



Florida Forever

Conservation Needs Assessment

Summary Report
to the
Florida Forever Advisory Council

prepared under the direction of the
Division of State Lands,
Florida Department of Environmental Protection

by the
Florida Natural Areas Inventory

December 2000

Note to Readers

The information contained in this report was developed or compiled specifically to inform actions relating to the Florida Forever program. This report represents, in part, the scientific assistance provided by the Florida Natural Areas Inventory to the Florida Department of Environmental Protection and the Florida Forever Advisory Council, pursuant to § 259.0345(5), F.S. Much of the data in this report was created or compiled to address specific performance measures of the program developed by the Florida Forever Advisory Council. As such, the data do not necessarily represent a definition of the resource that is appropriate for general use. While the information contained in this report has potential to inform other conservation planning activities, it should not be used for purposes other than the Florida Forever program without coordination with the Florida Natural Areas Inventory, or the original, primary source of the data. The data in this report are not intended for use in a regulatory decision-making process.

The conservation science and planning activities culminating in this report were funded through a contract with the Florida Department of Environmental Protection, Division of State Lands.

Florida Forever

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December 2000

cover photo:

sandhill upland lake, Camp Blanding Military Reservation
Dan Hipes, Florida Natural Areas Inventory

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INTRODUCTION

The Florida Legislature continued a strong commitment to conservation when in 1999 it created a second 10-year, \$3-billion land and water conservation program, the Florida Forever program. Florida Forever followed its groundbreaking predecessor, Preservation 2000, which to date has protected more than 1 million acres of Florida's natural resources. It was clear in the language of the Florida Forever Act (§259.105, F.S.) that, although Preservation 2000 was recognized as a success, more accountability was expected of the newly created program. The authors of the Act provided abundant guidance for implementation of the new program. This guidance made clear that the Legislature wanted a better way of identifying acquisition priorities and evaluating the success of the newly created program. These mandates—better acquisition priorities and clearer measures of success—lay the foundation for the development of a comprehensive, statewide **conservation needs assessment**.

The Act specifically states,

- ▶ acquisition should be based on a comprehensive assessment of Florida's natural resources and planned so as to protect the integrity of ecological systems and provide multiple benefits;
- ▶ a competitive selection process should be developed to select those projects best able to meet the goals of Florida Forever and maximize the efficient use of the program's funding;
- ▶ the success of previous environmental land acquisition programs could not be adequately evaluated;
- ▶ the Florida Forever program will be implemented in the context of measurable state goals and objectives, which shall include baseline measurements.

This Conservation Needs Assessment satisfies all of these requirements and provides other significant benefits as well, which are outlined in this report.

This report presents a summary of the findings of the Florida Forever Conservation Needs Assessment prepared by the Florida Natural Areas Inventory (FNAI or the Inventory). It describes the approach employed and demonstrates the uses of the assessment through examples. A full report with

complete technical documentation will be prepared by March 2001, in time for the next Florida legislative session.

What is the Conservation Needs Assessment?

The Florida Forever Conservation Needs Assessment is an analysis of the geographic distribution of certain types of natural resources, or resource-based land uses (such as recreation or sustainable forestry), that have been identified by the Legislature as needing increased conservation attention. The Inventory developed or compiled statewide data for 15 resource types that have been identified by the Florida Forever Advisory Council as the focus of Florida Forever's conservation actions. The geographic data for these resource types is compared with existing public conservation lands and proposed environmental land acquisition projects to evaluate the protection status of these resources and to guide decisions about future conservation efforts.

The Assessment was prepared specifically to inform the Florida Forever Advisory Council and addresses 15 of 34 performance measures identified by the Council. This Assessment considers only measures that guide environmental land acquisition decisions; it does not consider measures that are related to management performance or restoration.

The Assessment is an **objective, science-based analysis** using the best statewide data currently available. It is the result of a **collaborative effort** involving many of Florida's natural resource experts, and represents the **general consensus** of these experts, although final responsibility for interpretation of the data resides with the Inventory. Many agencies and organizations contributed data to the Assessment and are indicated in the Data Layer Documentation section of this report. Likewise many individuals participated in the Assessment and are recognized in the Acknowledgements.

Outcomes of the Conservation Needs Assessment

The Florida Forever Conservation Needs Assessment:

- ▶ provides baselines which inform overall program priorities and are a starting point to measure future progress;
- ▶ identifies priority lands to meet current conservation needs;

- ▶ identifies lands that meet multiple conservation goals;
- ▶ provides a continuous monitoring mechanism for re-evaluating conservation needs;
- ▶ clearly and continuously tracks and documents the progress of the Florida Forever program.

Guidance for Interpretation of the Assessment

The Conservation Needs Assessment is a powerful tool to help guide and inform the State's conservation planning activities. There are, however, specific guidelines that should be considered when interpreting the Assessment.

The Assessment was developed specifically to inform actions relating to the Florida Forever program. While the Assessment has potential to inform other conservation planning activities, we do not encourage its use for such purposes without coordination with the Inventory. The data in this report are not intended for use in a regulatory decision-making process.

The Assessment should not be construed as the conservation priorities of the Florida Natural Areas Inventory. We believe the data layers in this Assessment represent the best data currently available, but they are limited to only those issues that are performance measures of the Florida Forever program. The data layers are presented objectively, without recommendations regarding the conservation priorities different resources should have for land acquisition.

The Assessment does not represent all of the important resource issues that should be considered to inform conservation and environmental land acquisition decisions. For example, the restoration needs of the Everglades and other important ecosystems are not a part of this report. Similarly there may be important information from local sources that is applicable to specific projects.

This Summary Report does not fully describe the development of the data used in the Assessment. A full report with technical documentation will be produced by the Inventory in early 2001. Readers wishing to examine in more detail the development of the data should refer to the full report when it becomes available.

The information provided in the Assessment should be used to guide project design, not to define it. The Assessment should be used in conjunction with

existing project design methods employed by the acquisition agencies when developing new projects.

RECOMMENDATIONS

The following recommendations are based on the information and outcomes of this Conservation Needs Assessment.

1. The Conservation Needs Assessment should be used to measure the progress of the Florida Forever program on an annual basis, based on the goals and measures established for the program. As outlined in this report, the data layers included in the Assessment allow continuous measurement of lands acquired which protect each of the resource categories identified in the Florida Forever goals and measures. An annual report detailing progress toward each measure can be prepared by the Florida Natural Areas Inventory. This report would provide the Legislature and the Florida Forever Advisory Council with a clear statement of progress for the program.

2. The Conservation Needs Assessment should be used to evaluate new land acquisition proposals based on the goals and measures of the Florida Forever program. In order to ensure that new land acquisition proposals contribute to the goals and measures of the program, the Assessment should be used as a tool to evaluate each proposal. While other factors may also be considered in proposal evaluations, the Assessment represents the most complete set of information available to measure the benefits and features of individual proposals against the intended outcomes of Florida Forever.

3. The Conservation Needs Assessment should be used to develop new land acquisition proposals based on the statewide priorities identified in the Assessment. The results of the Assessment point to specific regions or locations in the state which would contribute significantly to the resources identified by the Florida Forever goals and measures. These areas should be targeted for new land acquisition proposals under Florida Forever. These proposals would not preclude proposals submitted from other sources throughout the state.

4. The data layers included in the Conservation Needs Assessment should be maintained and updated throughout the duration of the Florida Forever program. In order to track the progress of Florida Forever

using the best available data, the data layers presented in this Assessment should be maintained and updated continuously as conservation priorities change and new data become available.

5. The Conservation Needs Assessment should continue to be refined based on regional or programmatic needs. The Assessment can be refined to address the needs of specific regions or programs as deemed necessary or beneficial by the Florida Forever Advisory Council. For example, natural resource conservation priorities may be different for south Florida, which is dominated by the Everglades and Big Cypress ecosystems, than for north or central Florida. Other factors influencing land acquisition priorities could also be considered, such as property values or population growth pressures.

DATA LAYERS

The Florida Natural Areas Inventory compiled data for 15 of the Florida Forever measures related to acquisition. These data layers are depicted on the maps on pages 9 - 22. Although we recognize that for some measures better local or regional information may be available, we focused on data that were available in a consistent, statewide format, in order to set priorities and measure the success of a statewide program. This effort represents the best available statewide data for these resources.

For some measures, statewide data were not available. For example, we originally intended to include Federal Emergency Management Administration (FEMA) data to measure acres acquired to minimize flood damage (Measure C6). The FEMA data layer is not included in this version, however, because the digital FEMA coverage is incomplete for several counties, including most of the Suwannee River Water Management District.

The Data Documentation section at the end of this report describes in more detail the source and derivation of each data layer included in the Conservation Needs Assessment.

Collaboration with Resource Experts

The Inventory coordinated closely with experts to obtain, develop, prioritize and review data. Early in the process we contacted water management districts, state agencies, and other primary data sources in order to obtain as much relevant resource data as possible. Data providers and resource experts participated in a workshop to help determine what type of data best represented each measure. This often first required defining a measure. For example, water experts defined natural floodplain as “wetlands adjacent to natural waterways,” enabling us to create a data layer with those parameters from existing wetlands and rivers data. Our partners also assisted in prioritizing data within a resource category. The authors of Strategic Habitat Conservation Areas and the Florida Ecological Greenways Network prioritized their data for the Florida Forever program, and the Inventory worked with resource experts to develop priorities for seven additional data layers. In a second workshop our partners provided feedback on the individual data layers and their application in the Assessment.

Developing the Data Layers

In most cases, some modification or synthesis of existing data was required to develop data layers that best represent the measures of the program. We attempted to compensate for the limitations of a single data layer by using several data sets in conjunction with one another to develop the most accurate representation possible. For example, we used the agreement between two different landcover data sets, a specific scrub community data layer, and FNAI element occurrence records to develop the Under-represented Natural Communities layer. Where statewide data existed, but better regional information was available for part of the state, as in the case of Aquifer Recharge, we used the regional data, provided the resolution was not significantly different. In the case of Surface Water, we relied on water experts to help define “surface waters” and how to best protect them. We then assembled several existing data sets for surface water and created new data to delineate protection zones around those water bodies. Most other data layers were similarly modified in order to tailor them to specific Florida Forever measures.

Future Data Revisions

The Inventory intends to update these data as new and better information becomes available. In the next year, we expect to incorporate data for prioritized trails (Measure E2) currently being developed by the Office of Greenways and Trails and University of Florida, and a prioritized version of Archaeological Sites from Division of Historical Resources. A revised version of the Prioritized Ecological Greenways layer will also be available in early 2001. The Under-represented Natural Communities data layer has not yet been fully peer-reviewed, and some experts have suggested that pine flatwoods should be included. We also anticipate imminent revisions to other data layers such as Aquifer Recharge for which groundwater experts are refining the source information.

Creating the FNAI Habitat Conservation Priorities

A substantial component of this Assessment involved development of the FNAI Habitat Conservation Priorities data layer (Measure B2) for the Assessment. This involved creation of occurrence-based habitat maps for 250 rare species with the greatest conservation need in Florida. Habitat was delineated for known

occurrences primarily using the 1995 water management district land use landcover data.

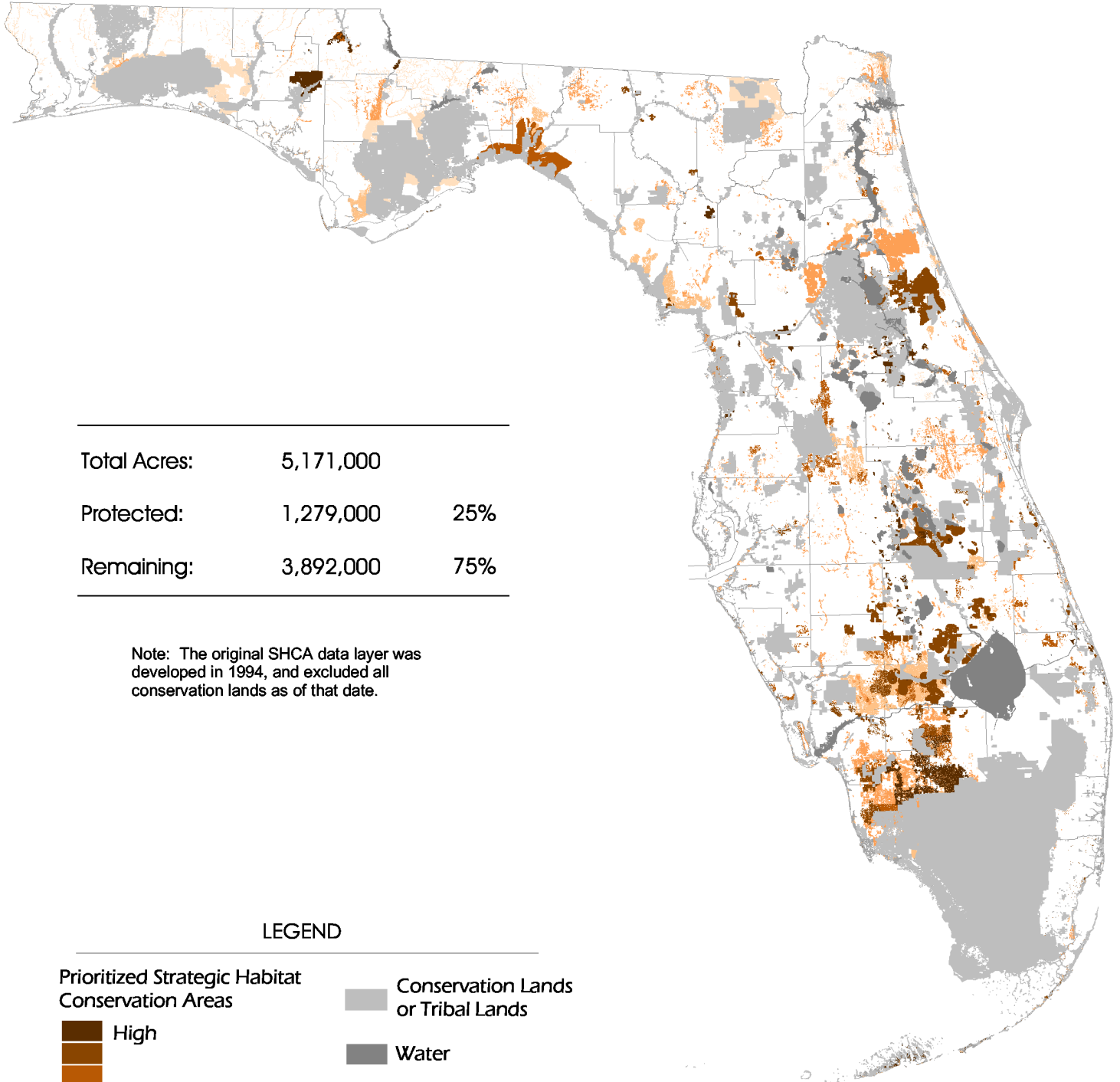
FNAI scientists reviewed and revised the maps, and assigned ranks to the habitat based on quality or suitability for a particular species. We also held several workshops and coordinated with species experts, who helped identify the most important habitats for species such as manatee, black bear, panther, freshwater fish and mussels, scrub-jay and sea turtles.

The 250 species were assigned a conservation needs weighting factor based on rarity and current protection status on public lands. The weighted habitat maps for all 250 species were then overlaid to produce the Habitat Conservation Priorities. We plan to regularly update this data layer as new species occurrence information is added to the FNAI database.

The FNAI Habitat Conservation Priorities data layer prioritizes places on the landscape that would protect both the greatest number of species and those species with the greatest conservation need. We also can provide analysis on a species by species basis. In addition, we can report how well the model protects an additional 730 species tracked by the FNAI database. The Florida Natural Areas Inventory maintains approximately 28,000 occurrence records for 980 rare species.

