burned and infrequently burned areas.

On some areas, prescribed burning is limited by the buildup of mid-story brush and a lack of pyrogenic groundcover fuels. This condition is not productive habitat for many wildlife species. Mechanical control of brush on upland sites or incidentally by logging equipment during commercial thinning operations, can reduce shading and thereby encourage the grasses and forbs that are necessary to sustain prescribed fire.

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

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. Silvicultural site preparation and creation of firebreaks are 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, an area-specific Prescribed Fire Plan has been developed and implemented for the CWEA. 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.

Since FWC acquisition all burnable acres have been burned on the Nature Center Tract. Burn histories for this tract date back to 1984. Most burn units have been burned more recently and are in rotation. The Big Pine Tract burn histories only date back to 2006. There are 253 acres on the Big Pine Tract that have no known fire history available. The remaining acreage at Big Pine has been burned at least once since 2006.

Among the continuing resource management activities that have been accomplished on the area to maintain and improve the existing sandhill natural community, mechanical and herbicide treatments were used. Mechanical treatments on the CWEA included chainsaw work on 15.5 acres and mowing on 18 acres. The chainsaw hand crew work was completed in May of 2011, by a contractor, with the goal of restoring the sandhill habitat by removing encroaching oak trees. Select oaks were marked according to species, size and proximity to one another in order to be excluded from the treatment. The mowing on the area was performed by a contractor in 2012 using a skid steer tractor with a front mounted hydraulic brush cutter. The goal of these treatments was to facilitate prescribed fire by changing the fuel arrangement and increasing fine fuels.

### 5.3.3 Habitat Restoration

As detailed in section 5.3, FWC will focus on managing for native habitat diversity and emphasizing maintenance of high-quality natural communities. Restoration may be achieved on disturbed areas by a combination of management techniques.

The re-introduction of fire, restoring historic hydrological conditions and/or the use of mechanical or chemical forest management are some of the techniques that may be employed. Retention of the native old growth component of forests, while also providing for natural regeneration, remains an important consideration. The CWEA is made up of mostly upland pine, sandhill, mesic hammock and upland pine that FWC will continue to manage and protect.



FNAI has conducted surveys and mapped the current vegetative communities and historic vegetation communities on the CWEA. This information will be used to guide and prioritize management and restoration efforts on the area.

To address habitat maintenance needs and to help achieve desired future conditions in native plant communities, FWC continues to conduct natural community restoration activities. Large portions of the CWEA are in a maintenance condition.

### 5.3.4 Apiaries

Currently, there are no apiaries operating on the CWEA. However, use of apiaries is conditionally approved for the CWEA. Apiaries are deemed to be consistent with the purposes for acquisition, in compliance with the Conceptual State Lands Management Plan, and are consistent with the FWC agency mission, goals, and objectives as expressed in the agency Strategic Plan and priorities document

(Appendix 13.5). Location, management, and administration of apiaries on the CWEA will be guided by the FWC Apiary Policy (Appendix 13.6).

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

### **5.4.1 Fish and Wildlife**

Due to the variety of natural communities, a diversity of associated wildlife, including rare and imperiled species, can be found on the CWEA. In managing for wildlife species, an emphasis will be placed on conservation, protection, and management of natural communities. Natural communities important to wildlife include basin marsh, basin swamp, bottomland forest, mesic flatwoods, mesic hammock, sandhill, upland hardwood forest, and upland pine forest.

Wildlife management emphasis is placed on documenting the occurrence and abundance of rare and imperiled species on the property and the conservation, protection and management of natural communities. The FWC will continue to update 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.

The unique character of the area's old-growth longleaf pine forests and the diversity of habitats on the CWEA create a unique assemblance for a variety of wildlife species.

Resident wildlife will be managed for optimum diversity and abundance. In addition to resident wildlife, the CWEA has a minor role in supporting the regional wading bird population. Wading birds benefit from a variety of foraging opportunities within their range, regardless of the size of the wetland. FWC will continue to update inventories for certain species, with emphasis on rare and imperiled fish and wildlife species.

FWC intends to manage fauna populations in a responsible and sustainable manor. This will assure healthy populations and high-quality educational and recreational experiences. In general, wildlife populations will be managed to provide continued recreational wildlife viewing opportunities.

Concurrent with ongoing species inventory and monitoring activities, management practices are designed to restore, enhance or maintain rare and imperiled species, and their habitats. This will be accomplished 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 FWC's comprehensive species management strategy for rare and imperiled wildlife and their respective habitats.



#### **5.4.2 Imperiled Species - Wildlife Conservation Prioritization and Recovery**

The FWC has identified the need to: 1) demonstrate optimal wildlife habitat conservation on FWC-managed lands; 2) develop science-based performance measures to evaluate management; 3) recover imperiled species; and 4) prevent future imperilment of declining wildlife species. To help meet these needs, the FWC uses a comprehensive resource management approach to managing FWC-managed areas. Restoring the form and function of Florida's natural communities is the foundation of this management philosophy. The FWC uses 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 FWC does for imperiled and focal species on FWC-managed areas; ensuring the actions taken on these areas are part of statewide conservation programs and priorities; and informing others about the work accomplished on lands FWC manages.

The WCPR program helps FWC take a proactive, science-based approach to species management on FWC-managed lands. This approach assesses information from statewide potential habitat models and Population Viability Analysis, and in conjunction with input from species experts and people with knowledge of the area, creates site-specific wildlife assessments for imperiled wildlife species and a select suite of focal species. Staff combines these assessments with area-specific management considerations to develop a wildlife management strategy for the area. Each strategy contains area-specific measurable objectives for managing priority species and their habitat, prescribes management actions to achieve these objectives, and establishes monitoring protocols to verify progress towards meeting the objectives. 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](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 FWC does for imperiled and focal species, prescribe management actions to aid in species recovery, prescribe monitoring protocols to allow evaluation of the species' response to management, and ensure the information is shared with others. Through the actions of this program, FWC will facilitate fulfilling the needs of focal and imperiled wildlife species on the CWEA. In the long-term, by implementing these strategies on FWC-managed lands and continuing to assess wildlife species' needs, FWC will continue to play an integral role in aiding the recovery of imperiled species and preventing the future imperilment of declining wildlife species.

#### **5.5 Exotic and Invasive Species Maintenance and Control**

The FWC will continue efforts to control the establishment and spread of FLEPPC Category I or II plants on the CWEA. 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.

FWC contracted and completed the survey and mapping of invasive exotic plant species on the area, and begun “in-house”, contractor, and volunteer treatment of those occurrences. FNAI found and documented multiple occurrences of Florida Exotic Pest Plant Council (FLEPPC) Category I and II exotic invasive plant species throughout the area.

Two contracts were utilized to treat exotic vegetation. In total, the contracts treated 322 acres and 22,079 individual exotic plants. The acreage treatment included grasses and vines such as cogon grass, natal grass, air potato, skunk vine, rosary pea and Japanese climbing fern. The individual plants consisted mainly of trees including Chinese tallow tree, camphor tree and chinaberry tree.



The individual plant treatment also included Caesar weed, tropical soda apple and Spanish lantana. Area staff has been very active in treating exotic vegetation on the area as the money available for contracts doesn't cover the entire area every year. The Brooksville ridge volunteer program has also been beneficial in the ongoing treatment of exotic vegetation on the area. During the 2010-2012 reporting period staff and volunteers treated 13.38 acres of air potato and cogon grass and 9245 individual plants. The acreage of 509 for 10/11 and 418 for 11/12 represents the total acreage that was searched using transects, and treated each year by staff and contractors.

## **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 ADA<sup>4</sup> where:

1. Compliance will cause harm to cultural or historic sites, or significant natural features and their characteristics.
2. Compliance will substantially alter the nature of the setting and therefore the purpose of the facility.
3. Compliance would not be feasible due to terrain or prevailing construction practices.
4. Compliance would require construction methods or materials prohibited by federal or state statutes, or local regulations.

### **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 CWEA. To accomplish this, FWC will work with recreational stakeholders and the general public to develop a Recreation Master Plan for the CWEA 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 Recreation Master Plan will include planning for parking, trail design, and area resource interpretation.

### **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, supported public access user opportunities, and the anticipated proportional visitation levels of the various user groups, FWC has determined that the CWEA can currently support 256 visitors per day. However, an objective to increase the carrying capacity to 456 visitors per day has been proposed in Section 6.4.11 of this Management Plan by creating additional public access and educational programs. This public access carrying capacity will be periodically reevaluated, and additional capacity may be contemplated as part of the Recreation Master Plan development and implementation process.

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 cultural resources on every area and to ensure that visitors will have a high-quality visitor experience.

### **5.6.4 Wildlife Viewing**

The CWEA provides a wide variety of native wildlife species, both resident and seasonally migratory, that are available for visitors’ enjoyment for observation and photography. The quality of habitat found on the CWEA attracts a suite of species including various birds, mammals, reptiles and amphibians.

### **5.6.5 Hunting**

While the CWEA provides a variety of outdoor fish and wildlife based educational and recreational opportunities, hunting is not permitted due to deed restrictions. However, opportunities for hunting are available on nearby public conservation lands such as Chassahowitzka WMA and Half Moon WMA.

### **5.6.6 Fishing**

Fishing is considered a consumptive use and is not an approved activity in accordance with deed restrictions and title provisions. Ample opportunities for fishing exist on nearby public conservation lands such as Half Moon WMA.

### **5.6.7 Boating**

Few water features exist within the established boundary of the CWEA. Therefore no boating opportunities exist. Though, numerous boating opportunities are available on public waters near the area.

### **5.6.8 Hiking**

Currently, 6.7 miles of hiking trails are available for public recreation on the CWEA. Both the Big Pine tract and the Nature Center tract have several hiking trails, including the new "Prairie to Pines Trail" which connects the two properties by winding through a variety of landscapes. The trails on the CWEA are open year-round and those at the Nature Center tract are open by appointment and during daylight hours with the exception of the trailhead at the south end of the nature center tract which allows hikers access to trails on all days. The FWC will continue to periodically reevaluate the potential for additional trails, as well as trail connectivity opportunities to other conservation areas, and will monitor new trails biannually for user impacts to natural communities.

### **5.6.9 Bicycling**

Bicycling is prohibited as it is 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. However, opportunities for bicycling activities are available on nearby public conservation lands.

### **5.6.10 Equestrian**

Currently, horseback riding is prohibited on the CWEA. The small size, limited facilities, and natural conditions present at the CWEA are not conducive to equestrian use. Recreation opportunities will be reassessed every three years. However, opportunities for equestrian activities are available on nearby public conservation lands.

### **5.6.11 Camping**

Camping is prohibited on the CWEA. Due to the limited size of the area, lack of appropriate sites that would not interfere with other uses, and proximity to several privately operated campgrounds that provide camping opportunities, FWC has not identified a need to provide camping facilities on the CWEA. Recreation opportunities will be reassessed every three years.

### **5.6.12 Geocaching**

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

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

[http://myfwc.com/media/1074886/FWC\\_Geocache\\_Guidelines.pdf](http://myfwc.com/media/1074886/FWC_Geocache_Guidelines.pdf) .

### **5.6.13 Environmental Education**

As previously stated, the main function of the CWEA is environmental and natural resource education. The Nature Center hosts four major events annually and provides several other structured programs during the year. FWC will continue to assess the need for and participate and encourage environmental education partnership opportunities as appropriate.

#### **5.6.13.1 Interpretation**

There is interpretive signage and resource interpretation materials provided at the main entrance. Additional interpretive materials including a kiosk and butterfly list have been developed.

#### **5.6.13.2 Programs**

The Chinsegut Nature Center offers many educational public and private group programs and hikes throughout the year. FWC will continue to assess the need for and participate and encourage structured program opportunities as appropriate.

## **5.7 Hydrological Preservation and Restoration**

### **5.7.1 Hydrological Assessment**

During the WCPR strategy development process for the CWEA, it was determined that Mays Prairie and Burns Prairie should be further evaluated to determine if restoration activities are appropriate and feasible. If it is determined that restoration is appropriate, and if additional resources are available, then restoration activities will be initiated on Mays Prairie and Burns Prairie.

A hydrological assessment for the CWEA will be conducted. Pursuant to the recommendations of the hydrological assessment, FWC will implement hydrological restoration as feasible and appropriate. The FWC may coordinate with DEP and the Southwest Florida Water Management District (SWFWMD) on appropriate water regulation schedules for the CWEA if deemed applicable, and will continue to encourage water regulation schedules that promote the protection of hydrological resources and enhance wildlife.

### **5.7.2 Water Resource Monitoring**

The FWC will cooperate with the SWFWMD and DEP to develop and implement any necessary surface water quality and quantity monitoring protocols for the CWEA. In this capacity, FWC will primarily rely on the expertise of the SWFWMD and DEP to facilitate these monitoring activities. Additionally, FWC may also initiate and facilitate water resources monitoring, in cooperation with DEP and the SWFWMD, as deemed necessary.

