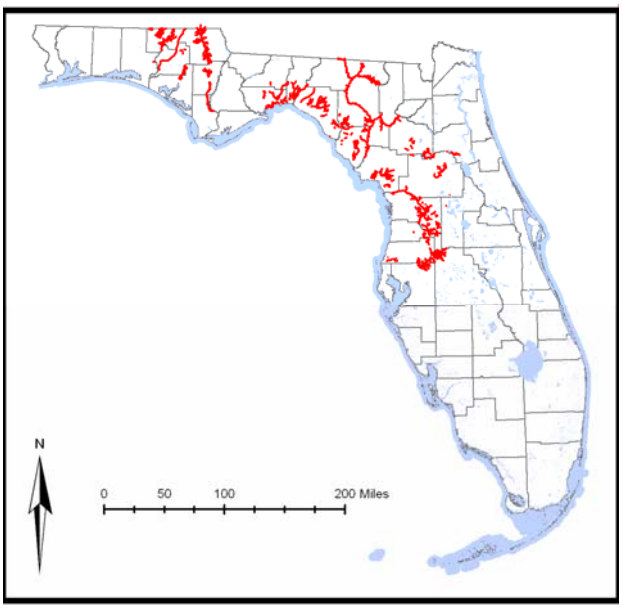
Calcareous Stream



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

Status

Current condition: Good and declining. According to the best available GIS information at this time (Appendix D. GIS Data Tables), there are approximately 2,071 miles (3,332 km) of Calcareous Streams in Florida.

Habitat Description

FNAI type: Spring-run Stream

The Calcareous Stream habitat occurs only in the north and central regions of the state and is comprised of 26 streams originating in or flowing through the Ocala Uplift region of north central Florida and the eastern panhandle, and the Dougherty Plain (Dougherty Karst) region in the central panhandle. Springs and spring runs form low-order tributaries to most of the Calcareous Streams. As a result, Calcareous Streams share many characteristics with the Spring and Spring Run habitat.

This habitat typically has a high pH, high carbonate level, and sand bottom with some limestone exposed. Most Calcareous Streams are clear and cool, although in areas where they flow through pinelands or scrub the streams will become stained by the tannins in the vegetation. Some Calcareous Streams are associated with sinks, where all or sections of the stream flow underground before resurfacing to flow overland. Surface and groundwater recharge is bidirectional; water in the river recharges the aquifer during flood conditions and the water in the aquifer recharges the river during drought conditions. Submerged plants are frequently dense, and can include tape grass, wild rice, and giant cutgrass. Calcareous Streams provide habitat to a variety of species including many snails, water snakes, and fish, and is critical to certain species of anadromous fish, such as Gulf

Sturgeon. Examples of streams in this category include the Suwannee River (downstream of the Big Shoals), Santa Fe River (downstream of the Big Rise), Ichetucknee, lower Withlacoochee (north) and Alapaha Rivers, Chipola River, Econfina Creek, Ocklawaha River, Hillsborough River and the lower, nontidal portions of most of the rivers draining into the Big Bend region on Florida's Gulf coast from the St. Marks River to the Waccasassa River.

Associated Species of Greatest Conservation Need

Mammals

- *Myotis austroriparius* Southeastern Bat
- *Myotis grisescens* Gray Bat
- *Lasiurus borealis* Eastern Red Bat
- *Lasiurus seminolus* Seminole Bat
- *Lasiurus intermedius* Northern Yellow Bat
- *Lasiurus cinereus* Hoary Bat
- *Corynorhinus rafinesquii* Rafinesque's Big-eared Bat
- *Eptesicus fuscus* Big Brown Bat
- *Pipistrellus subflavus* Eastern Pipistrelle
- *Lutra canadensis lataxina* River Otter
- *Trichechus manatus latirostris* Florida Manatee

Birds

- *Egretta caerulea* Little Blue Heron
- *Elanoides forficatus* Swallow-tailed Kite
- *Haliaeetus leucocephalus* Bald Eagle
- *Aramus guarauna* Limpkin
- *Seiurus montacilla* Louisiana Waterthrush

Amphibians

- *Amphiuma pholeter* One-toed Amphiuma
- *Desmognathus auriculatus* Southern Dusky Salamander

