Department of Defense
Legacy Resource Management Program

Recommended Best Management Practices
for the Western Pond Turtle
on Department of Defense Installations

Department of Defense Partners in Amphibian and Reptile Conservation

December 2020

Introduction

The Northwestern Pond Turtle, *Actinemys marmorata*, and Southwestern Pond Turtle, *Actinemys pallida* (collectively referred to as "Western pond turtle" in this document) is a species for which the U.S. Fish and Wildlife Service (USFWS) has been petitioned for listing under the Endangered Species Act (ESA). Western pond turtles are also on the Department of Defense at-risk herpetofaunal species priority list.

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 Western pond turtle. The management practices described in this document were developed specifically for DoD installations, but are also suitable for implementation off of DoD installations.

The management practices described in this report are intended 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 the Western pond turtle, while also providing information to comply with regulatory processes such as the Environmental Protection Agency's National Environmental Policy Act (NEPA) and associated components (i.e., Categorical Exclusions, Environmental Assessments, and Environmental Impact Statements). Implementation of these BMPs should not impede military readiness activities, should be documented in installation Integrated Natural Resource Management Plans (INRMPs), and should align with existing efforts among the DoD, federal/state governmental agencies, and non-governmental organizations (NGOs) to prevent this species' continued decline and preclude its listing under the ESA.

Species Profile

Description:

Among Emydidae (pond turtle family), the Western pond turtle is medium in size with a maximum length of 24 cm and a maximum recorded weight just over 1,200 g. Sexually mature adults have a length above 120 mm. They are mostly dark brown to olive in carapace color, but like other turtle species, they can become darker, usually with age. Dark spots or lines can mark individual scutes. Beneath, the plastrons start out yellowish with dark blobs slowly expanding through wear until most of the plastron is dark.

Males and females can be differentiated, but a series of characteristics are needed to give an overall impression and may not suffice individually. Males have flatter appearance with a concave plastron, a thick base of the tail, and a cloaca extended beyond the edge of the carapace, like most North American freshwater turtles. They can also have larger heads, longer noses, pointier snouts, larger necks, and yellow or white chin and throats. Females have a more rounded appearance, a flat plastron, thinner tail and cloaca positioned before the end of the shell, blunted snout, and a moustache across the upper lip. They also have darker markings on the chin and throat than males. Other than size, juveniles are often mistaken for females.

Age to maturity has been estimated at 4-10 years for females (longer in the northern parts of the range, shorter in the south). Male sexual maturity is unknown, but likely begins at 10-12 years in the northernmost range.

Figure 1. An adult Southwestern Pond Turtle (L), from the Mojave River, CA. photo by Jeff Lovich, U.S. Geological Survey, and a Northwestern Pond Turtle (R) from Beale AFB, photo by Chuck Carroll.

Figure 2. The plastron and carapace patterns of Southwestern Pond Turtle adults from Rio Santo Tomas, Baja California, Mexico. Photo by Robert E. Lovich.

Range: Despite very few native freshwater turtle species along the West Coast, the Western pond turtle has a wide-ranging distribution. The range covers aquatic habitats from native and reintroduced populations in Puget Sound, WA to strictly wild populations in Baja California, Mexico with a gap of coverage within central and southern Washington between the Puget Sound and Columbia River. The states of Washington, Oregon, Nevada, and California consider the species native.

The range formerly extended into British Columbia, Canada around the north coast of Puget Sound, but the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) declared the species extirpated due to several decades without a credible observation. The species was last seen in Canada in 1959 (AZA 2019).