## **5.8 Forest Resource Management**

As noted in section 2.2, a Timber Assessment of the timber resources of the CWEA will be conducted by the FFS. The management of timber resources will be considered in the context of the Timber Assessment and the overall land management goals and activities.

Thinning of the forest over-story, hydrological restoration and 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, FWC will continue to manage timber resources for wildlife benefits and natural community restoration. The primary management technique for encouraging reforestation is protection of young trees and seedlings on these sites from damage. However, where natural regeneration is lacking, artificial reforestation may be implemented. Planting trees on these selected sites is used to increase the rate of reforestation and to ensure diversity.

Upland forest management will focus on preserving the unique old-growth longleaf pine forests on the area in maintenance condition. Forested wetlands are managed for stands with old growth characteristics. Snags will be protected to benefit cavity-nesting species. Consequently, preservation, enhancement and maintenance of the old growth forest natural communities will be the primary focus of managing the area's forest resources.

### **5.8.1 Forest Management Plan**

As previously mentioned, a timber assessment has yet to be completed for the entire established boundary of the CWEA. This assessment will provide specific management prescriptions for the entire CWEA. The CWEA is a unique property and well-suited for its intended purpose. Timber harvesting is considered a consumptive use and is not an allowable activity on the CWEA as designated in the deed restrictions. Salvage cuts from wildfire, storm damage and pine beetle infestation is allowed. Through regularly scheduled and properly timed burns, conditions for ground cover plants will improve as well as the overall health and long-term sustainability of the longleaf pine.

### **5.8.2 Cultural and Historical Resources**

The DHR provides FWC recent data on occurrences of Florida's cultural resources. There are three archeological sites and three historic bridges presently mapped or recorded by DHR for the CWEA. DHR observations are broken down into five categories: archeological sites, resource groups, historical structures, historic bridges and historic cemeteries. There are no resource groups, historical structures or historic cemeteries noted on the CWEA.

As referenced in section 2.8, three archeological and three historical sites are found on the CWEA. The Chinsegut Hill site (HE00532) is a homestead that was once part of a larger village. This homestead was the home of Colonel Raymond Robins. The Big Pine Tract site (HE00317) consists of a diffuse scatter of stone flakes, some of which have been heat treated, found along a nature trail. The Bishop Homestead (HE00318) includes remains of a building or buildings that were occupied during the 1850s. The surrounding property was used to grow sugarcane. The site currently contains historic ceramics, bricks and some metal.

The historic bridges noted on the CWEA are John Korycki Bridge (HE00549), Meredith Footbridge (HE00548) and Old 41 Bridge (HE00550). All Master Site recordings, assessments and preservation strategies will be coordinated with DHR.

## **5.9 Capital Facilities and Infrastructure**

FWC's land management philosophy is designed to conserve the maximum amount of wildlife habitat while providing the minimal number of capital facilities and infrastructure necessary to effectively conduct operational and resource management activities, and provide ample opportunities for fish and wildlife 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.

Current capital facilities and infrastructure on the CWEA include eight facilities (Nature Center, shop, US 41 Trailhead, boardwalk, viewing blind, main entrance, Big Pine entrance, and water tower), 0.4 miles of roads and 6.7 miles of trails. Culverts and other hydrological structures may be needed as determined by a hydrological assessment and restoration plan, and will be constructed as feasible.

The enhancement of existing facilities and the addition of new facilities are planned on the CWEA (Figure 8). The listed structures are being located in the area already impacted by the education center. They do not replace current structures but rather expand the outdoor and environmental education function of the WEA. To enhance the Nature Center facility an additional classroom building will be constructed on the same impacted area as the existing Nature Center. This additional classroom will be used to expand conservation and environmental education programs with larger classroom capacity.

An archery range is in the process of being developed on the CWEA. It is a new structure. The field conservation facility is a covered shelter in the vicinity of Mays Prairie, the adjacent cypress swamp and the sink hole on site to allow for field instruction in the midst of these three distinct features which will be developed with FNAI and DHR input to avoid any unnecessary impact on the area's resources.

As described in Section 2.4.1 of this Management Plan, for any public facilities that are developed on areas managed by FWC, every effort is made to comply with the Americans with Disabilities Act (Public Law 101-33

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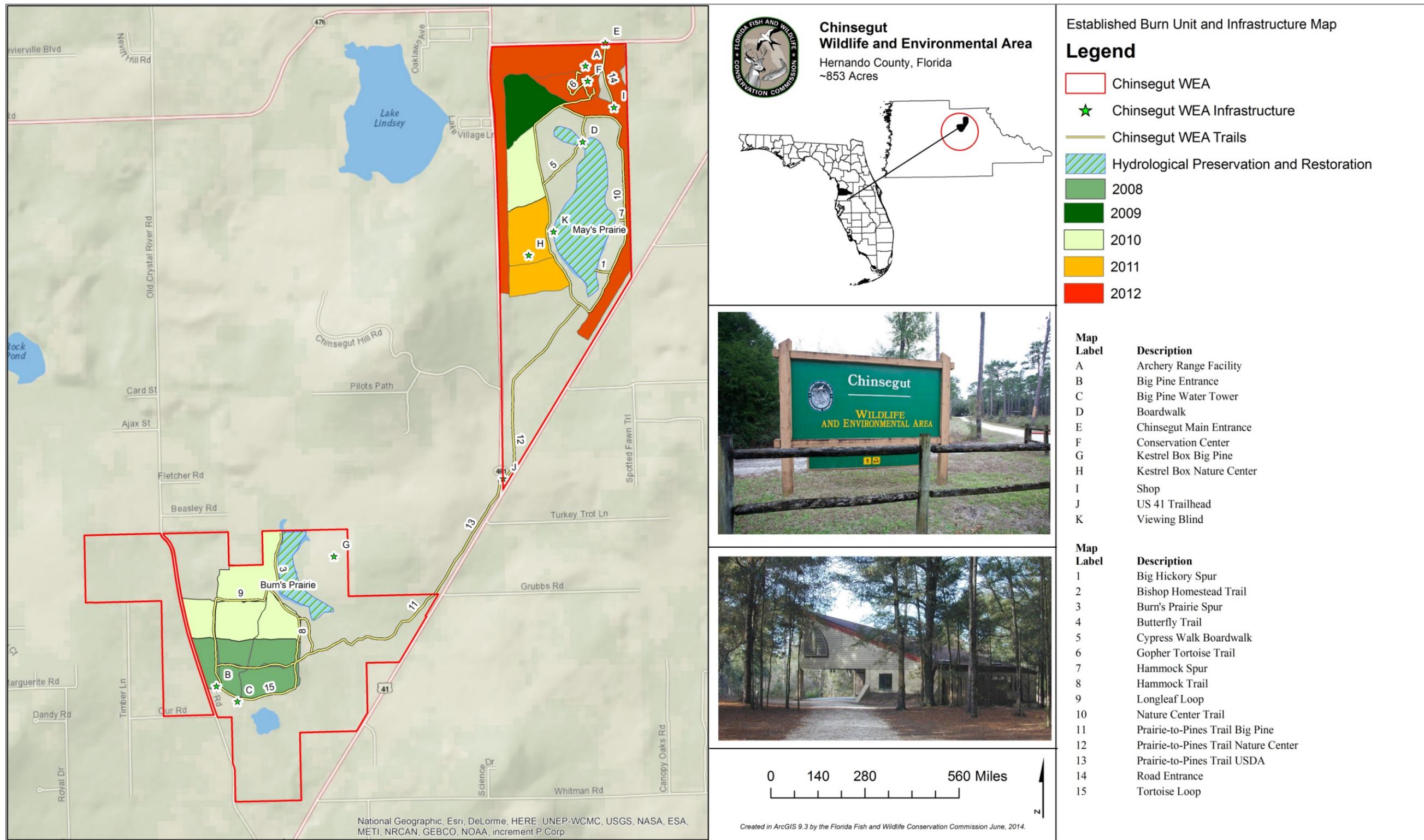


Figure 8. Established Burn Unit and Infrastructure Map

<b>Map Label</b>	<b>Description</b>	<b>Management Plan Objectives</b>	
A	Archery Range Facility	Capital Facilities and Infrastructure 6.8.4, 6.8.7	
B	Big Pine Entrance	Capital Facilities and Infrastructure 6.8.1, 6.8.7, 6.8.13	
C	Big Pine Water Tower	Capital Facilities and Infrastructure 6.8.1, 6.8.7, 6.8.13	
D	Boardwalk	Capital Facilities and Infrastructure 6.8.1, 6.8.7, 6.8.13	
E	Chinsegut Main Entrance	Capital Facilities and Infrastructure 6.8.1, 6.8.7, 6.8.13	
F	Nature Center	Capital Facilities and Infrastructure 6.8.1, 6.8.7, 6.8.13	
G	Kestrel Box Big Pine	Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration 6.2.4, 6.2.9	
H	Kestrel Box Nature Center	Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration 6.2.4, 6.2.9	
I	Shop	Capital Facilities and Infrastructure 6.8.1, 6.8.7, 6.8.13	
J	US 41 Trailhead	Capital Facilities and Infrastructure 6.8.1, 6.8.7, 6.8.13	
K	Viewing Blind	Capital Facilities and Infrastructure 6.8.1, 6.8.7, 6.8.13	
<b>Map Label</b>	<b>Description</b>	<b>Management Plan Objective</b>	<b>Miles</b>
1	Big Hickory Spur	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.06
2	Bishop Homestead Trail	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.05
3	Burn's Prairie Spur	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.22
4	Butterfly Trail	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.05
5	Cypress Walk Boardwalk	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.35
6	Gopher Tortoise Trail	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.19
7	Hammock Spur	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.02
8	Hammock Trail	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.22
9	Longleaf Loop	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.81
10	Nature Center Trail	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	2.03
11	Prairie-to-Pines Trail Big Pine	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.56
12	Prairie-to-Pines Trail Nature Center	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.75
13	Prairie-to-Pines Trail USDA	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.51
14	Road Entrance	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.2, 6.8.8	0.39
15	Tortoise Loop	Public Access and Recreational Opportunities 6.4.9, 6.4.14, Capital Facilities and Infrastructure 6.8.3, 6.8.9	0.78
	<b>Description</b>	<b>Management Plan Objective</b>	
	Burn's Prairie	Hydrological Preservation and Restoration 6.5.2, 6.5.6	
	May's Prairie	Hydrological Preservation and Restoration 6.5.2, 6.5.6	

## **5.10 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 plays 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 FWC to further the regional conservation of important fish and wildlife habitats through a proactive, comprehensive, and cooperative approach towards conservation.

### **5.10.1 Optimal Resource Boundary**

The three tiered model begins with the development of an ORB. An ORB 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.

### **5.10.2 Optimal Conservation Planning Boundary**

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

The OCPB provides the basis for development of a broader CAS for the CWEA. 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. The OCPB identifies surrounding lands and natural resources that may be important to the continued viability of fish and wildlife populations in the region. As they are currently managed, these lands appear to contribute to regional conservation and may support conservation landscape linkages (Figure 9).

### **5.10.3 Conservation Action Strategy**

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

Primary components of the CAS 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/>.

#### **5.10.4 FWC Florida Forever Additions and Inholdings Acquisition List**

Currently, FWC has identified zero acres of potential additions or privately held inholdings for the CWEA. However, 12,540 acres of the adjacent Annutteliga Hammock Florida Forever project have yet to be acquired.

Additionally, development of an optimum conservation planning boundary for the CWEA during the process of developing a management plan will aid in updating conservation priorities within the vicinity of the CWEA. The FWC will continue to cooperate with FFS and adjacent landowners in any potential acquisitions and management of any lands in the vicinity of the CWEA. Upon completion of the CAS, additions to the FWC Florida Forever Additions and Inholdings acquisition list may be recommended.

### **5.11 Research Opportunities**

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

### **5.12 Cooperative Management and Special Uses**

#### **5.12.1 Cooperative Management**

The FWC is responsible for the overall management and operation of the CWEA as set forth in the lease agreements with the Board of Trustees and the SWFWMD. In keeping with the lease agreements, 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 DHR to ensure the requirements of the Management Procedures Guidelines - Management of Archaeological and Historical Resources document (Appendix 13.7 ) are followed with regard to any ground-disturbing activities. In addition, the FFS is a designated cooperating agency, and assists FWC by providing technical assistance on forest resource management. Also, FWC cooperates and consults with the SWFWMD and DEP for the monitoring and management of both ground and surface water resources and the overall management of the CWEA.

### **5.12.2 First Responder and Military Training**

First-responder (public governmental police department or agency, fire and emergency medical service personnel) training and military training are restricted on the CWEA. Such activities are not considered allowable uses due to deed restrictions and size of the area.

