SUMMARY OF THE
FLORIDA WILDLIFE CORRIDOR
WATER BENEFITS REPORT

PRESENTED BY :
Archbold Biological Station
University of Florida Water Institute
March 2023

Photo by Carlton Ward, Jr/Wildpath.

ARCHBOLD BIOLOGICAL STATION

UF Water Institute UNIVERSITY of FLORIDA

LIVE WILDLY

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Photo by Carlton Ward, Jr/Wildpath.

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Since the campaign to conserve the 18-million-acre Florida Wildlife Corridor (FLWC) accelerated in 2021 with the unanimous passing of a state bill supporting the effort, understanding and communicating the benefits of land conservation and connectivity for wildlife, economies, and people has been critical to motivating large-scale land conservation action. Chief among these considerations is water.

Florida is famous for water. The state's iconic attractions include white sand Gulf beaches, the Everglades, alligators, roseate spoonbills, springs and fisheries. Myriad at-risk aquatic species exist in the state's northern rivers and all 22 million Floridians require drinking water. Moreover, the state's vast agricultural economy requires water for irrigation.

Perhaps because of water's ubiquity across the state, there has been a tendency to make assumptions about the benefits of land protection for water resources conservation. Given the immense interest in water statewide and the prominence of the FLWC effort, there was a clear need for authoritative information on the overlap between the FLWC and Florida's water resources.

To fill this gap, Archbold Biological Station (since 2021 the lead convener of statewide conservation science for the Corridor campaign and based in Venus, FL) approached the University of Florida Water Institute's Director, Dr. Wendy Graham. At Archbold's request, Graham organized an expert panel to assess the water benefits of the FLWC statewide.

The goal was to gather trustworthy information for conservationists, decision-makers (e.g., legislators, agency, and land trust leaders, landowners, and potential funders), and the public to motivate large-scale land conservation. The report also highlights outstanding unknowns about the intersection of water and land conservation in Florida, with suggestions for fruitful future scientific efforts.

On behalf of the FLWC's conservation community, we thank the UF Water Institute and the expert panel for their commitment in compiling this first-of-its-kind report. We hope it will inspire future conservation success, establish a baseline for monitoring water resources conservation, encourage the continued interaction of ecologists, hydrologists, and conservation professionals to identify win-win opportunities for wildlife and water, and promote the utility of science for conservation planning.

Joshua Daskin, Ph.D. | Director of Conservation and
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Archbold Biological Station
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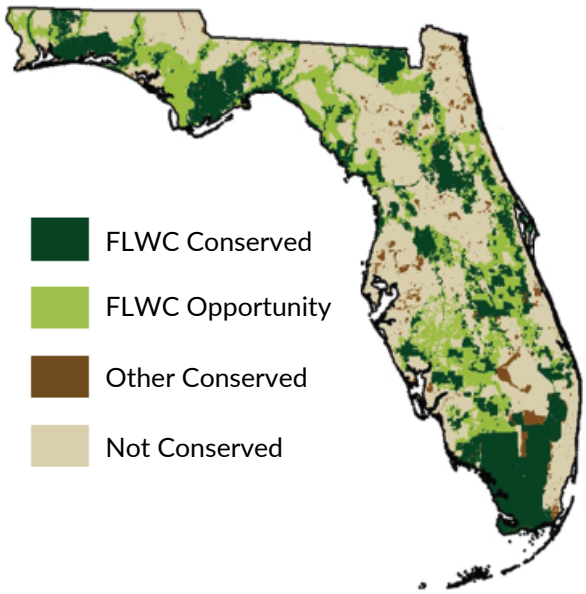
INTRODUCTION

The Florida Wildlife Corridor (FLWC) spans from the Everglades to the northwestern-most part of the panhandle. Fifty-four per cent of the FLWC, or 9.6 million acres, is already conserved. The remaining 46% (8.1 million acres) are "Opportunity Areas" prioritized for future conservation.

The eminent biologist E.O. Wilson argued for conserving 50% of the Earth to protect biodiversity and ecosystem function long into the future. In this context, the scope and ambition of the FLWC are globally significant. The proposed 50% statewide footprint of the Florida Wildlife Corridor is a landmark goal, but an achievable one, even with Florida's rapid development trajectory.

The purpose of the FLWC is to connect habitats for wildlife movement, but it also offers substantial benefits for Florida's water. **This summary outlines these benefits and makes the case that conserving FLWC Opportunity Areas will further secure the future of Florida's water.** We highlight the findings of the Florida Wildlife Corridor Water Benefits Report and the importance of continuing to protect Florida's water resources.

Photo by Carlton Ward, Jr/Wildpath.



FLWC Conserved Areas are already protected by the FLWC; FLWC Opportunity Areas have not yet been protected but are prioritized for conservation; Other Conserved Areas are already protected through other programs; and Not Conserved Areas have not been protected under any program.

