

MANAGEMENT AND CONSERVATION OF REPTILES AND AMPHIBIANS ON MILITARY INSTALLATIONS

Reptiles and amphibians (herptiles) are integral parts of our environment, occupying ecological roles as scavengers and predators. Healthy herptile populations are necessary for maintaining diverse, functional ecosystems. In specific cases, such as the Gopher tortoise (*Gopherus polyphemus*), herptiles have been identified as keystone species that create habitat for other species, including non-herptiles, and are biological indicator species of environmental health for entire ecoregions. Herptiles not only contribute to local, regional, and national biodiversity and aesthetic value, they also possess tremendous medical value. Healthy herptile populations are necessary for maintaining diverse, functional ecosystems through insect and rodent control. Unfortunately, reptile and amphibian populations and species diversity have declined, both within the United States and globally, in recent years (Gibbons et al. 2000, Reaser 2000).

The global decline of herptiles is well documented: Partners in Amphibian and Reptile Conservation's website (<http://www.parcplace.org/>) has a more in depth overview). Habitat loss/fragmentation, disease, and displacement by invasive species are just a few of the known factors contributing to their decline. DoD already addresses habitat loss in installation Integrated Natural Resources Management Plans (INRMPs), but implementation of additional simple but wise efforts could further reduce threats affecting reptile and amphibian populations on military installations. In many instances, military lands represent the last remaining intact habitat in an ecoregion, which gives additional importance to DoD conservation efforts.

The following are recommendations to promote the conservation of reptiles and amphibians and their habitats on military installations.

1. Intentional Take/Collecting/Translocation of Live, Native Herptiles:
 - a. Herptiles may only be taken in accordance with the host state's fish and game laws and the installation's INRMP. To provide greater protection for species particularly susceptible to over harvest, such as turtles/tortoises, consider imposing tighter limits on these species in the Installation INRMP.
 - b. Require installation natural resources manager(s) (NRM) to review requests for the collection of herptiles for research purposes. When such actions are deemed appropriate for scientific purposes, the NRM should ensure that only the minimum number of specimens is collected to achieve the research goals and/or provide voucher representation. Ensure that all voucher/research specimens are accessioned in accredited collections accessible to future researchers.
 - c. Prohibit the collecting of live herptiles, unless in accordance with 1.b. or 1.d., to prevent the potential for over-collection and the unauthorized release of herptiles that could result in the spread of disease and/or introduction of invasive herptile species on or off the installation.

d. Prohibit the use of commercially purchased, live herptiles for fishing bait to prevent the potential spread of disease and invasive herptiles. On-site collecting of live herptiles for use as fishing bait is a viable alternative if such collecting is done in accordance with all applicable state and federal regulations and in a manner that ensures no individual animals leave the site.

2. Captive/Commercially-Purchased Native/Non-Native Herptiles:

a. Require individuals who bring herptile pets onto a military installation to have proper documentation (origin, permits, purchase receipts, etc.) and be aware that under the Lacey Act of 1900, as amended, “it is unlawful for any person to import, export, transport, sell, receive, acquire, possess, or purchase any fish, wildlife, or plant taken, possessed, transported or sold in violation of any Federal, State, foreign, or Indian tribal law, treaty, or regulation when moving between states or from Federal to State land.”

b. Discourage collection of live herptiles off-post. Require individuals who bring such collections on-post to have the proper permits (see 2.a. above). The NRM should be made aware of live herptiles kept on-post.

c. Prohibit the release of pet herptiles anywhere on the installation to prevent spread of disease and non-native species. Require the NRM be consulted prior to disposal of unwanted herptile(s).

3. Unintentional/Incidental Take of Native Herptiles During Installation Operations and Military Activities:

a. Installation Grounds Maintenance:

(1) Avoid mowing along the edge of lakes, ponds, rivers and streams. Maintain a healthy vegetative buffer around these areas to provide habitat and dispersal corridor. The larger the buffer, the greater the benefits will be for herptiles. Consult with the installation NRM to determine an adequate buffer width.

(2) Avoid mowing semi-improved and unimproved areas. If this is unavoidable, mowing should take place during times that will minimize impacts on herptiles. If favoring amphibians, mow during dry, hot periods; if favoring reptiles, mow when conditions are cool and moist. To further reduce impacts, blades should be set at a height of 8”-12” or greater. This blade height will help reduce direct mortality and maintain adequate cover height. When controlling brush, small tree or exotic species invasions, patch mow no more than 35% of the area during the growing season. If located on an installation with a Bird Aircraft Strike Hazard (BASH) program, coordinate all mowing heights with the BASH program manager.

(3) Minimize, reduce or avoid use of pesticides and other chemicals in and around water bodies. Such chemicals can adversely affect amphibians, especially larval forms. When spraying is necessary (e.g., to control exotics such as hydrilla or salvinia), consult with the installation pest control specialist to develop and implement the most effective spraying program.

b. Agriculture/Timber Harvesting:

(1) Provide protected buffers around water bodies. A 100+ meter buffer is recommended. Avoid use of chemicals within and around these buffers. Create or maintain forested or grassland corridors between water bodies for dispersal and habitat.

