

Amphibians and the Department of Defense



Amphibians are a diverse group of ectothermic vertebrates that include frogs/toads, salamanders, and caecilians. There are approximately 8,150 species of amphibians worldwide and 300 native species in the continental United States. Approximately half of all the native amphibians in the United States are known to occur on Department of Defense lands!

Introduction: The word “amphibian” comes from “amphi” meaning “both,” and “bios,” meaning “life,” which refers to their life cycle. Most amphibians spend a portion of their lives in water (eggs and larvae) and part on land as adults (although most adult amphibians also spend a variable amount of time in the water, especially during the breeding season). However, there are exceptions. For example, slender (genus *Batrachoseps*) and woodland (genus *Plethodon*) salamanders spend their entire lives on land (e.g., the larvae develop inside eggs that are laid on land and eventually hatch into metamorphosed individuals). All native species of frogs and salamanders lay unshelled eggs in moist to wet environments; a few species in other parts of the world are live-bearing.



Amphibians on Military Lands: There 81 native species of frogs/toads and 80 native species of salamanders that occur on military lands in the continental United States.

- ◆ Army installations have the most native amphibian species (frogs/toads-72 species; salamanders-70 species).
- ◆ In the continental United States, there are 29 amphibian species/subspecies currently listed as threatened or endangered under the Endangered Species Act. Of these, DoD lands are home to nine of those amphibians.
- ◆ The five most common frog/toad species on military installations are the American Bullfrog, Green Frog, Spring Peeper, Southern Leopard Frog, and American Toad.
- ◆ The five most common salamander species are the Eastern Newt, Spotted Salamander, Marbled Salamander, Eastern Red-backed Salamander, and Southern Two-lined Salamander.

Marbled Salamander



Southern Two-lined Salamander



American Toad



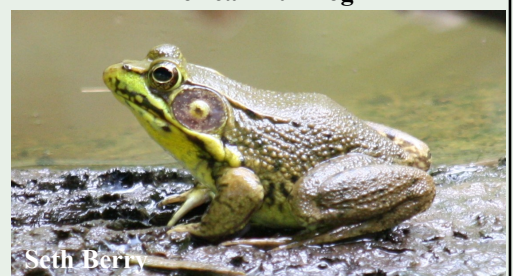
Eastern Newt



Spring Peeper



American Bullfrog



Why Native Amphibians are Important: Amphibians are essential components of the ecosystems they inhabit, maintaining the ecological integrity of their habitats as predators, competitors, and prey. These species also often surpass other vertebrate groups in terms of species abundance, diversity, and biomass, and serve as indicators of environmental health. In fact, amphibians are excellent indicators of environmental health due to their high sensitivity to environmental changes. This means that amphibian populations will quickly show signs of stress when their habitats become degraded or polluted, and when diseases or non-native invasive species have been introduced. This, in turn, means that amphibian species can be used as indicators to determine if DoD testing and training environments are healthy.

Threats to Native Amphibians:

- ◆ Habitat loss, degradation, and fragmentation.
- ◆ Introduction and proliferation of non-native invasive species.
- ◆ Changing climate.
- ◆ Introduction and proliferation of diseases, such as amphibian chytrid fungus, *Bsal* and ranavirus.
- ◆ Overuse or misuse of chemical contaminants (e.g., herbicides, pesticides, fungicides).

Green Frog



Jarrod Derr

Spotted Salamander



Mark Tegges

Southern Leopard Frog



Mundy Hackett

Red-backed Salamander



Daniel Hocking

How You Can Support Native Amphibians on Your Military Installation:

- ◆ Ensure your installation natural resources staff have conducted an amphibian inventory within the last five years. Species, populations, and habitats naturally change through time and are especially quick to change when exposed to anthropogenic pressures such as those associated with training exercises and associated activities.
- ◆ Ensure your installation's Integrated Natural Resources Management Plan (INRMP) addresses amphibian management and conservation. If it doesn't, consult with DoD PARC, your natural resources staff, and any other applicable subject matter experts to address such issues during the next INRMP update.
- ◆ Support research and monitoring of amphibians on your installation. Good data results in good environmental management decisions.
- ◆ Identify the key threats to amphibians on your installation and determine the fastest, safest, and most practical ways to manage or ameliorate threats. In particular, if federally-listed amphibian species are confirmed present on your installation, work closely with your natural resources staff and any other applicable subject matter experts to determine the necessary conservation and management measures and ensure that populations of these species are afforded such measures accordingly.
- ◆ Identify whether non-native amphibians occur on your installation, and manage or eradicate those populations as needed. They pose threats to native amphibian species in the form of direct competition and predation. They are also hosts and carriers of introduced diseases and parasites.