## **5.13 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.<sup>5</sup>

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, and educational 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.

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;<sup>6, 7, 8</sup> more frequent invasions and outbreaks of exotic invasive species;<sup>9</sup> and loss of habitat in coastal areas due to sea level rise.<sup>10</sup> 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.<sup>11</sup> 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, 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, 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.

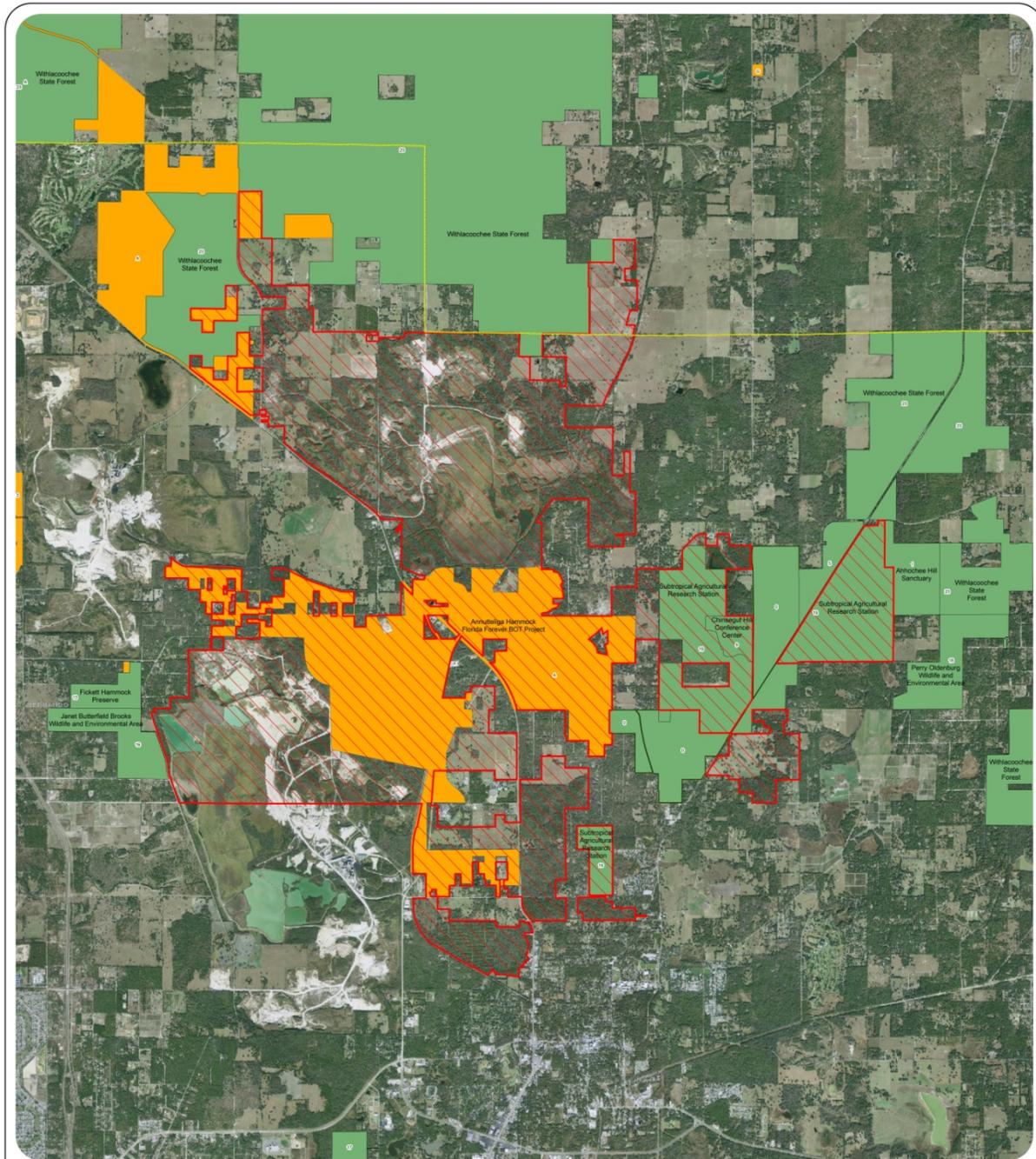
For these reasons, there is a continuing need for increased information and research to enable adaptive management to cope with potential long-term climate change impacts. The most immediate actions that FWC can take are to work with partners to gather the best scientific data possible for understanding 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, FWC will participate in organizations such as the Peninsular Florida Land Conservation Cooperative or similar organizations so that FWC continues to gain understanding and share knowledge of key issues related to potential climate change. In addition, 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.

Elements of climate change that may potentially affect the CWEA include more frequent and more potent storm events, alteration of vegetation reproductive cycles, and changes in the fire regime. The potential loss of habitat may result in the loss of species using that habitat, including migrating and nesting birds. 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.<sup>16, 17</sup> 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 CWEA, Goals and Objectives have been developed as a component of this Management Plan (Section 6.10). 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 CWEA Management Plan in the future.

#### **5.14 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.



**Chinsegut WEA Optimal Conservation Planning Boundary  
Hernando County, Florida**

**Legend**

- Chinsegut WEA
- Chinsegut WEA DRAFT Optimal Conservation Planning Boundary
- Conservation Lands
- Florida Forever Projects



Created in ArcGIS 9.3 by the Florida Fish and Wildlife Conservation Commission, October 2012.  
All data, information, and maps are provided "as is" without warranty or any representation of accuracy, completeness or timeliness. The Florida Fish and Wildlife Conservation Commission makes no warranty, express or implied, as to the use of this information. There are no implied warranties of merchantability or fitness for a particular purpose. The user acknowledges and accepts all liabilities, including the fact that the data, information, and maps are dynamic, and in a constant state of change, correction and update.

The DRAFT Optimal Conservation Planning Boundary (OCPB) shown on this map is designed to be a part of a broader Conservation Action Strategy for the management area. Although it provides the basis for potential future voluntary conservation acquisitions, it is designed to function primarily as a conservation planning boundary. The OCPB depicts 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. Continued conservation of these lands may be aided, if landowners so choose, by available voluntary landowner stewardship programs, conservation easements, and in some cases, potential voluntary conservation acquisitions. Participation in any of these FWC conservation efforts is entirely voluntary and at the sole choice of willing landowners.



**Figure 9. Optimal Conservation Planning Boundary**

## **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 CWEA. 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 Prescribe burn 150 acres of the area's fire adapted communities per year.
- 6.1.2 Maintain 30 acres (54% of fire adapted communities (823 acres)) within 2 - 3 year target fire return interval.
- 6.1.3 Implement prescribed burn plan.
- 6.1.4 Conduct habitat/natural community improvement on 10 acres per year including planting wiregrass on the Nature Center tract in vicinity of the Nature Center and mechanical treatment.

#### **Long-term**

- 6.1.5 Prescribe burn 250 acres of the area's fire adapted communities per year.
- 6.1.6 Maintain 553 acres (100% of fire adapted communities) per year within 2 - 3 year target fire return interval.
- 6.1.7 Continue to implement OBVM on the area.
- 6.1.8 Continue to conduct habitat/natural community improvement on 10 acres per year by mechanical treatment and planting wiregrass.

### **6.2 Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration**

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

#### **Short-term**

- 6.2.1 Implement the WCPR strategy developed for the CWEA
- 6.2.2 As described in the WCPR Strategy, monitor three imperiled and focal species, including Bachman's sparrow, Southeastern American kestrel, and Florida mouse.

- 6.2.3 As described in the WCPR Strategy, Continue to collect opportunistic wildlife species occurrence data.
- 6.2.4 As described in the WCPR Strategy, evaluate whether installing kestrel nest boxes is appropriate. If determined to be appropriate, install at least one kestrel nest box on each tract of the CWEA.

### **Long-term**

- 6.2.5 Continue to implement the WCPR strategy developed for the area by managing identified habitats and monitoring identified species.
- 6.2.6 As described in the WCPR Strategy, continue to monitor three imperiled and focal species, including Bachman’s sparrow, southeastern American kestrel, and Florida mouse.
- 6.2.7 As described in the WCPR Strategy, conduct a baseline Florida mouse survey, if staff and volunteer resources allow.
- 6.2.8 As described in the WCPR Strategy, continue to collect opportunistic wildlife species occurrence data.
- 6.2.9 If kestrel nest boxes are installed, continue to monitor annually during the breeding season as described in the WCPR Strategy.

## **6.3 Exotic and Invasive Species Maintenance and Control**

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

### **Short-term**

- 6.3.1 Annually treat at least 100 acres of EPPC Category I and Category II invasive exotic plant species including air-potato, alligator weed, Caesarweed, camphor-tree, chinaberry, Chinese tallow tree, Chinese wisteria, cogongrass, coral ardisia, elephant ear, Japanese climbing fern, jelly palm, lantana, Mexican petunia, mimosa, natal grass, paper mulberry, podocarpus, skunkvine, sword fern, torpedograss, tropical soda apple, water-hyacinth and wild taro.
- 6.3.2 Evaluate potential control measures on one exotic and nuisance animal species (feral hog). If feasible, implement control measures such as trapping.
- 6.3.3 Monitor for exotic animal species and control as possible including Cuban anole, Cuban treefrog, and Mediterranean geckos.

### **Long-term**

- 6.3.4 Continue to annually treat at least 100 acres of EPPC Category I and Category II invasive exotic plant species.
- 6.3.5 If feasible, continue to implement control measures on one exotic and nuisance animal species (feral hog).

- 6.3.6 Continue to monitor for exotic animal species and control as possible including Cuban anole, Cuban treefrog, and Mediterranean geckos.

## **6.4 Public Access and Recreational Opportunities**

**Goal: Provide public access and recreational opportunities.**

### **Short-term**

- 6.4.1 Maintain public access and recreational opportunities to allow for a recreational carrying capacity of 256 visitors per day.
- 6.4.2 Continue to provide website, social media, bird list, butterfly list, four trail guides, two trail brochures, conservation education exhibits, and 48 conservation education programs annually for interpretation and education.
- 6.4.3 Continue to utilize volunteers and partners in delivery of conservation education programs.
- 6.4.4 Continue to provide conservation education and wildlife viewing opportunities for partners such as Hernando County School Board, Hernando County Tourism Bureau, Gulf Coast Academy, Golden Rainbow Ranch, Hernando County Cooperative Extension Service, and Hernando County Chapter of the Audubon Society, Friends of Chinsegut, and Friends of Chinsegut Hill.
- 6.4.5 Continue to provide interpretation of the cultural and historical resources on the CWEA.
- 6.4.6 Continue to cooperate with Hernando County Tourism Development Council and other Nature Coast tourism organizations to promote the CWEA as a recreation destination.
- 6.4.7 Develop a new conservation education curriculum.
- 6.4.8 Develop and implement a conservation education evaluation protocol.
- 6.4.9 Continue to maintain 6.7 miles of trails on the area.
- 6.4.10 Monitor trails annually for visitor impacts.

### **Long-term**

- 6.4.11 Develop additional public access and recreational opportunities to allow for a carrying capacity of 456 visitors per day contingent on the feasibility of developing new facilities and programs.
- 6.4.12 Continue to provide website, social media, bird list, butterfly list, four trail guides, two trail brochures, conservation education exhibits, and 48 conservation education programs annually for interpretation and education.
- 6.4.13 Update the Recreation Master Plan for the area.
- 6.4.14 Continue to maintain 6.7 miles of trails on the area.

- 6.4.15 Monitor trails annually for visitor impacts.
- 6.4.16 Reassess recreational opportunities every three years.
- 6.4.17 Cooperate with other agencies, County, stakeholders, and regional landowners to investigate regional recreational opportunities including linking hiking, and multi-use trail systems between adjacent public areas.
- 6.4.18 Continue to cooperate with Hernando County Tourism Development Council and other Nature Coast tourism organizations to promote the CWEA as a recreation destination.
- 6.4.19 Continue to implement conservation education evaluation protocol.
- 6.4.20 Continue to identify partnerships that could provide for conservation educational programs and outreach.
- 6.4.21 Develop and implement a marketing plan that promotes conservation education.
- 6.4.22 Develop and implement a fundraising plan to provide support for educational programs at the Nature Center.
- 6.4.23 Continue to utilize volunteers and partners in delivery of conservation education programs.
- 6.4.24 Continue to provide conservation education and wildlife viewing opportunities for partners such as Hernando County School Board, Hernando County Tourism Development Council, Gulf Coast Academy, Golden Rainbow Ranch, Hernando County Cooperative Extension Service, and Hernando County Chapter of the Audubon Society, Friends of Chinsegut, and Friends of Chinsegut Hill.
- 6.4.25 Continue to provide interpretation of the cultural and historical resources on the CWEA.