Key results include:

- **The FLWC provides strong protection of spring vents, rivers, estuaries, and wetlands** for humans, ecosystem function, and at-risk species.
- **These ecosystems provide services** including fisheries production, recreational sites, cultural values, carbon sequestration, nutrient capture and cycling, water storage, and flood protection.
- **Permanent conservation of remaining FLWC Opportunity Areas can roughly double the protection of many key water benefits,** including those above, plus outstanding Florida springsheds, lake shorelines, and groundwater recharge areas critical to water supply.

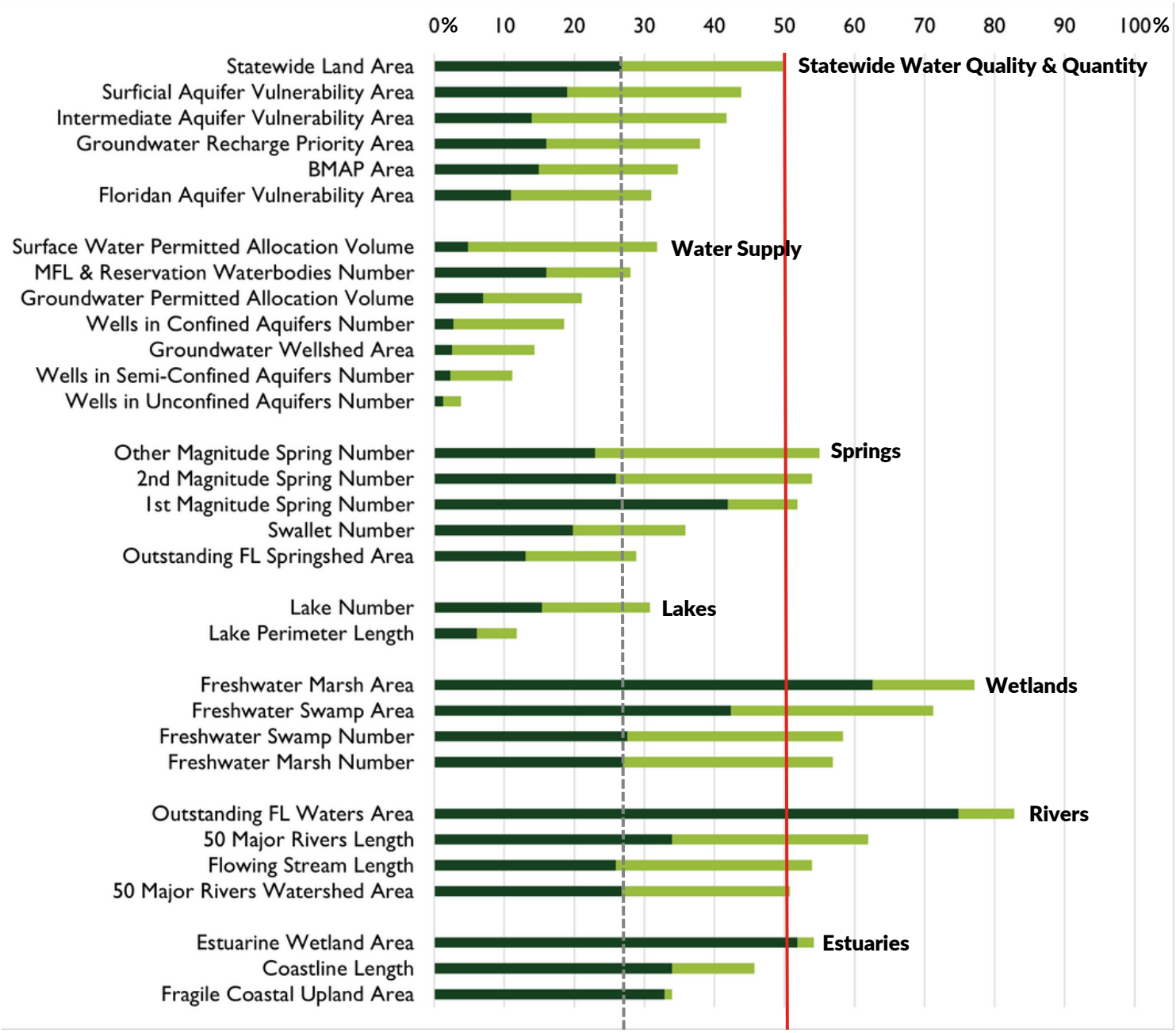
CONTENTS AND BENEFIT SCORING

Florida has a diverse system of water resources including three major aquifer systems, >50 major rivers and streams, >700 springs, >7700 lakes, and >10 million acres of wetlands. These and other water-based resources are not distributed evenly throughout the state, and therefore may be more or less well-represented within the Corridor.

The full report uses two designations to indicate how much the FLWC benefits a given water resource: **"Good-to-excellent"** and **"Low-to-moderate"**. Because the FLWC covers approximately 50% of Florida's land area, a resource receives "Good-to-moderate" benefit if 50% or more of the resource statewide is protected by the FLWC. If less than 50% of a resource is protected by the FLWC, it is underrepresented and receives "Low-to-moderate" benefits from the FLWC.

