Department of Defense

Legacy Resource Management Program

Recommended Best Management Practices

for the Gopher Frog

on Department of Defense Installations

Department of Defense Partners in Amphibian and Reptile Conservation

United States Fish and Wildlife Service

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Introduction

The gopher frog (*Lithobates capito*) is considered an at-risk species that has been petitioned for listing under the Endangered Species Act (ESA), and is currently 'Under Review' for listing by the U.S. Fish and Wildlife Service (USFWS). The Department of Defense (DoD), through its Partners in Amphibian and Reptile Conservation (PARC) network, and the USFWS have developed Best Management Practices (BMPs) for the gopher frog. Management practices described in this document were developed specifically for DoD installations, but are also suitable for implementation throughout the range of this species.

The management practices described in this report are intended to serve as guidelines that DoD resource managers can use to help plan, prioritize, and implement conservation and management actions that provide a positive conservation benefit to the gopher frog, while also providing information to comply with regulatory processes such as Environmental Protection Agency's National Environmental Policy Act (NEPA) and associated components (i.e., Environmental Assessments and Environmental Impact Statements). Management actions implemented according to these BMP guidelines should support military readiness activities and be documented in installation Integrated Natural Resource Management Plans (INRMPs). Actions also should align with existing efforts among the DoD, federal/state agencies, and non-governmental organizations (NGOs) to prevent species decline and preclude ESA-listing.

Species Profile

Description: A stout frog measuring 2.2-3.75 inches (7.0-9.5 cm) in snout-vent length. Gopher frogs are light to dark gray to grayish-brown or brown in color with irregular dark brown to black spots. Prominent circular or oval to elongated warts and dorsolateral ridges are present. The ventral surface is heavily mottled or with dark spots on the chin and throat. Males are smaller than females.


Picture by Jeff Hall


Picture by John D. Willson

Range: Mainly found on the Atlantic and Gulf Coastal Plains, gopher frogs range from southeastern North Carolina to southern Florida, and west to southern Alabama; there are historic records of isolated populations in central Alabama (Shelby County) and central Tennessee

(Coffee County). Much of its range is contained within the range of the gopher tortoise (*Gopherus polyphemus*).

Distribution on Military Sites: The gopher frog is confirmed present on the following 15 military sites:

- Air Force: Avon Park Air Force Range, Florida; Eglin Air Force Base (AFB), Florida; Cape Canaveral Air Force Station (AFS), Florida; MacDill AFB, Florida; Shaw AFB (Poinsett Electronic Combat Range), South Carolina

- Army: Camp Blanding Joint Training Center, Florida; Fort Benning, Alabama/Georgia; Fort Bragg, North Carolina; Fort Stewart, Georgia; McCrady Training Center, South Carolina; Military Ocean Terminal Sunny Point, North Carolina; Tullahoma Training Site, Tennessee

- Marine Corps: Marine Corps Base Camp Lejeune, North Carolina

- Navy: Naval Air Station (NAS) Pensacola (Saufley Field), Florida; NAS Whiting Field (Outlaying Landing Field Holley), Florida

The gopher frog is considered unconfirmed and potentially present on the following military sites because this species has been documented in the same county as a particular military site, but a specimen has not been confirmed within the boundaries of the installation:

- Air Force: Hurlburt Field, Florida; Jacksonville Air National Guard, Florida; Joint Base Charleston (Weapons Station), South Carolina; McEntire Joint National Guard Base, South Carolina; Patrick AFB (Jonathan Dickinson Missile Tracking Annex, Main Base, Malabar Transmitter Annex), Florida; Pope AFB, North Carolina; Seymour-Johnson AFB (Fort Fisher Recreation Area), North Carolina; Tyndall AFB, Florida

- Marine Corps: Marine Corps Air Station Beaufort, South Carolina; Marine Corps Air Station Cherry Point, North Carolina Marine Corps Logistics Base Albany, Georgia; Townsend Bombing Range, Georgia