## **6.5 Hydrological Preservation and Restoration**

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

### **Short-term**

- 6.5.1 To maintain and enhance natural hydrological functions, install and maintain low-water crossings and culverts as appropriate.
- 6.5.2 As described in the WCPR Strategy for the CWEA Basin Marsh Restoration Strategic Management Area (SMA), evaluate whether restoration of Mays and Burns Prairies is appropriate and feasible. Initiate restoration if additional resources are available.
- 6.5.3 Continue to cooperate with the SWFWMD to monitor surface and ground water quality.

## **Long-term**

- 6.5.4 To enhance natural hydrological functions, continue to install and maintain low-water crossings and culverts as appropriate.
- 6.5.5 If determined to be appropriate and feasible, continue to implement restoration of Mays and Burns Prairie as described in the WCPR Strategy for the CWEA Basin Marsh Restoration SMA.
- 6.5.6 Implement hydrological restoration plan.
- 6.5.7 Continue to cooperate with the SWFWMD to monitor surface and ground water quality.

## **6.6 Forest Resource Management**

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

### **Short-term**

- 6.6.1 Coordinate with the FFS to complete a Timber Assessment.
- 6.6.2 Consult with the FFS or a professional forestry consultant regarding forest management activities such as development of a Forest Management Plan as appropriate.

### **Long-term**

- 6.6.3 Prepare and implement a Forest Management Plan 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 CWEA.
- 6.6.4 Continue to consult with the FFS or a professional forestry consultant regarding forest management activities as appropriate.

## **6.7 Cultural and Historical Resources**

**Goal: Protect, preserve and maintain cultural and historic resources.**

### **Short-term**

- 6.7.1 If determined to be necessary by the DHR, contract for a cultural and archaeological resources survey.
- 6.7.2 Monitor the six known recorded sites and submit updates of additional sites to DHR for inclusion in their Master Site file.
- 6.7.3 Ensure management has DHR Archaeological Resources Monitoring training.
- 6.7.4 Follow DHR's Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties for the management of cultural and historic resources.

### **Long-term**

- 6.7.5 Continue to monitor the six known recorded site and submit updates of additional sites to DHR for inclusion in their Master Site file.
- 6.7.6 Continue to follow DHR’s Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties for the management of cultural and historic resources.

## **6.8 Capital Facilities and Infrastructure**

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

### **Short-term**

- 6.8.1 Continue to maintain eight facilities (Nature Center, shop, US 41 Trailhead, boardwalk, viewing blind, main entrance, Big Pine entrance, and water tower).
- 6.8.2 Maintain 0.4 miles of roads.
- 6.8.3 Maintain 6.7 miles of trails.
- 6.8.4 Construct one new archery range facility.
- 6.8.5 Monitor trails and infrastructure biannually for visitor impacts.

### **Long-term**

- 6.8.6 Monitor trails and infrastructure biannually for visitor impacts.
- 6.8.7 Continue to maintain nine facilities.
- 6.8.8 Continue to maintain 0.4 miles of roads.
- 6.8.9 Continue to maintain 6.7 miles of trails.
- 6.8.10 Construct three facilities (outdoor classroom and two field conservation education facilities) and 0.75 miles of roads.
- 6.8.11 Improve or repair two facilities (construct new conservation education building to enhance Nature Center facility and expand archery range facility).
- 6.8.12 If funding permits, contract for a boundary survey of the CWEA.
- 6.8.13 Continue to maintain eight facilities (Nature Center, shop, US 41 Trailhead, boardwalk, viewing blind, main entrance, Big Pine entrance, and water tower).

## **6.9 Land Conservation and Stewardship Partnerships**

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

### **Short-term**

- 6.9.1 Identify potential important wildlife resources, habitat, landscape-scale linkages, and wildlife corridors for operational/resource management that may be important to the continued viability of fish and wildlife populations in the region.
- 6.9.2 Develop a CAS.
- 6.9.3 Contact and inform adjoining landowners about the FWC LAP to pursue non-acquisition conservation stewardship, partnerships, and potential conservation easements.
- 6.9.4 Identify and recommend parcels for addition to the FWC acquisition list.
- 6.9.5 Identify potential non-governmental organization partnerships and grant program opportunities.
- 6.9.6 Determine efficacy of conducting an adjacent landowner's assistance/conservation stewardship partnership workshop.

### **Long-term**

- 6.9.7 To minimize fragmentation of the area, continue to identify strategic parcels to revise the completed OPCB for the CWEA as deemed necessary.
- 6.9.8 Continue to identify and recommend parcels for addition to the FWC acquisition list.
- 6.9.9 Pursue acquisition of parcels added to the FWC acquisition list as acquisition work plan priorities and funding allow.
- 6.9.10 Coordinate landowner assistance/ conservation stewardship partnership workshop as deemed appropriate.
- 6.9.11 Periodically (at least every three to five years) continue to contact and meet with adjacent landowners for willingness to participate in the Conservation Action Strategy.

## **6.10 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 CWEA.**

### **Long-term**

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

- 6.10.2 Assess the need to prioritize research and monitoring to ascertain the potential impacts of climate change on the hydrologic regime and water quality of the CWEA, such as increased nutrient and sediment loads, reduced surface and groundwater recharge, and increases in water temperatures.
- 6.10.3 Assess the need to prioritize research and monitoring to determine the potential impacts of climate change on native vegetation, and the possible spread of exotic and invasive species; incorporate appropriate monitoring protocols and management strategies into the OBVM program for the CWEA.
- 6.10.4 Assess the need for prioritized research and monitoring to determine the potential impacts of climate change on the imperiled species on the CWEA; incorporate appropriate adaptation strategies into the WCPR Strategy for the CWEA.
- 6.10.5 As appropriate, update the CWEA Prescribed Fire Plan to incorporate new scientific information regarding projected climate change, such as increased frequency of drought, on the fire regime of the CWEA's fire-adapted habitats.
- 6.10.6 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 update of the Recreation Master Plan.

## **6.11 Research Opportunities**

**Goal: Explore and pursue cooperative research opportunities.**

### **Short-term**

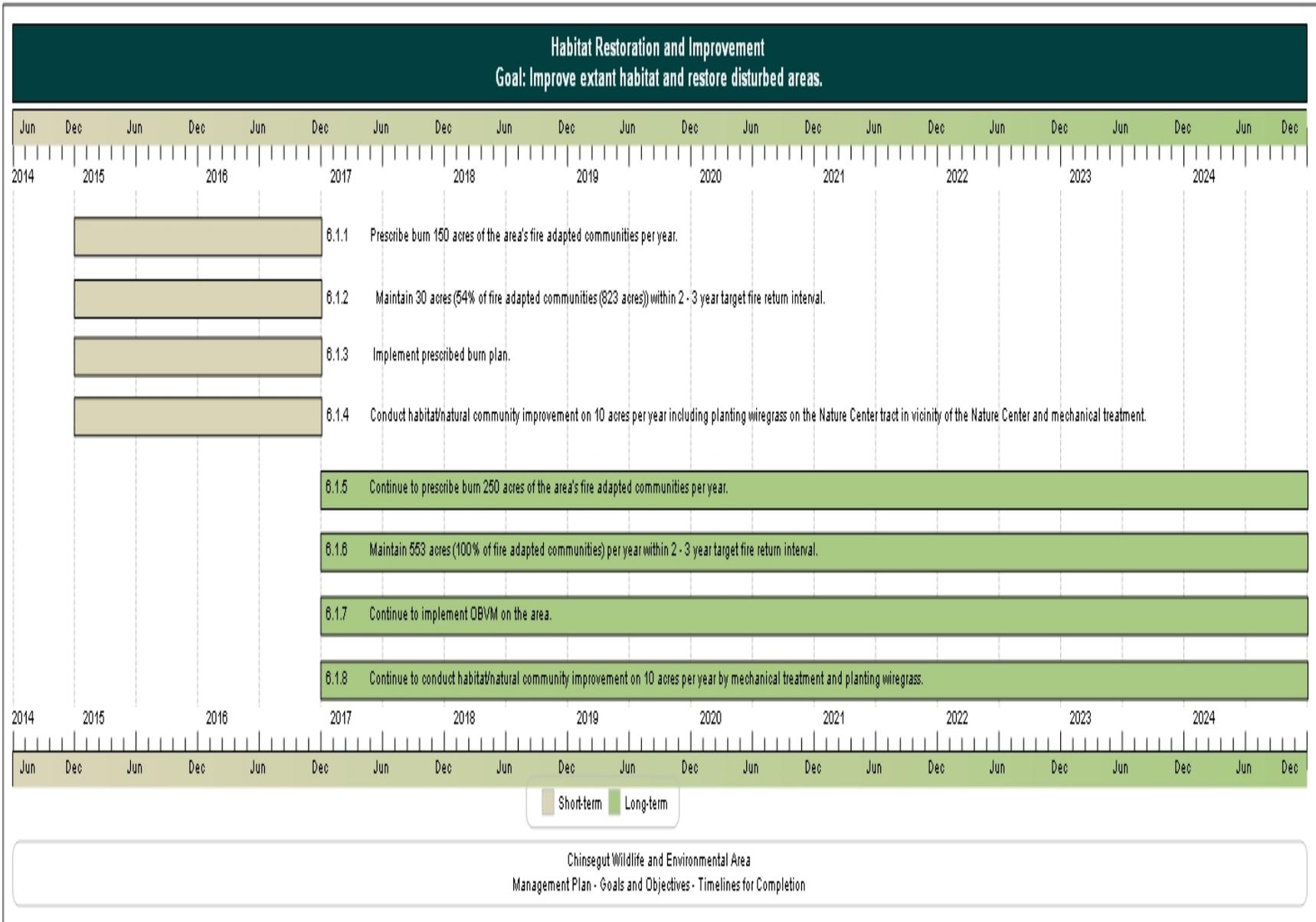
- 6.11.1 Continue to cooperate with the UF butterfly research project.
- 6.11.2 Cooperate with the USGS phenology climate change project.