Photo by Carlton Ward, Jr/Wildpath.

Benefit if full Florida Wildlife Corridor is conserved
Good-to-excellent (≥50% of statewide resource within Corridor)
Spring vents (pg. 08)
Freshwater swamps (pg. 10)
Freshwater marshes (pg. 10)
River corridors (pg. 11)
River watersheds (pg. 11)
Estuarine wetlands (pg. 12)
Low-to-moderate (<50% of statewide resource within Corridor)
Surface water quality (pg. 06)
Groundwater quality (pg. 06)
Groundwater recharge (pg. 06)
Groundwater supply (pg. 07)
Surface water supply (pg. 07)
Springsheds (pg. 08)
Lakes (pg. 09)
Coastlines (pg. 12)
Fragile Coastal Uplands (pg. 12)



Percent of each water-related metric within FLWC Conserved and Opportunity areas. The red line represents the statewide land area within the combined FLWC Conserved and Opportunity lands (the 50% threshold between low-to-moderate and good-to-excellent benefits), whereas the grey dashed line represents the statewide land area within only FLWC Conserved lands.

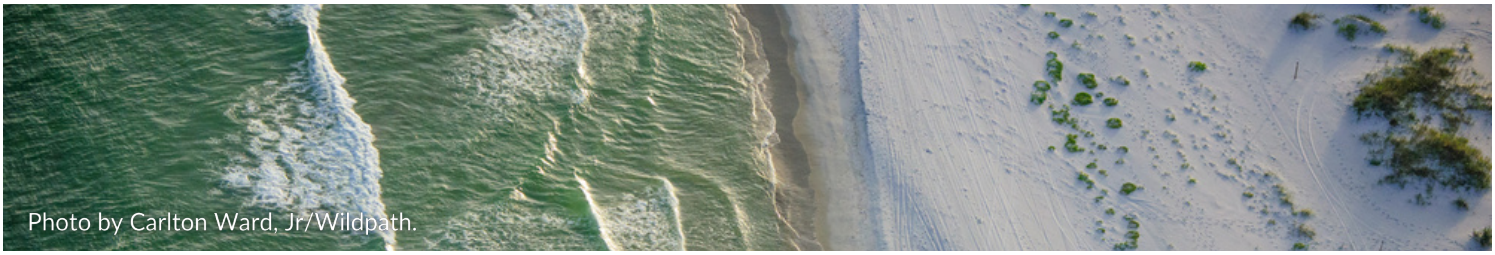


Photo by Carlton Ward, Jr/Wildpath.

