

Department of Defense

Legacy Resource Management Program

Department of Defense

Herpetofaunal Mission-sensitive Species Priority List

Department of Defense Partners in Amphibian and Reptile Conservation

December 2023

Produced by

Christopher E. Petersen and Robert E. Lovich

Introduction

The Department of Defense (DoD), through its Partners in Amphibian and Reptile Conservation (PARC) network, has developed a herpetofaunal DoD Mission-sensitive Species (MSS) priority list for military lands within the continental United States. Species on the priority list have confirmed populations on DoD lands, and are currently under review or recently proposed for Endangered Species Act (ESA) listing by the U.S. Fish and Wildlife Service (USFWS). If these species continue to decline and receive listing protections under the ESA, there is a high potential to impact military mission training and testing activities.

The MSS priority list is intended to serve as an informational tool that senior DoD leadership and installation natural resource managers can use to help prioritize proactive species and habitat conservation and management actions to help reverse decreasing population trends and/or prepare installations for potential listings. In addition, it can serve as a tool to guide DoD or the Military Services in participating in conservation partnerships for these species. The priority list provides recommendations based on best available science, and is not intended to supersede Military Service-specific monitoring, management, or funding priorities.

Methods

The species considered for inclusion on the MSS priority list are a subset of a larger inventory that included 59 federally-listed and at-risk herpetofauna species confirmed present on military sites (see *Department of Defense Herpetofauna Conservation Status Summary 2019*). Twenty-nine of those species were already ESA-listed or recently determined not warranted for ESA-listings, and thus not considered in this analysis. Of the remaining 30 species, we sought answers to the questions listed below to evaluate the potential to mission impacts if a species was to become federally-listed:

- What percentage of the species overall range is on DoD lands?
- How many military sites is the species confirmed and potentially present?
- Do installation INRMPs adequately address the conservation and management of the species?
- Are there existing partnerships within or outside of DoD that are working to prevent the decline of the species?
- Is the species currently undergoing population declines?
- Is the species state-endangered or threatened?
- What is the global imperilment of the species (NatureServe Ranking G1-G3)?
- What is the International Union for Conservation of Nature's (IUCN) Red List Status of the species (Critically Endangered, Endangered or Vulnerable)?
- What is each species degree of endemicity?

Results

Using the criteria list above, we evaluated 30 at-risk species, many of which are under review by the USFWS, confirmed present on DoD installations in the continental U.S. We eliminated 19 of these species (Table 1) primarily because they were confirmed present on three or fewer military installations. Several of these species (e.g. Yuman Fringe-toed Lizard [*Uma rufopunctata*], Texas Salamander [*Eurycea neotenes*] and Panamint Alligator Lizard [*Elgaria panamintina*]) are found on few installations because of their small distributions, extreme rarity or endemicity. Although they could have an inordinately strong effect on a single or few installations where they occur if they become ESA-listed, they presumably would have minimal impact on training capacity at a large number of installations and to overall DoD mission readiness. The 11 remaining species (Table 2; Appendix 1) are those that we believe would have a significant impact to military mission readiness if ESA-listed since they are wide-ranging and occur on many DoD sites.

Common Name	Species Name	Number of DoD Installations Confirmed Present
Desert Massasauga	Sistrurus tergeminus edwardsii	3
Escambia Map Turtle ¹	Graptemys ernsti	3
Streamside Salamander	Ambystoma barbouri	3
Western Chicken Turtle	Deirochelys reticularia miaria	3
Chamberlain's Dwarf	Eurycea chamberlaini	2
Salamander		
Yuman Fringe-toed Lizard	Uma rufopunctata	2
Black-knobbed Map Turtle	Graptemys nigrinoda	1
Black-spotted Newt	Notophthalmus meridionalis	1
Cascade Caverns Salamander	Eurycea latitans	1
Cascades Frog	Rana cascadae	1
Dixie Valley Toad ²	Anaxyrus williamsi	1
Florida Scrub Lizard	Sceloporus woodi	1
Foothill Yellow-legged Frog ³	Rana boylii	1
Green Salamander	Aneides aeneus	1
Panamint Alligator Lizard	Elgaria panamintina	1
Rio Grande Cooter	Pseudemys gorzugi	1
Short-tailed Snake	Lampropeltis extenuata	1
Spot-tailed Earless Lizard	Holbrookia lacerata	1
Texas Salamander	Eurycea neotenes	1

Table 1. Species eliminated from consideration for inclusion on the DoD herpetofaunal species

 MSS priority list.

¹ESA-listed as Proposed Similarity of Appearance (Threatened)

²ESA-listed as Endangered

³ESA-listed as Endangered and Threatened

Common Name	Species Name	Number of DoD Installations Confirmed Present
Spotted Turtle	Clemmys guttata	42
Gopher Tortoise (eastern population) ¹	Gopherus polyphemus	31
Eastern Diamond-backed Rattlesnake	Crotalus adamanteus	29
Northern Red-bellied Cooter	Pseudemys rubriventris	27
Alligator Snapping Turtle ²	Macrochelys temminckii	17
Gopher Frog	Lithobates capito	15
Wood Turtle	Glyptemys insculpta	13
Western Pond Turtle ^{2,3}	Actinemys marmorata/pallida	13
Western Spadefoot ²	Spea hammondii	11
Blanding's Turtle	Ēmydoidea blandingii	10
Florida Pinesnake ¹	Pituophis melanoleucus mugitus	8

Table 2. Species proposed for inclusion on the DoD Herpetofaunal MSS priority list.

¹Determined not warranted for ESA listing by the USFWS

²ESA-listed as Proposed Threatened by USFWS

³Our rationale for lumping the two species of Western Pond Turtles was that each is declining in distribution and abundance range-wide, and the conservation and management actions for these two species would be very similar since they occur in similar habitats.