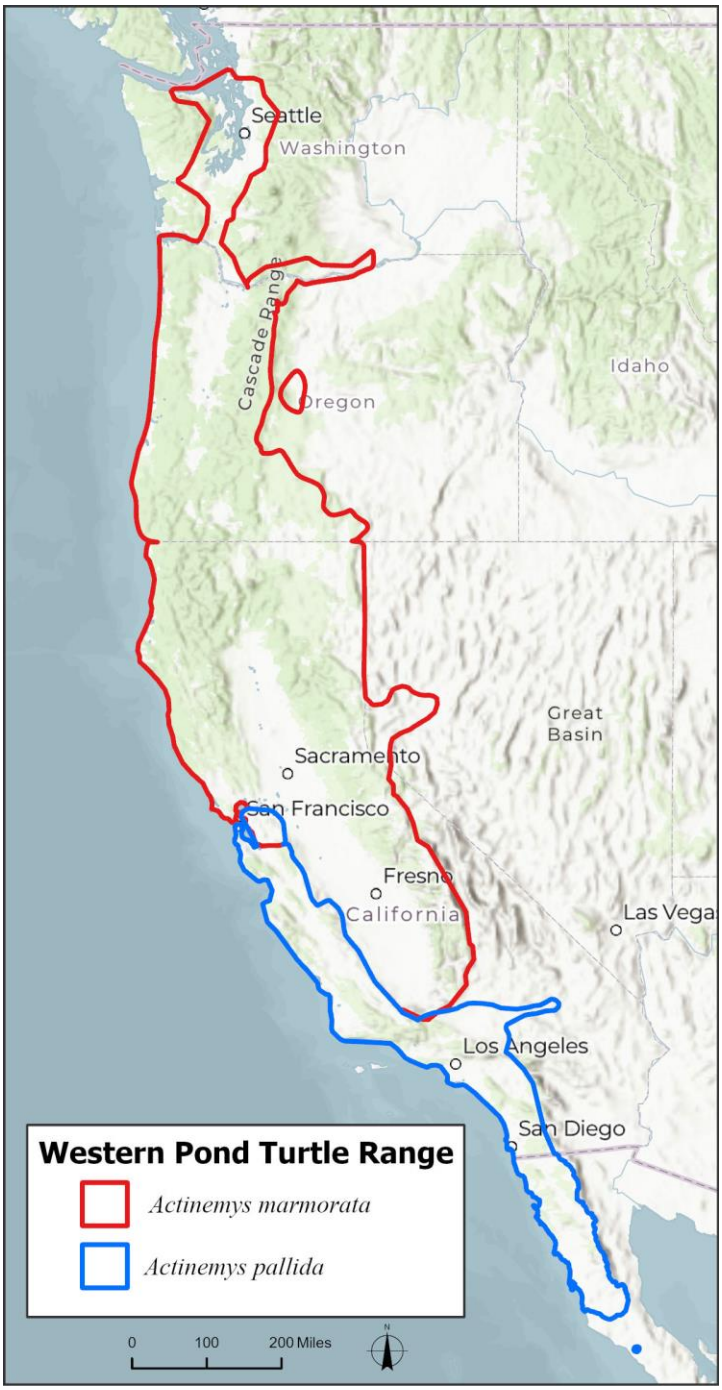


Figure 3. Western pond turtle range with species splits as proposed in Spinks et al. 2014 and Crother et al. 2017 (AZA 2019).

Distribution on Military Sites:

Western pond turtles affect 37 total military sites either with confirmed presence or through proximity associations. These effects are spread across Military Services, Reserves, Guards, Corps, and even the Defense Logistics Agency (DLA). Army Corps of Engineers lands are also thought to have significant holdings but are not included on this list.

Western pond turtles are confirmed present on the following 11 military sites (Petersen et al. 2018):

- Air Force: Beale AFB (CA), Travis AFB (CA), Vandenberg AFB (CA), Edwards AFB (CA)
- Army: Camp Roberts Training Site MTC (CA), Camp San Luis Obispo (CA), Fort Hunter Liggett (CA)
- Marine Corps: MCB Camp Pendleton (CA)
- Navy: NB Coronado (RTS Warner Springs) (CA), NAVBASE Ventura County (Point Mugu) (CA), NWS Seal Beach (Fallbrook) (CA)

Western pond turtles are unconfirmed and potentially present on the following 25 military sites; specimens have been found in the same county as these sites, but not within the boundaries of the installation itself (Petersen et al. 2018):