Measure B1 - Strategic Habitat Conservation Areas

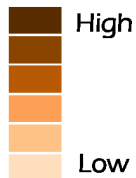
Source: Florida Fish & Wildlife Conservation Commission



Note: The original SHCA data layer was developed in 1994, and excluded all conservation lands as of that date.

LEGEND

Prioritized Strategic Habitat Conservation Areas



Conservation Lands or Tribal Lands

Water

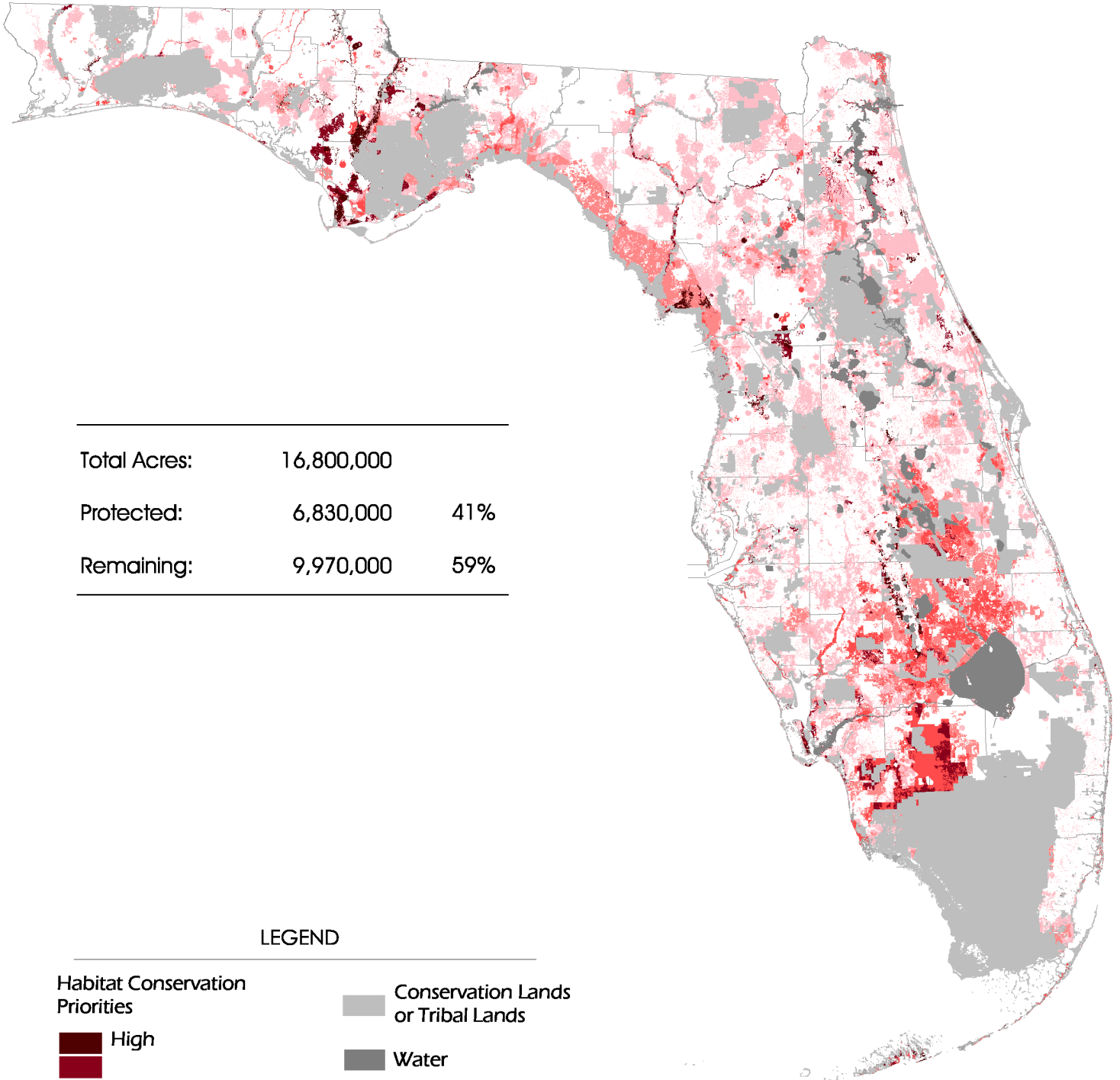
Map Date:
December 2000

A detailed description of this data layer is available in the Data Layer Documentation section of the Florida Forever Conservation Needs Assessment.

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Measure B2 - FNAI Priority Conservation Areas for Rare Species

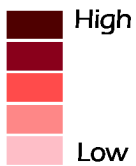
Source: Florida Natural Areas Inventory



Total Acres:	16,800,000	
Protected:	6,830,000	41%
Remaining:	9,970,000	59%

LEGEND

Habitat Conservation Priorities



Conservation Lands or Tribal Lands

Water

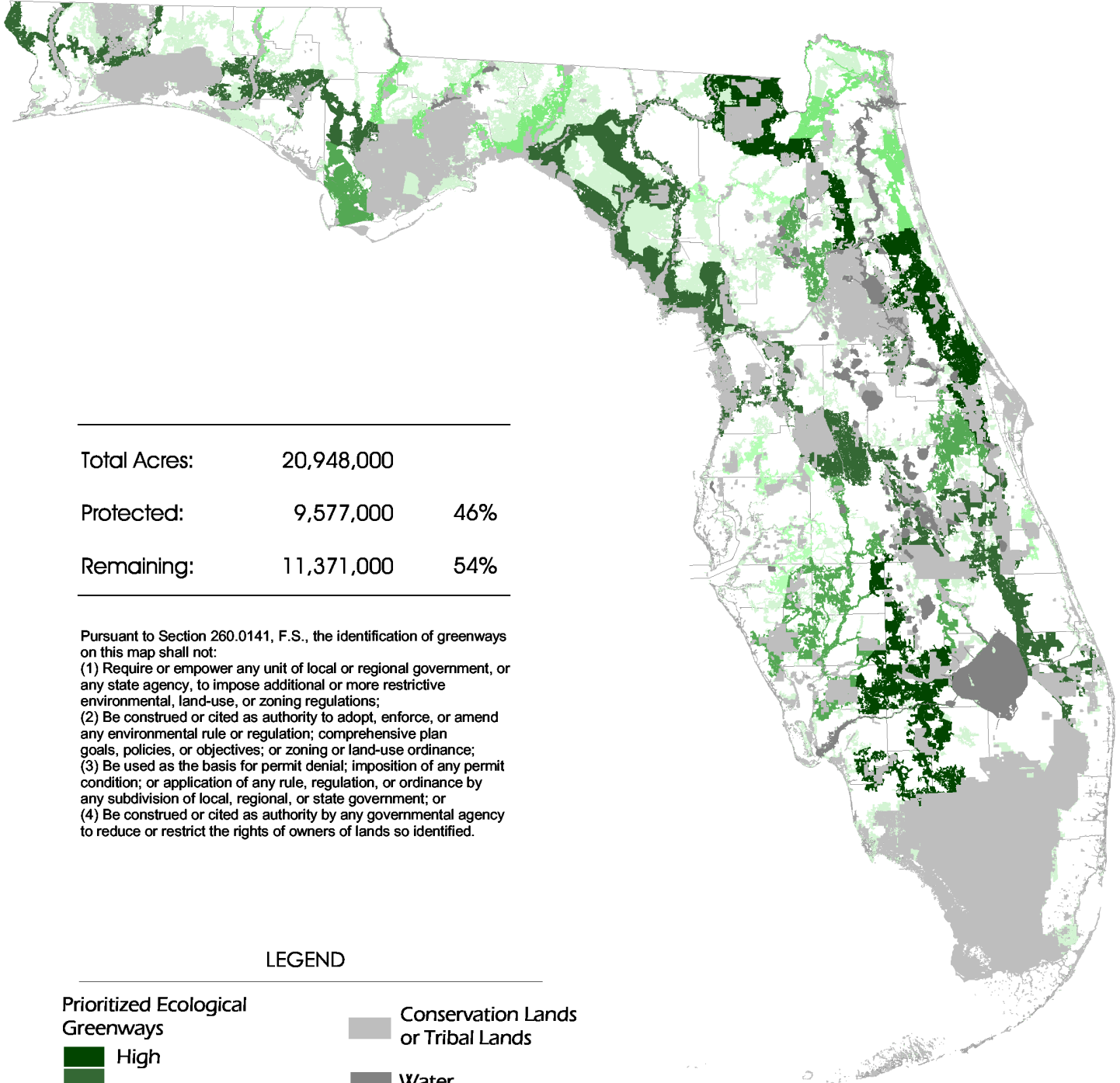
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Measure B3 - Significant Landscapes, Linkages, and Conservation Corridors

Source: University of Florida and Florida Dept. of Environmental Protection, Office of Greenways and Trails



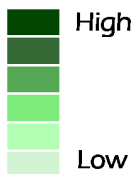
Total Acres:	20,948,000	
Protected:	9,577,000	46%
Remaining:	11,371,000	54%

Pursuant to Section 260.0141, F.S., the identification of greenways on this map shall not:

- (1) Require or empower any unit of local or regional government, or any state agency, to impose additional or more restrictive environmental, land-use, or zoning regulations;
- (2) Be construed or cited as authority to adopt, enforce, or amend any environmental rule or regulation; comprehensive plan goals, policies, or objectives; or zoning or land-use ordinance;
- (3) Be used as the basis for permit denial; imposition of any permit condition; or application of any rule, regulation, or ordinance by any subdivision of local, regional, or state government; or
- (4) Be construed or cited as authority by any governmental agency to reduce or restrict the rights of owners of lands so identified.

LEGEND

Prioritized Ecological Greenways



Conservation Lands or Tribal Lands

Water

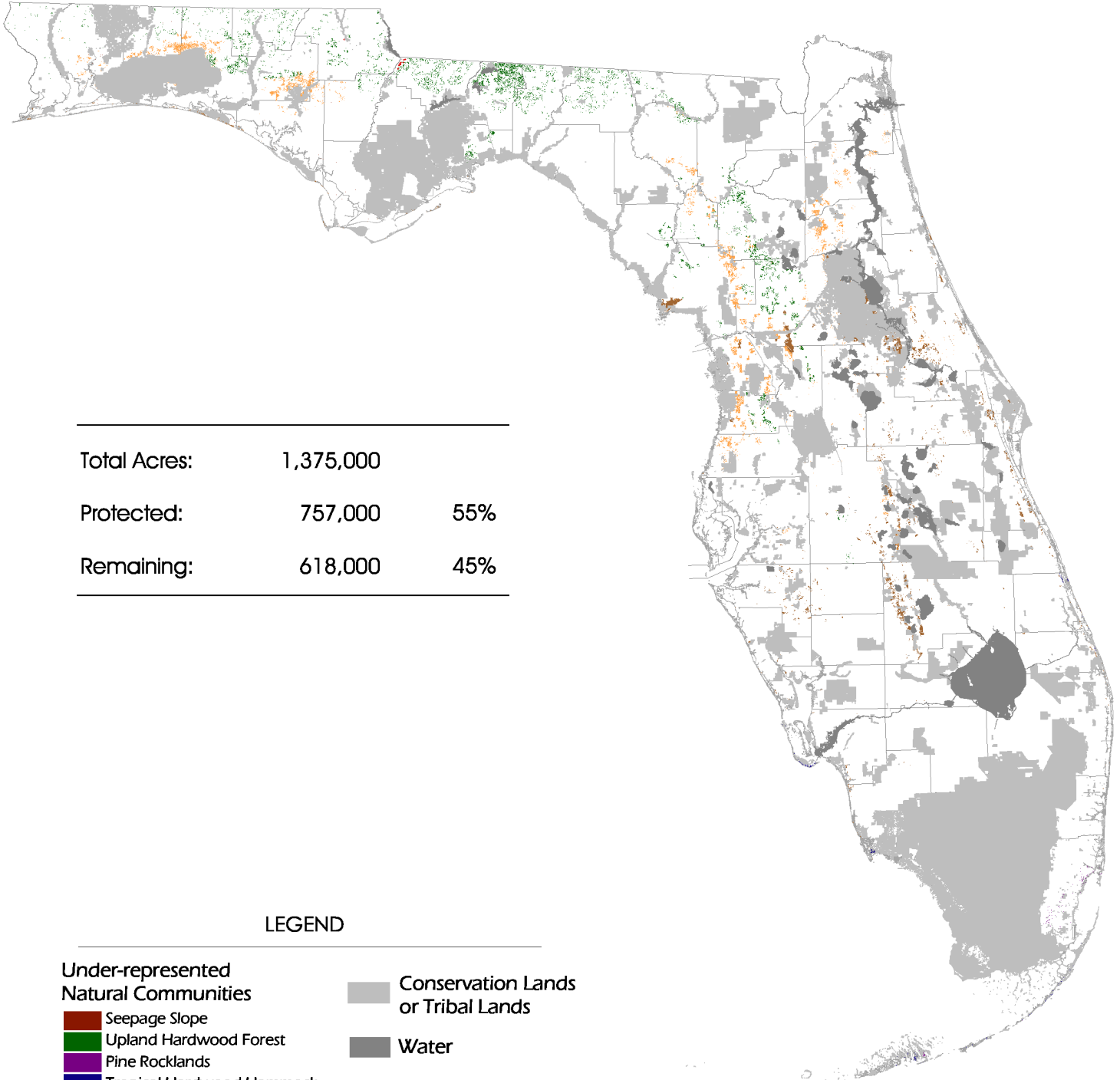
Map Date:
December 2000

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Measure B4 - Under-represented Natural Communities

Source: Florida Natural Areas Inventory



Total Acres:	1,375,000	
Protected:	757,000	55%
Remaining:	618,000	45%

LEGEND

Under-represented Natural Communities

- Seepage Slope
- Upland Hardwood Forest
- Pine Rocklands
- Tropical Hardwood Hammock
- Sandhill
- Scrub
- Upland Glades

Conservation Lands or Tribal Lands

Water

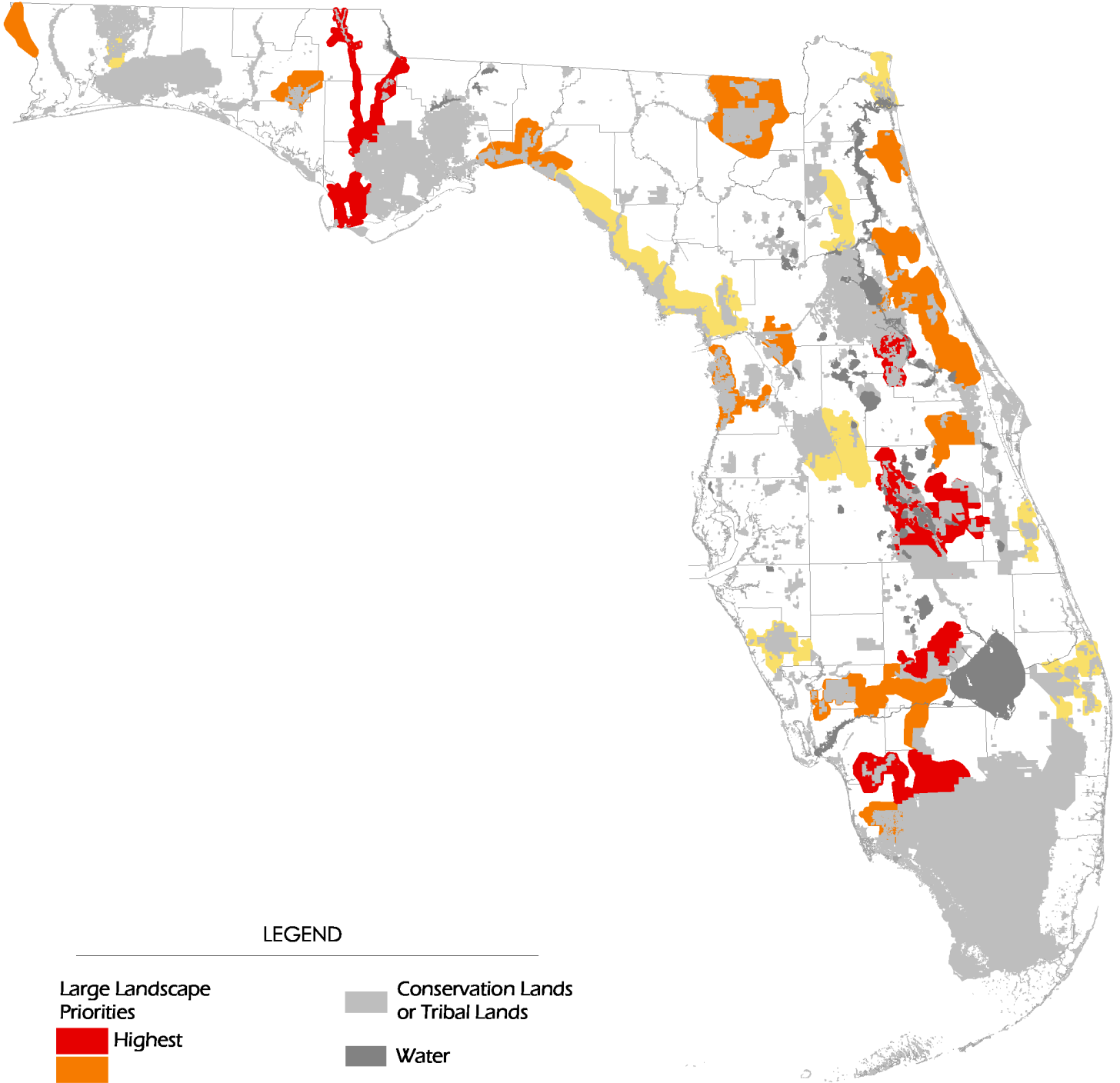
Map Date:
December 2000

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Measure B5 - Landscape-sized Protection Areas