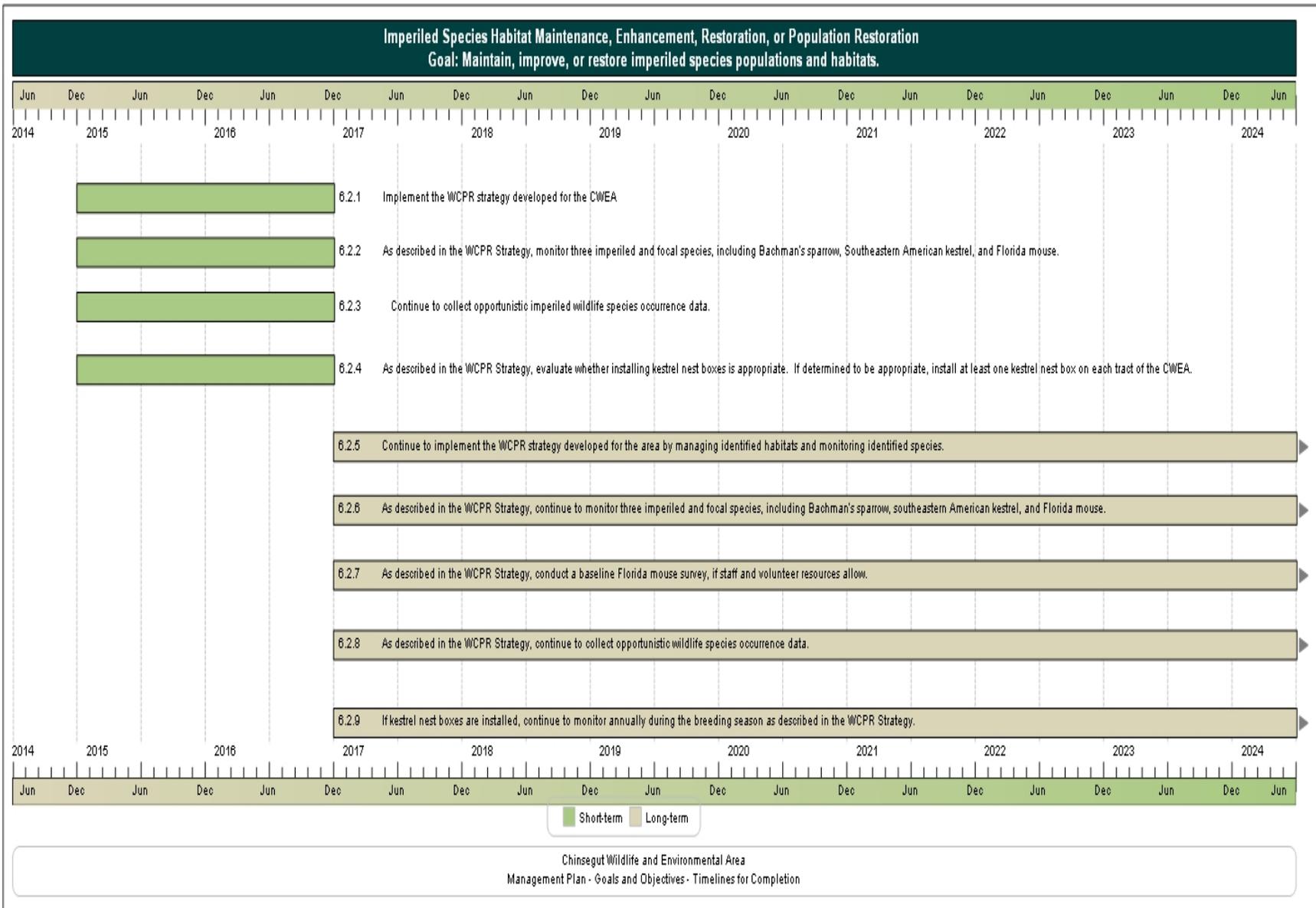
### **Long-term**

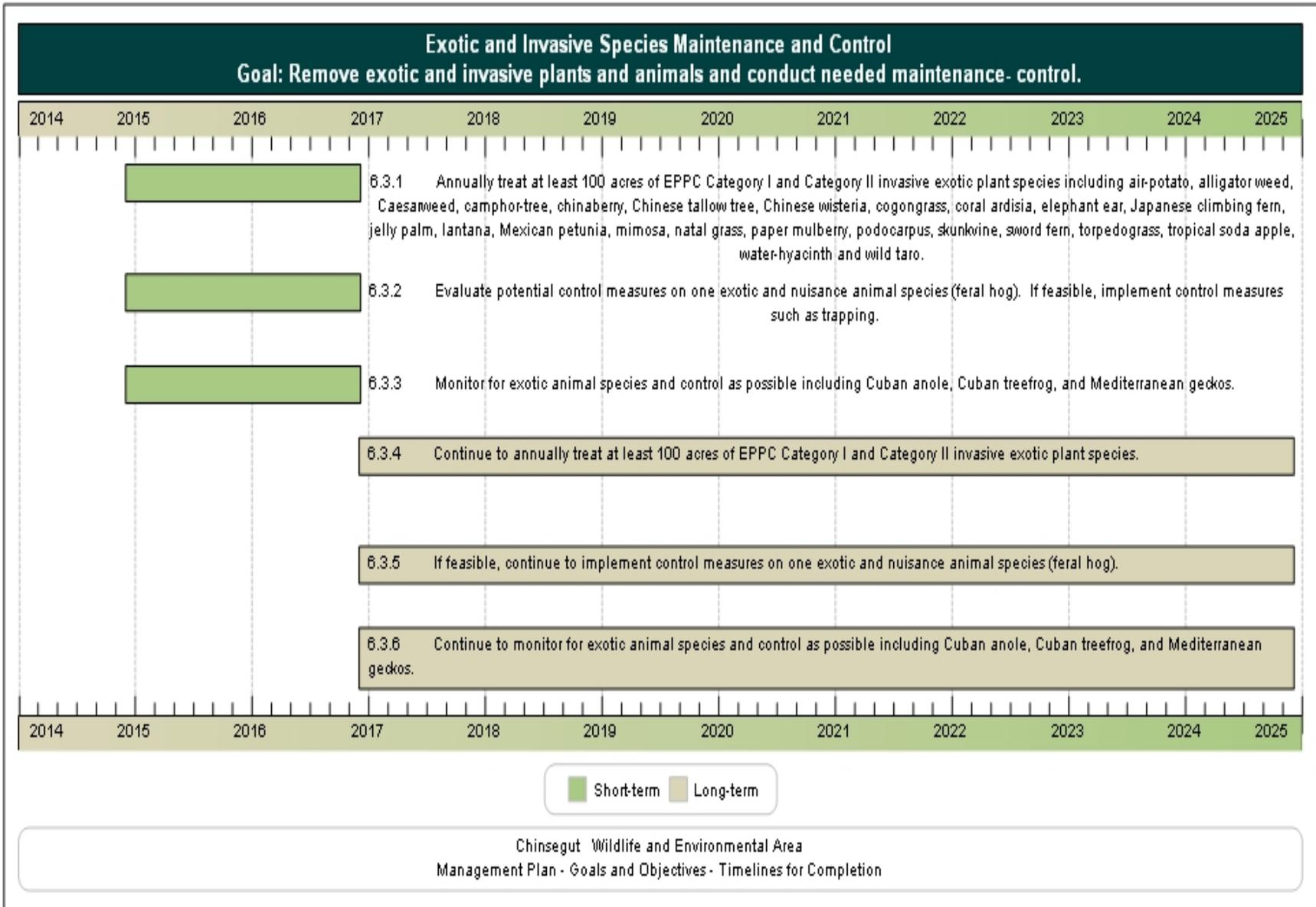
- 6.11.3 Explore and pursue cooperative research opportunities through universities, FWRI, etc.
- 6.11.4 Continue to cooperate with researchers, universities, and others as appropriate.
- 6.11.5 Continue to assess the need for and pursue research opportunities as appropriate.

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

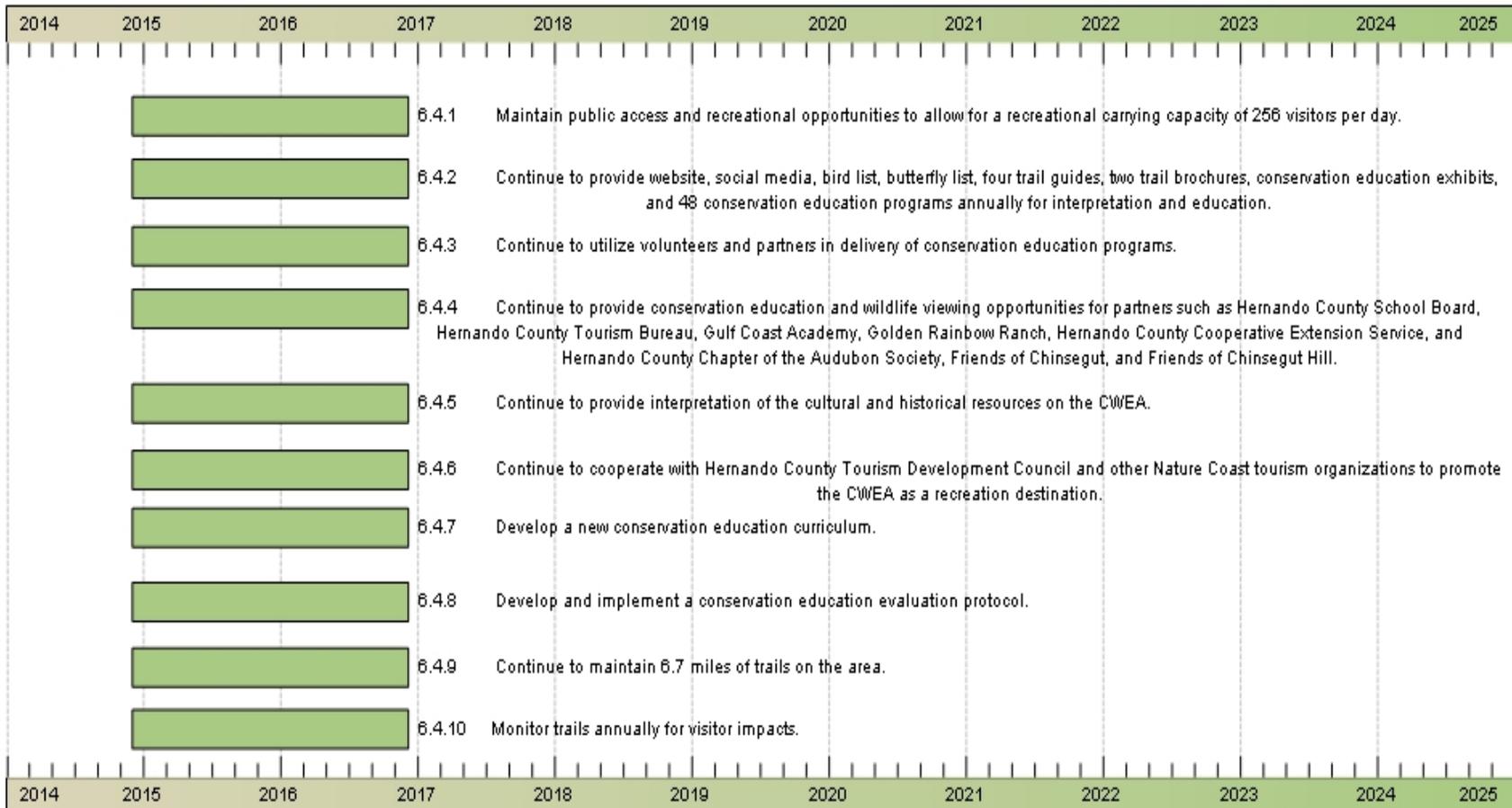
The following section presents the short- and long-term goals and objectives for the management of the CWEA graphically in a timeline format. These timelines directly reflect the short- and long-term goals and objectives presented above in Section 6.