- Navy: NAS Jacksonville (Main Base, OLF Whitehouse, Rodman Bombing Target Range), Florida; NAS Pensacola (Main Base, NOLF Bronson Field), Florida; NAS Whiting Field (Main Base, NOLF Evergreen, NOLF Harold, NOLF Pace, NOLF Santa Rosa, NOLF Site 8-A), Alabama/Florida; Naval Station Mayport (Greenfield Plantation, Main Base, Naval Fuel Depot, Ribault Bay Village Housing), Florida; Naval Support Activity Orlando (LEFAC/Bugg Spring Facility), Florida; NAVSUBASE Kings Bay, Georgia; NSA Panama City, Florida

Habitat: Outside of the breeding season, primarily found in dry upland habitats and generally occurs where there are gopher tortoises in the southern part of the frogs' range (Georgia, Florida, and southern Alabama), or in areas with high quality stump refugia. Habitat types include longleaf pine/turkey oak sandhill associations, dry to moist longleaf pine flatwoods, sand pine

scrub, oak hammocks, and various successional (usually early) stages of these habitats. They typically spend daylight hours in burrows, holes, or tunnels that are created by gopher tortoises, crayfishes, or rodents, and may also hide under logs or in stumps. Breeding occurs in ephemeral to semi-permanent wetlands that lack large predatory fishes. They have also been observed breeding in ditches, borrow pits and even bomb craters (Eglin AFB; John Jensen pers. comm.). An important component of breeding wetlands is having multiple available ponds of varying hydroperiods within a population. This allows for breeding in both dryer and wetter years, as the frogs will switch to the most appropriate pond(s) in any given year.

Longleaf pine habitat and a gopher frog breeding site at Marine Corps Base Camp Lejeune, NC


Behavior: This species is mainly nocturnal, but sometimes active on the surface in daylight. Breeding generally occurs from January to May and may not occur every year at a particular site. Fall breeding is not uncommon in some areas, especially following heavy tropical rain events. Migrations to breeding wetlands occur mainly on warm, rainy nights, and documented movements of 2 km between upland retreats and breeding sites have been recorded (Franz et al. 1988). Gopher frogs tracked in the Sandhills of North Carolina using radio telemetry revealed the frogs traveled 0.5-3.5 km (mean = 1.3 km) between the breeding pond and a summer refugium (Humphries & Sisson 2012). Individuals may spend about 1.5-3.5 weeks in the breeding ponds (Bailey 1991, Palis and Jensen 1995). Their call resembles a loud snore that lasts up to two seconds. They may also call while submerged beneath the water's surface, which significantly mutes the call (Jensen et al. 1995). Gopher frogs eat earthworms, cockroaches, spiders, grasshoppers, beetles, and other toads and frogs.

Threats: Threats are diverse and include loss and alteration of wetland and upland habitats, establishment of pine monocultures, decreased frequency of fire and inappropriate season of fire, introduction of predatory fish into breeding ponds, and declining populations of gopher tortoises whose burrows are used by gopher frogs (Bailey 1991; Godley 1992). Additionally, off-road recreational vehicle (ORV) use in breeding ponds may shorten wetland hydroperiods as a result of breaking up the organic hardpan, which prevents water from draining into the sand. Loss of herbaceous vegetation from ORV use in wetland sites could also discourage gopher frog reproduction, since egg masses are attached to stems of herbaceous vegetation (Bailey 1990).

Conservation Status

The gopher frog is considered an at-risk species by the USFWS. The USFWS was petitioned to list the gopher frog as a threatened or endangered species on July 11, 2012 and the species is scheduled for a listing determination in fiscal year 2025. It is listed as State Protected in Alabama (also a species of Highest Conservation Concern), a Species of Concern in Florida, State-rare in Georgia, State-endangered in South Carolina, and State-endangered in North Carolina, has a NatureServe Raking of G3-Vulnerable, and is listed as Near Threatened by the IUCN Red list.

Recommended Conservation Implementation Strategies and Best Management Practices for Gopher Frogs on Military Sites

If any of the following BMPs for gopher frogs are currently being performed, or are conducted in the future, it is important to document these actions in your installation's INRMP. The USFWS may consider these proactive conservation actions prior to making a listing determination for this species.