Source: natural resource experts from Florida Natural Areas Inventory, Florida Fish & Wildlife Conservation Commission, The Nature Conservancy, and University of Florida



LEGEND

Large Landscape
Priorities

- Highest
- High
- High

Conservation Lands
or Tribal Lands

Water

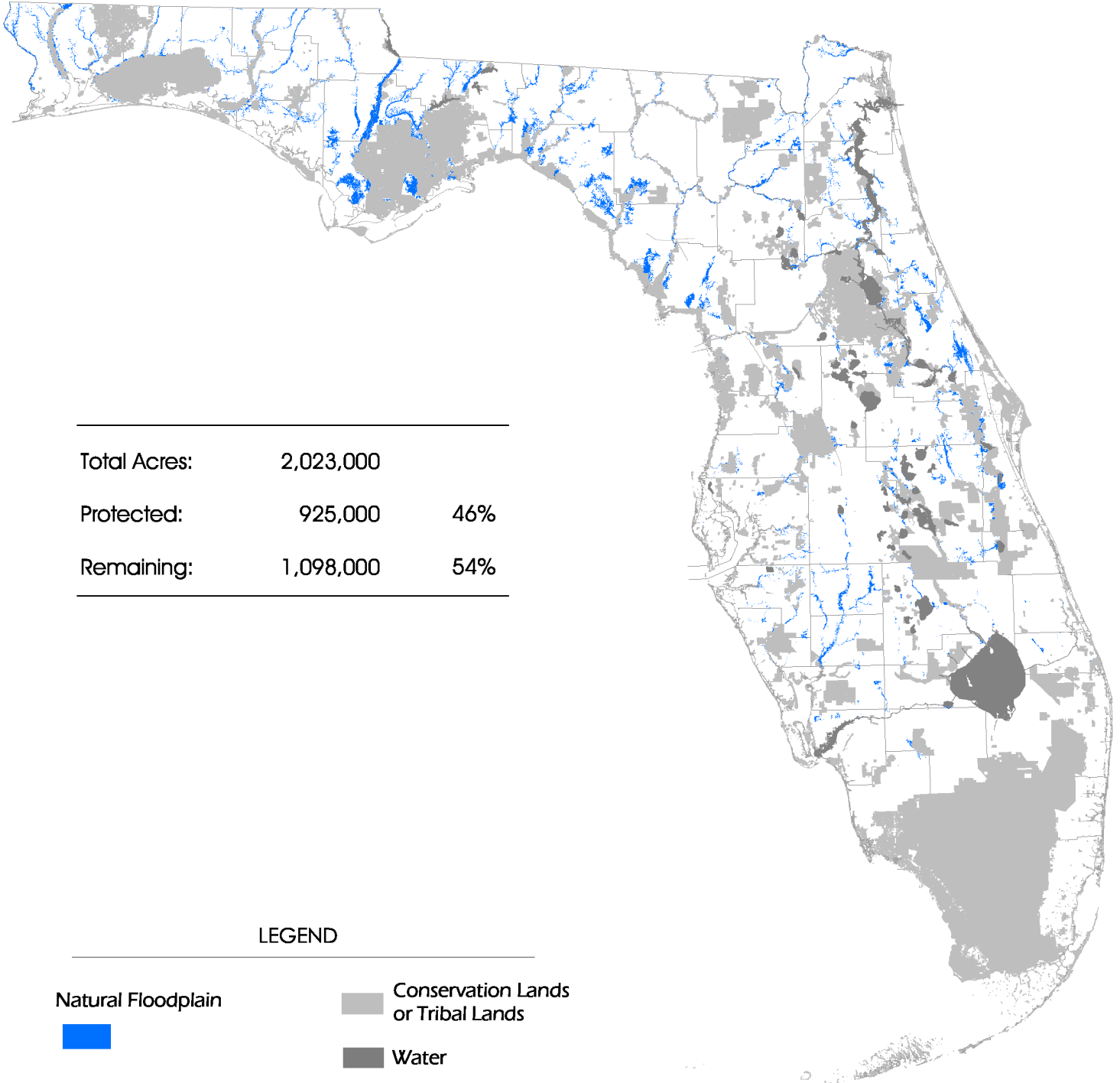
Map Date:
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Measure C4 - Natural Floodplain

Source: Florida Natural Areas Inventory, based on National Wetlands Inventory and U.S. Geological Survey data



Total Acres:	2,023,000	
Protected:	925,000	46%
Remaining:	1,098,000	54%

LEGEND

- Natural Floodplain 
- Conservation Lands or Tribal Lands 
- Water 

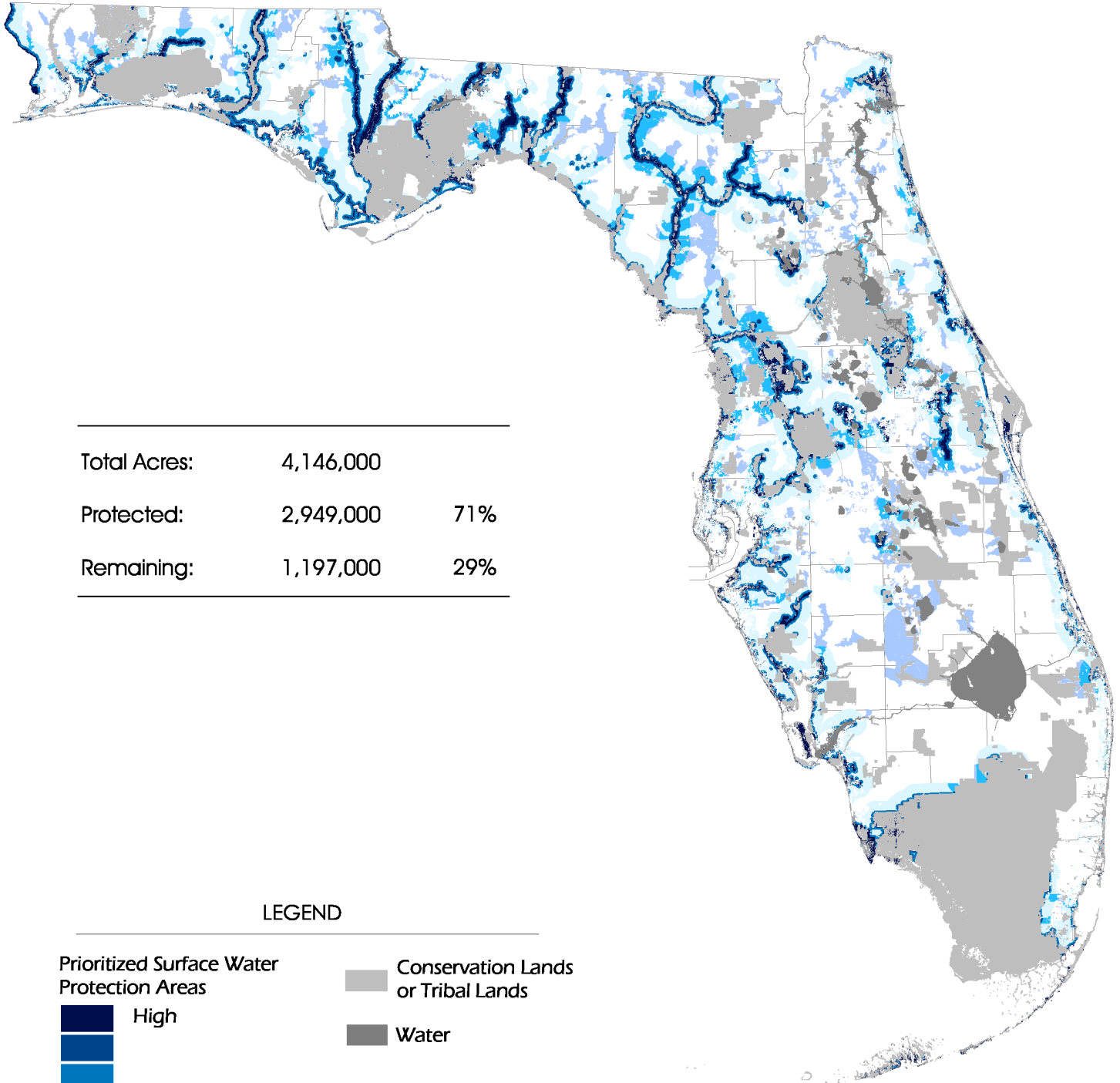
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Measure C5 - Surface Water

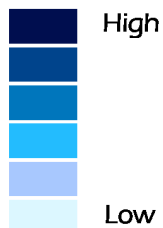
Source: Florida Natural Areas Inventory, Florida Dept. of Environmental Protection, and Florida Marine Resource Institute



Total Acres:	4,146,000	
Protected:	2,949,000	71%
Remaining:	1,197,000	29%

LEGEND

Prioritized Surface Water Protection Areas



Conservation Lands or Tribal Lands

Water

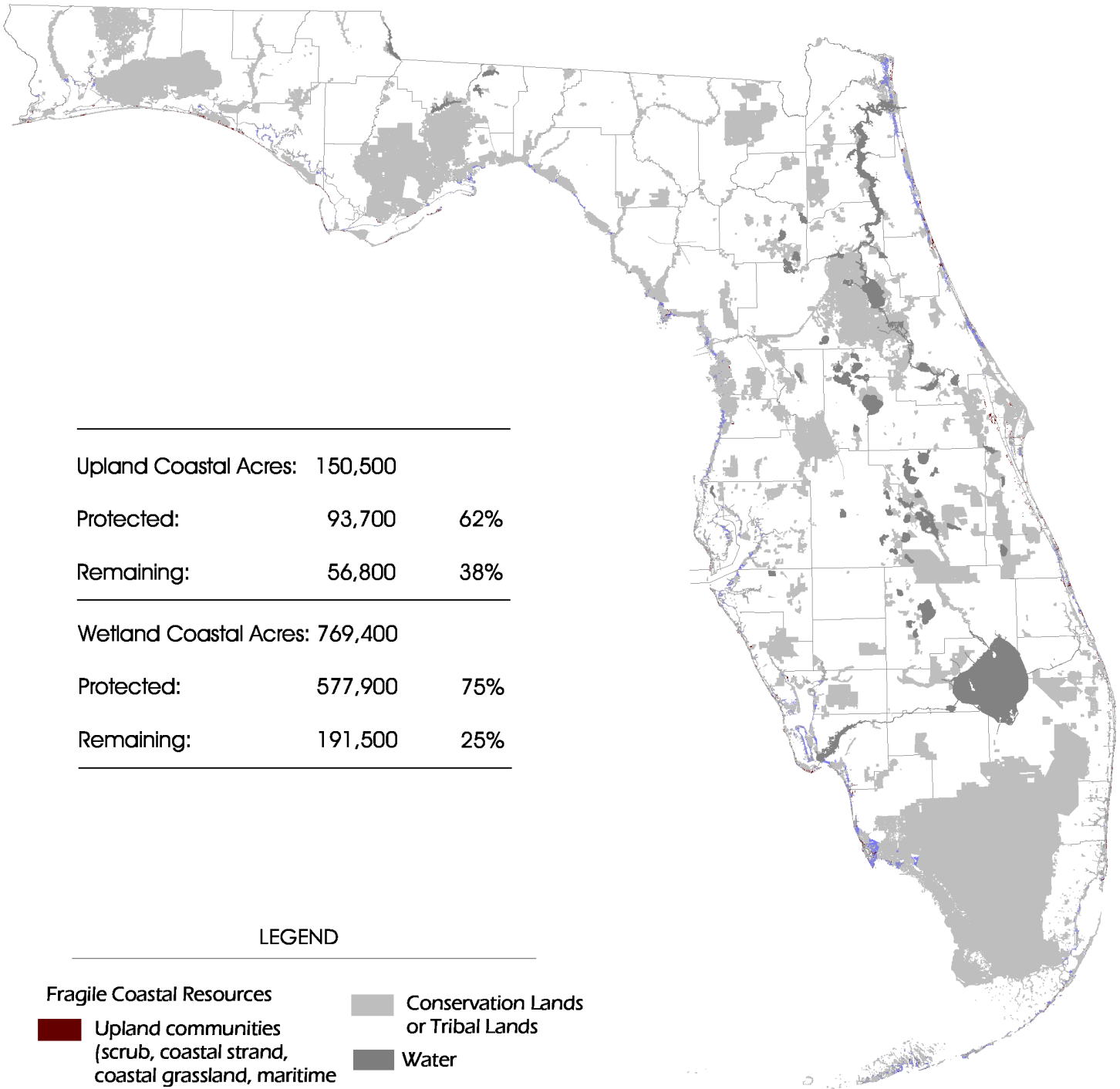
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Measure C7 - Fragile Coastal Resources

Source: Florida Natural Areas Inventory



Upland Coastal Acres: 150,500		
Protected:	93,700	62%
Remaining:	56,800	38%
Wetland Coastal Acres: 769,400		
Protected:	577,900	75%
Remaining:	191,500	25%

LEGEND

- | | |
|---|--|
| Fragile Coastal Resources | |
|  Upland communities (scrub, coastal strand, coastal grassland, maritime hammock, beach dune) |  Conservation Lands or Tribal Lands |
|  Wetland communities (mangroves, saltmarsh) |  Water |

