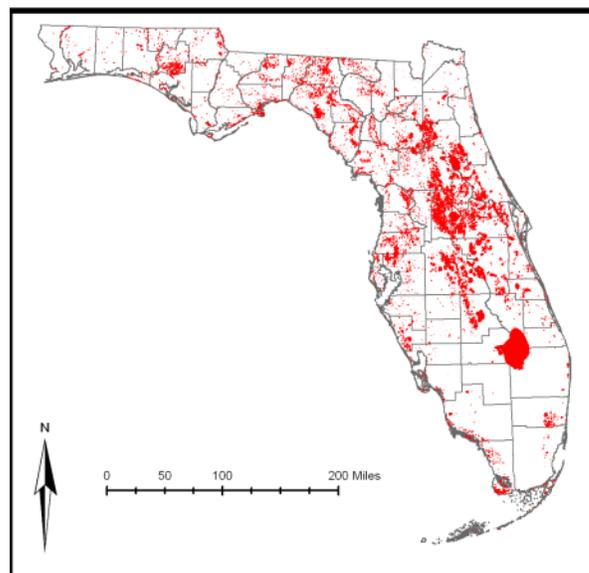


# Natural Lake



## Status

Current condition: Good and declining. According to the best available GIS information at this time (see Appendix C: GIS Data Tables), 1,510,216 acres (611,163 ha) of Natural Lake habitat exist.



Some habitat distributions or locations may be misrepresented on this map due to size, resolution and insufficient data sources.

## Habitat Description

**FNAI type:** Clastic Upland Lake, Sandhill Lake, Sinkhole Lake

Florida has approximately 7,800 Natural Lakes with a surface area of one acre (0.4 ha) or more. Very few of these lakes were formed by riverine processes. However, the great majority were formed or enlarged by dissolution of the underlying limestone by acidic surface waters. Slumping of the overburden resulted in a surface depression. Most Natural Lakes in Florida retain an intimate connection with groundwater, and lack a natural surface outflow. They may be connected to aquatic caves by underground fissures or bedding planes, and thus provide additional habitat for animal species found in those subterranean habitats, or they may have bottom substrates of silt or sand. Most of these lakes have highly variable water levels. Despite their origin, many Florida lakes are not alkaline, and are vulnerable to acidification. They also commonly are nutrient-deficient, thus are vulnerable to nutrient inputs.

Florida's lakes are usually less than 45 feet (14 m) deep, with sand, silt, or organic bottom substrates. Depending on the water chemistry, vegetation in the lakes can vary from nonexistent, to a fringe of emergent plants at the shoreline, to a complete covering of floating plants. Indeed, introduced aquatic weeds are a major threat to this habitat. Some Florida lakes have held water continuously for 8,000 years, and two exceed 30,000 years in age.

This habitat category is comprised exclusively of standing water bodies of natural origin, some of which have been altered by the construction of water control structures. Natural Lakes are essentially permanent, although many of them dry completely during droughts.

## Associated Species of Greatest Conservation Need

### **Mammals**

• <i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat
• <i>Eptesicus fuscus</i>	Big Brown Bat
• <i>Eumops floridanus</i>	Florida Bonneted Bat
• <i>Lasiurus borealis borealis</i>	Red Bat
• <i>Lasiurus cinereus cinereus</i>	Hoary Bat
• <i>Lasiurus intermedius floridanus</i>	Northern Yellow Bat
• <i>Lasiurus seminolus</i>	Seminole Bat
• <i>Myotis austroriparius</i>	Southeastern Myotis
• <i>Myotis grisescens</i>	Gray Bat
• <i>Perimyotis subflavus</i>	Tricolored Bat
• <i>Lontra canadensis lataxina</i>	River Otter
• <i>Trichechus manatus latirostris</i>	West Indian Manatee