1. **Identify and protect gopher frog wetland breeding sites and contiguous upland (non-breeding) habitats on military properties.** Review aerial photography and installation Geographical Information System (GIS) data to identify potentially suitable wetland breeding sites and contiguous upland habitats (3.5 km area buffer around wetland breeding sites) for gopher frogs. As mentioned above, breeding habitat typically consist of ephemeral to semi-permanent wetlands of varying hydroperiods that lack large predatory fishes. Follow-up by ground-truthing prospective areas, and if they appear to support suitable habitat, or are otherwise known to support gopher frogs, post as necessary with official signage along roads and other human travel corridors or places of utilization to inform personnel about the actual or potential presence of gopher frogs and their vulnerability to military and other human operations and activities. Include a contact number on signage to report observations of illegal and/or disruptive operations and activities.

2. **Survey existing gopher frog populations on military sites.** Monitoring existing gopher frog populations is critical to understanding if a population is increasing or decreasing (see inventory and monitoring techniques for gopher frogs below)**.** Trapping frogs at drift fences that completely enclose breeding sites is currently the most effective means of tracking population fluctuations and monitoring recruitment; however, it is very labor intensive and costly. Acoustic surveys and automated recorders are also tools that can document presence/absence of calling males. Egg mass surveys can be conducted to verify reproduction. Dip nets and funnel traps can be used to monitor the presence or absence of tadpoles at sites. Survey work should be conducted according to established biosecurity protocols to avoid transmission of pathogens between sampling sites. Several inventory and monitoring techniques are described in more detail below.

3. **Develop fact sheets and outreach tools**. Educational fact sheets and pamphlets can be developed to inform military personnel about this species. Include information on its behavior, habitat use and threats. Contact Chris Petersen (chris.petersen@navy.mil;757-322-4560) for assistance developing outreach materials.

4. **Avoid the use of all vehicles in wetland breeding habitats used by gopher frogs.** If possible, establish a vehicle-free buffer zone of at least 100-200 feet around the edges of all known wetland breeding sites of gopher frogs. At a minimum, vehicles should avoid wetlands during the breeding season, from January to May. In some cases, it may be advisable to establish a vehicle-free corridor between uplands and wetlands during rainy nights in the breeding season to prevent the potential of killing large numbers of frogs that are moving between the different habitat types. Moreover, operation of vehicles in the soft soils around wetlands can cause significant rutting damage to the ground, kill sensitive vegetation, and lead to serious erosion issues. Any area that is impacted as such should be restored towards its original condition. The use of tracked equipment for mechanical wetland restoration projects during dry conditions is preferred.

5. **Prescribed Burning.** Restore natural fire frequency, seasonality, and intensity (as long as such efforts do not impede military training operations, maintenance activities, etc.) to upland and wetland breeding habitats. This may include a combination of both growing season and dormant season burns depending on the specific habitat management goals. Managers must weigh and consider varying conditions to determine appropriate timing of fire at each site. If possible, avoid prescribed burning when adults are likely to be on the surface (generally January – May). Inappropriately applied winter fires threaten adult frogs moving across the landscape. Winter fires may also not have the desired effect of removing organic buildup in breeding ponds (see number 6 below). Late spring or summer are ideal times for application of prescribed fire in upland habitats, however it is recommended that you consult with your installation forester, state's Division of Forestry or wildlife agency for assistance.

6. **Carry prescribed fires through uplands and allow them to burn into wetlands when water levels are naturally low.** Prescribed fires are important for promoting and maintaining the growth of herbaceous vegetation in uplands and around wetlands by preventing the succession of shrubs and other densely growing woody vegetation that inhibit the growth of herbaceous vegetation, and block sunlight from reaching the forest floor and wetland surfaces, resulting in decreased plant and animal diversity and lower habitat quality for nearly all species of native wildlife, including gopher frogs. Woody vegetation succession results in fewer food resources and longer developmental times for gopher frog tadpoles due to greater shading of the wetlands and correspondingly lower water temperatures. The timing of a prescribed fire event (dormant vs. growing season) will impact the penetration and effectiveness of it into wetland sites. Fires conducted during the growing season are more effective at penetrating wetland

sites reducing woody vegetation and organic debris on the bottom of the ponds (Bailey et al 2006).