(2) Utilize no-till or conservation-till agricultural practices to minimize soil run-off and prevent water quality degradation.

(3) Prevent cattle from damaging natural areas in and around water bodies.

(4) Utilize native, warm-season grasses for hay and grazing leases. Vegetation structure and microclimate are more favorable than those of non-native, cool-season grass fields.

(5) Conduct timber harvesting activities during periods that will minimize impacts on herptiles. For example, harvest during winter months in northern climates, select or patch cut hardwoods instead of clear cutting. Retain some downed woody debris after timber harvesting to maintain habitat for herptiles. NOTE: This will also benefit many bird species.

(6) Follow Forestry Best Management Practices to reduce non-point source pollution from forestry operations.

c. Other Natural Resources Management:

(1) Use fire in lieu of chemicals to maintain grassland, savannah, longleaf pine communities, etc. Conduct burns during periods that will minimize impact on priority herptile species. Ensure burn plans and fire management plans consider the effects of burning on herptiles, nesting birds, and other species.

(2) Identify and protect seasonal wetlands and isolated waters (e.g., playas, mudflats). These water bodies are very important for amphibians that require temporary or seasonal water bodies to breed. If an installation has a BASH program, coordinate management of appropriate water bodies with the BASH program manager.

(3) Maintain and/or restore wetlands and connective corridors between wetland sites.

(4) Maintain and/or restore connective corridors between natural areas. Isolated patches of habitat in a fragmented landscape impair the movement and dispersal of herptiles. Establishment of corridors and habitat that increase survival of herptiles moving among habitats will greatly enhance the conservation of most herptiles species.

(5) Prevent or avoid the introduction of fish (e.g., smallmouth bass [*Micropterus dolomieu*], rainbow trout [*Oncorhynchus mykiss*], green sunfish [*Lepomis cyanellus*]), in water bodies, especially fishless ponds and shallow wetlands. Fish exclude most pond-breeding amphibians. If possible, remove exotic and non-native predatory fish from potentially high quality amphibian breeding sites.

(6) Control non-native species. A number of non-native species, both plant and animal, have detrimental effects on herptiles. Bullfrogs (*Rana catesbeiana*) and other amphibians introduced into areas where they are not native can adversely impact local populations of native amphibians through predation and competition. Feral cats (*Felis silvestris*), dogs (*Canis familiaris*) and hogs (*Sus scrofa*) can deplete local population of reptiles. Non-native plants can out compete native plants and affect habitat quality.

(7) Educate installation personnel on the importance and methods of herptile management and conservation.

d. Ecological Risk Assessments: Consider using herptiles as assessment endpoints or indicator species in ecological risk assessments. Herptiles have been shown to have varying degrees of sensitivity to environmental contaminants; therefore, they can be excellent ecological indicators for identifying the current and future environmental threats from a hazardous substance release.

e. Military Testing/Training Missions and Support Activities:

(1) Work with proponents to ensure the development and implementation of appropriate mitigation measures and species monitoring efforts for training activities that may have an adverse impact on herptiles and/or their habitat. Habitat loss and fragmentation are the most evident threats to herptiles.

(2) Consider the timing of testing and training events and, when possible, adjust action times/dates to minimize impacts to herptiles. Many herptile species have narrowly defined time periods when they are especially vulnerable to adverse impacts or are vulnerable at certain locations. It may be possible to schedule testing and training activities to meet the military objectives while providing maximum protection to the herptiles.

(3) During Trenching/Excavation Activities:

(i) Minimize the amount of open trench at any given time; keep trenching and back-filling crews close together.

(ii) Schedule trenching projects in the cooler months (October – March), whenever possible, to avoid times when herptiles are most active and susceptible to entrapment in trenches.

(iii) Inspect and remove herptiles from trenches/excavations that are left open overnight and prior to back-filling.

(iv) Install escape ramps at intervals of 100 yards (or closer) along the entire length of an open trench/excavation site. Have at least one escape ramp per open trench/excavation site. Escape ramps can be short lateral trenches sloping to the surface or wooden planks extending to the surface. The slope for escape ramps should be less than 45 degrees (100%).

(f) National Environmental Policy Act (NEPA): Ensure that NEPA documents adequately address the potential impacts of the proposed action and alternatives on herptiles and their habitat.

Literature Cited

Gibbons, J.W.; D.E. Scott, T.J. Ryan, K.A. Buhlmann, T.D. Tuberville, B.S. Metts, J.L. Greene, T.M. Mills, Y. Leiden, S. Poppy, and C.T. Winne. 2000. Reptiles in Decline: The Global Decline of Reptiles, Déjà vu Amphibians. *BioScience* 50(8):653—666.

Reaser, J. K. 2000. Amphibian declines: an issue overview. Federal Taskforce on Amphibian Declines and Deformities, Washington, DC.