Supporting Information

Spotted Turtle

- Number of occurrences on military sites considered high (42 sites)
- State endangered or threatened in eight states
- IUCN Ranking-Endangered
- NatureServe Ranking-G5 Secure
- Population size is declining throughout much of its range due to threats that include habitat destruction and over collecting (Ashley and Robinson 1996, Buhlmann and Gibbons 1997, Dreslik et al. 1998, Brodman et al. 2002, Ernst and Lovich 2009, van Dijk 2010, NatureServe 2020). The species is likely to have suffered more than 50 percent overall reduction in population size, with much of this loss irreversible given habitat loss (van Dijk 2010). The spotted turtle was petitioned for federal listing status in 2012 and the USFWS made a 90-day substantial finding in 2015 stating that there is "substantial information indicating that the petitioned listing may be warranted." The Spotted Turtle is currently on the USFWS National Listing Workplan with a planned listing determination in Federal Fiscal Year 2024
- Potential Mission Impacts if ESA-listed:
 - Training restrictions in wetland habitats and upland buffer zones (up to 1,000 meters) around wetlands and streams. Training events impacted may include tactical vehicle (track and non-tracked) maneuver training, bivouac, freshwater watercraft maneuver training, explosive training in wetlands, low-level flight

training of fixed-wing and rotary-wing aircraft (noise impacts), and vegetation clearing on weapon ranges within wetland buffer zones

Gopher Tortoise

- Number of occurrences on military sites considered high (31 sites)
- Federally threatened in Alabama, Louisiana, and Mississippi; State endangered or threatened in five states
- IUCN Ranking-Vulnerable
- NatureServe Ranking-G3Vulnerable
- Percent overlap of species range with DoD installations considered high
- Formerly common in upland ecosystems throughout the southeastern United States; now threatened with extirpation in many areas and in serious decline in others. There has been an approximately 80% decline in the number of gopher tortoises in the last 100 years (Auffenberg and Franz 1982). The Gopher Tortoise in the eastern portion of its range (AL, GA, FL, and SC) was petitioned for federal listing in 2006. In the 12-month finding on that petition, USFWS determined that the Gopher Tortoise warrants listing range-wide and considered the eastern metapopulation to be a Candidate species for listing. A Candidate Conservation Agreement (CCA) for the Gopher Tortoise was signed in December 2008 to implement proactive Gopher Tortoise conservation measures across its eastern range. Stakeholders in the CCA include four the four military services (Army, Navy, Air Force, Marine Corps), U.S. Forest Service, USFWS, the fish and wildlife agencies of FL, GA, AL, and SC, and related non-profit organizations. A Species Status Assessment (SSA) for the gopher tortoise was completed in 2021. In 2022, the USFWS found that listing the Gopher Tortoise as an endangered or a threatened species throughout its entire six-state range was not warranted. In addition, the USFWS found that the eastern Distinct Population Segments (DPS) was not warranted for listing at this time, necessitating removal of the eastern DPS from the candidate list
- Potential Mission Impacts if ESA-listed:
 - Training restrictions to ground-based events in upland habitats such as personnel movement, tactical and non-tactical vehicle (track and non-tracked) maneuver training, convoy movement training, counter improvised explosive device training, bivouac, vegetation clearing on ranges, weapons firing on fixed and mobile targets, munitions dropped from aircraft, future military construction projects, prescribed burning, and forest silviculture practices

Eastern Diamond-backed Rattlesnake

- Number of occurrences on military sites considered high (29 sites)
- State endangered in North Carolina
- IUCN Ranking-Least Concern
- NatureServe Ranking-G3 Vulnerable
- Percent overlap of species range with DoD installations considered high
- Area of occupancy, number of subpopulations, and population size have declined significantly compared to the historical situation. This species probably ranged throughout the original extent of the longleaf pine forest in the Coastal Plain, but the

longleaf pine forest now occupies only a small percentage of its former extent (Ware et al. 1993). Longleaf pine upland habitat has shrunk from 60.6% to less than 1.4% of the landscape since pre-settlement times (Ware et al. 1993), so that the principal natural habitat of the species has diminished greatly. Range contractions are known from Louisiana, Mississippi, and South and North Carolina. This snake is now very rare or virtually extirpated at the northern and western extremes of the range in North Carolina (Palmer and Braswell 1995) and Louisiana (Dundee and Rossman 1989). The Eastern Diamond-backed Rattlesnake was petitioned for federal listing status in 2012 and placed on the USFWS National Listing Workplan with a planned listing determination in Federal Fiscal Year 2024

- Potential Mission Impacts if ESA-listed:
 - Training restrictions to ground-based events in upland habitats such as personnel movement, tactical and non-tactical vehicle (track and non-tracked) maneuver training, bivouac, vegetation clearing on ranges, weapons firing on fixed and mobile targets, munitions dropped from aircraft, prescribed burning, future military construction projects, and forest silviculture practices

Northern Red-bellied Cooter

- Number of occurrences on military sites considered high (27 sites)
- State threatened in Pennsylvania
- IUCN Ranking-Near Threatened
- NatureServe Ranking-G5 Secure
- Percent overlap of species range with DoD installations considered high
- Populations along the Delaware River in Pennsylvania have declined as a result of the effects of industrial expansion, drainage of wetlands, water pollution, and application of pesticides to control mosquitos (Ernst et al. 1994). The Northern Red-bellied Cooter was petitioned for federal listing in 2012, but was later removed for USFWS Listing Workplan. The isolated Massachusetts population remains federally listed as endangered, but is not in proximity to any DoD installations
- Potential Mission Impacts if ESA-listed:
 - Training restrictions in freshwater wetland habitats and upland buffer zones (up to 1,000 meters) around wetlands and streams. Training events impacted may include watercraft maneuver and patrol training, diving and salvage training, underwater search procedures training, land navigation, underwater explosive ordnance disposal (EOD) training, and unmanned underwater/surface vehicle training in freshwater habitats