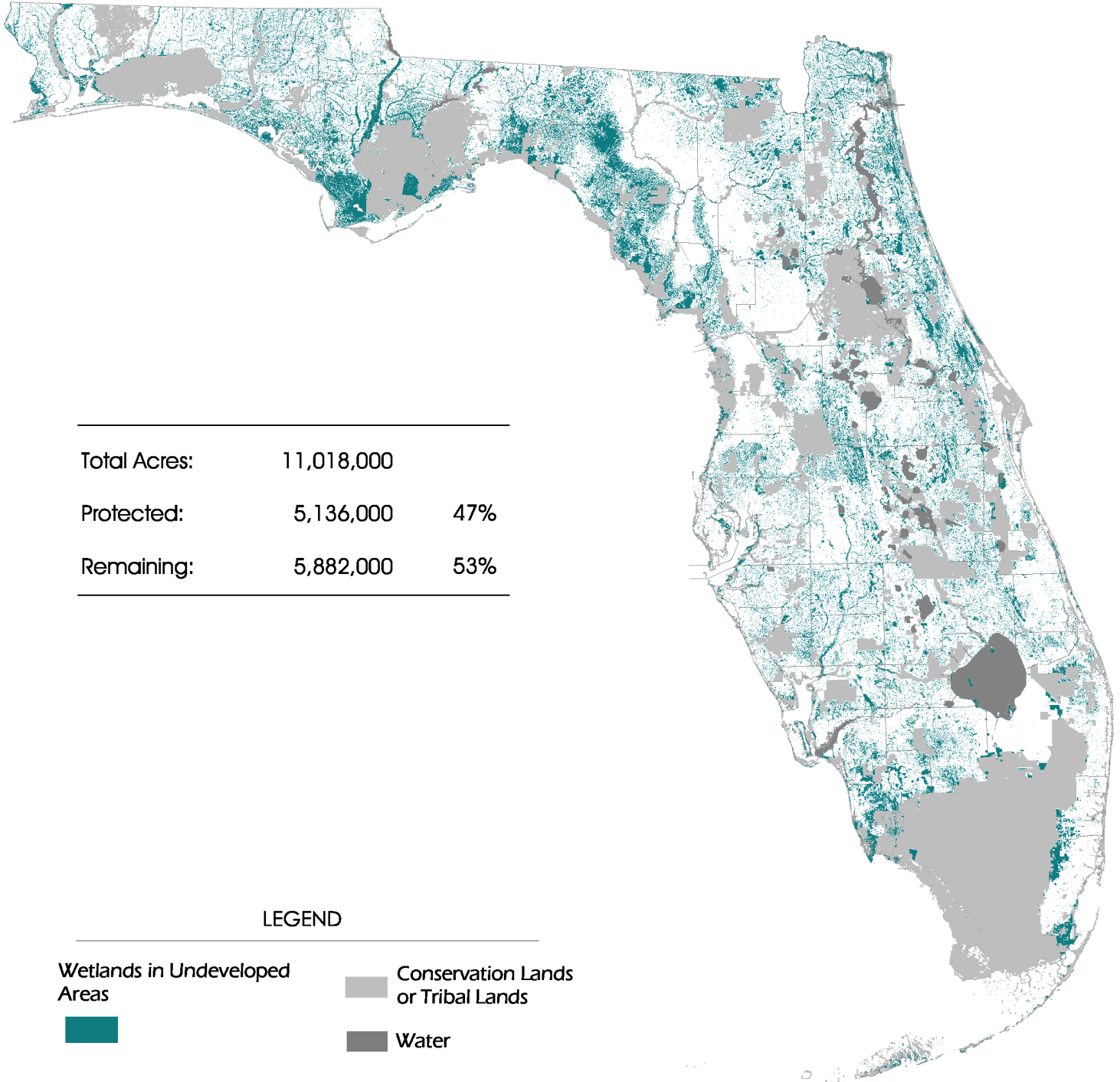
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Measure C8 - Functional Wetlands

Source: Florida Natural Areas Inventory, based on National Wetlands Inventory



Total Acres:	11,018,000	
Protected:	5,136,000	47%
Remaining:	5,882,000	53%

LEGEND

Wetlands in Undeveloped Areas



Conservation Lands or Tribal Lands

Water

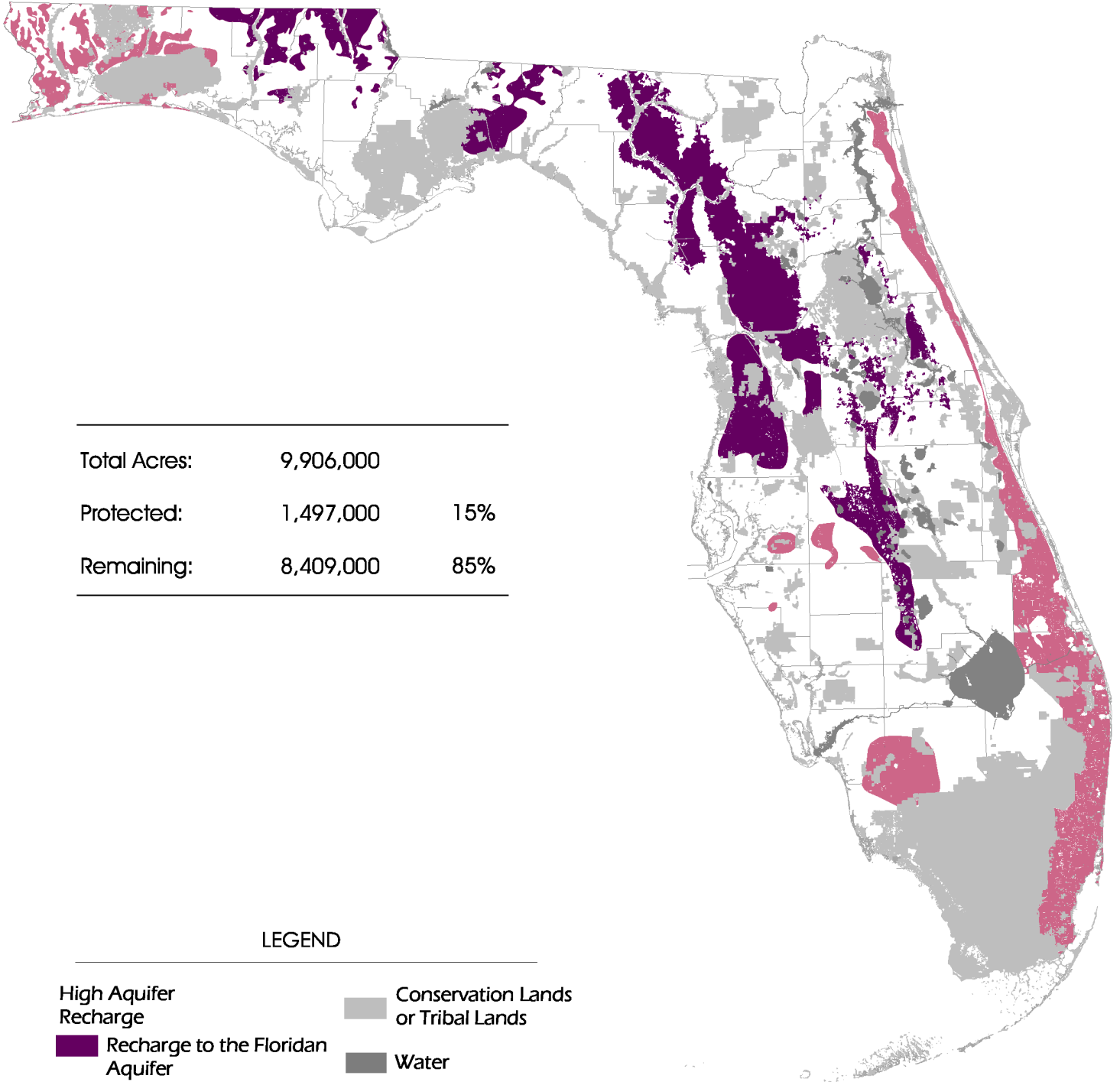
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Measure D3 - Aquifer Recharge

Source: Florida Geological Survey, Water Management Districts, and other water resource experts



Total Acres:	9,906,000	
Protected:	1,497,000	15%
Remaining:	8,409,000	85%

LEGEND

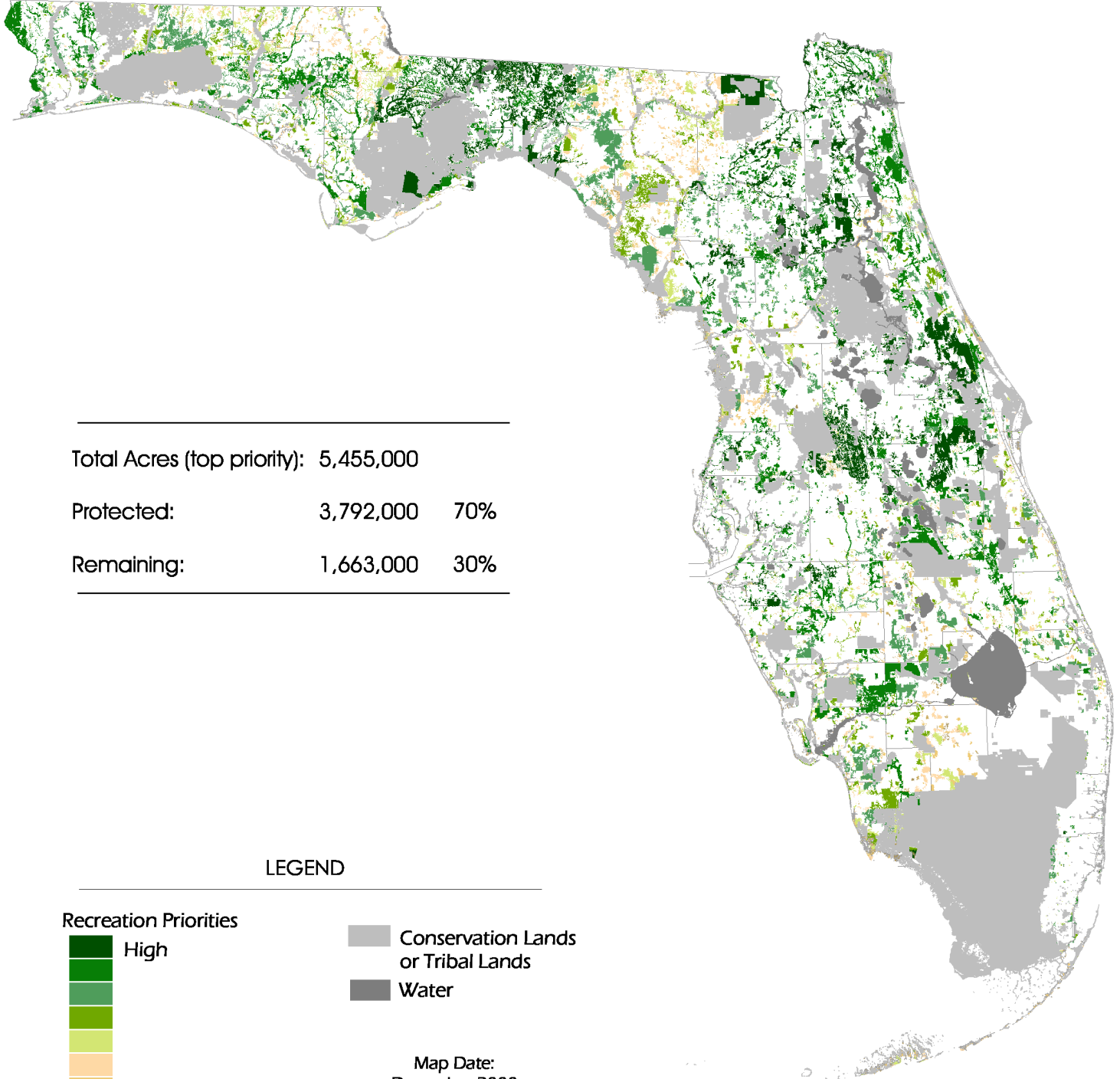
- High Aquifer Recharge
 - Recharge to the Floridan Aquifer
 - Recharge to surficial or intermediate aquifers
 - Conservation Lands or Tribal Lands
 - Water
- Map Date:
December 2000

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Measure E1 - Natural Resource-based Recreation

Source: Florida Natural Areas Inventory, in collaboration with recreation experts



Total Acres (top priority):	5,455,000	
Protected:	3,792,000	70%
Remaining:	1,663,000	30%

LEGEND

Recreation Priorities



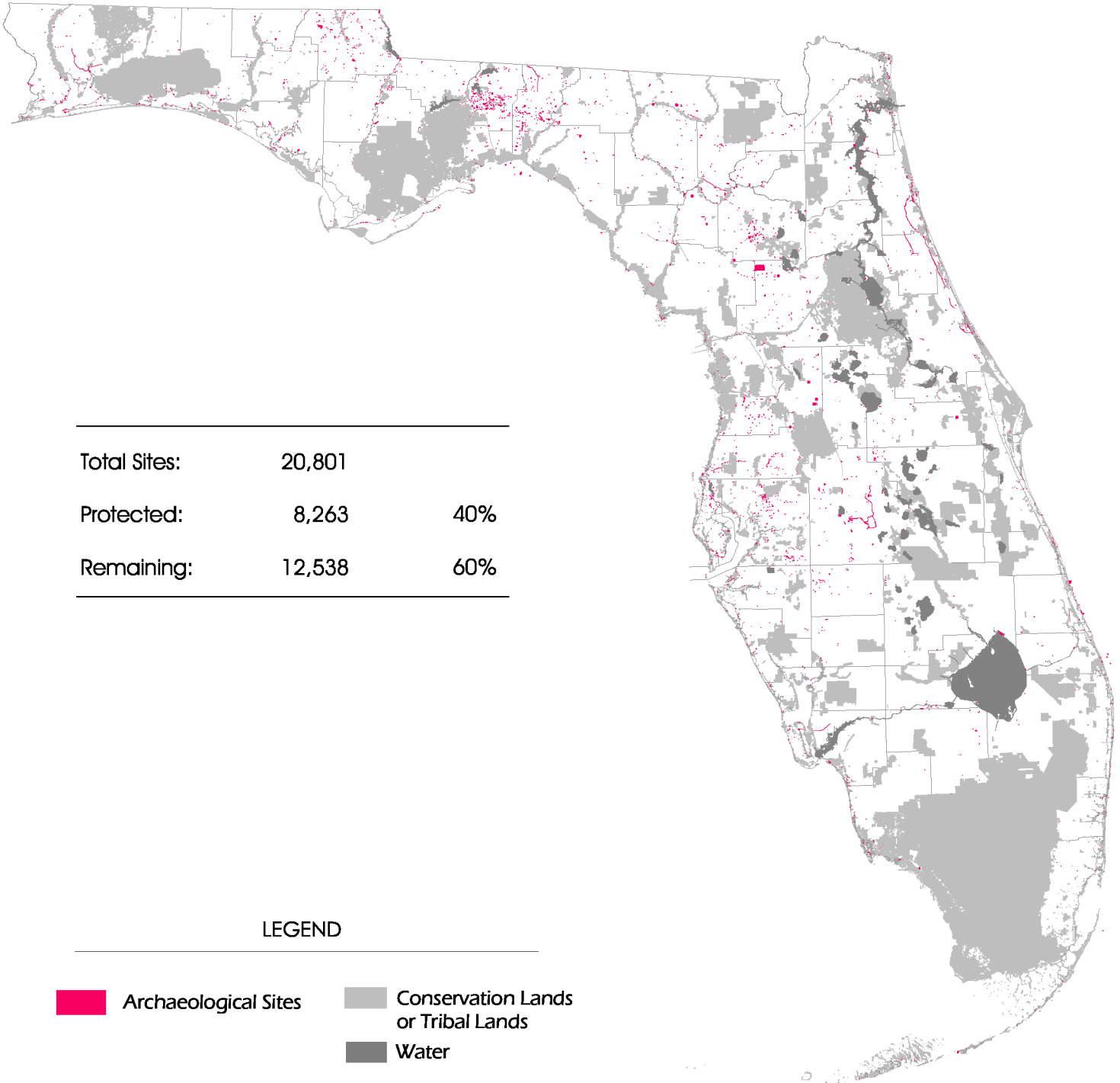
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Measure F1 - Significant Archaeological Sites