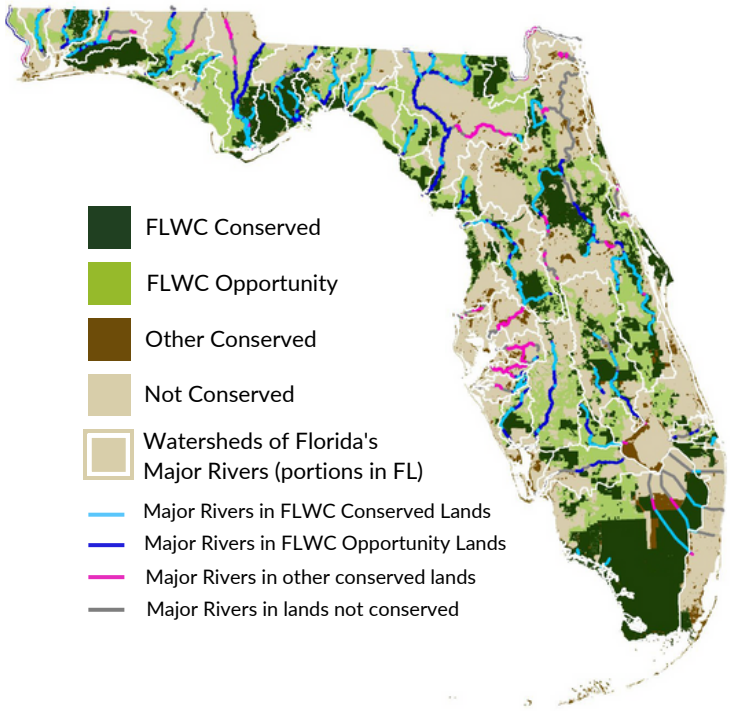
STATEWIDE WATER QUALITY & QUANTITY

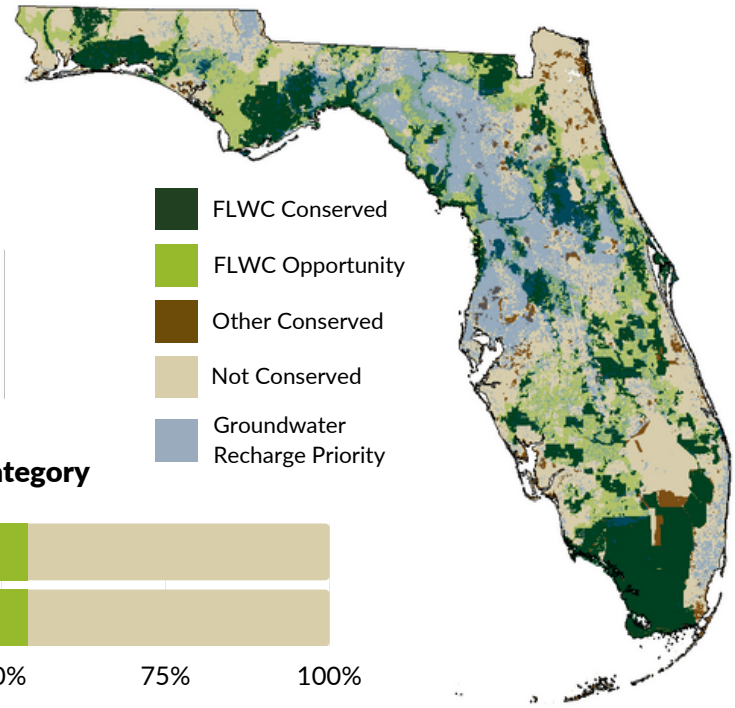
Maintaining water quality and quantity in Florida's water bodies is critical for protecting ecosystems, human health, and economic prosperity.

Most water that supplies these resources comes from rainfall. Potential threats include pollution by fertilizers, wastewater effluent, industrial chemicals, and pharmaceuticals. Land use change or water overuse can reduce groundwater recharge, drain wetlands, and overdraw aquifers.

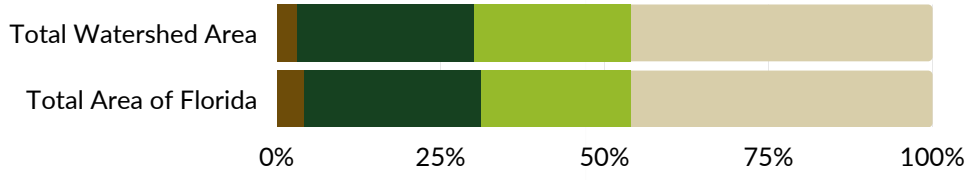
KEY CONCLUSIONS:

- Florida's **50 major river watersheds are provided a good-to-excellent benefit** by the FLWC.
- Priority FLWC Opportunity Areas whose conservation would safeguard **surface water quality and quantity** include areas in the Suwannee, Upper St. Johns, and Peace River Basins.
- Both groundwater quality and groundwater recharge **are provided low-to-moderate benefit** by the FLWC.
- FLWC Opportunity Areas whose conservation would safeguard **groundwater quality and quantity** include areas of the Peace River Basin and the Suwannee River Basin.
- Upland areas in central and north Florida, which receive rainwater to recharge aquifers, are under-represented in the FLWC. **Strategies complementary to the FLWC should be pursued to better protect the supply and quality of Florida's groundwater.**





% of Major River Watershed Area by Land Category



WATER SUPPLY

More than 90% of public drinking water in Florida comes from groundwater. As of 2020, Florida's current water demand exceeded 6.4 billion gallons per day, and this is estimated to increase by nearly another billion gallons per day by 2040.

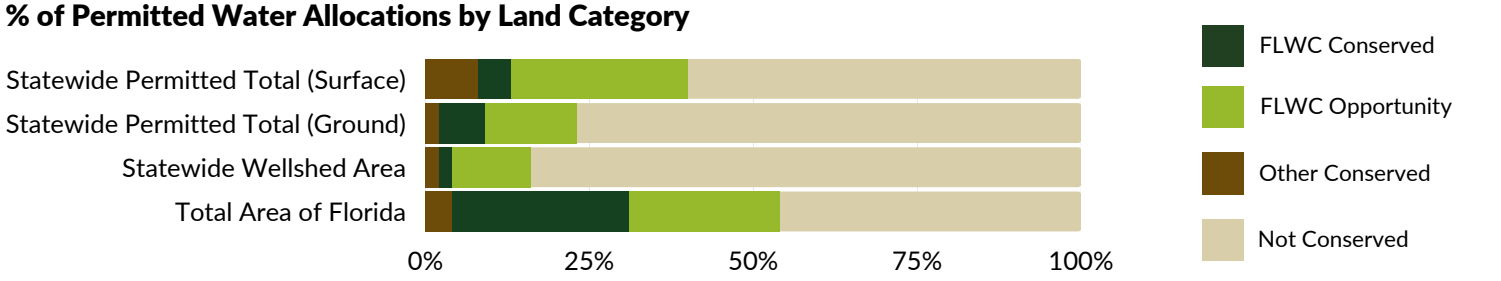
Public supply is the largest water use by volume, accounting for around 40% of the current water demand (agriculture, a close second, accounts for ~38%).

Florida has programs to secure water supply for current water use and future growth. Planning and permitting of water consumption is overseen by the state's five Water Management Districts, together with FDEP.