Alligator Snapping Turtle

- Number of occurrences on military sites considered moderate (17 sites)
- The species is considered a "species of greatest conservation need" (SGCN designation) in 12 states.
- IUCN Ranking-Vulnerable
- NatureServe Ranking-G3 Vulnerable

- Percent overlap of species range with DoD installations considered low
- Loss and degradation of habitat in many historically occupied sites and reductions in trapping success in remaining suitable habitat indicate that a large decline in area of occupancy and abundance has occurred across most of the range (Pritchard 1989, Moler 1996, Heck 1998, Reed et al. 2002, Jensen and Birkhead 2003, Riedle et al. 2005, Shipman and Riedle 2008). This species is likely extirpated from Indiana and there are no records showing evidence of a viable breeding population in Iowa (NatureServe 2020). The Alligator Snapping Turtle was petitioned to be federally listed by the USFWS in 2012. In 2015 the USFWS stated "the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted." On November 9, 2021, the USFWS found that listing the species is warranted. Accordingly, they propose to list the Alligator Snapping Turtle as a threatened species with a rule issued under section 4(d) of the ESA
- Potential Mission Impacts if ESA-listed:
 - Training restrictions in freshwater river and stream habitats and adjacent upland habitat used for nesting. Training events impacted may include riverine maneuver and patrol training, diving and salvage training, underwater search procedures training, underwater EOD training, and unmanned underwater/surface vehicle training.

Gopher Frog

- Number of occurrences on military sites considered moderate (15 sites)
- 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 North Carolina
- IUCN Ranking-Vulnerable
- NatureServe Ranking-G2 Imperiled
- Percent overlap of species range with DoD installations considered high
- This species is experiencing widespread declines across its range in the southeastern United States due to the loss of its longleaf pine ecosystem. Specifically, the distribution and abundance of the gopher frog are much reduced from historical levels, mainly due to loss and degradation of habitat caused by silvicultural practices and fire suppression, combined with reduced gopher tortoise populations (NatureServe 2020). The Gopher Frog was petitioned for federal listing status in 2012 and placed on the USFWS National Listing Workplan with a planned listing determination in Federal Fiscal Year 2027
- Potential Mission Impacts if ESA-listed:
 - Mission restrictions to ground-based training in upland habitats such as personnel movement, tactical and non-tactical vehicle (track and non-tracked) maneuver training, bivouac, emergent vegetation clearing on weapon ranges, forestry practices (thinning and clearing), weapons firing on fixed and mobile targets, munitions dropped from aircraft, future military construction projects, prescribe burning, forest silviculture practices, and invasive plant species control

Wood Turtle

- Number of occurrences on military sites considered moderate (13 sites)
- State-endangered in Iowa and state-threatened in Minnesota, New Jersey, Virginia, and Wisconsin
- IUCN Ranking-Endangered
- NatureServe Ranking-G3 Vulnerable
- Percent overlap of species range with DoD installations considered moderate
- This species is rare and declining across its range and it is subject to continuing threats of habitat destruction, overcollection, and predation. It is considered to be one of the most endangered freshwater turtles in North America and is classified as Endangered in most of the states in which it occurs (Garber et al. 1994, Klemens 2000, Castellano et al. 2009). The Wood Turtle was petitioned for federal listing status in 2012 and placed on the USFWS National Listing Workplan with a planned listing determination in Federal Fiscal Year 2024
- Potential Mission Impacts if ESA-listed:
 - Training restrictions in wetland habitats and upland buffer zones (up to 1,000 meters) around wetlands and streams. Training events impacted may include tactical vehicle (track and non-tracked) maneuver training, bivouac, freshwater watercraft maneuver training, explosive training in wetlands, low-level flight training of fixed-wing and rotary-wing aircraft (noise impacts), and vegetation clearing on weapon ranges within wetland buffer zones

Western Pond Turtles

- Number of occurrences on military sites considered moderate (13 sites)
- State endangered in Washington
- IUCN Ranking-Vulnerable
- NatureServe Ranking: (Southwestern Pond Turtle [*Actinemys pallida*]: G2-Impereled; Northwestern Pond Turtle [*Actinemys marmorata*]: G3-Vulnerable)
- Percent overlap of species range with DoD installations considered low
- Western Pond Turtles are declining in distribution and abundance range-wide, especially in the northernmost part and southern one-third of the range (NatureServe 2020). Specifically, three areas show marked and significant declines in populations: southern California from Baja up to Ventura, the Central Valley of California, and the northernmost populations in Washington and perhaps Oregon (Bury and Germano 2008). Today, only northern California and southern Oregon support large populations, but even in those areas their status is uncertain (Ernst and Lovich 2009). In October 2023, the USFWS proposed to list the Northwestern Pond Turtle and the Southwestern Pond Turtle as threatened species under the ESA
- Potential Mission Impacts if ESA-listed:
 - Additional ESA Section 7 consultations for actions associated with airfield vegetation height management (multiple airfields with high/widespread populations), military construction (MILCON) actions in nesting habitat, and vegetation removal along aquatic habitats. Restrictions to amphibious training and

recreation along shorelines and banks of freshwater habitats. Additionally, since this species is known to move considerable distances into upland habitats away from water (~1 mile), and have been documented to live out of water entirely for hundreds of days, essentially all mission activities could be impacted.