7. **Timber Harvesting and Replanting.** If possible, clear cuts should be avoided in gopher frog upland habitats. If forest clearing does take place, it is recommended that tree stumps remain in place and are not removed. For long leaf pine stands, uneven-aged stand management should be the goal. Replant timber harvested areas with longleaf pine (the recommended growth density varies by hydrology, slope, and other site characteristics; consult your natural resources staff/forester for specific planting guidelines for your installation). A variety of site preparation techniques can be used for longleaf pine stand establishment. Broadcast use of broad spectrum herbicides should be avoided because of impacts to native grasses and herbaceous vegetation. In addition, avoid mechanical site preparation and do not remove tree stumps if possible. Guidelines developed for the gopher tortoise are also appropriate for the gopher frog. (http://www.gophertortoisecouncil.org/style/pdfs/GT_habitat_management_guidelines_2017.pdf).

8. **Avoid ditching and draining seasonal wetlands.** Any activities such as ditching or draining that result in a decrease in the natural hydroperiod of wetlands in which gopher frogs breed will correspondingly decrease the period of time over which the eggs and tadpoles of the frogs can develop prior to metamorphosis (a total period of approximately seven months, depending on the geographical location, weather conditions, wetland physical and hydrologic characteristics, and other factors). Therefore, the decreased developmental time results in increased mortality and/or decreased fitness of the surviving metamorphic frogs.

9. **Avoid stocking permanent or isolated seasonal wetlands in which gopher frogs breed with predatory or exotic fish.** Predatory and exotic fish (e.g., mosquitofish, sunfish, crappie, bass, catfish, carp etc.) may directly impact gopher frogs through consumption of their eggs and/or tadpoles. Moreover, the presence of predatory fish may indirectly impact the frogs by causing the tadpoles to engage in anti-predatory behaviors such as increasing and decreasing the duration of their hiding and feeding times, respectively, which in turn results in a decrease in growth/development rate and thus an increase in time to metamorphosis and a decrease in overall body condition. Ultimately, this will lead to a decrease in recruitment success and frog population sizes.

10. **Retain underground retreats in upland habitats, including gopher tortoise burrows (and more generally, gopher tortoise populations) and stump holes, which are used by gopher frogs.** This is particularly important because post-metamorphic frogs spend the vast majority of their time sheltering below the surface in upland habitats. In the southern part of the frog's range (Georgia, Florida, and southern Alabama), gopher tortoise burrows are the preferred shelter site for gopher frogs in upland habitats. However, stump holes are also used. In the northern part of the gopher frog's range (outside the range of the gopher

tortoise) stump holes are very important for sheltering and a critical part of their habitat structure.

11. **Control invasive species in areas inhabited by gopher frogs.** Invasive species may include various plants that grow at unnaturally high densities, particularly in the absence of fire and in both wetlands and uplands, thereby changing physical habitat structure and decreasing wetland hydroperiod, both of which adversely impact the frogs. Invasive species may also include animals such as fire ants, armadillos, coyotes, and feral hogs that predate the frogs, particularly metamorphic individuals that are dispersing into uplands. The best procedures for controlling invasive species are those that both effectively limit their proliferation, as well as minimize potentially harmful impacts to gopher frogs, and will vary according to the invasive species in need of control, and numerous criteria specific to each installation. Therefore, consult your natural resources staff for invasive species control guidelines for your installation.

12. **Mechanical/Chemical Restoration of Breeding Ponds**. Absence of fire for prolonged periods may lead to encroachment of woody vegetation that would be difficult to restore using prescribed fire alone. In those cases, mechanical and/or chemical treatment may be appropriate to restore ponds to suitable conditions. Experts should be consulted before undertaking mechanical restoration.