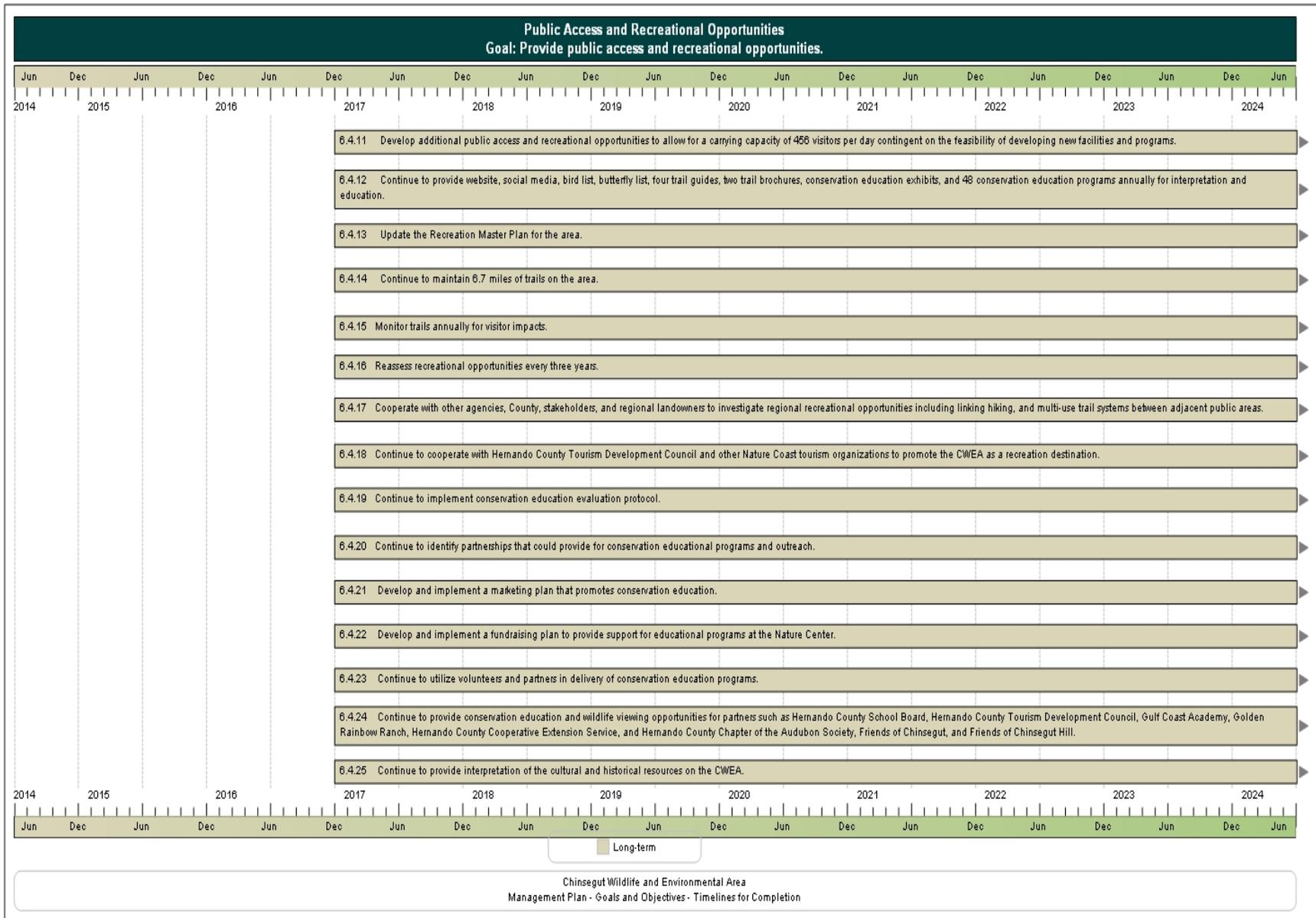


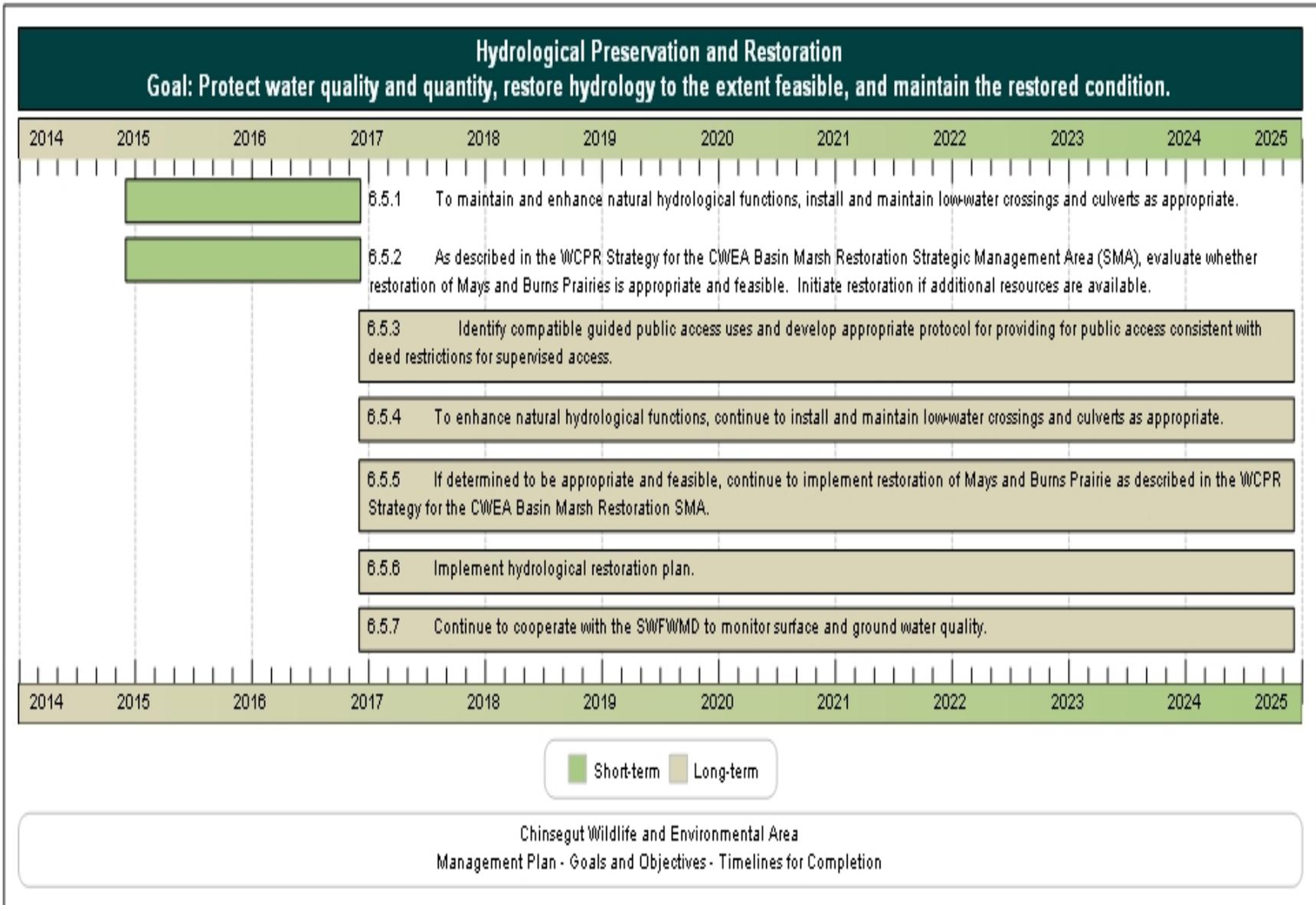
**Public Access and Recreational Opportunities**  
**Goal: Provide public access and recreational opportunities.**



■ Short-term

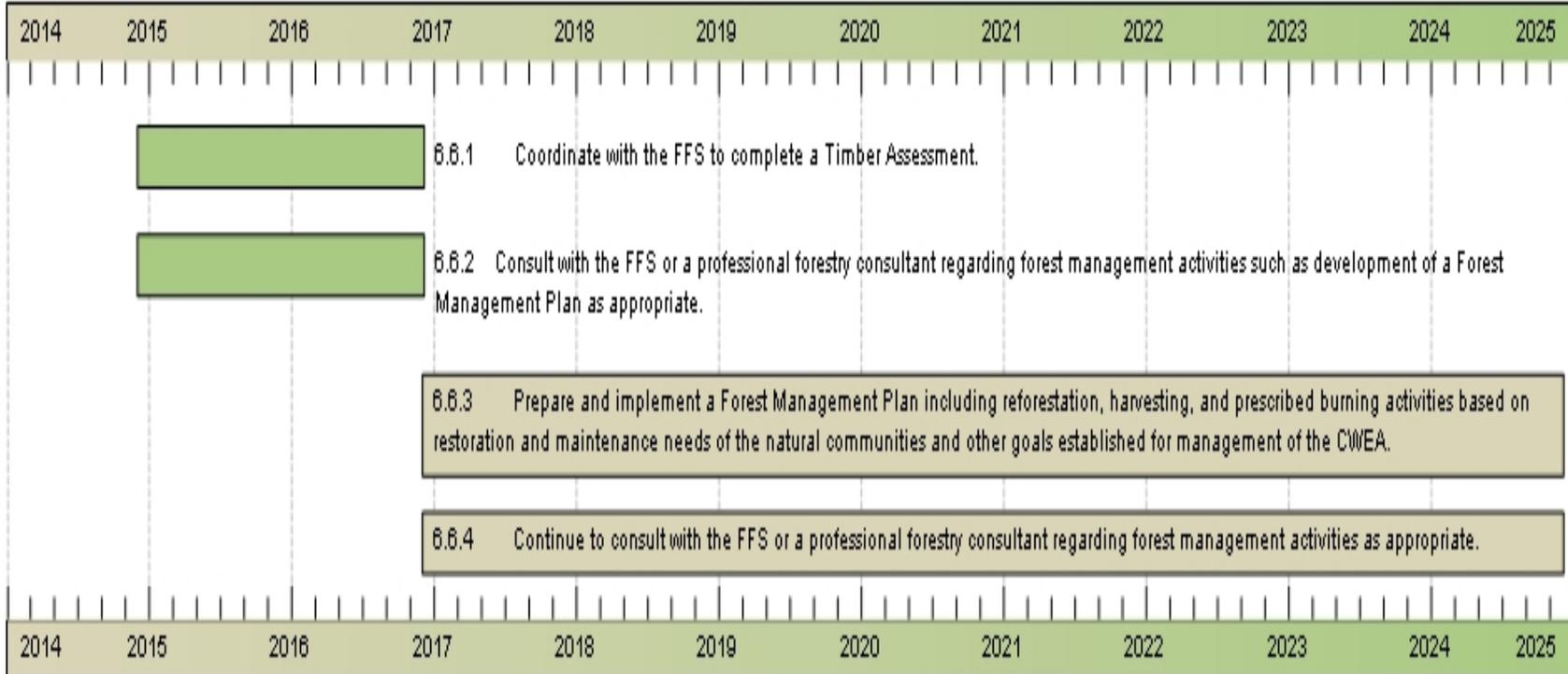
Chinsegut Wildlife and Environmental Area  
 Management Plan - Goals and Objectives - Timelines for Completion





