

Gopher Frog

Lithobates capito



Photograph by Michelina Dziadzio, FWC.

Species Overview

Status: Removed from Florida's Endangered and Threatened Species List.

Current Protections

- 68A-4.001, F.A.C., General Prohibitions and Requirement – Prohibits the take, transport, sale, and possession of wildlife.
- 68A-1.004, F.A.C., Take – The term take shall include taking, attempting to take, pursuing, hunting, molesting, capturing, or killing any wildlife or freshwater fish, or their nests or eggs by any means whether or not such actions result in obtaining possession of such wildlife or freshwater fish or their nests or eggs.
- 68A-26.002, F.A.C., Regulations relating to the Taking of Amphibians – Excludes the gopher frog from allowable take of frogs, except as authorized by permit from the executive director as provided in rule 68A-9.002, F.A.C., or as authorized in Commission approved guidelines.

Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support gopher frogs, and the threats faced by the species.

Gopher frogs (*Lithobates capito*; formerly *Rana capito*) are large, stout-bodied frogs in the family Ranidae with a complex life history. They are primarily a sandhill species that rely on intact, connected upland and aquatic habitats. Notably, they are a gopher tortoise burrow commensal species. Adult gopher frogs are heavily spotted with brown or tan blotches over a cream background. Bronze dorsolateral folds extend from behind the eye to the waist. Adult frogs are typically 7 – 11 cm (2.8 – 4.3 in.) in length. Tadpoles (Figure 1) are greenish gold in coloration and have scattered dark spots along the body and tail. Gopher frog tadpoles are difficult to distinguish from other *Lithobates* species. Historically, two subspecies of gopher frog were thought to occur in Florida, separated by the Apalachicola River; however, current evidence suggests *Lithobates capito* is a singular species east of the Mississippi River (Young and Crother 2001, Jensen and Richter 2005, Frost et al. 2006). Gopher frogs usually live for 4 – 5 years, but longevity may exceed 10 years (Richter et al. 2003).



Figure 1. Late-stage gopher frog tadpole. Photograph by Kevin Enge, FWC.

Gopher frogs use two distinct habitat types during the non-breeding, breeding, egg, and larval parts of their life cycle. Non-breeding adults and juveniles use upland habitats with well drained sandy soils that typically support gopher tortoise (*Gopherus polyphemus*) colonies. Gopher frogs can persist in areas where gopher tortoises have been extirpated and will use other refugia types, especially in the Florida panhandle. Examples of habitat types that support gopher frogs include longleaf pine-xeric oak sandhills, xeric hammock, mesic flatwoods, upland pine forest, mixed hardwood-pine communities, scrub, scrubby flatwoods, dry prairie, and disturbed habitats (Enge 2019).



Figure 2. Gopher tortoise burrows are an important landscape feature for gopher frogs. Photograph by Bradley O'Hanlon, FWC.

Subterranean refugia within upland habitats are important to adults and juveniles as these shelters can protect animals from desiccation and predation (Roznik and Johnson 2009a). Examples of suitable refugia include gopher tortoise burrows (Figure 2), Southeastern pocket gopher (*Geomys pinetis*) and other small mammal burrows, crayfish burrows, stump holes, and root mounds (Gentry and Smith 1968, Lee 1968, Blihovde 2006, Roznik et al. 2009). Stump holes and small mammal burrows are important refugia in areas where gopher tortoises are not present in large numbers (Richter et al. 2001, Humphries and Sisson 2012).

Gopher frogs in North Florida and the Florida panhandle typically breed between October and April, with peak activity occurring after heavy rains in February and March (Palis 1998). In central and south Florida frogs may breed year-round following heavy rain events (Godley 1992, Jackson 2004a). Adults will migrate up to, and possibly over, 2 km (1.2 mi) to reach suitable breeding habitat (Franz et al. 1988, Humphries and Sisson 2012). Adults breed in semi-permanent, ephemeral, and temporary ponds. Breeding ponds are usually fishless due to their ephemeral nature, have open canopies, and contain emergent grassy vegetation (Jensen and Richter 2005; Figure 3). Egg masses are attached to vegetation and tadpoles transform into froglets after 3 to 7 months (Godley 1992). The species breeding call sounds like a loud snore (see [Recommended Survey Methodology](#) for an example).