Western Spadefoot

- Number of occurrences on military sites: Considered low (11 sites)
- Several clades range-wide are state-listed
- IUCN Ranking: Near Threatened
- NatureServe Ranking: G2 Imperiled
- Percent overlap of species range with DoD installations: Considered moderate
- This species is experiencing rapid and significant population declines due to habitat destruction. Since the 1950s, drastic declines have been noted in the Central Valley and in southern California (Georgina Santos-Barrera et al., 2004, NatureServe 2020). The toad is extirpated across much of southern California, and more than 80 percent of the previously occupied habitat has been developed or converted to incompatible uses (Georgina Santos-Barrera et al. 2004). The species is lost from more than 30 percent of its habitat in northern and central California (Jennings and Hayes 1994). The Western Spadefoot was petitioned for federal listing status in 2012 and placed on the USFWS National Listing Workplan with a planned listing determination in Federal Fiscal Year 2023
- Potential Mission Impacts, if ESA-listed:
 - Additional ESA Section 7 consultations for actions associated with MILCON projects; restrictions or modifications to ground-based training including maneuver exercises, bivouac, field exercises, artillery, mortars along shoreline habitats; more stringent vernal pool restrictions; potential infrastructure closings following rain events during the breeding season; restrictions on wildland fire control measures such as fill points, fire containment lines, and prescribed fire use; disruption of habitat maintenance procedures such as herbicide/pesticide, soil disruption, vegetation removal; repair and maintenance of infrastructure such as levees (e.g., MCAS Camp Pendleton); and restrictions to clear zone vegetation removal/height management on airfields (e.g., MCAS Camp Pendleton)

Blanding's Turtle

- Number of occurrences on military sites: Considered low (10 sites)
- State threatened or endangered: Listed in 10 states
- IUCN Ranking: Endangered
- NatureServe Ranking: G4 Apparently Secure
- Percent overlap of species range with DoD installations: Considered low
- Blanding's turtles have suffered extensive slow declines of most of its populations from habitat loss and direct removal, accidental mortality, and increased predation. The species is experiencing significant and ongoing population declines across a significant portion of

its range (van Dijk, P.P. 2010), Blanding's Turtle was petitioned for federal listing status and placed on the USFWS National Listing Workplan with a planned listing determination in Federal Fiscal Year 2024

- Potential Mission Impacts, if ESA-listed:
 - Training restrictions in wetland habitats and upland buffer zones (up to 1,000 meters) around wetlands and streams. Training events impacted may include tactical vehicle (track and non-tracked) maneuver training, bivouac, freshwater watercraft maneuver training, explosive training in wetlands, low-level flight training of fixed-wing and rotary-wing aircraft (noise impacts), and vegetation clearing on weapon ranges within wetland buffer zones

Florida Pinesnake

- Number of occurrences on military sites considered low (8 sites)
- IUCN Ranking- Subspecies not reviewed
- NatureServe Ranking-T3 Vulnerable Subspecies
- Percent overlap of species range with DoD installations considered high
- The Florida Pinesnake is suffering significant declines and range contractions, and faces the ongoing threats of habitat destruction and overcollection. Franz (1992) reported that Florida Pinesnakes had seriously declined in the last 20 years. The populations are likely to have since suffered from further declines with the loss of additional habitat. It is designated as a Species of Greatest Conservation Need (SGCN) in each of the states (AL, FL, GA, SC) in which it occurs. The Florida Pinesnake is experiencing population declines in Florida (Franz 2005) and is considered uncommon or not abundant in Alabama and South Carolina. It was petitioned for federal listing status in 2012 and placed on the USFWS National Listing Workplan with a planned listing determination in Federal Fiscal Year 2024
- Potential Mission Impacts if ESA-listed:
 - Training restrictions to ground-based events in upland habitats such as personnel movement, tactical and non-tactical vehicle (track and non-tracked) maneuver training, bivouac, clearing of emergent vegetation on weapon ranges, forestry practices (thinning and clearing), weapons firing on fixed and mobile targets, munitions dropped from aircraft, and future MILCON projects, prescribed burning and forest silviculture practices

Proactive Conservation Actions

The DoD PARC network and the USFWS have developed Best Management Practices (BMPs) for all 11 of the herpetofaunal DoD MSS. BMPs can be download from the following website: https://www.denix.osd.mil/dodparc/resources/materials-for-installation-personnel/. The management practices described in these BMPs are DoD-specific, and are intended to serve as guidelines that DoD natural resource managers can use to help plan, prioritize, and implement conservation and management actions that provide a conservation benefit to these species. Implementation of BMPs are designed to enhance military readiness activities, are consistent

with installation Integrated Natural Resource Management Plan implementation, and align with existing efforts among DoD, federal/state governmental agencies, and non-governmental organizations to prevent the species' continued decline and preclude listing under the ESA.

Acknowledgements

This project is supported by the Department of Defense Legacy Resource Management Program. We are grateful for their support and for providing comments on draft versions of this report.

Literature Cited

Ashley, E.P., and J.T. Robinson. 1996. Road mortality of amphibians, reptiles and other wildlife on the Long Point Causeway, Ontario. Can. Field-Nat. 110: 403-12.

Auffenberg, W., and R. Franz. 1982. The status and distribution of the gopher tortoise (Gopherus polyphemus). Pp. 95-126 in R. B. Bury, editor. North American tortoises: conservation and ecology. U.S. Fish and Wildlife Service.

Brodman, R., S. Cortwright, and A. Resetar. 2002. Historical changes of reptiles and amphibians of northwest Indiana fish and wildlife properties. American Midland Naturalist 147: 135-144.

Buhlmann, K. A., and J. W. Gibbons. 1997. Imperiled aquatic reptiles of the southeastern United States: historical review and current conservation status. Pages 201-232 in G. Benz and D. E. Collins, editor. Conference on aquatic fauna in peril: the southeastern perspective. Southeast Aquatic Research Institute, Lenz Design & Communications, Decatur, GA. 554 pp.

Bury, R.B, and D.J. Germano. 2008. *Actinemys marmorata* (Baird and Girard 1852) – Western pond turtle, Pacific pond turtle. Conservation Biology of Freshwater Turtles and Tortoises: A compilation project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs No. 5.

Castellano, C.M., J.L. Behler, and G. Amato. 2009. Genetic diversity and population genetic structure of the Wood Turtle (*Glyptemys insculpta*) at Delaware Water Gap National Recreation Area, USA. Conservation Genetics 10(6): 1783.

Dreslik, M. J., E.O. Moll, C.A. Phillips, and T.P. Wilson. 1998. The endangered and threatened turtles of Illinois. Illinois Audubon, Winter 1997-98: 10-15.