Source: Florida Department of State, Division of Historical Resources



Total Sites:	20,801	
Protected:	8,263	40%
Remaining:	12,538	60%

LEGEND

-  Archaeological Sites
-  Conservation Lands or Tribal Lands
-  Water

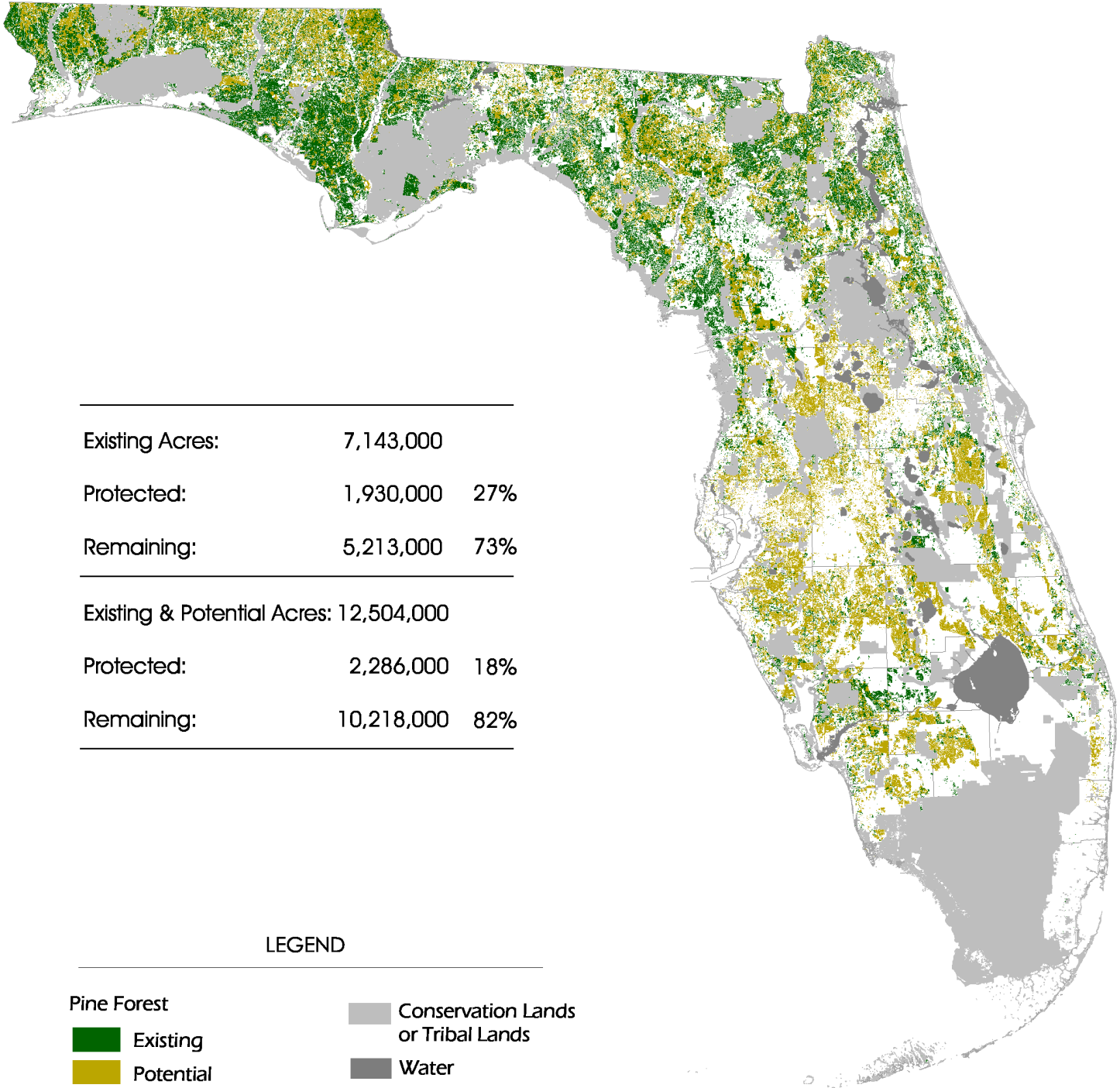
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Measures G1 & G2 - Sustainable Forest Management

Source: Florida Natural Areas Inventory, based on Water Management District Land Use Landcover Data



Existing Acres:	7,143,000	
Protected:	1,930,000	27%
Remaining:	5,213,000	73%
<hr/>		
Existing & Potential Acres:	12,504,000	
Protected:	2,286,000	18%
Remaining:	10,218,000	82%

LEGEND

Pine Forest		Conservation Lands or Tribal Lands
Existing		Water
Potential		

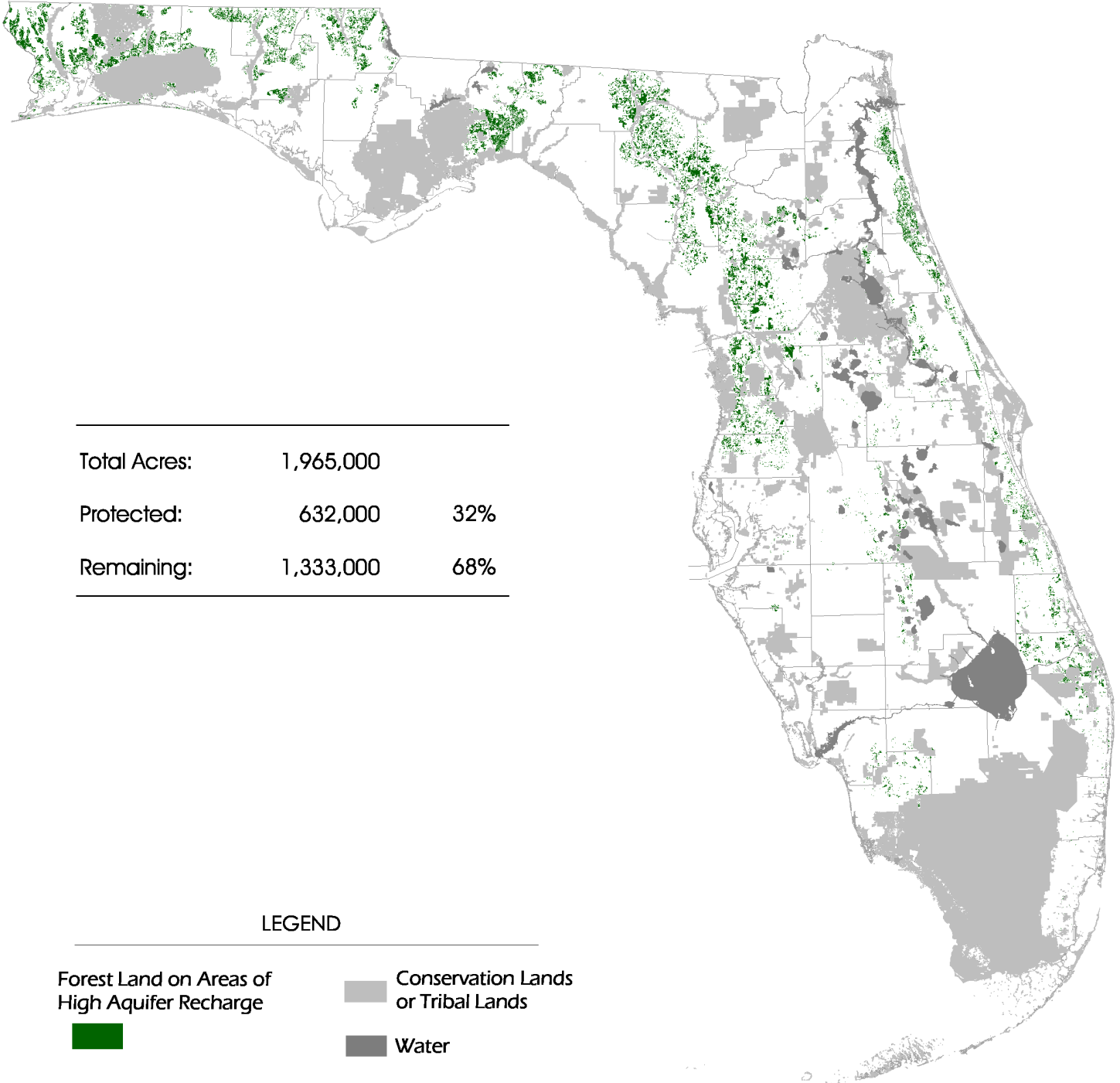
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Measure G3 - Forest Land to Maintain Recharge Function

Source: Florida Natural Areas Inventory, based on Forest Land and Aquifer Recharge Data Layers



Total Acres:	1,965,000	
Protected:	632,000	32%
Remaining:	1,333,000	68%

LEGEND

Forest Land on Areas of High Aquifer Recharge



Conservation Lands or Tribal Lands



Water

Map Date:
December 2000

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BASELINES

The baseline measures provided by this Conservation Needs Assessment serve two primary functions. First, they provide a starting point from which progress can be measured. With baseline data we are able to say how much of each resource type is currently protected on conservation lands and report progress as new acres are acquired. Second, baselines can inform decisions about overall program priorities. Statistics for different resource categories can be compared to determine where protection gaps exist, and which resources merit the most attention in the Florida Forever program.

The FNAI Conservation Lands Database

Baselines were calculated using the Florida Natural Areas Inventory Conservation Lands database, which is generally recognized as the best source for comprehensive statewide conservation lands data. The Inventory maintains digital boundaries of conservation lands and continually updates the database with the latest information from a variety of federal, state, local, and private managing agencies. Consequently, we are able to report progress toward meeting the Florida Forever goals and measures on a continuous basis. The baselines for the Assessment were calculated using conservation lands in the FNAI database as of October 2000.

Interpreting the Baselines

Complete baseline statistics are given in Table 1. The number and percentage of acres on conservation lands are reported for each baseline and both should be considered when viewing baselines. For example, a comparison of Under-represented Natural Communities and Functional Wetlands shows that a greater percentage of under-represented natural communities (55%) than wetlands (47%) is protected. The acreages, however, indicate that less than 1 million acres of under-represented natural communities are protected versus 5 million acres of wetlands. Similarly, coastal resources appear to be relatively well protected at 73 percent, but in reality coastal uplands are one of the least well-represented resources on conservation lands with less than 100,000 acres.

For some data layers statistics for the top priorities are shown along with statistics for the entire data set. The top priorities identify the most important areas for acquisition. The top priority in the Surface Water layer is a 1000-foot

buffer around high quality surface waters. Much of this zone is already protected (71%) because surface waters include Outstanding Florida Waters, which are by definition waters in conservation lands. The lower priority categories for this layer still contribute to surface water protection but include buffer zones farther from the water body. Thus, the total acres identified for surface water protection are less well represented on conservation lands (33%).

An important factor to note is that the baseline for Prioritized Strategic Habitat Conservation Areas is not directly comparable to other baseline measures. The original Strategic Habitat Conservation Areas (SHCA) were created in 1994 and developed for areas outside of conservation lands. Thus, the baseline reports acres of SHCAs protected since 1994.

The baseline for Landscape-sized Protection Areas (measure B5) is not reported in Table 1. Because the measure implies that these areas should be tracked with the onset of Florida Forever acquisitions, the baseline for large landscapes is also effectively zero. This data layer conceptually identifies regions that represent large-scale, high quality, functioning ecosystems where landscape-sized acquisition projects could be developed. We recognize that landscape-sized projects could also be developed in areas other than those identified here. We will track the number of landscape-sized protection areas established through new acquisition projects, or augmentations to previous projects, as stated in measure B5.

Table 1. Florida Forever Baseline Measures

FLORIDA FOREVER MEASURE	DATA LAYER	BASELINE - OCTOBER 2000		
		TOTAL ACRES	ACRES on CONS. LANDS	PERCENT ON CONS. LANDS
B1	Prioritized SHCA <i>top priorities</i> ^a	1,551,000	429,000	28%
	Prioritized SHCA <i>all</i> ^a	5,171,000	1,279,000	25%
B2	FNAI Habitat Cons. Priorities <i>top priorities</i>	1,080,000	256,000	24%
	FNAI Habitat Cons. Priorities <i>all</i>	16,800,000	6,830,000	41%
B3	Prioritized Ecological Greenways <i>top priority</i> ^b	2,716,000	844,000	31%
	Prioritized Ecological Greenways <i>all</i> ^b	20,948,000	9,577,000	46%
B4	Under-represented Natural Communities	1,375,000	757,000	55%
C4	Natural Floodplain	2,023,000	925,000	46%
C5	Surface Water <i>top priority</i>	4,146,000	2,949,000	71%
	Surface Water <i>all</i>	17,411,000	5,788,000	33%
C7	Fragile Coastal wetlands	769,000	578,000	75%
	Fragile Coastal uplands	151,000	94,000	62%
	Fragile Coastal Resources <i>all</i>	920,000	672,000	73%
C8	Functional Wetlands	11,018,000	5,136,000	47%
D3	Aquifer Recharge	9,906,000	1,497,000	15%
E1	Resource-based Recreation <i>top priority</i>	5,455,000	3,792,000	70%
	Resource-based Recreation <i>all</i>	15,303,000	7,985,000	52%
F1	Significant Archaeological Sites	20,801 sites	8,263 sites	40%
G2	Sustainable Forestry			
	Forest land existing	7,143,000	1,930,000	27%
G1	Forest land potential	5,361,000	356,000	7%
	Forest land <i>all</i>	12,504,000	2,286,000	18%
G3	Forest Land for Recharge	1,965,000	632,000	32%

^a Baseline is calculated as acres acquired since 1994, when the original version of SHCAs was created. Conservation lands were not included in the development of this data layer.

^b Acres of open water outside of existing conservation lands and within the ecological greenways network have been excluded. Note that none of the other data layers includes open water.

APPLICATIONS

This section demonstrates some applications of the information provided in this report for evaluating potential land acquisitions and tracking the progress of Florida Forever over the life of the program. These examples will help demonstrate the value of the Conservation Needs Assessment in meeting the needs of the Florida Forever program.

Providing a Vision for Florida Forever Accomplishments

With the data available in this Assessment, we can analyze proposed acquisitions in order to project future progress of Florida Forever toward the specific goals and measures of the program. In this exercise, we use the Priority Conservation and Recreation Lands (CARL) projects as an example to demonstrate the increase in protection of resources which could be accomplished according to the goals and measures of the Florida Forever program. This approach demonstrates not only how we can project the progress of future acquisitions today, but also how the Assessment can be used throughout the life of the program to track acquisition accomplishments since the program's inception.

The Priority CARL projects represent the most important remaining statewide environmental land acquisition projects established through the existing Preservation 2000 program. The portions of these projects not yet acquired are illustrated on the map on page 31, and will be used for this analysis. Table 2 documents, for each measure, how much of the resource is currently protected on existing conservation lands, how much is located within the portions of the Priority CARL projects yet to be acquired, and the percent increase in protection of the resource if the CARL projects were to be acquired. There are 821,000 acres remaining in the Priority CARL projects, which would represent an increase of eight percent over existing conservation lands.

Table 2 shows that, in this example, many of the resource categories would achieve substantial gains in protection through acquisition of the CARL projects. In particular, the FNAI Habitat Conservation Priorities and Sustainable Forestry data layers show the most gain in terms of percentage increase, while Strategic Habitat Conservation Areas, Surface Water, Functional Wetlands, and Recreation all show large increases in acreage. Some resource categories appear to be under-represented, including Fragile Coastal Resources, Aquifer Recharge, and Archaeological Sites.

This type of analysis allows us to envision the future outcomes of Florida Forever land acquisitions, and highlights resources which are likely to achieve successful gains in conservation, as well as those which might warrant more attention. This example also demonstrates how the Florida Natural Areas Inventory can, throughout the duration of the program, measure the success of Florida Forever land acquisitions toward meeting each of the goals and measures identified by the Legislature and the Florida Forever Advisory Council.