Gopher frogs occur throughout the Florida Panhandle and Peninsula north of the Everglades. Throughout the species' range fire is an important natural disturbance. Historically, lightning-ignited fire maintained suitable habitats for gopher frogs. Prescribed fire practices are currently important to mimic the effects of this disturbance. Fire may prevent the encroachment of woody plants while wetlands are dry. Fire suppression may create barriers to gopher frog dispersal (Roznik et al. 2009, Roznik and Johnson 2009b). Mechanical and chemical treatments can be used to restore and maintain wetlands that have been historically fire excluded. Further



Figure 3. Suitable gopher frog breeding pond and ecotone. Photograph by Bradley O'Hanlon, FWC.

background information pertaining to the gopher frog may be found in the [Gopher Frog Biological Status Review Report](#) (FWC 2011) and [A Species Action Plan for the Gopher Frog](#) (FWC 2013a).

Threats

A Biological Status Review (BSR) found that the gopher frog did not meet criteria for state listing in Florida (FWC 2011). However, amphibians face many complex challenges that threaten their survival, including habitat loss, climate change, emergence of invasive species, overexploitation for the pet trade, and disease. The primary threat to gopher frogs in Florida is upland and wetland habitat conversion, either as a result of anthropogenic development or due to fire suppression or improper fire management (Greenberg 2003). Improper fire management, such as burning during cooler and wetter conditions than those that mimic historically occurring natural fires, may fail to adequately suppress vegetative succession. Resultant encroachment of hardwood vegetation into ephemeral and temporary ponds can eliminate suitable vegetative structure and reduce available moisture through increased evapotranspiration, both of which can negatively impact breeding habitat conditions and have been associated with declines of other pond-breeding amphibians (Skelly et al. 1999, Thurgate and Pechmann 2005).

Other threats to the species include off-road vehicle use in wetlands, which can alter and destroy breeding habitat. Ground water withdrawals can alter wetland hydroperiod, making them unsuitable for breeding. Climate change impacts may alter the timing of winter rains and reduce opportunities for prescribed fire in uplands. Diseases such as *Batrachochytrium dendrobatidis*, *Ranavirus spp.* and *Anuraperkinsus emelandra* (Davis et al. 2007, Rothermel et al. 2008) has been tied to major amphibian mortality events. The introduction of pollution, pesticides, and predatory fish into breeding wetlands may all negatively impact the species.

Distribution and Survey Methodology

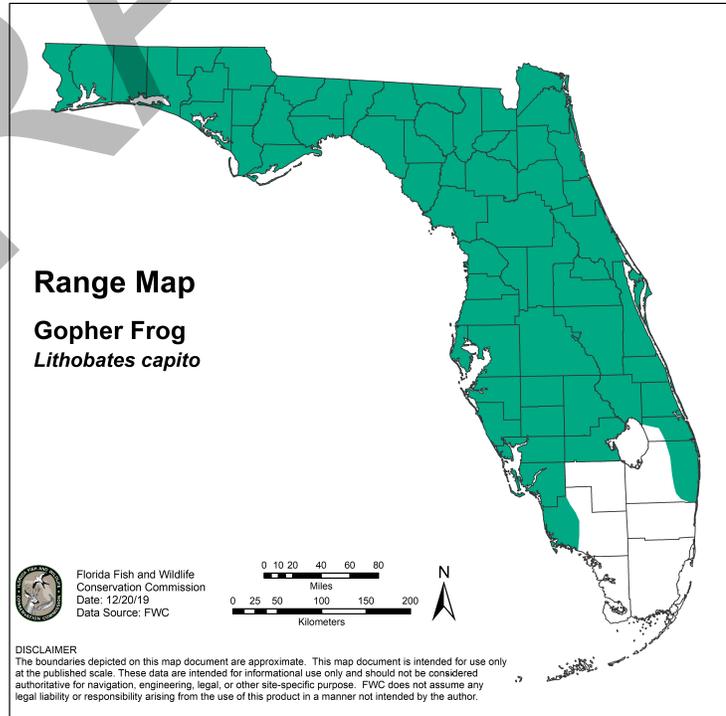
The range map (right) represents the principal geographic range of the gopher frog in Florida, including intervening areas of unoccupied habitat. This map is for information purposes only and not for regulatory use.