Dundee, H. A., and D. A. Rossman. 1989. The amphibians and reptiles of Louisiana. Louisiana State University Press, Baton Rouge.

Ernst, C.H. and J.E. Lovich. 2009. Turtles of the United States and Canada. The John Hopkins University Press. 827 pages.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington. 578 pp.

Franz, R. 1992. Florida pine snake *Pituophis melanoleucus mugitus* Barbour. Pages 254-258 in P. E. Moler, editor. Rare and endangered biota of Florida. Vol. III. Amphibians and reptiles. Univ. Press of Florida.

Franz, R. D. 2005. Up close and personal: a glimpse into the life of the Florida pine snake in a North Florida sand hill. Pages 120–131 *in* W. E. Meshaka, Jr., and K. J. Babbitt, editors. Amphibians and reptiles: status and conservation in Florida. Krieger, Malabar, Florida, USA.

Garber S.D., J. Burger, J.H. Harding, C. Ernst, S.E. Tuttle, and J. Davis. 1994. Petition for a rule to list the North American Wood Turtle (*Clemmys insculpta*) as Threatened under the Endangered Species Act 16 U.S.C. Sec. 1531 et seq. (1973) as amended.

Georgina Santos-Barrera, Geoffrey Hammerson, Steven Morey 2004. *Spea hammondii*. The IUCN Red List of Threatened Species 2004: e.T59045A11874606. https://dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T59045A11874606.en. Downloaded on 01 April 2020.

Heck, B. A. 1998. The alligator snapping turtle (*Macroclemys temminckii*) in southeast Oklahoma. Proceedings of the Oklahoma Academy of Science 78: 53-58.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final Report submitted to the California Department of Fish and Game, Inland Fisheries Division. Contract No. 8023. 255 pp.

Jensen, J. B., and W. S. Birkhead. 2003. Distribution and status of the alligator snapping turtle (Macrochelys temminkii) in Goergia. Southeastern Naturalist 2: 25-34.

Klemens, M.W. 2000. Turtle conservation. Smithsonian Institution Press, Washington, DC.

Moler, P. E. 1996. Alligator Snapping Turtle Distribution and Relative Abundance. Final report for the Florida Game and Freshwater Fish Commission.

NatureServe. 2020. NatureServe Explorer. NatureServe, Arlington, Virginia, *available at* https://explorer.natureserve.org/(last visited April 1, 2020).

Palmer, W. M., and A. L. Braswell. 1995. Reptiles of North Carolina. North Carolina State Museum of Natural Sciences, University of North Carolina Press, Chapel Hill, North Carolina.

Pritchard, P. C.H. 1989. The alligator snapping turtle, biology and conservation. Milwaukee Public Museum, Milwaukee, Wisconsin. 104 pp.

Reed, R. N., J. Congdon, and J. W. Gibbons. 2002. The alligator snapping turtle [Macrochelys (Macroclemys) temminckii]: a review of ecology, life history, and conservation, with demographic analyses of the sustainability of take from wild populations. Report to United States Fish and Wildlife Service, Arlington, Virginia. 17 pp.

Riedle, J. D., P. A. Shipman, S. F. Fox, and D. M. Leslie, Jr. 2005. Status and distribution of the

alligator snapping turtle *Macrochelys temminckii* in Oklahoma. Southwestern Naturalist 50:79-84.

Shipman, P. A., and J. D. Riedle. 2008. Status and distribution of the alligator snapping turtle (*Macrochelys temminckii*) in southeastern Missouri. Southeastern Naturalist 7: 331-338.

van Dijk, P.P. 2011. *Clemmys guttata* (errata version published in 2016). The IUCN Red List of Threatened Species 2011: e.T4968A97411228. https://dx.doi.org/10.2305/IUCN.UK.2011-1.RLTS.T4968A11103766.en. Downloaded on 01 April 2020

van Dijk, P.P. 2010. Impacts of non-harvest anthropogenic activities on freshwater turtles in the United States in U.S. Fish and Wildlife Service, Conservation and Trade Management of Freshwater and Terrestrial Turtles in the United States.

Ware, S., C. Frost and P. D. Doerr. 1993. Southern mixed hardwood forest: the former longleaf pine forest. Pages 447-93 in W. H. Martin, S. G. Boyce, and A. C. Echternacht (editors). Biodiversity of the southeastern United States, lowland terrestrial communities. John Wiley and Sons, New York.

Appendix 1. DoD Herpetofaunal Mission-sensitive Species Priority List.