KEY CONCLUSIONS:

- **In general, water supply is not comprehensively conserved by the FLWC. Other programs protecting these resources should be supported.**
- Five percent of permitted surface water allocations are within FLWC Conserved lands. If acquired, **FLWC Opportunity lands would add a further 27% of surface water allocations**, increasing the total more than 5-fold to 32%.
- **Just 7% of groundwater allocations by volume and 2% of wellshed areas (i.e. groundwater source areas) are within FLWC Conserved lands**. FLWC Opportunity Areas would add 14% and 12% respectively, multiplying the protection of these resources.
- Statewide, **77% of groundwater allocations by volume and 84% of wellshed areas are not within conserved lands** —FLWC or otherwise. These resources are underrepresented in the FLWC largely because of their proximity to urban areas and row-crop agriculture.

% of Permitted Water Allocations by Land Category



SPRINGS

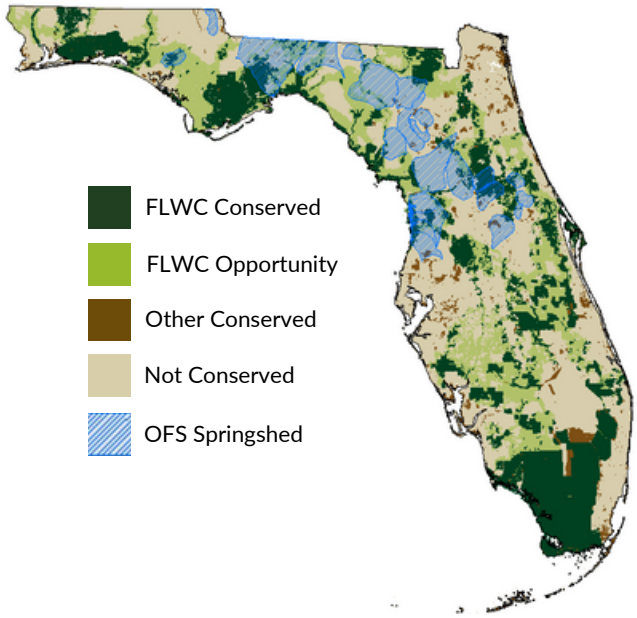
Florida has more than 700 springs that collectively discharge >8 billion gallons of water per day from the Upper Floridan aquifer into downstream rivers. There are 376 springs within the FLWC whose output has been measured. Of these springs, 33 are 1st magnitude, discharging over 100 cubic feet of water per second. Florida has the highest concentration of 1st magnitude springs on Earth.

The springs are fed by groundwater, which is fed by infiltration from the surface. Thus, land use within a spring's recharge area, or "springshed," determines the quality and quantity of the spring's discharge.

Florida's springs support rich aquatic food webs including fish, turtles, amphibians, and manatees, which are sensitive to changes in water quality and quantity. Florida residents and tourists also visit the springs for recreation, including wildlife and nature viewing, kayaking, snorkeling, tubing, and cave diving.

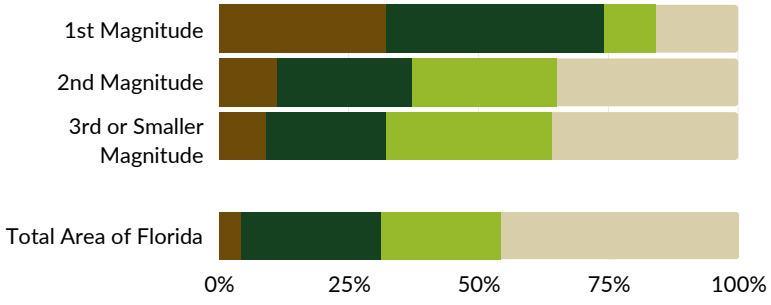
KEY CONCLUSIONS:

- **55% of all mapped spring vents are within the FLWC.**
- **42% of Florida's 1st-magnitude springs lie within FLWC Conserved Areas**. Conserving FLWC Opportunity Areas would increase the number of conserved 1st magnitude springs within the FLWC by almost 25% and more than double the number of conserved 2nd- and lower-magnitude springs.
- Of the **springsheds feeding the state's "Outstanding Florida Springs"** (OFS; including all 1st-magnitude springs plus other unique springs), only 29% are within the FLWC, indicating that they **receive low-to-moderate benefit from the FLWC**.
- **Priority FLWC Opportunity Areas that could be conserved to increase OFS springshed protection** include Panhandle lands surrounding the Gainer, Wacissa, and Wakulla springsheds, land surrounding DeLeon Springs near the Ocala National Forest, and lands surrounding Chassahowitzka and Homosassa Springs on the central Gulf coast.



% of Total OFS Springsheds within each Land Category

% of Springs within each Land Category by Magnitude



LAKES

Florida has around 8000 permanent lakes that cover nearly 3475 square miles, approximately 6% of the state.