Counties: Gopher frogs can be found throughout all of Florida except for Broward, Hendry, Miami-Dade, and Monroe counties.

Recommended Survey Methodology

Surveys, though not required, can document gopher frog presence in an area. The presence of gopher frogs on a landscape can be determined by several survey methods including frog call surveys, dip-netting, drift fence arrays around wetlands, or incidentally through surveys of gopher tortoise burrows. The

objective of these surveys is to document the occurrence of gopher frogs; sampling can cease after they are initially detected. Call-based detection surveys are most often non-invasive and typically do not require a permit from FWC; however, auditory surveys may result in false negative error (type II error) in which the species is present but not detected. Surveys that require handling of gopher frogs (e.g., trapping, dip netting)



will require a permit and should be conducted in coordination with FWC. Frog call surveys are most effective during the primary breeding season (October – April) and can be achieved by simple pedestrian (i.e., listening) surveys, or by using electronic recording devices (e.g., frog call loggers). The call is similar to a loud snore that can last for up to 2 seconds. Examples of gopher frog calls may be found on the [USGS Patuxent Wildlife Research Center](#) webpage. To reduce type II error, FWC recommends a combination of visual and auditory surveys during appropriate weather conditions (see below) to determine presence. An example data sheet can be found in [Appendix A](#) of this document and may be used as a guide for gopher frog data collection.

- All surveys should follow a standard amphibian disinfection protocol. A list of suitable procedures is provided by the [North American Bsal Taskforce](#).
- Surveys should be conducted:
 - Within earshot of suitable gopher frog breeding wetlands.
 - Following large rain events that result in wetland inundation.
 - At least 3 times during suitable survey conditions within peak breeding season (October through April) to maximize the chance of hearing calling males.
 - At least 30 minutes after sunset and be completed by 1:00 A.M.
- Surveys may be conducted in light rain.
- Surveys should not be conducted:
 - During periods of heavy rain, wind (> 10 mph), or cool temperatures (< 50° F).
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 - During periods with prolonged or loud noises (e.g., low flying aircraft) which can cause frogs to momentarily stop calling.

Visual surveys for adults, tadpoles, and egg masses can also document species presence. Surveys for actual frogs are typically performed in conjunction with scientific studies. A scientific collecting permit is required for scientific studies that involve capturing or collecting individuals (see [permits for justifiable purposes](#)). Because gopher frog tadpoles are difficult to distinguish from other frogs in the *Lithobates* genus a professional biologist should confirm identification. In situations involving the capture of gopher frogs, frogs may be secured in plastic containers (1 frog per container) with a wet paper towel soaked with non-chlorinated water (bottled water, filtered water, or well water). Containers with frogs should be of a length that is at least double the body length, with a width that is equal to the body length, and a height that will permit the animal to sit naturally with head clearance. Containers with frogs should have air holes in the lid and/or sides of the container that are sufficient for ventilation. Frog containers must be cleaned, and new wet paper towels replaced daily to prevent desiccation of the animals.



Figure 4. Gopher frogs may be detected by burrow scoping surveys. Photograph by FWC.

Gopher frogs may also be encountered during gopher tortoise burrow surveys. Typically, frogs are incidentally detected while using a burrow scoping system (Figure 4). The presence of gopher frogs in tortoise burrows permitted for relocation should be recorded during data collection and submitted to FWC in accordance with gopher tortoise relocation permit conditions. Further information regarding gopher tortoise surveys and related permitting needs may be found in [Appendix 9 of the Gopher Tortoise Permitting Guidelines](#) (FWC 2017).

Recommended Conservation Practices

Recommended conservation practices are general measures that could benefit the gopher frog but are not required. These conservation practices can be implemented by private landowners, land managers, developers, and forestry professionals. No FWC permit is required to conduct these activities. Further assistance on recommended conservation practices may be provided by the [FWC Landowner Assistance Program](#).