Reptiles

- *Macrochelys temminckii* Alligator Snapping Turtle
- *Graptemys barbouri* Barbour's Map Turtle
- *Pseudemys concinna suwanniensis* Suwannee Cooter
- *Apalone mutica calvata* Gulf Coast Smooth Softshell
- *Farancia erytrogramma* Rainbow Snake

Fish

- *Acipenser oxyrinchus desotoi* Gulf Sturgeon
- *Alosa alabamae* Alabama Shad
- *Pteronotropis welaka* Bluenose Shiner
- *Moxostoma n. sp. cf poecilurum* Grayfin Redhorse
- *Ameiurus brunneus* Snail Bullhead
- *Ameiurus serracanthus* Spotted Bullhead
- *Morone saxatilis* Striped Bass
- *Micropterus cataractae* Shoal Bass

- *Micropterus notius* Suwannee Bass
- *Etheostoma olmstedi* Tessellated Darter

Invertebrates

- *Alasmidonta wrightiana* Ochlockonee Arc-mussel
- *Elliptio chipolaensis* Chipola Slabshell
- *Elliptio purpurella* Inflated Spike
- *Fusconaia escambia* Narrow Pigtoe
- *Lampsilis australis* Shiny-rayed Pocketbook
- *Lampsilis teres* Yellow Sandshell
- *Medionidus acutissimus* Alabama Moccasinshell
- *Medionidus penicillatus* Gulf Moccasinshell
- *Medionidus walkeri* Suwannee Moccasinshell
- *Pleurobema pyriforme* Oval Pigtoe
- *Quadrula infucata* Sculptured Pigtoe
- *Quadrula kleiniana* Suwannee Pigtoe
- *Villosa choctawensis* Choctaw Bean
- *Villosa villosa* Downy Rainbow
- *Elimia clenchi* Clench's Goniobasis
- *Procambarus suttkusi* A Crayfish
- *Procambarus youngi* Florida Longbeak Crayfish
- *Hexagenia limbata* A Burrowing Mayfly
- *Stenacron floridense* A Mayfly
- *Asioplax dolani* A Mayfly
- *Hetaerina americana* American Rubyspot
- *Neurocordulia molesta* Smoky Shadowfly
- *Neurocordulia obsoleta* Umber Shadowfly
- *Dromogomphus armatus* Southeastern Spinyleg
- *Gomphus geminatus* Twin-striped Clubtail
- *Gomphus vastus* Cobra Clubtail
- *Hydroptila molsonae* Molson's (Varicolored) Microcaddisfly
- *Ceraclea floridana* Florida (Scaly Wing Sedge) Ceraclean Caddisfly
- *Oecetis floridana* Florida Long-horn Sedge
- *Triaenodes furcella* Little-fork Triaenode Caddisfly
- *Chimarra florida* Floridian Finger-net Caddisfly

Conservation Threats

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

- Chemicals and toxins
- Conversion to housing and urban development
- Incompatible forestry practices
- Incompatible resource extraction: mining/drilling
- Invasive animals
- Invasive plants
- Nutrient loads–agriculture
- Nutrient loads–urban
- Roads

The Calcareous Stream-specific threats identified focused on water quality issues caused primarily by nutrient inputs and on invasive plant species. Nutrients from stormwater runoff, agricultural fertilizers, and septic systems result in eutrophication of this habitat, potentially altering species composition and other important ecosystem functions and processes. Methods to control invasive aquatic plants are more successful in still water than in flowing water systems, also leading to changes in species composition and other stresses.

The following stresses and sources of stress threaten this habitat:

Stresses		Habitat Stress Rank
A	Altered species composition/dominance	High
B	Altered water quality of surface water or aquifer: nutrients	High
C	Erosion/sedimentation	High
D	Altered water quality of surface water or aquifer: contaminants	Medium
E	Altered landscape mosaic or context	Medium
F	Altered hydrologic regime	Medium
G	Fragmentation of habitats, communities, ecosystems	Low
H	Habitat destruction or conversion	Low
I	Altered water salinity, pH, conductivity, or other physical water quality characteristics of surface water or aquifer	Low