Weighing In on Land Acquisition Proposals

Another potential application involves the evaluation of *individual* land acquisition proposals for their contribution to the protection of each of the resources addressed under the Florida Forever goals and measures. In this example, we focus on a particular CARL project, the Corkscrew Regional Ecosystem Watershed, or CREW, located in Collier and Lee Counties, in southwest Florida. This project has been chosen for demonstration purposes only, and this example is not intended to represent a comprehensive evaluation of the overall value of the CREW project.

According to the *2000 CARL Annual Report*, the purposes for acquiring CREW lands include protection of habitat for wildlife, including Florida panther and black bear; providing connections between existing conservation lands; protecting pristine cypress swamps and marshes which provide water flow to those conservation lands; and providing public natural resource-based recreational opportunities.

Table 3 lists the acreage of each resource category which falls on CREW lands, as well as the percent of the project containing each resource. Some of these resource categories are also highlighted on the maps on page 34. The four maps on that page illustrate the distributions of SHCAs, Functional Wetlands, Surface Water, and Recreation opportunities in the vicinity of the CREW project.

The maps illustrate that the CREW project captures a large amount of high priority Strategic Habitat Conservation Areas, which include habitat for both panther and black bear. This impression is confirmed in Table 3, which shows that nearly 80 percent of CREW is covered by the top two SHCA priorities.

The maps show that wetlands are also well represented on the project, and Table 3 confirms that over two-thirds of the project contains Functional Wetlands. Natural Resource-based Recreational opportunities also show up strongly on the

CREW project, with 83 percent of the project having some recreational value as defined by the data layer.

The Surface Water map is shown to illustrate that not every resource category will be addressed by every land acquisition project. In this case, the Surface Water data layer identifies specific types of surface waters, such as springs and Outstanding Florida Waters, which are not the focus of the CREW project.

Table 3 shows that CREW serves additional purposes. Nearly two-thirds of the project contains top Habitat Conservation Priorities as designated by FNAI, and all of the project has some level of FNAI Habitat Conservation Priorities. Nearly 90 percent of the project is within a top priority Ecological Greenways Network landscape linkage, which supports the project's stated purpose of connecting existing conservation lands. CREW also contains substantial acreage identified as high Aquifer Recharge.

Overall, the data compiled for this Assessment confirm that the CREW project does a good job of capturing the resources identified as the purpose for the project's acquisition. A similar type of evaluation could be performed on every CARL project, as well as future projects proposed under the Florida Forever program. Different proposals could also be compared to one another using the common currency of the data layers compiled for this Assessment.

While this example illustrates the value of this Conservation Needs Assessment in evaluating land acquisition proposals, it is by no means our intent to suggest that this approach become the overriding influence in approving or ranking individual proposals. For every project, local information may exist which provides more detail or accuracy than the statewide data layers included in this analysis. In addition, proposals may have less tangible qualities which merit serious consideration. Nevertheless, this Assessment, in conjunction with other criteria, provides a powerful tool to examine proposals statewide on an even playing field, and to track the progress of the Florida Forever program on a project-by-project basis.

Clarifying Multiple Measures with Overlay Models

The previous examples have evaluated land acquisition projects by examining each data layer separately. If we want a sense of the overall value of a particular project, or of an area in general, it may also be useful to overlay all of the data layers to achieve a composite view of the resource values of a site. Such a view

enables us to more easily compare two or more different sites, and also allows us to address some of the broader Florida Forever goals which combine several individual measures.

In order to provide a synthesis of different groups of measures, three overlay models were developed: a biodiversity model, a water resources model, and an overall conservation priorities model. The flowchart in Figure 1 illustrates how individual data layers were combined in the overlay models. It is important to recognize that these maps do not illustrate a simple overlay of data layers, but a somewhat more complex scoring and modeling process. This process is necessary to achieve a balanced representation of each of the data layers in the overlay models. A full explanation and documentation for these models will be included in the full report to be completed in early 2001.

These models are not intended to represent an ultimate statewide land acquisition plan for Florida Forever. The models were designed to give each individual data layer equal weight, which may not be the ultimate goal of the Florida Forever program. In addition, the models represent only those resource values identified in the Florida Forever land acquisition measures, which are intended to help monitor the ongoing success of the program. As noted previously, other local and regional data may be available for resources which are equally pertinent to conservation, and less tangible qualities of particular sites, such as unique geological features or aesthetic landscape vistas, might also be considered. These models will also change as new data become available, new lands are acquired, and program priorities change over time.

The map on page 36 illustrates an overlay of the data layers which address the measures associated with Florida Forever Goal B: increasing the protection of biodiversity. This overlay model combines four data layers: Strategic Habitat Conservation Areas (page 9), FNAI Priority Conservation Areas for Rare Species (page 10), Prioritized Ecological Greenways (page 11), and Under-represented Natural Communities (page 12). The darkest areas on the map represent those areas of the most overlap of regions of high priority or high resource value for the individual data layers. This model helps to illustrate those regions of the state with high general biodiversity resource value, such as the Apalachicola River basin in the panhandle, the Lake Wales Ridge region in central Florida, the Caloosahatchee region in southwest Florida, or the Florida Keys.

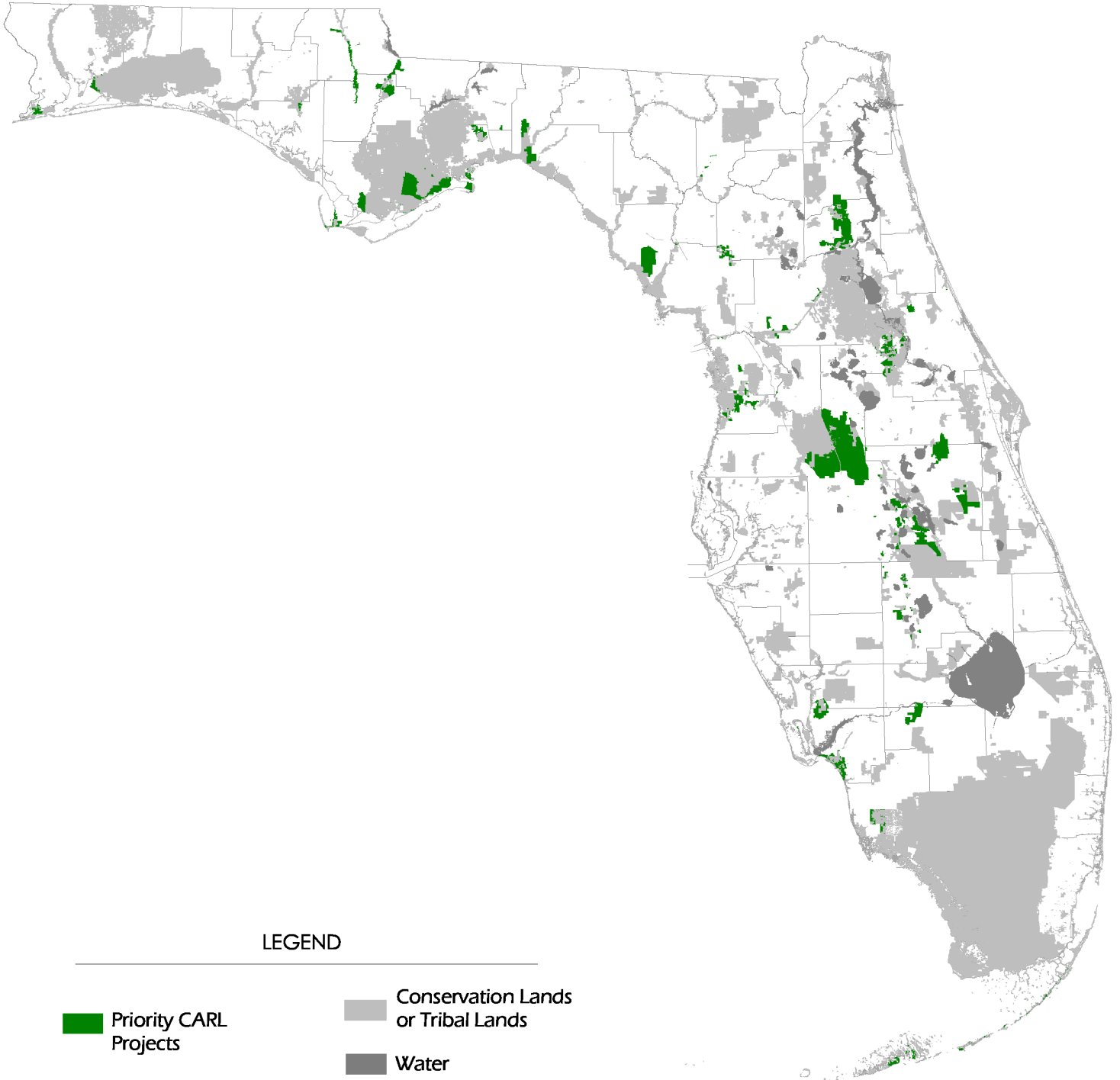
The map on page 37 shows a similar overlay of data layers which address water resources. This model combines the Natural Floodplain (page 14), Surface Water (page 15), Wetlands (page 17), and Aquifer Recharge (page 18) data layers. This

map illustrates areas with high general water resource value, such as the Apalachicola and St. Marks river basins in the panhandle, the Nassau River basin in northeast Florida, areas of the central Florida highlands region, and wetlands on the fringes of the Everglades and Big Cypress regions in south Florida.

Finally, the map on page 38 represents a composite of the biodiversity and water resources overlay models, together with the Coastal Resources (page 16) and Recreation (page 19) data layers. This model illustrates general conservation resource values for the state, showing that many of the areas highlighted in the biodiversity and water resources overlay models, and some additional areas, have the highest overall conservation resource value. These high value areas indicate locations where several different natural resource categories could be protected simultaneously. These are areas where land acquisition could potentially achieve the most overall conservation progress for the money spent.

These overlay models can serve as useful tools to help focus acquisition efforts to those areas of the state that have high resource values for many of the resource categories identified in the Florida Forever measures. The models can also assist in comparing overall resource values of different regions of the state. Taken together with the other applications demonstrated in this Assessment, the models represent a useful tool to help guide acquisition efforts under the Florida Forever program.

Example of Florida Forever Measure Evaluation Priority CARL Projects



LEGEND

-  Priority CARL Projects
-  Conservation Lands or Tribal Lands
-  Water

Map Date:
December 2000

Table 2. Resource Evaluation for 32 Combined Priority CARL Projects

FLORIDA FOREVER MEASURE	DATA LAYER	ACRES PROTECTED	ACRES on CARL	PERCENT INCREASE
	TOTAL	10,015,000	821,000	8%
B1	Prioritized SHCA <i>top priorities</i> ^a	429,000	101,000	24%
	Prioritized SHCA <i>all</i> ^a	1,279,000	345,000	27%
B2	FNAI Habitat Cons. Priorities <i>top priorities</i>	256,000	75,000	29%
	FNAI Habitat Cons. Priorities <i>all</i>	6,830,000	551,000	8%
B3	Prioritized Ecological Greenways <i>top priority</i>	844,000	98,000	12%
	Prioritized Ecological Greenways <i>all</i>	9,577,000	749,000	8%
B4	Under-represented Natural Communities	757,000	53,000	7%
C4	Natural Floodplain	925,000	94,000	10%
C5	Surface Water <i>top priority</i>	2,949,000	102,000	3%
	Surface Water <i>all</i>	5,788,000	484,000	8%
C7	Fragile Coastal uplands	94,000	1,900	2%
	Fragile Coastal wetlands	578,000	14,000	2%
	Fragile Coastal Resources <i>all</i>	672,000	16,000	2%
C8	Functional Wetlands	5,136,000	341,000	7%
D3	Aquifer Recharge	1,497,000	88,000	6%
E1	Resource-based Recreation <i>top priority</i>	3,792,000	351,000	9%
	Resource-based Recreation <i>all</i>	7,985,000	666,000	8%
F1	Significant Archaeological Sites	8263 sites	528 sites	6%
G2	Sustainable Forestry			
	Forest land existing	1,930,000	190,000	10%
G1	Forest land potential	356,000	149,000	42%
	Forest land <i>all</i>	2,286,000	339,000	15%
G3	Forest Land for Recharge	632,000	30,000	5%

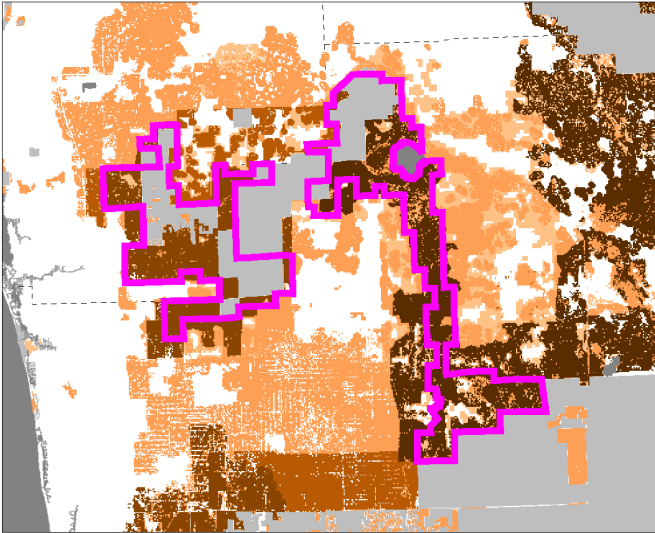
^a Baseline is calculated as acres acquired since 1994, when the original version of SHCAs was created. Conservation lands were not included in the development of this data layer.

Table 3. Resource Evaluation of the Corkscrew Regional Ecosystem Watershed CARL Project

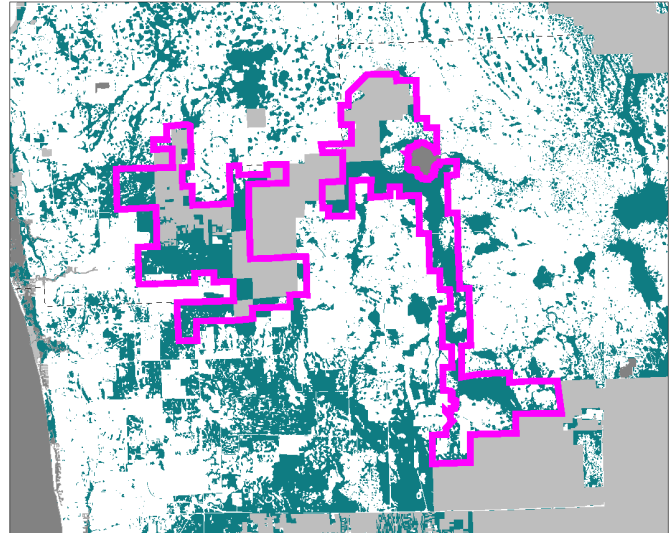
FLORIDA FOREVER MEASURE	DATA LAYER	ACRES on PROJECT	PERCENT of PROJECT
	TOTAL PROJECT	49,036	100%
B1	Prioritized SHCA <i>top 2</i>	38,639	79%
	Prioritized SHCA <i>all</i>	47,482	97%
B2	FNAI Habitat Cons. Priorities <i>top 2</i>	30,269	62%
	FNAI Habitat Cons. Priorities <i>all</i>	48,945	100%
B3	Prioritized Ecological Greenways <i>top 1</i>	42,560	87%
	Prioritized Ecological Greenways <i>all</i>	44,569	91%
B4	Under-represented Natural Communities	11	0%
C4	Natural Floodplain	0	0%
C5	Surface Water <i>top 1</i>	1,347	3%
	Surface Water <i>all</i>	26,350	54%
C7	Fragile Coastal uplands	0	0%
	Fragile Coastal wetlands	0	0%
	Fragile Coastal Resources <i>all</i>	0	0%
C8	Functional Wetlands	33,334	68%
D3	Aquifer Recharge	43,758	89%
E1	Resource-based Recreation <i>top 1</i>	0	0%
	Resource-based Recreation <i>all</i>	40,796	83%
F1	Significant Archaeological Sites	0	0%
G2	Sustainable Forestry Forest land existing	1,411	3%
	Forest land potential	5,553	11%
G1	Forest land <i>all</i>	6,964	14%
G3	Forestland for Recharge	1,031	2%