### **Birds**

• <i>Anas rubripes</i>	American Black Duck
• <i>Anas fulvigula</i>	Mottled Duck
• <i>Aythya marila</i>	Greater Scaup
• <i>Gavia immer</i>	Common Loon
• <i>Mycteria americana</i>	Wood Stork
• <i>Pelecanus occidentalis</i>	Brown Pelican
• <i>Botaurus lentiginosus</i>	American Bittern
• <i>Ixobrychus exilis</i>	Least Bittern
• <i>Ardea herodias</i>	Great Blue Heron
• <i>Ardea alba</i>	Great Egret
• <i>Egretta thula</i>	Snowy Egret
• <i>Egretta caerulea</i>	Little Blue Heron
• <i>Egretta tricolor</i>	Tricolored Heron
• <i>Egretta rufescens</i>	Reddish Egret
• <i>Butorides virescens</i>	Green Heron
• <i>Nycticorax nycticorax</i>	Black-crowned Night-Heron
• <i>Nyctanassa violacea</i>	Yellow-crowned Night-Heron
• <i>Eudocimus albus</i>	White Ibis
• <i>Plegadis falcinellus</i>	Glossy Ibis
• <i>Platalea ajaja</i>	Roseate Spoonbill
• <i>Pandion haliaetus</i>	Osprey
• <i>Rostrhamus sociabilis</i>	Snail Kite
• <i>Haliaeetus leucocephalus</i>	Bald Eagle
• <i>Falco peregrinus</i>	Peregrine Falcon
• <i>Rallus elegans</i>	King Rail
• <i>Porphyrio martinica</i>	Purple Gallinule
• <i>Aramus guarauna</i>	Limpkin
• <i>Grus canadensis pratensis</i>	Florida Sandhill Crane
• <i>Grus americana</i>	Whooping Crane
• <i>Tringa solitaria</i>	Solitary Sandpiper

- *Tringa flavipes*
- *Tryngites subruficollis*
- *Limnodromus scolopaceus*
- *Phalaropus tricolor*
- *Chlidonias niger*
- *Rynchops niger*
- *Euphagus cyanocephalus*

Lesser Yellowlegs  
Buff-breasted Sandpiper  
Long-billed Dowitcher  
Wilson's Phalarope  
Black Tern  
Black Skimmer  
Brewer's Blackbird

### Amphibians

- *Lithobates capito*
- *Lithobates virgatipes*
- *Ambystoma tigrinum*
- *Desmognathus auriculatus*

Gopher Frog  
Carpenter Frog  
Eastern Tiger Salamander  
Southern Dusky Salamander

### Reptiles

- *Alligator mississippiensis*
- *Farancia erytrogramma*
- *Nerodia cyclopion*
- *Seminatrix pygaea cyclus*
- *Apalone mutica calvata*
- *Apalone spinifera aspera*
- *Deirochelys reticularia*
- *Macrochelys temminckii*
- *Pseudemys nelsoni*

American Alligator  
Rainbow Snake  
Mississippi Green Watersnake  
Southern Florida Swampsnake  
Gulf Coast Smooth Softshell  
Gulf Coast Spiny Softshell  
Chicken Turtle  
Alligator Snapping Turtle  
Florida Red-bellied Cooter (Panhandle Population)

### Fish

- *Anguilla rostrata*
- *Cyprinodon variegatus hubbsi*
- *Acantharchus pomotis*
- *Enneacanthus chaetodon*

American Eel  
Lake Eustis Pupfish  
Mud Sunfish  
Black Banded Sunfish

### Invertebrates

- *Amblema plicata*
- *Anodonta hartfieldorum*
- *Anodonta heardi*
- *Utterbackia peggyae*
- *Utterbackia peninsularis*
- *Cambarellus schmitti*
- *Macrobrachium acanthurus*
- *Macrobrachium carcinus*
- *Macrobrachium ohione*
- *Anax amazili*
- *Nehalennia pallidula*
- *Epithea spinosa*
- *Gomphus vastus*
- *Progomphus alachuensis*
- *Progomphus bellei*
- *Lestes inaequalis*
- *Lestes spumarius*
- *Libellula jesseana*
- *Nannothemis bella*
- *Hydroptila berneri*

Threeridge  
Cypress Floater  
Apalachicola Floater  
Florida Floater  
Peninsular Floater  
A Crayfish  
Cinnamon River Shrimp  
Big Claw River Shrimp  
Ohio River Shrimp  
Amazon Darner  
Everglades Sprite  
Robust Tongtail  
Cobra Clubtail  
Tawny Sanddragon  
Belle, Belle's Sanddragon  
Elegant Spreadwing  
Antillean Spreadwing  
Purple Skimmer  
Elfin Skimmer  
Berner's Microcaddisfly