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

Sources of Stress		Habitat Source Rank	Related Stresses (see above)
1	Nutrient loads–urban	**High**	A, B
2	Invasive plants	**High**	A
3	Nutrient loads–agriculture	**High**	A, B
4	Invasive animals	**Medium**	A, C
5	Conversion to housing and urban development	**Medium**	B, C, E
6	Chemicals and toxins	**Medium**	D
7	Roads	**Medium**	C
8	Incompatible forestry practices	**Low**	A, C
9	Incompatible agricultural practices	**Low**	B, C
10	Incompatible resource extraction: mining/drilling	**Low**	C
Statewide Threat Rank of Habitat		**High**	

Conservation Actions

Actions to abate the threats to Calcareous Stream that were also identified as statewide threats (Nutrient loads–urban, Invasive plants, Nutrient loads–agriculture, Invasive animals,

Conversion to housing and urban development, Chemicals and toxins, Roads, Incompatible forestry practices, Incompatible resource extraction: mining/drilling) are in the Chapter Multiple Habitat Threats and Conservation Actions.

Several of the actions developed for a statewide threat were only applicable to Calcareous Stream and a few other habitats (i.e., Aquatic Cave, Cypress Swamp, Freshwater Marsh and Wet Prairie, Natural Lake, Reservoir/Managed Lake, Seepage/Steephead Stream, Softwater Stream, Spring and Spring Run, Terrestrial Cave, and Coastal Tidal River or Stream) and are listed below. These actions were designed to prevent harm to stream ecosystems influenced by groundwater inflows by placing limits on the total permissible nutrient loads and to develop improved methods for applying herbicides in flowing water systems.

Nutrient Loads – Urban

Overall Rank	Planning and Standards	*Feasibility*	*Benefits*	Cost
H	Develop numeric nutrient criteria to monitor effects on groundwater ecosystems as well as biota where groundwater discharges to springs and other surface waters.	M	H	H

Invasive Plants

Overall Rank	Research	*Feasibility*	*Benefits*	Cost
M	Research methods for control of aquatic invasive species in flowing waters where current control methods for those species are only effective in non-flowing waters.	VH	L	M

Nutrient Loads – Agriculture

Overall Rank	Planning and Standards	*Feasibility*	*Benefits*	Cost
H	Develop numeric nutrient criteria to monitor effects on groundwater ecosystems as well as biota where groundwater discharges to springs and other surface waters.	M	H	H

Conversion to Housing and Urban Development

Overall Rank	Economic and Other Incentives	*Feasibility*	*Benefits*	Cost
L	Encourage tax or other incentives, such as density transfers, for environmentally friendly comprehensive development plans for projects that front on rivers and floodplains.	M	L	VH
Overall Rank	**Planning and Standards**	*Feasibility*	*Benefits*	**Cost**
L	Encourage development of and use of a buffer zone between new development and river or floodplain edges, of a minimum distance (e.g., the 550 ft zone specified for the Wekiva River, FWS recommendations).	M	L	M

Chemicals and Toxins

Overall Rank	Planning and Standards	*Feasibility*	*Benefits*	Cost
L	For situations where they do not yet exist, develop management techniques and standards for private landowners that minimize runoff of chemicals and toxins into wetlands and aquatic systems.	H	L	M
Overall Rank	**Research**	*Feasibility*	*Benefits*	**Cost**
L	Conduct research defining appropriate sediment-quality standards for the various aquatic and marine systems for development and implementation of state sediment-quality standards. Fund research defining the cause-and-effect 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 for development and implementation of state water-quality standards. Fund research defining the cause-and-effect 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

Roads

Overall Rank	Capacity Building	*Feasibility*	*Benefits*	Cost
M	Work with the USFWS to improve coordination of the Technical Advisory Committee for the Stream Crossing Technical Center (SCTC).	VH	L	L
Overall Rank	**Education and Awareness**	*Feasibility*	*Benefits*	**Cost**
L	Provide training to road maintenance personnel on methods for minimizing sediment movement to water bodies.	M	L	L
Overall Rank	**Land/Water/Species Management**	*Feasibility*	*Benefits*	**Cost**
L	Support operation of the Stream Crossing Technical Center (SCTC) to promote recovery and conservation of aquatic ecosystems from interactions between unpaved road-stream crossings that result in sediment movement into streams.	H	L	M
L	Based on a stream crossing inventory and prioritization, develop funding opportunities for road stabilization projects in Florida counties.	H	L	H