Example of Florida Forever Measure Evaluation Corkscrew Regional Ecosystem Watershed (CREW) CARL Project

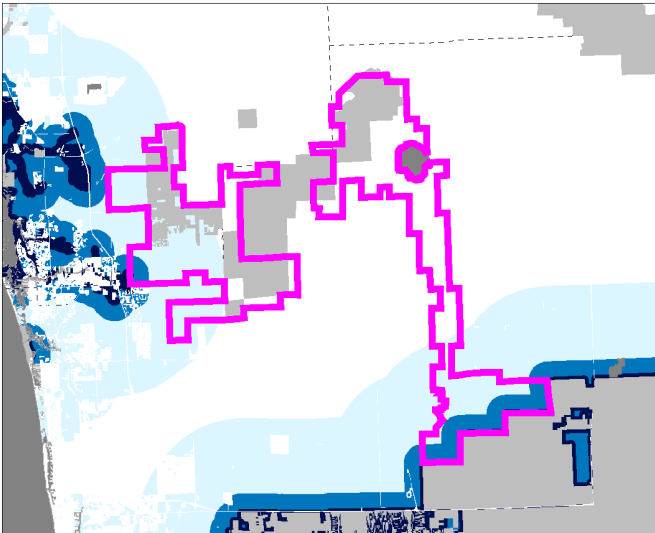
Map 1: Strategic Habitat Conservation Areas



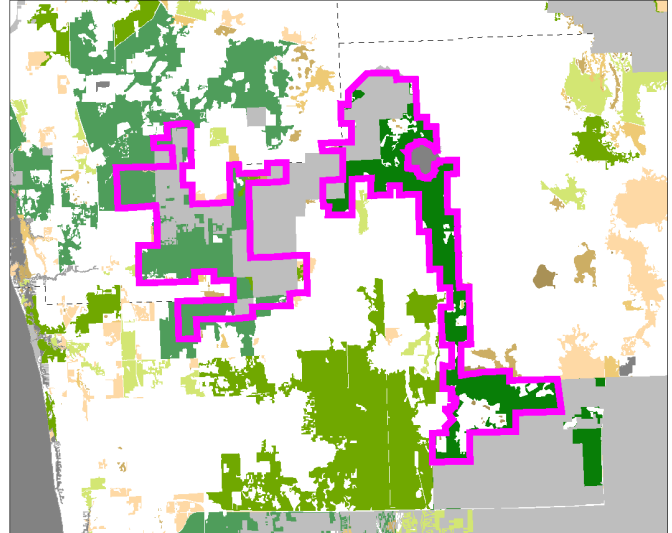
Map 2: Wetlands



Map 3: Surface Water



Map 4: Recreation Opportunities



LEGEND

- | | |
|---|--|
|  CREW Project Boundaries |  Conservation Lands or Tribal Lands |
|  County Boundaries |  Water |

Map Date:
December 2000

The information displayed on this map was developed or provided to address specific performance measures of the Florida Forever program. The data may not be appropriate for general use, and are not intended for use in a regulatory decision-making process.

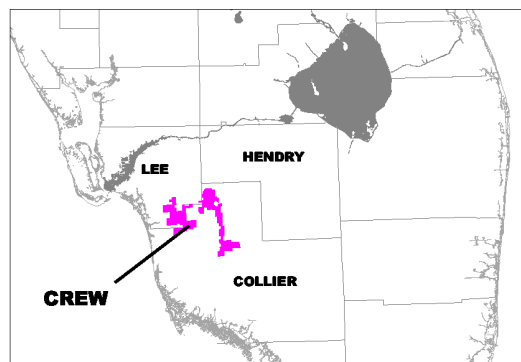
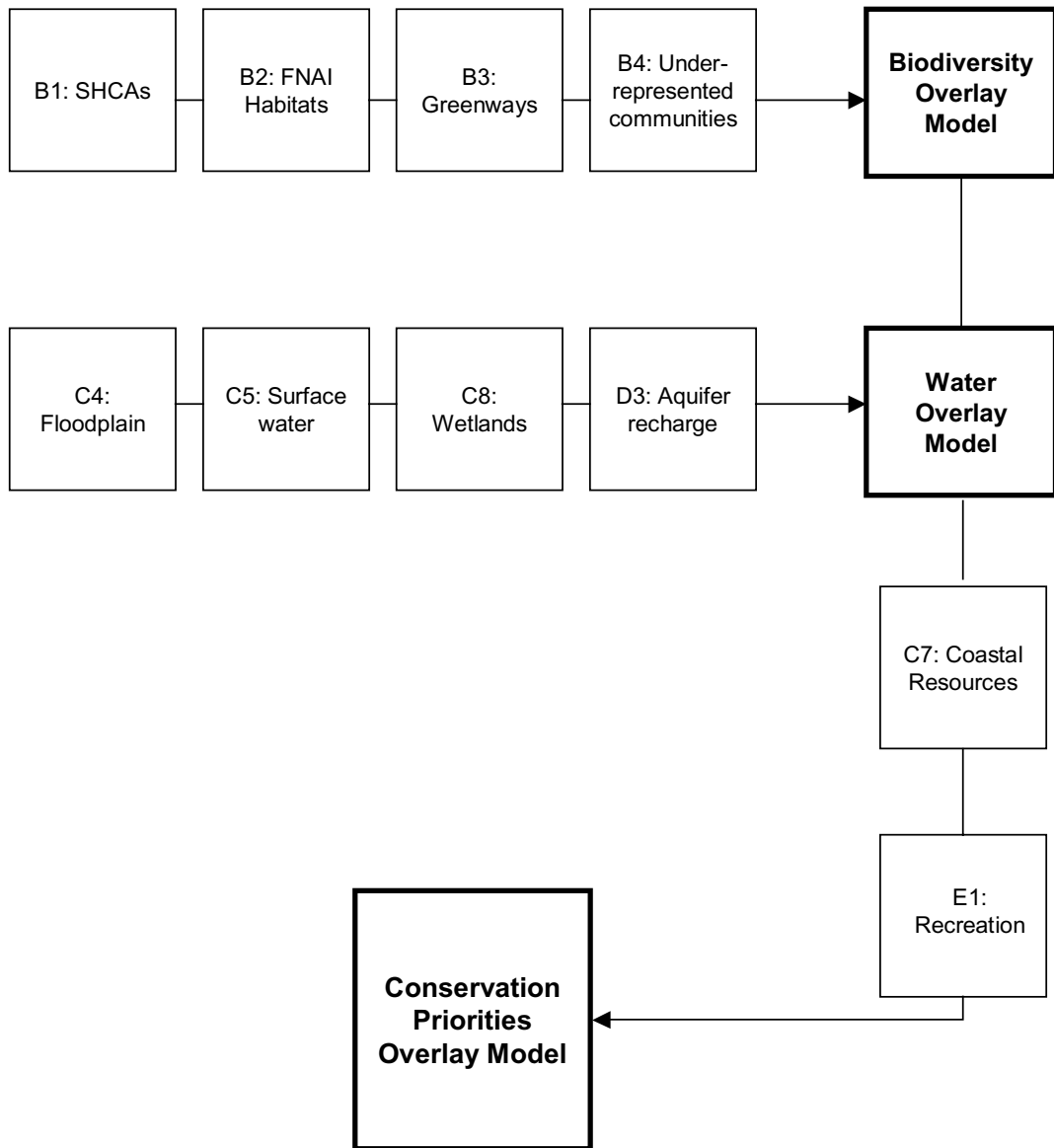
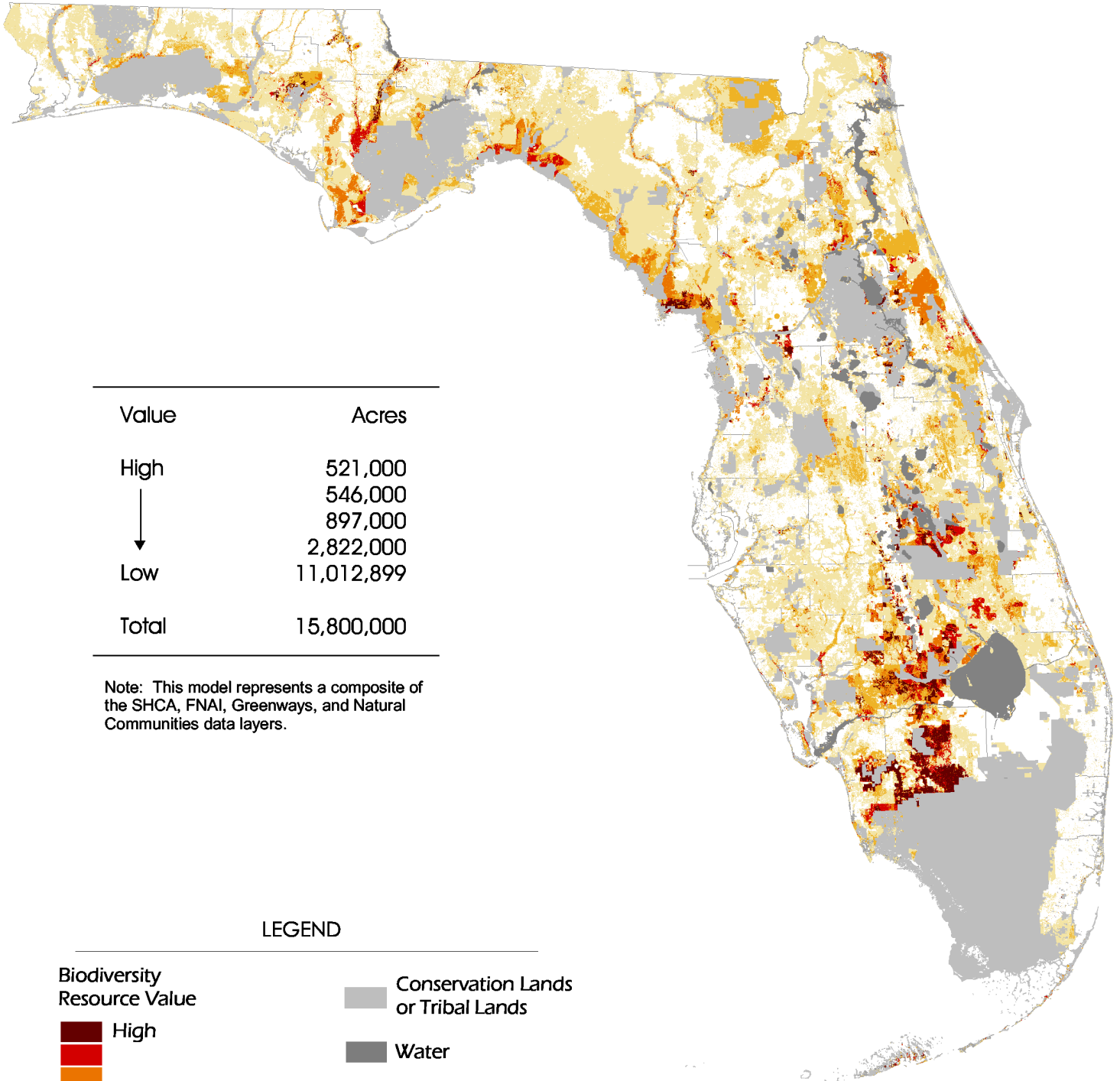


Figure 1. Outline of Overlay Process









Biodiversity Overlay Model



Value	Acres
High	521,000
↓	546,000
↓	897,000
↓	2,822,000
Low	11,012,899
Total	15,800,000

Note: This model represents a composite of the SHCA, FNAI, Greenways, and Natural Communities data layers.

LEGEND

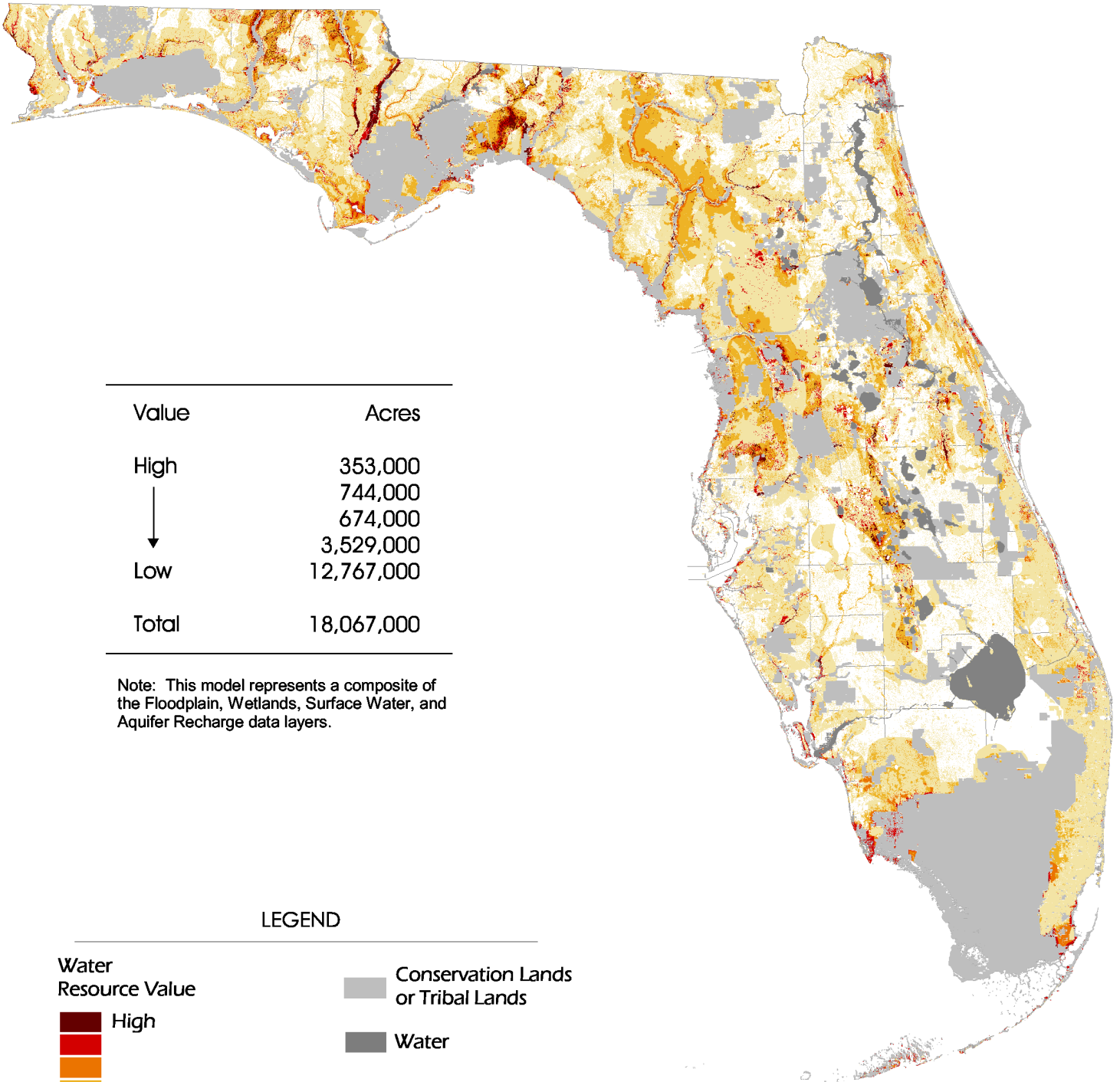
Biodiversity Resource Value	 Conservation Lands or Tribal Lands
 High	 Water
	
	
 Low	

Map Date:
December 2000

A detailed description of this data layer is available in the Data Layer Documentation section of the Florida Forever Conservation Needs Assessment.