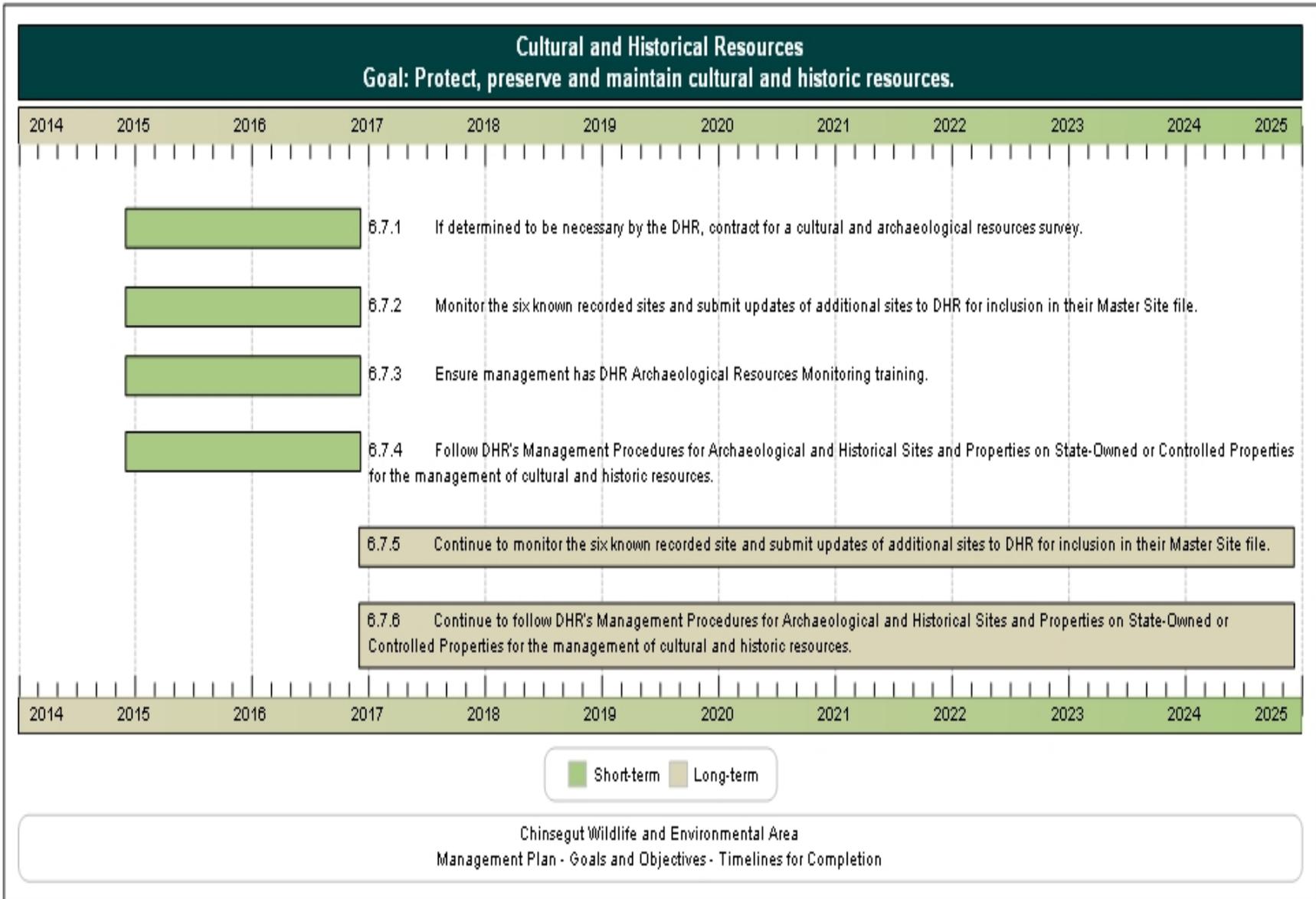
## Forest Resource Management

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



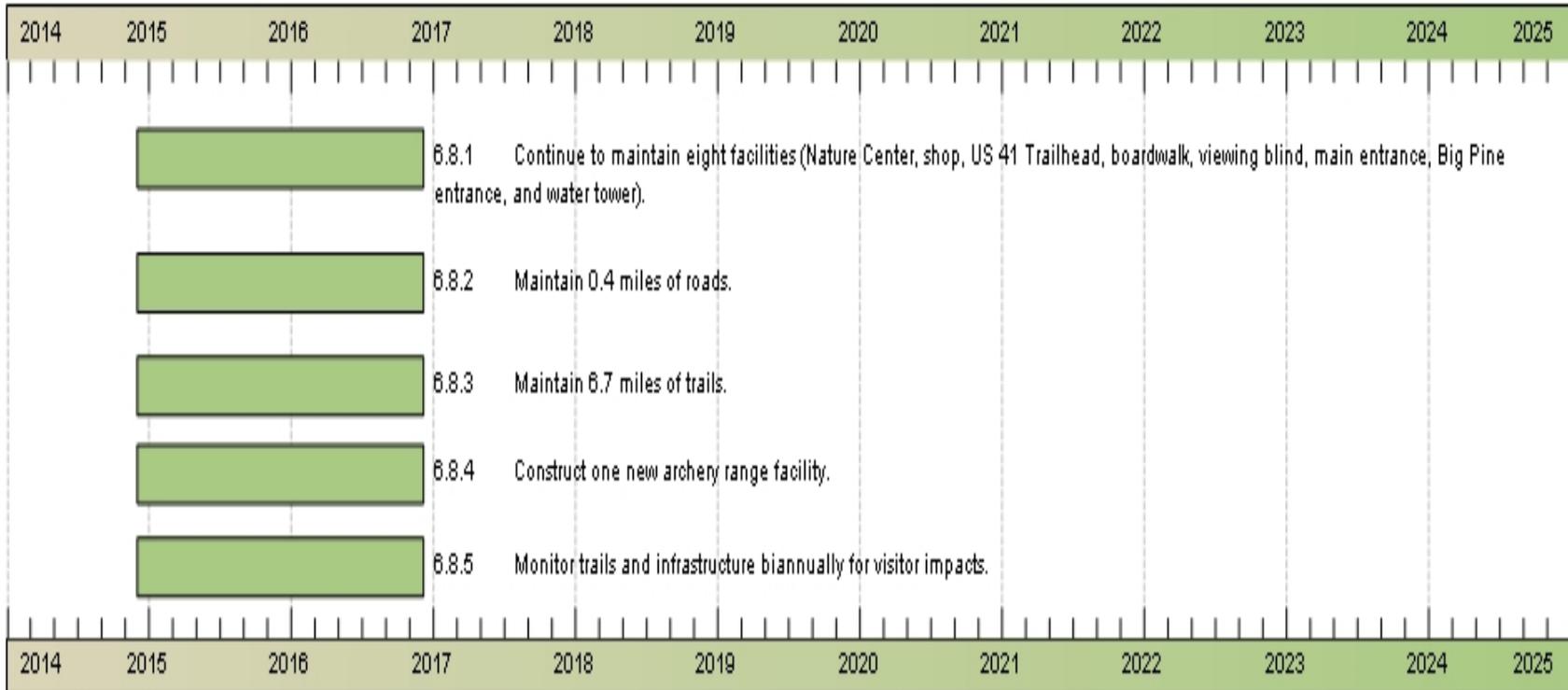
Short-term
  Long-term

Chinsegut Wildlife and Environmental Area  
Management Plan - Goals and Objectives - Timelines for Completion



## Capital Facilities and Infrastructure

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

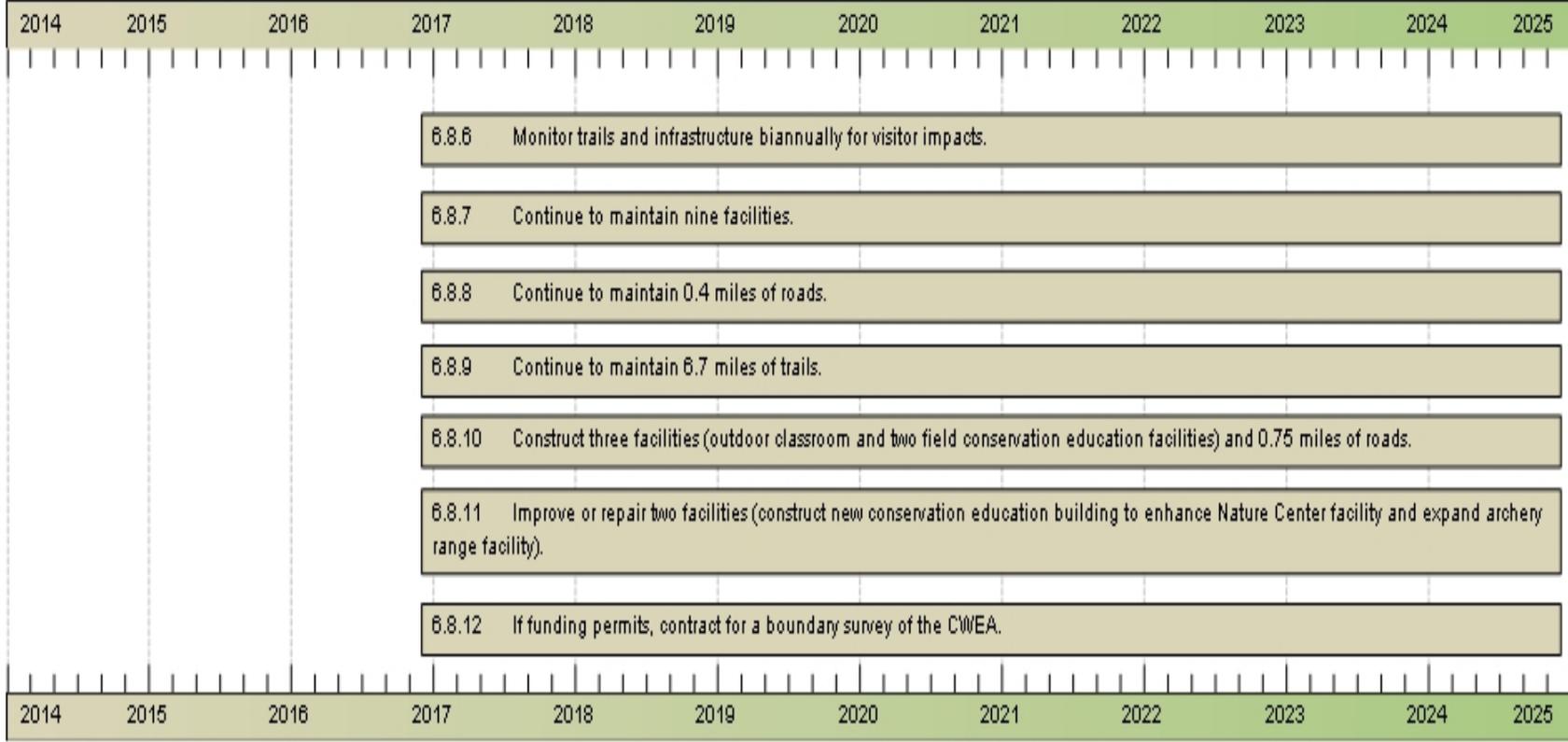


■ Short-term

Chinsegut Wildlife and Environmental Area  
Management Plan - Goals and Objectives - Timelines for Completion

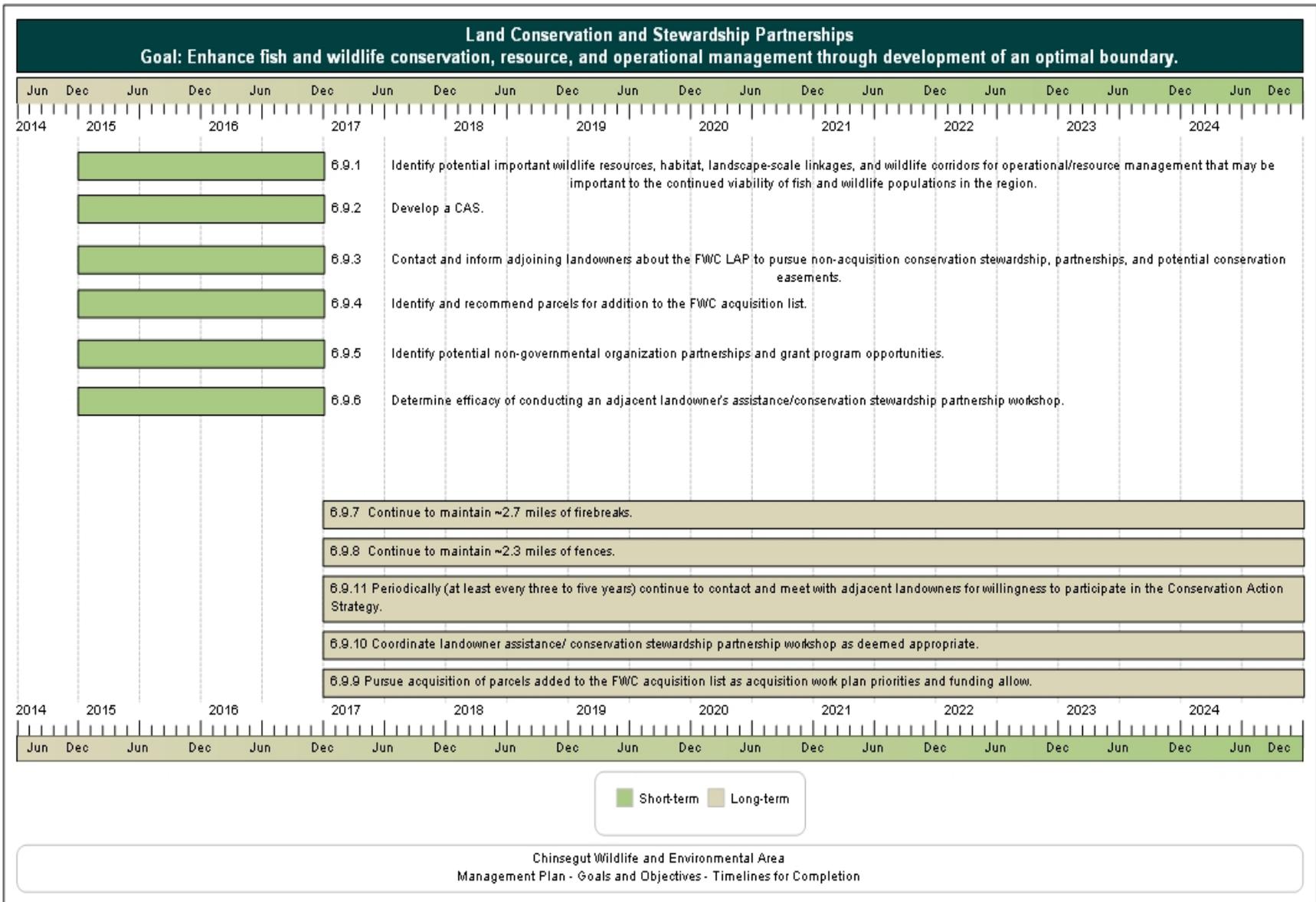
## Capital Facilities and Infrastructure

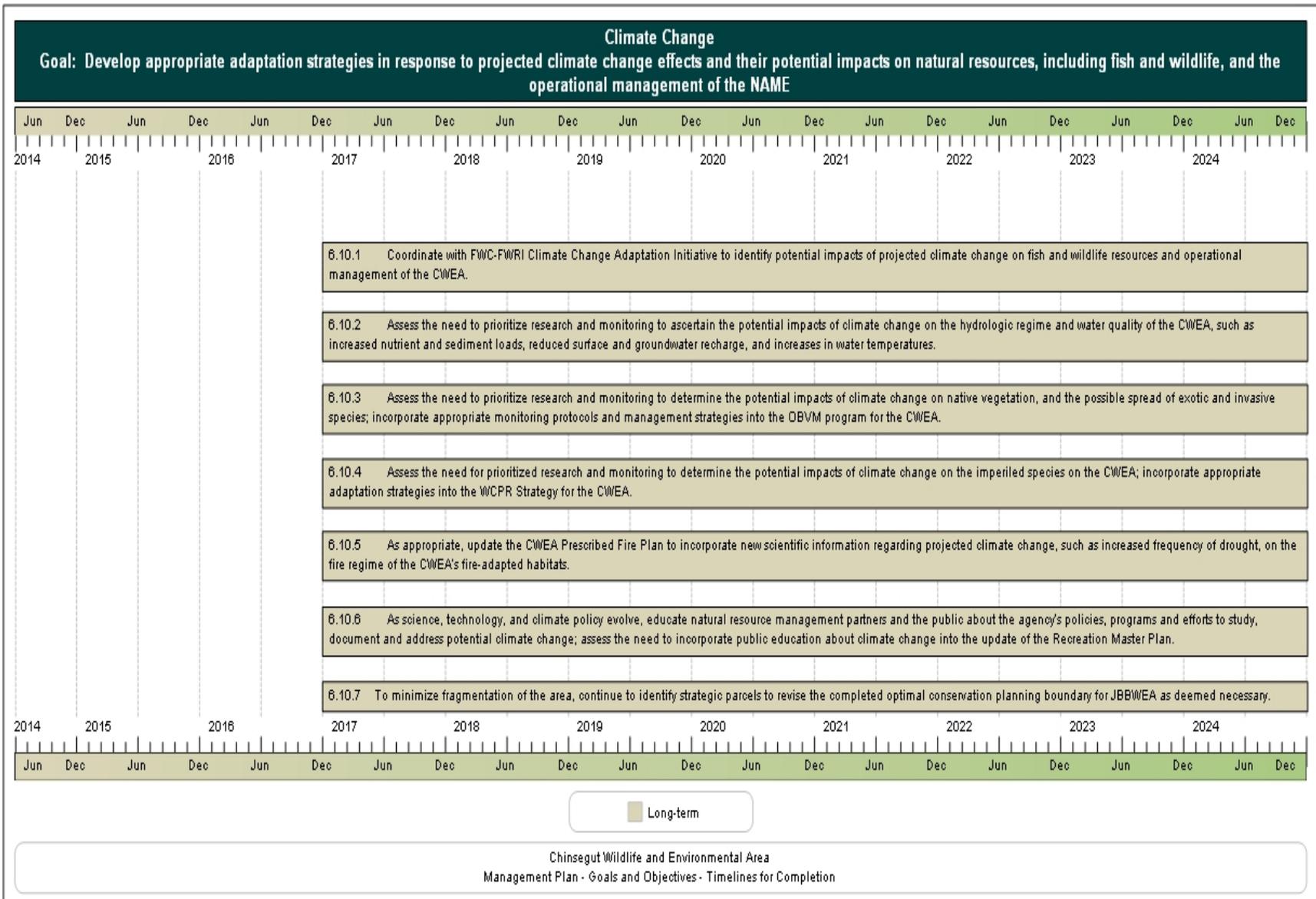
**Goal: Develop the capital facilities and infrastructure necessary to meet the goals and objectives of this Management Plan.**