- Develop and implement a prescribed fire regime in suitable or occupied habitat (Roznik et al. 2009, Roznik and Johnson 2009b).
 - Growing season burns (May through September) appropriate to the habitat type are ideal because they mimic historical fire regimes and are more effective than winter burns at controlling woody vegetation (Means 2006).
 - If growing season burns are not feasible due to high fuel loads, dormant-season burns can be used to reduce fuel loads before implementing the recommended burn schedule.
 - Fire breaks should not be installed around wetlands where the species occurs because they would prevent fires originating in the uplands from burning into wetlands.
 - Whenever possible, fire should be allowed to enter and burn through wetland basins when they are dry or mostly dry.
- Refrain from fragmenting upland habitats, such as sandhills, scrub, xeric hammock, scrubby flatwoods, mesic pine flatwoods, pinewoods, and dry prairie with dry soils.
- Thin dense upland pine forests to create suitable habitat for gopher frogs and gopher tortoises.
- Retain stump holes after habitat modification or following forestry operations.
- Avoid soil compaction.
- Establish and manage conservation easements that maximize the conservation of suitable or occupied habitat on private lands, including an upland buffer of suitable habitat around wetlands.
- Implement nonnative plant and animal controls in and around suitable and occupied habitat.
- Prior to using herbicides or pesticides in or around suitable or occupied habitat, review labels for potential effects on non-target organisms (Jackson 2004b). Use only herbicides that are labeled for aquatic use and check that any adjuvants are aquatic compatible.
- Report trespass and illegal dumping occurring around suitable or occupied habitat to FWC.
- Conduct activities such as debris management, tree removal and planting, or vegetation trimming and maintenance using techniques that avoid permanent alteration of habitat.”

Prohibitions and Permitting

Gopher frogs are protected by the general prohibitions outlined in Rule 68A-4.001, F.A.C.: no wildlife or freshwater fish or their nests, eggs, young, homes, or dens shall be taken, transported, stored, served, bought, sold or possessed in any manner or quantity at any time except as specifically permitted by these rules nor shall anyone take, poison, store, buy, sell, possess or wantonly or willfully waste the same except as specifically permitted these rules. Take is defined in Rule 68A-1.004, F.A.C., as pursuing, hunting, molesting, capturing, or killing (or attempting to do those things). A permit is required for any other activity that involves the possession, capture, sell, purchase, transport, hunting or killing of gopher frogs. These permits are issued for justifiable purposes as outlined in Rule 68A-9.002 and 68A-26.002, F.A.C. Justifiable purposes are scientific, educational, exhibition, propagation, management or other justifiable purposes. Collection of gopher frogs is prohibited by 68A-26.002, F.A.C., except by permit from the executive director as provided in Rule 68A-9.002, F.A.C.

No Permit Needed

The following activity could cause take, but is authorized to be conducted without an FWC-issued permit:

- Vegetation removal or trimming in the linear right of way for power restoration. This applies only in cases where there is an immediate danger to the public’s health and/or safety (including imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local government entity), and only to non-routine removal or trimming of vegetation within the linear right of way, in accordance with a vegetation management plan that meets applicable federal and state standards. If conducted under these circumstances, no FWC take permit is required.

Gopher Tortoise Commensal Species Guidelines

The gopher frog is listed as a priority commensal species of gopher tortoises within the FWC Policy on the Relocation of Priority Commensals (FWC 2017). In accordance with this policy, limited relocation of gopher frogs may be a suitable option to consider when applying for a gopher tortoise relocation permit. A summary of guidance for relocation of gopher frogs is found in Table 1, below. Authorization for the limited relocation of priority commensals will be included as a permit condition in the applicant’s gopher tortoise relocation permit. Under certain circumstances, FWC may work with permitted individuals to collect gopher frogs for purposes of meeting specific actions identified in the Species Action Plan. Consultants and professionals who are working on landscape modifications in which no habitat will remain should contact FWC during the permitting process to inquire about these circumstances.

Table 1: Summarized guidance from Gopher Tortoise Permitting Guidelines, Appendix 9, FWC Policy on the Relocation of Priority Commensals.