Common Name	Photograph	Federal Status	State Status	Global Status	National Listing Workplan Year	Number of DoD Sites Species Confirmed Present	DoD Sites Confirmed Present by Military Service	DoD Sites Unconfirmed and Potentially Present by Military Service
Spotted Turtle (Clemmys guttata)	With Block	Under Review or Petitioned	Endangered: IL, IN, VT Threatened: ME, MI, NH, OH, SC	NatureServe-G5 IUCN-Endangered Population- Decreasing	2024	42	 Air Force: Cape Canaveral AFS; Dare County Range; Joint Base Langley-Eustis (Fort Eustis); Joint Base McGuire-Dix-Lakehurst; New Boston AFS; Otis Air National Guard; Warren Grove Air National Guard; Westover Air Reserve Base Army: Aberdeen Proving Ground; Blossom Point Research Facility; Camp Curtis Guild; Devens Reserve Forces Training Area; Fort A.P Hill; Fort Belvoir; Fort Bragg; Fort Drum; Fort Indiantown Gap; Fort Lee; Fort Stewart; Letterkenny Army Depot; Maneuver Training Center-Fort Pickett; New Castle River Road Training Site; Picatinny Arsenal; West Point Military Reservation Marine Corps: MCAS Beaufort; MCB Camp Lejeune; MCB Quantico Navy: JEB Little Creek-Fort Story (Fort Story); NALF Fentress; NAS Oceana (Dam Neck Annex, Main Base); NAS Patuxent River (Main Base, Webster Field); NSA Northwest; NSF Indian Head; NSF Dahlgren; NWS Yorktown (Cheatham Annex, Main Base, Yorktown Fuel Deport) Percent overlap of species range with DoD installations: 0.8% 	 Air Force: Cape Cod AFS; Hanscom AFB; Jacksonville Air National Guard; Joint Base Andrews; Joint Base Charleston (Weapons Station); McEntire Joint NGB; Moody AFB; Niagara Fall Air Reserve Station; Pope AFB; Robins AFB; Selfridge ANGB; Seymour-Johnson AFB (Fort Fisher Recreation Area, Main Base); Shaw AFB/Poinsett Electronic Combat Range; Wright-Patterson Army: Auburn Training Site; Bangor IAP ANGB; Bangor Training Site; Bog Brook Training Site; Brunswick Training Site; Camp Edwards; Camp Grayling Joint Maneuver Center; Camp Smith Training Site; Carlisle Barracks; Fort Custer Training Center; Fort George G. Meade; Fort Gordon; Fort Jackson; Gardiner Training Site; Hollis Training Site; McCrady Training Center; Military Ocean Terminal Sunny Point; New Hampshire Army National Guard Training Site; Plymouth Training Site Marine Corps: MCAS Cherry Point; MCLB Albany; Townsend Bombing Range Navy: JEB Little Creek-Fort Story (Little Creek); NAS Jacksonville (Main Base, OLF Whitehouse, Rodman Bombing Target Range); NAS Patuxent River (Bloodsworth Island Bombing Range); Naval Station Mayport (Greenfield Plantation, Main Base, Naval Fuel Depot, Ribault Bay Village Housing); Naval Support Activity Orlando (LEFAC/Bugg Spring Facility); NAVSTA Newport; NAVSUBASE Kings Bay; NAVSUBASE New London (Admiral Fife Recreational Area, Beaverdam Brook Wetland, Main Base); NRL Washington (Chesapeake Bay Detachment, Pomonkey Detachment); NS Norfolk (Craney Island, Main Base); NSA Annapolis; NSF Carderock; NWS Earle

Common Name	Photograph	Federal Status	State Status	Global Status	National Listing Workplan Year	Number of DoD Sites Species Confirmed Present	DoD Sites Confirmed Present by Military Service	DoD Sites Unconfirmed and Potentially Present by Military Service
Gopher Tortoise (Gopherus polyphemus)	Caitlin Snyder	Threatened (AL, LA, MS); Eastern Population Determined Not Warranted for ESA Listing 2022	Endangered: MS, SC Threatened: FL, GA, LA	NatureServe-G3 IUCN-Vulnerable Population- Unspecified	Eastern Distinct Population Segments (DPS) was not warranted for listing, necessitating removal of the eastern DPS from the candidate list	31	 Air Force: Avon Park AFR; Cape Canaveral AFS; Eglin AFB; Hurlburt Field; MacDill AFB; Moody AFB; Patrick AFB (Jonathan Dickinson Missile Tracking Annex, Main Base, Malabar Transmitter Annex); Tyndall AFB Army: Camp Blanding Joint Training Center; Camp Shelby Joint Forces Training Center; Fort Benning; Fort Gordon; Fort Rucker; Fort Stewart Marine Corps: MCLB Albany; MCRD Parris Island; MCSF Blount Island; MCAS Beaufort; Townsend Bombing Range Navy: NAS Jacksonville (Main Base, OLF Whitehouse, Rodman Bombing Target Range); NAS Pensacola (Main Base, Saufley Field NETPDTC, NOLF Bronson Field); NAS Whiting Field (Main Base, OLF Holley); Naval Station Mayport; Naval Support Activity Orlando (Bugg Spring Facility); NAVSUBASE Kings Bay Percent overlap of species range with DoD installations: 2.2% 	Air Force: Jacksonville Air National Guard Army: Camp Villere Navy: NAS Whiting Field (NOLF Evergreen, NOLF Harold, NOLF Pace, NOLF Santa Rosa, NOLF Site 8-A, NOLF Spencer, NOLF Wolf); Naval Station Mayport (Greenfield Plantation, Naval Fuel Depot, Ribault Bay Village Housing); NSA Panama City
Eastern Diamond- backed Rattlesnake (<i>Crotalus adamanteus</i>)	Warty Korenet	Under Review or Petitioned	Endangered: NC	NatureServe-G3 IUCN-Least Concern Population- Decreasing	2024	29	 Air Force: Avon Park AFR; Cape Canaveral AFS; Eglin AFB; Hurlburt Field; Joint Base Charleston (Weapons Station); MacDill AFB; Patrick AFB (Malabar Transmitter Annex) Army: Camp Blanding Joint Training Center; Camp Shelby Joint Forces Training Center; Fort Benning; Fort Rucker; Fort Stewart Marine Corps: MCAS Beaufort; MCB Camp Lejeune; MCLB Albany; MCRD Parris Island; MCSF Blount Island; Townsend Bombing Range; Marine Corps Reserve Center Jacksonville Navy: NAS Jacksonville (Main Base, Pinecastle Range); NAS Key West; NAS Pensacola (Main Base, NOLF Bronson Field, Saufley Field NETPDTC); NAS Whiting Field (OLF Holley); Naval Station Mayport (Naval Fuel Depot); NAVSUBASE Kings Bay Percent overlap of species range with DoD installations: 2.4% 	 Air Force: Homestead ARB; Jacksonville Air National Guard; Moody AFB; Seymour-Johnson AFB (Fort Fisher Recreation Area); Tyndall AFB Army: Military Ocean Terminal Sunny Point Marine Corps: MCAS Cherry Point Navy: NAS Jacksonville (OLF Whitehouse, Rodman Bombing Target Range); NAS Whiting Field (Main Base, NOLF Evergreen, NOLF Harold, NOLF Pace, NOLF Santa Rosa, NOLF Site 8-A, NOLF Spencer, NOLF Wolf, Naval Station Mayport (Main Base, Greenfield Plantation, Ribault Bay Village Housing); Naval Support Activity Orlando (LEFAC/Bugg Spring Facility); NSA Panama City