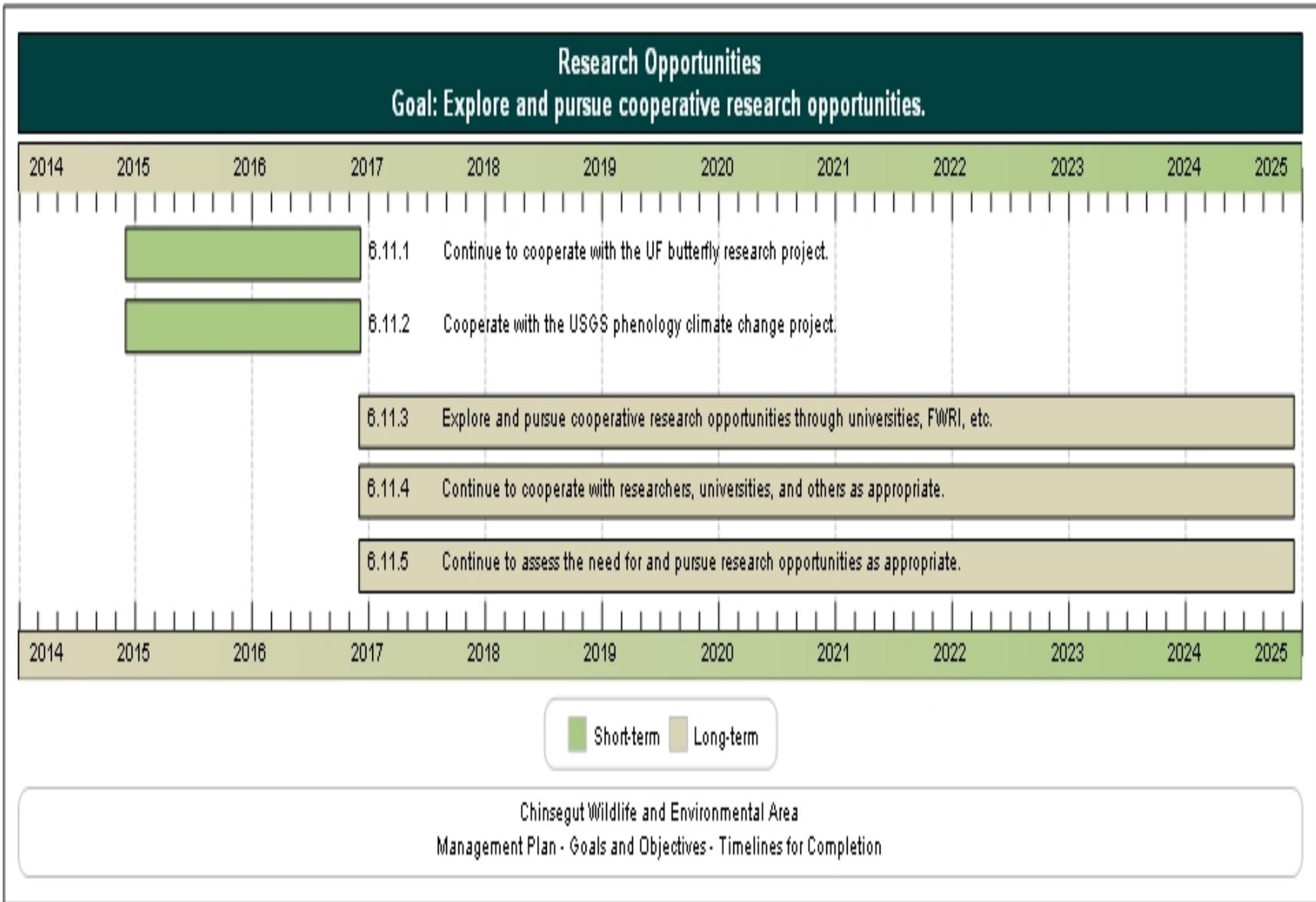


■ Long-term

Chinsegut Wildlife and Environmental Area  
Management Plan - Goals and Objectives - Timelines for Completion







## **8 Resource Management Challenges and Strategies**

The following section identifies and describes further management needs and challenges associated with the CWEA and provide 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: Currently, the USDA Subtropical Agricultural Research Station is undergoing the surplus process and eventual sale of the property to a private party may adversely affect management and use of the CWEA.**

8.1.1 Strategy: Cooperate and coordinate with the USDA on possible conservation alternatives to sale of the property.

### **8.2 Challenge: Currently, the Chinsegut Hill property is undergoing the surplus process and eventual sale of the property to a private party may adversely affect management and use of the CWEA.**

8.2.1 Strategy: Cooperate and coordinate with the DEP on possible conservation alternatives to sale of the property.

### **8.3 Challenge: Insufficient area exists within the CWEA for long term conservation of far-ranging species that have been documented to exist on the CWEA such as Eastern indigo snake and Sherman's fox squirrel.**

8.3.1 Strategy: Explore conservation stewardship and acquisition opportunities to secure habitat necessary for far-ranging species such as Eastern indigo snake and Sherman's fox squirrel.

### **8.4 Challenge: Currently, staffing is at insufficient levels for optimal management of the CWEA.**

8.4.1 Strategy: Pursue funding for increased staffing.

8.4.2 Strategy: Explore potential volunteer resources for assisting with management.

### **8.5 Challenge: There are smoke management challenges during prescribed burns due to proximity to major roadways and residential areas.**

8.5.1 Strategy: Use available tools and resources to minimize smoke impact and increase outreach for areas of potential impact.

8.5.2 Strategy: Cooperate with other agencies such as FWC Law Enforcement, Florida Highway Patrol, Florida Department of Transportation, FFS, and Hernando County Sheriff's Office to aid in management of smoke issues and impacts.

## **8.6 Challenge: Exotic invasive plants from adjacent private lands are spreading to the CWEA.**

- 8.6.1 Strategy: Coordinate with FWC's LAP to work with adjacent landowners to control and manage exotic invasive plants on adjacent properties.
- 8.6.2 Strategy: Coordinate with other governmental and private organizations to obtain resources to control and manage exotic invasive species on adjacent properties.

## **9 Cost Estimates and Funding Sources**

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

The cost estimate below, although exceeding what FWC typically receives through the appropriations process, is consistent with the direction taken by current operational planning for the CWEA. Cost estimate categories are those currently recognized by FWC and the Land Management Uniform Accounting Council. More information on these categories, as well as the Fiscal Year 2013-2014 operational plan showing detailed cost estimates by activity and categories of expenditures, may be found in Appendix 13.10.

**Table 15. Maximum Expected One Year Expenditure**  
**Chinsegut WEA Management Plan Cost Estimate**  
*Maximum expected one year expenditure*

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority schedule:</u>	
Exotic Species Control	\$80,000	<b>Bold</b>	Immediate (annual)
Prescribed Burning	\$56,000	Normal	Intermediate (3-4 years)
Cultural Resource Management	\$1,307	<i>Italic</i>	Other (5+ years)
Timber Management	\$2,499		
Hydrological Management	\$2,499		
Other (Restoration, Enhancement, Surveys, Monitoring, etc.)	\$106,185		
<b>Subtotal</b>	<b>\$248,491</b>		
<u>Administration</u>			
General administration	<b>\$16,000</b>		
<u>Support</u>			
Land Management Planning	\$14,426		
<i>Land Management Reviews</i>	\$0		
Training/Staff Development	\$4,466		
Vehicle Purchase	\$120,000		
Vehicle Operation and Maintenance	\$9,664		
Other (Technical Reports, Data Management, etc.)	\$38,692		
<b>Subtotal</b>	<b>\$187,248</b>		
<u>Capital Improvements</u>			
New Facility Construction	\$423,712		
Facility Maintenance	\$94,575		
<b>Subtotal</b>	<b>\$518,287</b>		
<u>Visitor Services/Recreation</u>			
Info./Education/Operations	<b>\$169,225</b>		
<u>Law Enforcement</u>			
Resource protection	<b>\$672</b>		
<b><u>Total</u></b>	<b>\$1,139,923</b>		

\* Based on staffing requirements and special needs for staffing required to meet the needs of the educational programs, three FTE positions would be optimal to fully manage the area covered by this Management Plan. All land management funding is dependent upon annual legislative appropriations.

**Table 16. Maximum Expected Ten Year Expenditure**

**Chinsegut WEA Management Plan Cost Estimate**

*Ten-year projection*

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority schedule</u>	
Exotic Species Control	\$800,000	<b>Bold</b>	Immediate (annual)
Prescribed Burning	\$560,000	Normal	Intermediate (3-4 years)
Cultural Resource Management	\$13,313	<i>Italic</i>	Other (5+ years)
Timber Management	\$25,455		
Hydrological Management	\$25,455		
Other (Restoration, Enhancement, Surveys, Monitoring, etc.)	\$1,081,553		
<b>Subtotal</b>	<b>\$2,505,776</b>		
<u>Administration</u>			
General administration	\$162,964		
<u>Support</u>			
Land Management Planning	\$146,939		
Land Management Reviews	\$0		
Training/Staff Development	\$45,488		
Vehicle Purchase	\$325,457		
Vehicle Operation and Maintenance	\$98,431		
Other (Technical Reports, Data Management, etc.)	\$394,101		
<b>Subtotal</b>	<b>\$1,010,416</b>		
<u>Capital Improvements</u>			
New Facility Construction	\$800,175		
Facility Maintenance	\$963,294		
<b>Subtotal</b>	<b>\$1,763,469</b>		
<u>Visitor Services/Recreation</u>			
Info./Education/Operations	\$1,723,640		
<u>Law Enforcement</u>			
Resource protection	\$6,845		
<b>Total</b>	<b>\$7,173,110</b>		

\* Based on staffing requirements and special needs for staffing required to meet the needs of the educational programs, three FTE positions would be optimal to fully manage the area covered by this Management Plan. 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:

	<b>Approved</b>	<b>Conditional</b>	<b>Rejected</b>
• 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 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 CWEA are in compliance with the Conceptual State Lands Management Plan and its requirement for "balanced public utilization," and are in compliance with the mission of FWC as described in its Agency Strategic Plan (Appendix 13.5). 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 372, 253, 259, 327, 370, 403, 870, 373, 375, 378, 487, and 597 FS.

The FWC has developed and utilizes an Arthropod Control Plan for the CWEA in compliance with Chapter 388.4111 F.S. (Appendix 13.11). This plan was developed in cooperation with the local Osceola County arthropod control agency. This plan is also in conformance with the Local Government Comprehensive Plan as approved and adopted for Hernando County, Florida, (Appendix 13.13).

## 12 Endnotes

- <sup>1</sup> 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.
- <sup>2</sup> Wilhere, G. F. 2002. Adaptive management in Habitat Conservation Plans. *Conservation Biology* 16:20-29.
- <sup>3</sup> Walters, C. J. and R. Hilborn. 1978. Ecological optimization and adaptive management. *Annual Review of Ecology and Systematics* 9:157–188.
- <sup>4</sup> Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas, Final Report (1999).
- <sup>5</sup> 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.
- <sup>6</sup> McCarty, J. P. 2001. Ecological consequences of recent climate change. *Conservation Biology* 15:320-331.
- <sup>7</sup> 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.
- <sup>8</sup> Parmesan, C. 2006. Ecological and evolutionary responses to recent climate change. *Annual Review of Ecology, Evolution, and Systematics* 37:637-669.
- <sup>9</sup> 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.
- <sup>10</sup> 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.
- <sup>11</sup> 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.
- <sup>12</sup> Emanuel, K.A. 1987. The Dependence of Hurricane Intensity on Climate. *Nature* 326: 483-485.
- <sup>13</sup> Emanuel, K.A. 2005. Increasing Destructiveness of Tropical Cyclones Over the Past 30 Years.
- <sup>14</sup> 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.

- <sup>15</sup> Mann, M.E. and K.A. Emanuel. 2006. Atlantic Hurricane Trends Linked to Climate Change. *Eos Trans. AGU* 87: 233-244.
- <sup>16</sup> 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.