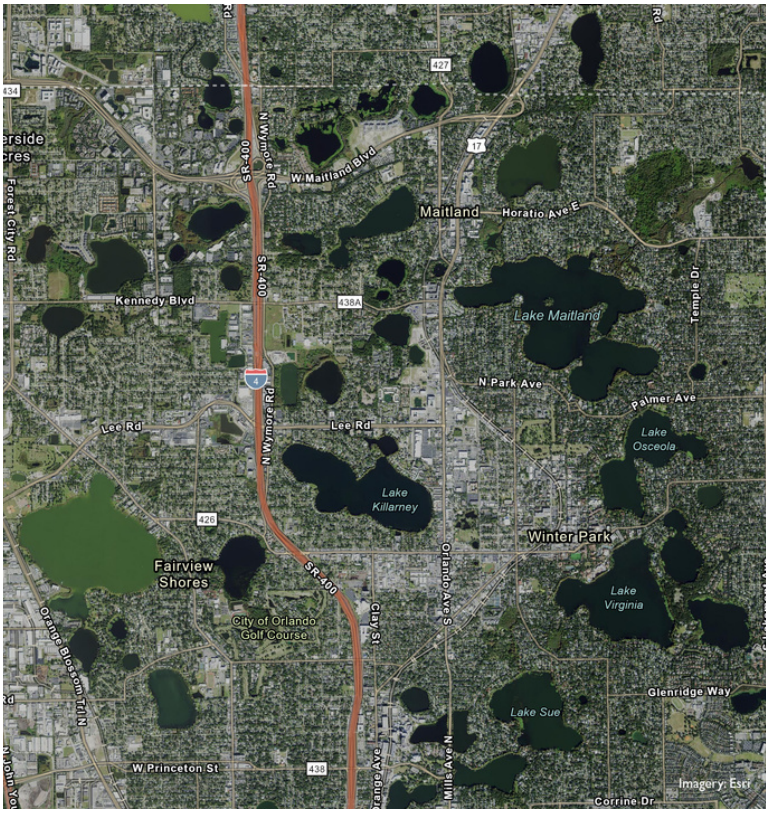
Lakes provide habitat for many of the ~220 species of fish that occupy inland FL waters, reptiles, aquatic mammals, numerous amphibians, resident and migratory aquatic birds, and prey for endangered species including snail kites.

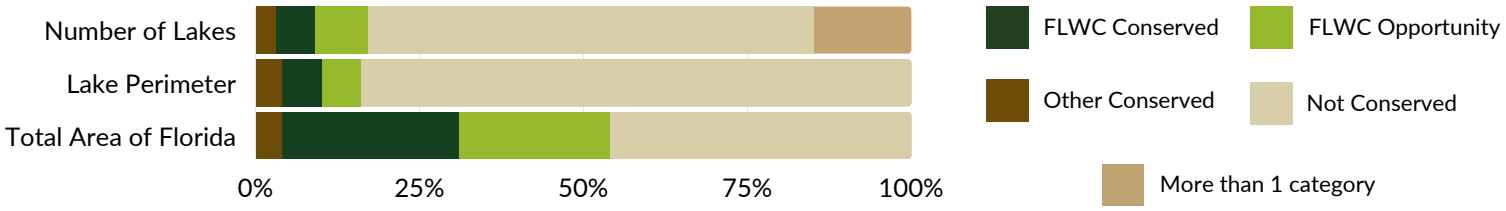
Lakes are also sites for fishing, swimming, boating, and paddling, as well as ecosystem services like water storage and flood protection. Florida lake sediments also sequester about 0.5% of the state's carbon emissions annually.

Florida lakes are threatened by issues like acid rain, pollution from golf course herbicides, sewage, fertilizer runoff, road construction, and phosphate mining.

KEY CONCLUSIONS:

- Of nearly 16,000 miles of lake perimeter in Florida, only 959 are conserved by the FLWC.
- Although lake perimeter is provided low-to-moderate benefit by the FLWC, acquisition of all FLWC Opportunity Areas **would nearly double the amount** of lake shoreline conserved within the FLWC to 12%.
- Lakes enjoy far less conservation from the FLWC than do rivers or wetlands; FLWC lands generally track the large river systems in the state, whereas many lakes and their watersheds are in developed upland areas.