Common Name	Photograph	Federal Status	State Status	Global Status	National Listing Workplan Year	Number of DoD Sites Species Confirmed Present	DoD Sites Confirmed Present by Military Service	DoD Sites Unconfirmed and Potentially Present by Military Service
Northern Red-bellied Cooter (Pseudemys rubriventris)	Pattl Block	Not ESA Listed	Threatened: PA	NatureServe -G5 IUCN-Near Threatened Population- Unknown	Removed from National Listing Workplan	27	 Air Force: Dare County Range; Joint Base Langley-Eustis (Fort Eustis); Joint Base McGuire-Dix-Lakehurst; Warren Grove Air National Guard Army: Aberdeen Proving Ground; Fort A.P Hill; Fort Belvoir; Fort Indiantown Gap; Maneuver Training Center- Fort Pickett Marine Corps: MCB Quantico Navy: JEB Little Creek-Fort Story (Little Creek, Fort Story); NALF Fentress; NAS Oceana (Dam Neck Annex, Main Base); NAS Patuxent River; Naval Recreation Center Solomons; Naval Support Activity Orlando (LEFAC/Bugg Spring Facility); Naval Support Facility Dahlgren; NSA Northwest; NSF Carderock; NSF Indian Head; Naval Research Laboratory Washington (Chesapeake Bay Detachment); NWS Earle; NWS Yorktown (Cheatham Annex, Main Base) Percent overlap of species range with DoD installations: 2.0% 	Air Force: Joint Base Andrews Army: Adelphi Laboratory Center; Blossom Point Research Facility; Fort Detrick; Fort George G. Meade; Fort Lee; Sea Girt Navy: NAS Patuxent River (Bloodsworth Island Bombing Range, Webster Field); Naval Research Laboratory Washington (Pomonkey Detachment); NS Norfolk (Craney Island, Main Base); NSA Annapolis
Alligator Snapping Turtle (Macrochelys temminckii)	Jim Godwin	Proposed Threatened under ESA	Endangered: IL, IN Threatened: TX	NatureServe-G3 IUCN-Vulnerable Population- Unspecified	On November 9, 2021, the USFWS found that listing the species is warranted. Accordingly, they propose to list the Alligator Snapping Turtle as a threatened species with a rule issued under section 4(d) of the ESA	17	 Air Force: Barksdale AFB; Little Rock AFB; Moody AFB; Tyndall AFB Army: Fort Benning; Fort Chaffee; Fort Polk; Red River Army Depot; Robinson Maneuver Training Center Navy: NAS JRB NOLA; NAS Pensacola (Main Base; NOLF Bronson Field; Saufley Field NETPDTC); NAS Whiting Field; NCBC Gulfport (Western Maneuver Area) Percent overlap of species range with DoD installations: 0.8% 	Air Force: Eglin AFB; Hurlburt Field; Maxwell AFB Army: Camp Beauregard Training Site; Camp Gruber Maneuver Training Center; Camp McCain; Camp Minden Training Center; Camp Villere; McAlester AAP; Pine Bluff Arsenal Navy: NAS Meridian (Joe Williams Field; McCain Field; Searay Target Range); NAS Whiting Field (NOLF Evergreen, NOLF Site 8-A)