- *Orthotrichia curta* Short Orthotrichian Microcaddisfly
- *Orthotrichia instabilis* Changeable Orthotrichian Microcaddisfly
- *Oxyethira florida* Florida Cream And Brown Microcaddisfly
- *Ceraclea limnetes* Sandhill Lake Caddisfly
- *Nectopsyche tavara* Tavares White Miller Caddisfly
- *Oecetis parva* Little Oecetis Longhorned Caddisfly
- *Oecetis porteri* Porter's Long-horn Caddisfly
- *Triaenodes dendyi* A Caddisfly
- *Triaenodes florida* Floridian Triaenode Caddisfly
- *Triaenodes furcellus* Little-fork Triaenode Caddisfly
- *Cernotina truncona* Florida Cernotin Caddisfly
- *Poanes viator zizaniae* Broad-winged Skipper

## Conservation Threats

Threats to the Natural Lake habitat that were also identified for multiple other habitats are addressed in Chapter 7: Multiple Habitat Threats and Conservation Actions. These threats include:

- Chemicals and toxins
- Conversion to agriculture
- Conversion to commercial/industrial development
- Conversion to housing and urban development
- Groundwater withdrawal
- Incompatible recreational activities
- Invasive animals
- Invasive plants
- Nutrient loads–agriculture
- Nutrient loads–urban
- Surface water withdrawal and diversion

Many of the threats to this habitat stem directly or indirectly from lakefront development which is ubiquitous on natural lakes throughout Florida. Like many wetland habitats, Natural Lakes, even those relatively unaffected by direct threats, suffer from an altered landscape context as surrounding uplands have been developed for housing and agricultural development. Additional threats specific to this habitat include the operation of dams or control structures, especially on lakes in central and south Florida.

The following stresses and sources of stress threaten this habitat:

Stresses		Habitat Stress Rank
A	Altered landscape mosaic or context	High
B	Altered hydrologic regime	High
C	Altered species composition/dominance	High
D	Altered water quality of surface water or aquifer: nutrients	High
E	Erosion/sedimentation	Medium
F	Altered community structure	Medium
G	Habitat degradation/disturbance	Medium
H	Insufficient size/extent of characteristic communities or ecosystems	Medium
I	Habitat destruction or conversion	Medium
J	Altered water quality of surface water or aquifer: contaminants	Medium

The sources of stress, or threats, were used to generate conservation actions.

Sources of Stress		Habitat Source Rank	Related Stresses (see above)
1	Invasive plants	High	C
2	Dam operations	High	B, C
3	Nutrient loads–urban	High	C, D, E, F
4	Conversion to housing and urban development	High	A, C, D, F, I
5	Surface water withdrawal	Medium	B, C
6	Nutrient loads–agriculture	Medium	C, D, E, F
7	Invasive animals	Medium	C
8	Conversion to commercial and industrial development	Medium	A, C, D, I
9	Conversion to agriculture	Medium	A, H
10	Chemicals and toxins	Medium	J
11	Groundwater withdrawal	Low	B
12	Incompatible recreational activities	Low	G
13	Incompatible residential activities	Low	G
14	Management of nature–aquatic plant treatment	Low	F
15	Incompatible agricultural practices	Low	B, C, D, E
<b>Statewide Threat Rank of Habitat</b>		<b>High</b>	

## Conservation Actions

Actions to abate the threats to Natural Lakes that were also identified as statewide threats (invasive plants, nutrient loads–urban, conversion to housing and urban development, surface water withdrawal and diversion, nutrient loads–agriculture, invasive animals, conversion to commercial/industrial development, conversion to agriculture, chemicals and toxins, groundwater withdrawal, incompatible recreational activities) are in Chapter 7: Multiple Habitat Threats and Conservation Actions.

Several of the actions developed for a statewide threat were only applicable to Natural Lakes and a few other habitats (i.e., Aquatic Cave, Calcareous Stream, Cypress Swamp, Freshwater Marsh and Wet Prairie, Reservoir/Managed Lake, Seepage/Steephead Stream, Softwater Stream, Spring and Spring Run, Terrestrial Cave, and Coastal Tidal River or Stream) and are listed below. Additional actions were developed to address threats specific to this habitat. These actions are intended to improve the condition of lake-fringe wetland habitat by managing lake levels to more closely resemble a natural hydrologic regime, maintain the amounts of littoral vegetation on lake edges necessary to sustain ecosystem function, improve the compatibility of lakefront development with wildlife habitat conservation, and increase our knowledge of the impact of chemicals and toxins on lake ecosystems.