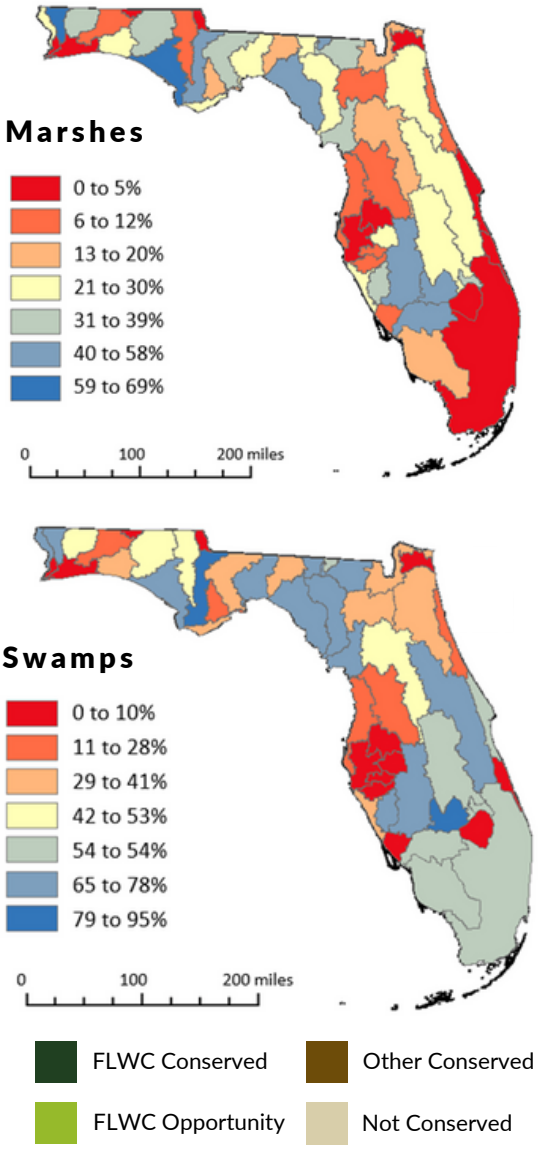
WETLANDS

Florida's swamps and marshes cover more than 10 million acres. Existing statewide conserved lands cover 3.1 million acres of swamps and 2.3 million acres of marshes (dominated by the Everglades).

Wetlands are important for water storage, flood mitigation, water quality, wildlife habitat, recreation, and carbon sequestration, all of which provide economic benefits. Rapid human development, climate change, and habitat fragmentation all imperil the services that wetlands provide, and 44% of wetlands in Florida (50% across North America) have been lost.

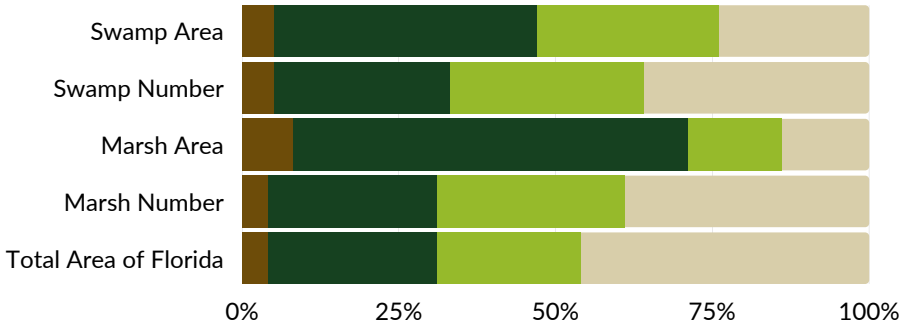
Conserving large swaths of connected "wetlandscapes" that contain diverse wetland types is key, but so is protection of smaller wetlands, which provide higher per-unit-area habitat and ecosystem service values.

% protection available in FLWC Opportunity Areas by watershed



KEY CONCLUSIONS:

- **Wetlands are provided excellent benefit** by the FLWC Conserved and Opportunity Areas. Existing FLWC Conserved Areas **protect 63% and 42% of marsh and swamp area**, respectively, and 27% and 28%, respectively, of the total number of marshes and swamps in the state.
- Conserving the FLWC Opportunity Areas **would dramatically improve coverage of both swamps and marshes**. FLWC Opportunity Areas would nearly double the number of protected swamps and marshes and increase the protected area of swamps by 2 million acres and marshes by 500,000 acres.
- FLWC Opportunity Areas **would be particularly beneficial** for marshes in the New River, Apalachicola River, Myakka River, the Upper St. Johns River, and Fisheating Creek watersheds and for swamps in the Apalachicola River, Peace River, Upper Suwannee River, St. Marks River, and Fisheating Creek watersheds.



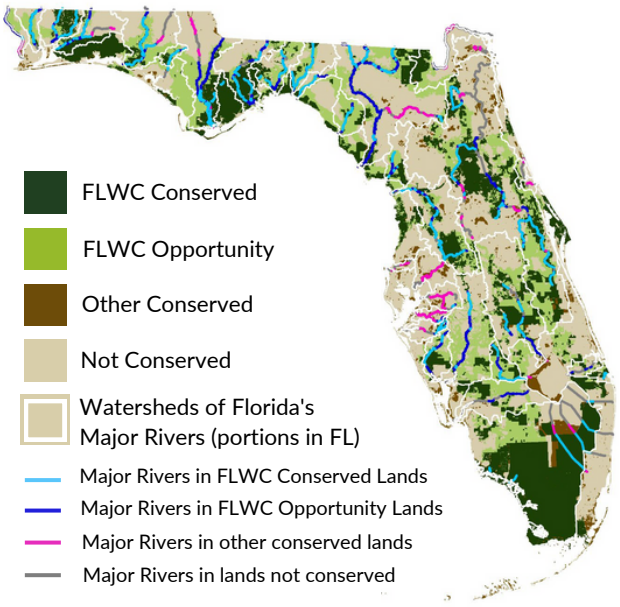
RIVERS

Rivers are enormously important for biodiversity and human wellbeing. Florida's rivers act as natural corridors for movements of manatees, sturgeon, and other at-risk and economically important fish. As rivers reach the sea, having an intact, well-functioning drainage network is vital to maintaining the health of estuaries and other nearshore habitats for fisheries and recreation.