Common Name	Photograph	Federal Status	State Status	Global Status	National Listing Workplan Year	Number of DoD Sites Species Confirmed Present	DoD Sites Confirmed Present by Military Service	DoD Sites Unconfirmed and Potentially Present by Military Service
Gopher Frog (<i>Lithobates capito</i>)	J.B. Willson	Under Review or Petitioned	Endangered: SC Threatened: NC	NatureServe- G2 Imperiled IUCN- Vulnerable Population- Decreasing	2027	15	 Air Force: Avon Park AFR; Cape Canaveral AFS; Eglin AFB; MacDill AFB; Shaw AFB/Poinsett Electronic Combat Range Army: Camp Blanding Joint Training Center; Fort Benning; Fort Bragg; Fort Stewart; McCrady Training Center; Military Ocean Terminal Sunny Point; Tullahoma Training Site Marine Corps: MCB Camp Lejeune Navy: NAS Pensacola (Saufley Field NETPDTC); NAS Whiting Field (OLF Holley) Percent overlap of species range with DoD installations: 2.1% 	 Air Force: Hurlburt Field; Jacksonville Air National Guard; Joint Base Charleston (Weapons Station); McEntire Joint NGB; Patrick AFB (Jonathan Dickinson Missile Tracking Annex, Main Base, Malabar Transmitter Annex); Pope AFB; Seymour-Johnson AFB; Tyndall AFB Marine Corps: MCAS Beaufort; MCLB Albany; Townsend Bombing Range Navy: NAS Jacksonville (Main Base, OLF Whitehouse, Rodman Bombing Target Range); NAS Pensacola (Main Base, NOLF Bronson Field); NAS Whiting Field (Main Base, NOLF Evergreen, NOLF Harold, NOLF Pace, NOLF Santa Rosa, NOLF Site 8-A); Naval Station Mayport (Greenfield Plantation, Main Base, Naval Fuel Depot, Ribault Bay Village Housing); Naval Support Activity Orlando (LEFAC/Bugg Spring Facility); NAVSUBASE Kings Bay; NSA Panama City
Wood Turtle (Glyptemys insculpta)	Paul Block	Under Review or Petitioned	Endangered: IA Threatened: MN, NJ, VA, WI	NatureServe-G3 IUCN-Endangered Population- Decreasing	2024	13	Air Force: New Boston AFS Army: Camp Grayling Joint Maneuver Center; Devens Reserve Forces Training Area; Fort Belvoir; Fort Drum; Fort Indiantown Gap; Fort McCoy; Franklin Armory; Letterkenny Army Depot; Pembroke Regional Training Institute; Picatinny Arsenal; West Point Military Reservation Percent overlap of species range with DoD installations: 1.3%	Air Force: Cape Cod AFS; Hanscom AFB; Joint Base Andrews; Joint Base McGuire-Dix-Lakehurst; Otis Air National Guard; Warren Grove Air National Guard; Westover Air Reserve Base Army: Aberdeen Proving Ground; Adelphi Laboratory Center; Auburn Training Site; Bangor IAP ANGB; Bangor Training Site; Blossom Point Research Facility; Bog Brook Training Site; Brunswick Training Site; Camp Smith Training Site; Carlisle Barracks; Caswell Training Site; Ethan Allen Firing Range, Fort George G. Meade; Gardiner Training Site; Hollis Training Site; Plymouth Training Site Navy: Great Pond Outdoor Adventure Center; NAVSTA Newport; NCTAMSLANT DET Cutler (High Frequency Site, Very Low Frequency Site); NSF Carderock; NWS Earle; Rangeley SERE School
Western Pond Turtles Southwestern (Actinemys pallida) and Northwestern (Actinemys marmorata)	effrey E. Lovich, U.S. Geological Survey	Proposed Threatened under ESA	Endangered: WA	NatureServe-G3 IUCN-Vulnerable Population- Unspecified	In October 2023, the USFWS proposed to list the Northwestern Pond Turtle and the Southwestern Pond Turtle as threatened species under the ESA	13	 Air Force: Beale AFB; Edwards AFB; Travis AFB; Vandenberg AFB Army: Camp Roberts Training Site MTC; Camp San Luis Obispo; Fort Hunter Liggett; Military Ocean Terminal Concord, Parks Reserve Forces Area Marine Corps: MCB Camp Pendleton Navy: Naval Base Coronado (Remote Training Site Warner Springs); NAVBASE Ventura County (Point Mugu); NWS Seal Beach (Fallbrook Detachment) Percent overlap of species range with DoD installations: 0.7% 	 Air Force: March ARB; Pillar Point AFS Army: Camp Adair; Camp Murray; Joint Base Lewis-McCord;; Presidio Of Monterey/Fort ORD; Sierra Army Depot Marine Corps: MCAS Camp Pendleton; MCAS Miramar; MCLB Barstow Navy: NAS Whidbey Island (Ault Field, Seaplane Base); Naval Base Kitsap (Camp Mckean, Camp Wesley Harris, NBK Bangor, NBK Jackson Park Housing Complex and Naval Hospital Bremerton, NBK Keyport, Toandos Peninsula, Zelatched Point); Naval Base Ventura County (Port Hueneme); NRTF Dixon; Manchester Fuel Depot

Common Name	Photograph	Federal Status	State Status	Global Status	National Listing Workplan Year	Number of DoD Sites Species Confirmed Present	DoD Sites Confirmed Present by Military Service	DoD Sites Unconfirmed and Potentially Present by Military Service
Blanding's Turtle (Emydoidea blandingii)	Part-Brock	Under Review or Petitioned	Endangered: IL, IN, ME, MO, NH Threatened: IA, MA, MN, NY, OH	NatureServe-G4 IUCN-Endangered Population- Decreasing	2024	10	Air Force: New Boston AFS Army: Arden Hills Army Training Site; Camp Grayling Joint Maneuver Center; Camp Ripley; Devens Reserve Forces Training Area; Fort Custer Training Center; Fort Drum; Fort McCoy; New Hampshire Army National Guard Training Site Marine Corps: MCRC Battle Creek Percent overlap of species range with DoD installations: 0.3%	Air Force: Cape Cod AFS; Hanscom AFB; Offutt AFB; Otis Air National Guard; Westover Air Reserve Base Army: Bog Brook Training Site; Camp Curtis Guild; Camp Perry Training Site; Hollis Training Site; Iowa Army Ammunition Plant Navy: Naval Station Great Lakes
Western Spadefoot (Spea hammondii)	Robert Lovich	Proposed Threatened under ESA 2023	Several clades range-wide now state- listed	NatureServe-G2 IUCN-Near Threatened Population- Decreasing	2023	11	 Air Force: Vandenberg AFB; Beale AFB (Lincoln Receiver Site) Army: Camp Roberts Training Site MTC; Fort Hunter Liggett Marine Corps: MCAS Camp Pendleton; MCAS Miramar; MCB Camp Pendleton Navy: NAS Lemoore; Naval Base Coronado (Remote Training Site Warner Springs); Naval Base San Diego (Murphy Canyon Housing Area); NWS Seal Beach (Fallbrook Detachment) Percent overlap of species range with DoD installations: 1.8% 	Air Force: March ARB; Travis AFB Army: Camp San Luis Obispo; Presidio Of Monterey/Fort ORD Navy: Naval Base Coronado (Camp Michael Monsoor); Naval Base San Diego (Chollas Heights Housing Area, Mission Gorge Recreational Facility); Naval Weapons Station Seal Beach; NRTF Dixon
Florida Pinesnake (Pituophis melanoleucus mugitus)	CP. Willson	Determined Not Warranted for ESA Listing 2023	Threatened: FL	NatureServe-T3 IUCN-Subspecies not reviewed	2024	8	Air Force: Avon Park AFR; Cape Canaveral AFS Army: Camp Blanding Joint Training Center; Fort Benning; Fort Gordon; Fort Rucker Marine Corps: Townsend Bombing Range Percent overlap of species range with DoD installations: 2.5%	 Air Force: Hurlburt Field; Joint Base Charleston (Weapons Station) Marine Corps: MCAS Beaufort; MCLB Albany Navy: Naval Support Activity Orlando (LEFAC/Bugg Spring Facility); NAVSUBASE Kings Bay