The information displayed on this map was developed or provided to address specific performance measures of the Florida Forever program. The data may not be appropriate for general use, and are not intended for use in a regulatory decision-making process.

Water Resources Overlay Model



Value	Acres
High	353,000
↓	744,000
↓	674,000
↓	3,529,000
Low	12,767,000
Total	18,067,000

Note: This model represents a composite of the Floodplain, Wetlands, Surface Water, and Aquifer Recharge data layers.

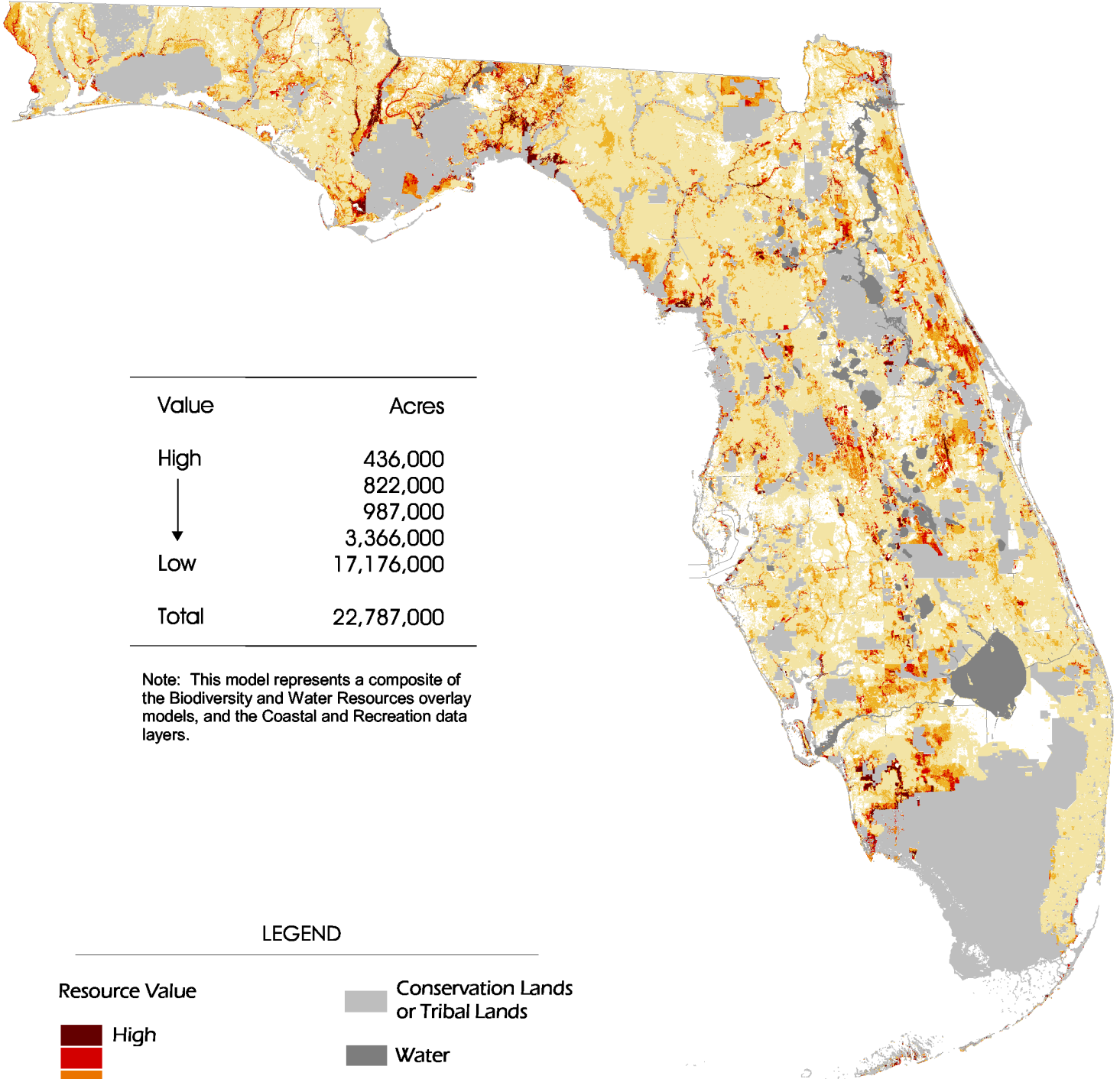
LEGEND

<p>Water Resource Value</p> <ul style="list-style-type: none"> High Low 	<ul style="list-style-type: none"> Conservation Lands or Tribal Lands Water <p style="text-align: right; margin-top: 10px;">Map Date: December 2000</p>
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A detailed description of this data layer is available in the Data Layer Documentation section of the Florida Forever Conservation Needs Assessment.

The information displayed on this map was developed or provided to address specific performance measures of the Florida Forever program. The data may not be appropriate for general use, and are not intended for use in a regulatory decision-making process.

Conservation Priorities Overlay Model

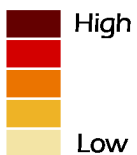


Value	Acres
High	436,000
↓	822,000
↓	987,000
Low	3,366,000
	17,176,000
Total	22,787,000

Note: This model represents a composite of the Biodiversity and Water Resources overlay models, and the Coastal and Recreation data layers.

LEGEND

Resource Value



Conservation Lands or Tribal Lands

Water

Map Date:
December 2000

A detailed description of this data layer is available in the Data Layer Documentation section of the Florida Forever Conservation Needs Assessment.

The information displayed on this map was developed or provided to address specific performance measures of the Florida Forever program. The data may not be appropriate for general use, and are not intended for use in a regulatory decision-making process.

ACKNOWLEDGMENTS

The Florida Natural Areas Inventory gratefully acknowledges the participation of many individuals and agencies in all phases of this project. The participants listed below provided information, expertise, and data. Many attended workshops to develop data and review various aspects of this project. We especially acknowledge Randy Kautz, Florida Fish and Wildlife Conservation Commission, for his contributions throughout the process. We also appreciate the support of the Office of Environmental Services, Division of State Lands, Department of Environmental Protection, through which this project was funded.

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DATA LAYER DOCUMENTATION

The following section generally describes the source and derivation of each data layer included in the conservation needs assessment. Complete documentation of data construction/compilation and scoring will be included in a Technical Report produced by the Florida Natural Areas Inventory in early 2001.

MEASURE B1: Prioritized Strategic Habitat Conservation Areas

SOURCE: Strategic Habitat Conservation Areas (SHCA) from *Closing the Gaps in Florida's Wildlife Habitat Conservation System* (Florida Game and Fresh Water Fish Commission 1994), habitats from *Habitat Conservation Needs of Rare and Imperiled Wildlife in Florida* (Florida Fish and Wildlife Conservation Commission 1999), and land acquisition priorities determined by expert working groups for Florida black bear and Florida panther. Habitats for 55 animal species and SHCAs for 4 natural communities were prioritized by Randy Kautz, Office of Environmental Services, Florida Fish and Wildlife Conservation Commission (FWC).

METHODS: SHCAs were prioritized for potential acquisition under the Florida Forever program based on (1) degree of imperilment of species or natural communities for which SHCAs were proposed, *i.e.* listing status, and (2) upland versus wetland dependence of the species. The authors originally identified 4.8 million acres of SHCAs, some of which have been acquired. The prioritized SHCAs developed for Florida Forever exclude SHCAs already on conservation lands and include new SHCAs for an additional 15 species.

MEASURE B2: Priority Conservation Areas for Rare Species

SOURCE: Florida Natural Areas Inventory (FNAI)

METHODS: FNAI developed occurrence-based habitat for 250 rare species having the greatest conservation need. Habitat quality for each species was ranked and species were assigned a conservation needs weighting factor based on rarity and degree of protection. Weighted habitats were overlaid to determine Habitat Conservation Priorities.

MEASURE B3: Prioritized Landscapes, Landscape Linkages, and Conservation Corridors

SOURCE: Ecological Greenways of the Statewide Greenways System Planning Project developed by the University of Florida and Dept. of Environmental Protection (DEP)/Office of Greenways and Trails (OGT). Ecological network results were prioritized by Tom Hctor, Dept. of Wildlife Ecology and Conservation, University of Florida and approved by the Florida Greenways and Trails Council.

METHODS: Ecological greenways were prioritized based on the following criteria: (1) Potential importance for maintaining or restoring populations of wide-ranging species (e.g., Florida black bear and Florida panther; (2) importance for maintaining a statewide, connected reserve network from south Florida through the panhandle; (3) redundant landscape linkages that provide other important opportunities to maintain statewide connectivity; and, (4) importance as a riparian corridor to protect water resources, provide functional habitat gradients, and to possibly provide connectivity to areas within

other states. Note: The original ecological greenways network included most conservation lands. Existing conservation lands were, however, excluded from the prioritized version used in this analysis.

MEASURE B4: Under-represented Native Ecosystems

SOURCE: Florida Natural Areas Inventory

METHODS: FNAI identified 7 under-represented natural community types and ranked them in the following priority order: (1) upland glades and pine rocklands; (2) scrub, sandhill, tropical hardwood hammock, and seepage slope; and, (3) upland hardwood forest. Geographic coverage for these communities was synthesized from one or more of the following data sets: Florida Natural Areas Inventory element occurrence records, 1995 WMD landcover data, 1985-89 FWC Landsat landcover data, and 1992-94 U.S. Fish and Wildlife Service/Archbold Biological Station scrub survey.

MEASURE B5: Landscape-sized Protection Areas

SOURCE: Collaborative project between Tom Hocht, University of Florida, Dept. Wildlife Ecology and Conservation, Richard Hilsenbeck, The Nature Conservancy, Randy Kautz, FWC, and Florida Natural Areas Inventory.

METHODS: A panel of resource experts identified 28 regions that represent significant large-scale functioning ecosystems where landscape-sized acquisition projects could be developed. These landscapes were prioritized based on their contribution to protection of biodiversity and overall ecological integrity.

MEASURE C4: Natural Floodplain Function

SOURCE: Synthesis by Florida Natural Areas Inventory of National Wetlands Inventory (NWI) and U.S. Geological Survey (USGS) stream data.

METHODS: "Natural floodplain" is defined as wetlands adjacent to natural waterways, as recommended by Kathleen Swanson, DEP/Bureau of Submerged Lands and Environmental Resources. All streams identified by the USGS Digital Line Graph 1:2,000,000 hydrography were used to represent the major riverine systems in Florida. All contiguous wetlands occurring within the drainage sub-basins of these rivers were included as floodplain. Wetlands identified as urban, developed, or agricultural by 1995 WMD landcover data were excluded so that the resulting data layer was "natural floodplain."

MEASURE C5: Surface Water Protection

SOURCE: Synthesis by Florida Natural Areas Inventory and Dept. of Environmental Protection/Office of Coastal and Aquatic Managed Areas of the following data: Outstanding Florida Waters, shellfish harvesting areas (Dept. of Agriculture and Consumer Services/Division of Aquaculture), seagrass beds (Florida Marine Research Institute), springs, and sub-basins (Dept. of Environmental Protection) that fully meet their designated use (DEP State Water Quality Assessment 305(b) report).

METHODS: The surface waters selected represent high quality surface waters in need of protection versus waters in need of restoration. Buffers of 1000 feet, 1 mile, and 5 miles delineated priority surface water protection areas around water bodies.

MEASURE C7: Fragile Coastal Resources

SOURCE: Florida Natural Areas Inventory

METHODS: Beach dune, coastal scrub, coastal strand, coastal grassland, maritime hammock, salt marsh, and mangroves were identified as fragile coastal communities based on FNAI element occurrence records and 1995 WMD landcover data.

MEASURE C8: Functional Wetlands

SOURCE: National Wetlands Inventory

METHODS: Degree of disturbance was assumed to be an indicator of functionality. Only those wetlands that were considered as natural landcover types by the WMD landcover data were included. Natural wetlands within FNAI Potential Natural Areas (PNA) were given higher priority than those outside PNAs.

MEASURE D3: Aquifer Recharge

SOURCE: Compiled by Florida Natural Areas Inventory from the following sources: Suwannee River WMD (Floridan aquifer in the SRWMD); St. Johns River WMD (Floridan aquifer in the SJRWMD); Florida Geological Survey, 1995 *Generalized Prime Recharge for Aquifers of Primary Use*, Scale 1:250,000, Open File Map Series 69-82 (Floridan aquifer outside of SRWMD and SJRWMD, sand and gravel aquifer in the western panhandle, surficial aquifer along Atlantic coast north of St. Lucie County); *Recharge rates to the intermediate aquifer system in the Southern West-Central Florida Ground-Water Basin*, Southwest Florida WMD (intermediate aquifer in SWFWMD); Fairbank, P. and S. Hohner, 1995. *Mapping Recharge (Infiltration/Leakage) throughout the South Florida Water Management District*, Technical Publication 95-02 (surficial aquifer on east coast south of Indian River County); Dr. Thomas Missimer, Missimer International, Inc. (surficial aquifer in Lee, Collier and Hendry Counties.)

METHODS: Areas of highest recharge to aquifers of primary use were identified.

MEASURE E1: Natural Resource-based Recreation

SOURCE: Model developed by Florida Natural Areas Inventory in collaboration with DEP/Division of Recreation and Parks, DEP/Office of Greenways and Trails, DEP/Office of Coastal and Aquatic Managed Areas, Florida Fish and Wildlife Conservation Commission, Dept. of Agriculture and Consumer Services/Division of Forestry.

METHODS: Recreation criteria were developed by Division of Recreation and Parks and modified in a workshop with the sources listed above. Recreation potential of a site depends on available road access, presence of a water body or beach, proximity to urban areas, and size of the site. These criteria were applied to Potential Natural Areas delineated by FNAI using aerial photography and revised using the 1995 WMD landcover data. Sites were ranked by recreation potential.

MEASURE E2: Trails Available for Recreation

SOURCE: Trails network of the Statewide Greenways System Planning Project developed by the University of Florida and DEP/Office of Greenways and Trails.

METHODS: The trails network developed in 1998 is undergoing prioritization and upon completion, will be included in the Florida Forever Conservation Needs Assessment. This data layer should be available in early 2001.

MEASURE F1: Significant Archaeological or Historic sites

SOURCE: Dept. of State/Division of Historical Resources (DHR)

METHODS: DHR provided a statewide database of 20,801 archaeological sites from the Florida Master Site File.

MEASURE G1: Sustainable Forest Management

SOURCE: Florida Natural Areas Inventory based on 1995 WMD landcover data in collaboration with Division of Forestry and Florida Forestry Association

METHODS: Land was considered to be available for sustainable forest management if it contained existing pine (natural or planted) or had the potential to support pine (*e.g.* pasture that was historically sandhill). Note: Not all pinelands on conservation lands should be considered available for sustainable forest management-- availability depends on the timber management policies of the managing agency.

MEASURE G2: Forestland Managed for an Economic Return

SOURCE: Florida Natural Areas Inventory based on 1995 WMD landcover data in collaboration with Division of Forestry and Florida Forestry Association

METHODS: Land was considered to be managed for economic return if it contained existing pine as defined in measure G1, and the timber would be managed for an economic return under the policies of the managing agency.

MEASURE G3: Forestland to Maintain Groundwater Recharge Function

SOURCE: Florida Natural Areas Inventory synthesis of existing forestland data (see MEASURE G2) intersected with aquifer recharge data (see MEASURE D3)

METHODS: Existing pine forest that occurs in an area of high recharge was extracted for this measure.

About the Florida Natural Areas Inventory. The Florida Natural Areas Inventory is a private, non-profit program affiliated with The Nature Conservancy and the Florida Department of Environmental Protection. The Inventory collects, interprets, and distributes, ecological resource information critical to the conservation of Florida's natural heritage. The program is a unique, central source of reliable information about rare species, critical habitats, conservation lands, and environmental land acquisition projects. Funding is provided primarily by the CARL Trust Fund as authorized by Florida Statutes 259.032(5).

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