Additional land conservation will help to sustain water quality, aquatic habitat, and migration corridors along riparian zones that are critical for the continued function of stream and river ecosystems and their estuaries.

KEY CONCLUSIONS:

- Overall, the FLWC provides **good-to-excellent benefits for rivers and streams** in Florida. Approximately 62% of the length of Florida's major rivers flows through the FLWC, roughly split between Opportunity and Conserved Areas, highlighting the intentional focus on river corridors in the FLWC design.
- **51% of the major river watershed areas lie within the FLWC,** 27% in Conserved and 24% in Opportunity Areas. The inclusion of entire drainage networks in Opportunity areas represents a key benefit of the FLWC.
- **Conserving Opportunity Areas within the Peace River and Myakka River watersheds would ensure protection for major river corridors** and streams, Charlotte Harbor, and regional flood mitigation.
- **Opportunity Areas in the Florida Panhandle and the upper Suwannee River** watershed provide habitat for the Gulf Sturgeon and many endangered mussel species.



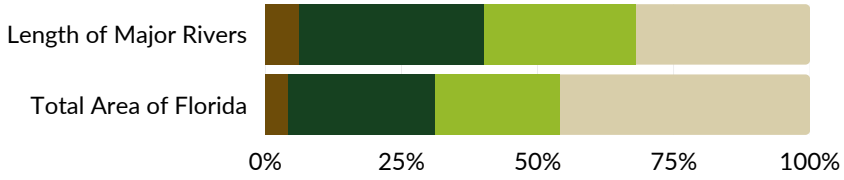



Photo by Carlton Ward, Jr/Wildpath.

ESTUARIES

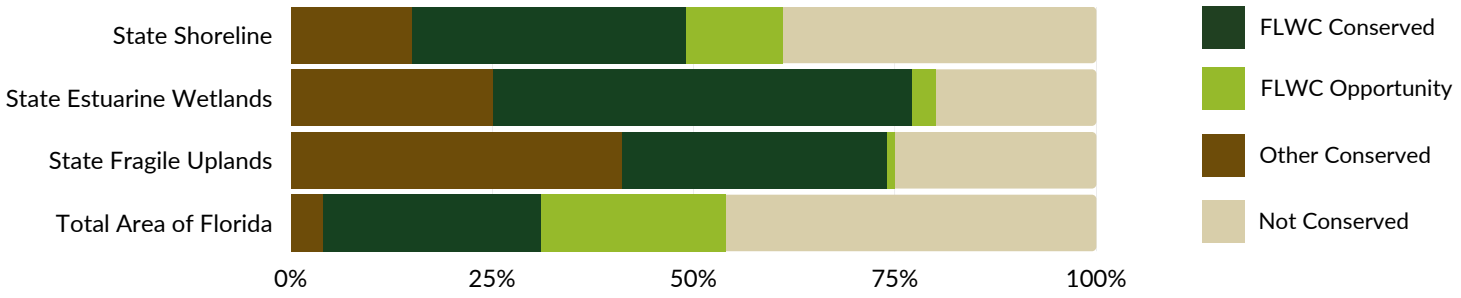
Florida has the longest coastline in the lower 48 United States, home to major coastal ecosystems such as seagrass beds, estuarine wetlands, dunes, and coastal strand. Florida's coastal resources and estuaries are threatened by heavy development and poor water quality. Therefore, protecting both Florida's shoreline and upstream watersheds is critical for maintaining Florida's unique estuarine systems.

Coastal or estuarine wetlands provide nurseries for fish including commercially important species. They are also sites for recreation, removal of nutrient pollution, carbon sinks, and habitats for many species. Estuarine wetlands, dune, and coastal strand systems are also critical to buffering coastal communities from storms and erosion.

Photo by Carlton Ward, Jr/Wildpath.

KEY CONCLUSIONS:

- A total of **49% of FL's coastline is already conserved**, with FLWC Conserved Areas covering 34% and Other Conserved lands covering 15%.
- **Estuarine wetlands**, including salt marshes and mangroves, **are already more than 77% conserved**, with FLWC Conserved Areas covering 52%, and Other Conserved Lands 25%.
- **Fragile coastal upland ecosystems** (e.g., dunes and coastal strand) that protect coastal communities **are already 74% conserved**, with 33% in FLWC Conserved Areas and 41% in Other Conserved Areas.



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FULL REPORT ACCESS AND CITATION:

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