Benefits of Gopher Frog Best Management Practices to Military Training Operations

1. Identification of wetland breeding sites enables military planners to consider these sensitive habitats when developing and/or scheduling training and maneuvering activities
2. Prescribed fires preclude woody plant invasion, thus keeping training and maneuvering areas from becoming overgrown with thick vegetation
3. Longleaf pine naturally grows at lower densities than do other species of pine, thus allowing for greater military maneuvering capacity
4. Management of invasive species lessens the damage they may cause to training and maneuver area conditions (e.g., feral hog rooting activity)

Points of Contact and Species Experts

Contact your Military Service headquarters natural resources personnel with questions regarding gopher frog management and conservation actions:

Navy: Tammy Conkle (tamara.conkle@navy.mil; 202-685-9203)
Marine Corps: Jacque Rice (jacqueline.rice@usmc.mil; 571-256-2796)
Army: Steve Sekscienski (steven.sekscienski@us.army.mil; 571-256-9725)
Air Force: Kevin Porteck (kevin.porteck@us.af.mil; 210-925-4259)

In addition, the following experts may be contacted with questions regarding gopher frog biology or for potential partnering opportunities:

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Inventory and Monitoring Techniques for Gopher Frogs

Acoustic Surveys and Automated Acoustic Recorders

A common technique used to inventory and monitor gopher frogs, as well as other frogs and toad species, is acoustic surveys. This involves listening for calling males when they gather at aquatic breeding sites. As with birds, the males of each frog and toad species have a unique call making species identification possible from calls alone. Surveyors go to designated listening stations at the edge of aquatic sites or along road transects and listen for several minutes, recording all species of frog and toad heard, and the approximate number of each species. Various websites, including the USGS Patuxent Wildlife Research Center, have recordings of the calls of frog and toad species from across North America that are helpful when learning to use this technique. In lieu of surveyors, automated recording devices can also be used. Automated recording devices are mounted at the breeding site and set to record calls at regular intervals from dusk to midnight. Each recording session appears as a spectrogram, and the calls of each species can be identified

by their unique pattern when specialized software is used to analyze these data. For more information on the use of acoustic recording devices and analysis, contact Chris Petersen (chris.petersen@navy.mil;757-322-4560). At wetland sites where gopher frogs were determined present based on acoustic surveys, it is recommended that an egg mass survey (see techniques below) also be conducted.

Egg Mass Surveys

Egg mass surveys may be conducted at seasonal or permanent wetland sites during the breeding period (January to May) to monitor reproductive activity of gopher frogs. This technique involves searching the perimeter and interior, of wetlands for globular masses of eggs attached to vegetation. Surveyors must be able to accurately identify gopher frog egg masses and distinguish them from the egg masses of other species of frogs and salamanders. Egg mass surveys can provide information on the presence/absence and reproduction of gopher frogs. In addition, since each female lays a single egg mass, egg mass surveys can provide an index on the number of breeding females if eggs are searched for throughout the breeding season.

Tadpole Surveys

Gopher frog tadpole surveys may be conducted in the late winter though the spring. Tadpole surveys are typically performed using a dip net, which consists of a wood or metal pole with a mesh net on one end. This technique involves walking the pond bank or wading slowly through the water sweeping the dip net through the water to catch tadpoles. Typically, the best habitat is shallow water (less than two feet deep) which is not shaded and has open areas mixed with submerged aquatic vegetation. Surveyors must be able to accurately identify gopher frog tadpoles and distinguish them from the tadpoles of other frogs and salamanders.

Environmental DNA

A new and emerging technique for surveying aquatic amphibians and reptiles is using Environmental DNA or eDNA. This technique involves collecting water or soil samples from wetland sites and identifying the species that inhabit those wetlands based on the species-specific DNA in the soil or water. This technique may be used to determine if gopher frogs are present at a particular site but will not provide data on population size. It is recommended that multiple water samples from each pond be collected during the appropriate time (within a two-week window after what would be considered good weather for a gopher frog breeding event). For more information on the use of eDNA on DoD lands, visit: https://www.denix.osd.mil/nr/priorities/herpetofauna/reports/monitoring-amphibian-populations-using-environmental-dna-report-legacy-14-616