***Dam Operations***

Overall Rank	Capacity Building	Feasibility	Benefits	Cost
H	Coordinate interstate Action Plan actions to ensure that all fish and wildlife resources in all states are protected when changing dam operations in shared basins (USFWS).	M	H	L
L	Coordinate multiagency review of USACE activities, including biological aspects (fish spawn guidelines, protection of fish and wildlife resources) of water control plans for interstate water projects, fish spawn guidelines, re-establishing natural seasonal fluctuation of flows.	H	L	M
Overall Rank	Land/Water/Species Management	Feasibility	Benefits	Cost
M	Integrate lake management activities to coordinate multiple species and habitat conservation, restoration, and invasive plant management (FWC).	H	M	M
Overall Rank	Policy	Feasibility	Benefits	Cost
H	Continue developing and implementing hydrologic management plans that restore the natural seasonal fluctuation to lakes in order to successfully manage sediment-dwelling wildlife.	M	H	L
Overall Rank	Research	Feasibility	Benefits	Cost
L	Develop a position paper on the impacts of lake level stabilization and absence of dry-season drawdown on littoral zone vegetation and dependent wildlife, and sediment accumulation in managed natural lakes.	H	L	L
L	Evaluate feasibility of incentive programs to remove small rural impoundments.	H	L	L

***Conversion to Housing and Urban Development***

Overall Rank	Economic and Other Incentives	Feasibility	Benefits	Cost
L	Encourage conservation of lake frontage, riparian habitats and their floodplains.	M	L	VH

***Conversion to Agriculture***

Overall Rank	Economic and Other Incentives	Feasibility	Benefits	Cost
M	Create incentives for maintenance and conversion of lands to agricultural uses that use less water and result in lower nutrient outputs into Florida's waters and wetlands, and create market-based incentives to compensate private landowners for the environmental services they provide to the state through management that increases water storage and nutrient reduction.	M	M	H

***Chemicals and Toxins***

Overall Rank	Planning and Standards	Feasibility	Benefits	Cost
L	Develop management techniques and recommendations for private landowners that minimize runoff of chemicals and toxins into wetlands and aquatic systems.	H	L	M
L	Develop management techniques and design protocols to minimize exposure of wading birds and other wetland wildlife to contaminants.	H	L	M

Overall Rank	Research	Feasibility	Benefits	Cost
L	Conduct research defining appropriate sediment quality standards for the various aquatic and marine systems. Fund research defining the relationship between sediment contamination (individually and in chemical interactions) and key biological indicators of degradation in different aquatic and marine systems.	M	L	H
L	Conduct research defining standards for persistent organic contaminants for the various aquatic and marine systems. Fund research defining the relationship between contamination from organics (individually and in chemical interactions) and key biological indicators of degradation in different aquatic and marine systems.	M	L	H

### *Incompatible Recreational Activities*

Overall Rank	Policy	Feasibility	Benefits	Cost
H	Identify a specified percentage of littoral vegetation clearing that does not reduce lake ecological integrity, and explore incentives for reaching that percentage on public and private lands.	M	H	M

### *Incompatible Residential Activities*

Overall Rank	Economic and Other Incentives	Feasibility	Benefits	Cost
M	Expand the scale of the <a href="#">Florida Yards and Neighborhoods</a> program from certifying individual landowners to whole neighborhoods; certification should be renewed biennially and any time property ownership changes.	M	M	L
L	Support incentives for residential property owners to resolve issues of incompatible use of Natural Lakes, including pesticide use, pet control, feeding of wildlife, household or yard waste disposal, landscape plants, irrigation use, prescribed fire tolerance, and lighting in coastal areas.	M	L	L
L	Identify and promote effective reward models for homeowners, maintenance companies, and municipalities for reducing impacts on neighboring conservation areas.	M	L	L
L	Develop a voluntary program directed at developers to provide on-site site-specific educational materials and recommendations to homeowner associations about incompatible residential activities.	M	L	L
Overall Rank	Education and Awareness	Feasibility	Benefits	Cost
M	Encourage and support continuing education opportunities for landscape maintenance industry that includes appropriate use of chemicals, irrigation, plants, and disposal of yard waste.	H	M	M
L	Develop and implement management techniques for management of shoreline vegetation to reduce movement of sediment into water bodies.	M	L	M
Overall Rank	Policy	Feasibility	Benefits	Cost
L	Develop and promote management techniques that allow homeowners not to exceed recommended safe pesticide levels.	L	L	L