Post-development site characteristics	If a gopher tortoise burrow will be impacted from development activities and some habitat will remain on-site	If a gopher tortoise burrow will be impacted from development activities and adjacent habitat is available off-site	If a gopher tortoise burrow will be impacted/ destroyed from development activities and no habitat will remain
Gopher frog	Any captured gopher frog may be released on-site within the property boundary, provided that the frog is released outside of a physical barrier (i.e., silt fencing) to the area to be developed. Captured frogs should be released near the mouth of a gopher tortoise burrow, other suitable refugia, or in adjacent suitable habitat. Alternatively, frogs may be allowed to escape unharmed.	Any captured gopher frog may be released at the periphery of the area to be developed, provided that the frog is released outside of a physical barrier (i.e., silt fencing). Captured frogs should be released near the mouth of a gopher tortoise burrow or other suitable refugia. Alternatively, frogs may be allowed to escape unharmed.	Any captured gopher frog should be released and allowed to escape unharmed or, upon request of FWC, authorized persons may collect the gopher frog consistent with permit conditions.

Permits for Justifiable Purposes - Scientific Collecting and Educational Use

Scientific collecting permits may be issued for the gopher frog using guidance found in Rule 68A-27.007(2)(a), F.A.C. Activities requiring a permit include any research that involves capturing, handling, or marking wildlife; conducting biological sampling, including collecting blood or genetic material for taxonomic analyses; or other research that may cause take. Visual encounter or auditory surveys that do not involve handling animals do not require a permit. A scientific collecting permit is required to use gopher frogs for education and outreach events. A scientific collecting permit will not be issued for the sole purpose of removing a frog from the wild to use as an educational or outreach animal. Gopher frogs permitted for educational and outreach purposes should be used for a minimum of 12 educational engagements equating to a minimum of 48 hours of contact time annually.

- Applicants can apply for scientific collecting permits on the FWC's [online permitting site](#). Scientific collecting permit applications should include a justification, objectives, and scope of the project.
- Applications should include detailed description of project methods, including duration, sample size, disposition of individuals, and capture/handling procedures (including measures taken to reduce the risk of injury or death).
- The proposal should also include a thorough description of the project's methods, timeframe, and final disposition of all individuals. Permit amendment and renewal applications must be "stand-alone" (i.e., include all relevant information on objectives and methods).
- Permits may be issued to display a specimen if the specimen was obtained via rehabilitation facility or was encountered dead.
- Permits may be issued for captive possession (removal from the wild) if the individual is deemed non-releasable.
- Methodologies for any procedures should be clearly described, including measures taken to reduce stress and injury to frogs.
- Methodologies for any collection of tissues (such as blood) should be clearly spelled out, including measures taken to reduce stress and injury to frogs.
- Disposition involving captive possession for any period must include a full explanation of whether the facility has appropriate resources for accomplishing the project objectives and for maintaining the animals in a safe and humane manner.
- Any mortality should be reported immediately to FWC at the contact information below. FWC will provide guidance on proper disposition of specimens.
- Geographical or visual data gathered must be provided to FWC in the specified format in the permit conditions.
- A final report should be provided to FWC in the format specified in the permit conditions.

Other Permits

For any other justifiable purpose permit that does not fall under scientific collecting or educational use, please submit your request to WildlifePermits@myfwc.com.

Additional Information

Information on Economic Assessment of this guideline can be found at <http://myfwc.com/wildlifehabitats/imperiled/management-plans/>

Contact

For more species-specific information or related permitting questions, contact FWC at (850) 921-5990 or WildlifePermits@myfwc.com. For regional information, visit <http://myfwc.com/contact>.

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Appendices

Appendix A. Sample datasheet for use in gopher frog call surveys

Property Name: _____ Route ID _____ Survey
 Date: _____ Survey Run: _____

<i>RUN INFORMATION</i>	Start	Finish
Overall Time (Military)		
# days since last rainfall		

Observer Name(s): _____ Page 1 of _____

<i>SITE INFORMATION</i> (note: number of sites subject to vary according to survey)										
Site Name or ID #	Start Time (Military)	Air Temp (°F)	Wind code	Sky code	Moon or moonlight visible? (Y/N)	Number of cars that passed by:	Noise a factor? (Y/N)	Timeout required? (Y/N)	Calling Index (see codes)	Notes