Drift Fence with Pitfall Traps

Another common survey technique that can be used to survey for gopher frogs is the use of drift fences with pitfall traps. Drift fencing, when setup around wetland breeding sites, may be used as an effective long-term monitoring technique for tracking population fluctuations and monitoring recruitment of amphibians. With this technique, frogs are captured in traps via the use of fences

that are partially buried below the ground and standing up to approximately 50 cm high. Drift fences are typically made of aluminum flashing, however plastic silt-fencing and hardware cloth may also be used. The fencing intercepts individuals as they move along the ground and diverts them into pitfall traps, which are usually buckets that are buried so that the top of the bucket is at ground level. Due to the high initial expense for the materials, and the level of effort required for the installation and checking of traps, this technique is best used when establishing a long-term monitoring program. It is essential that traps be checked each morning at a minimum, but during major migration periods the traps should be checked at multiple times through the night as to not interfere with their breeding. If not monitored frequently, drift fences can be very dangerous to gopher frogs and other wildlife. It is recommended you consult with your state wildlife agency before initiating this technique.

High Priority Research Questions

1. How do habitat management activities (specifically forestry practices) influence gopher frog populations?
2. What are the dispersal patterns, distances traveled and barriers to adult and metamorphic frogs to, and from, breeding sites?
3. What are the best techniques for population augmentation and restoration?
4. What are the best practices for reintroducing head-started metamorphs into the environment, including where should these be released to maximize survival (e.g. in pond, at wetland edge, in woods some distance from pond, or at stump/refuge some distance from pond)?
5. What is the most effective time to use eDNA in sampling: a) While adults and egg masses are in ponds; b) post hatching of eggs and during tadpole growth and development?
6. How frequently should eDNA samples be taken during a breeding and larval development period?
7. What are the effects of stochastic rainfall patterns, pond filling and water retention on breeding and successful larval development and metamorph recruitment?
8. How does the habitat use of the gopher frog vary throughout its range?
9. Are gopher frogs present on the military sites listed above where they are considered unconfirmed?
10. What is the optimal underground refugia density (both for the portion of the range that overlaps with gopher tortoise and the northern portion that doesn't)?

Additional Sources of Information on Gopher Frogs

Florida Fish and Wildlife Conservation Commission
University of Florida, Department of Wildlife Ecology
Savannah River Ecology Laboratory
BioKids
IUCN Red List
Amphibians and Reptiles of North Carolina
Alabama Department of Conservation and Natural Resources

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Literature Cited

Bailey, M. A. 1990. Movement of the dusky gopher frog (*Rana areolata sevosa*) at a temporary pond in the lower coastal plain of Alabama. Pp. 27-43 in C. K. Dodd Jr., R. E. Ashton Jr., R. Franz and E. Ester (eds.). Proceedings of the Eighth Annual Meeting of the Gopher Tortoise Council. Florida Museum of Natural History, Gainesville, FL.

Bailey, M.A. 1991. The dusky gopher frog in Alabama. J. Alabama Acad. Sci. 62(1):28-34.

Bailey, M.A., J.N. Holmes, K.A. Buhlmann, and J.C. Mitchell. 2006. Habitat Management Guidelines for Amphibians and Reptiles of the Southeastern United States. Partners in Amphibian and Reptile Conservation Technical Publication HMG-2, Montgomery, Alabama. (88 pp.).

Franz, R., Dodd, Jr., C.K. and Jones, C. 1988. Natural history notes: *Rana areolata aesopus* (Florida gopher frog). Movement. Herpetological Review 19:33.

Godley, J. S. 1992. Gopher frog. In P. E. Moler, editor. Rare and endangered biota of Florida. Vol. III. Amphibians and reptiles. Univ. Press of Florida. pp 15-19.

Humphries, W. J., & Sisson, M. A. (2012). Long distance migrations, landscape use, and vulnerability to prescribed fire of the gopher frog (*Lithobates capito*). Journal of Herpetology, 665-670.

Jensen, J. B., J. G. Palis and M. A. Bailey. 1995. Natural history notes: *Rana capito sevosa* (dusky gopher frog) submerged vocalization. Herp. Rev. 26:98.

Palis, J. G., and J. B. Jensen. 1995. Distribution and breeding biology of the flatwoods salamander (*Ambystoma cingulatum*) and gopher frog (*Rana capito*) on Eglin Air Force Base, Florida. Final Report. Florida Natural Areas Inventory, Tallahassee, Florida.