- Air Force: March ARB (CA), Pillar Point AFS (CA)
- Army: Camp Adair (OR), Camp Murray (WA), Joint Base Lewis-McChord (WA), Parks Reserve Force Training Area (CA), Presidio of Monterey / Fort Ord (CA), Sierra Army Depot (CA)
- Defense Logistics Agency: Manchester Fuel Depot (WA)
- Marine Corps: MCAS Camp Pendleton (CA), MCAS Miramar (CA), MCLB Barstow (CA)
- Navy: Point Sur (CA), NAS Whidbey Island (Ault Field, Seaplane Base) (WA), NB Kitsap (Camp Mckean, Camp Wesley Harris, NBK Bangor, NBK Jackson Park Housing Complex and Naval Hospital Bremerton, NBK Keyport, Toandos Peninsula, Zelatched Point) (WA), Indian Island (WA), NAVBASE Ventura County (Port Hueneme) (CA), NRTF Dixon (CA)

The Western pond turtle has historical records but is believed extirpated from the following military site:

- Navy: Military Ocean Terminal Concord (CA)

Habitat:

Western pond turtles require both aquatic and terrestrial habitats. Western pond turtles occupy riverine and open water habitats throughout their range. Almost any permanent water source can harbor or facilitate the species. The turtles can be found in fast-moving water habitats, but also need slack-water pools, underwater cover, and structures in or beside the water for basking. There are no preferred substrates with turtles using anything from bedrock to sand and mud. Aquatic vegetation, while a potential food source, does not need to be present. Preferred basking happens on surfaces and structures with immediate aquatic escape routes. Aquatic vegetation and slow-moving water is more important for juvenile turtles. These conditions are effective for development while providing for protection during development of their swimming ability. As turtles mature, they may become more independent of these conditions.

Western pond turtles move onto land for nesting, overwintering, dispersal, and aestivation. Nesting typically occurs within 100 meters (328 feet) of aquatic habitat in areas with compact well-drained soil, sparse vegetation, and good solar exposure. Nesting occurs in sun-warmed (typically south or west aspect) loose soil. The soil is typically fairly clear of vegetation.

Overwintering is typically done in dead vegetation and duff overland or underwater. Underwater mud or silt deposits can also host overwintering turtles. Overland habitats generally include native grasslands and forests. Many Western pond turtles overwinter on land at sites within 500 meters (1640 feet) from the water. Overwintering sites in duff might expose turtles to potential fire mortality, and closed vegetation habitats can discourage nesting.

Behavior:

Basking: Western pond turtles are more abundant at sites with ample basking opportunities. They bask throughout the year, but this behavior peaks in July, at least in parts of the range. Basking has been observed as low as 6^{o} C (Holland 1994). Typical basking structures include logs, stumps, rock piles, floating vegetation, and other mats or clumps unattached to shoreline or land.

Movements and Overwintering: Most out-of-water movement occurs in habitats that require brumation over the winter. Brumation is similar to hibernation except that dormancy is incomplete, and individuals may become active in suitable conditions to forage or resituate themselves. Overwintering can occur for up to 7 months out of the year in some colder portions of the range. In the southern portion of the range, dormancy may never occur or they brumate in place at the bottom of water features. In the northern and central range, the turtles can brumate in place or leave the water for overwintering sites in forested habitats under leaf and needle litter. These environments produce some of their own heat through composting, are easy to burrow into, and provide fire protection through depth and moisture accumulation though fire can be unnaturally severe due to human-manipulated ecology, negating this benefit.

Out-of-water movement is also essential is the nesting season, when females emerge to lay eggs. Males typically stay in situ during this period.

In-water movement is the preferred method, and travel over fairly long distances in short periods of time is usually a result of following surface waterways. Streams can provide primarily males with opportunities to interact between sites. They also act to conduct juveniles to points of safety away from the nesting site. Juvenile emydid turtles typically follow the path of least-resistance to the water, not to say downhill in all cases, but rather as water itself would trickle over the landscape if poured on the surface over the nest.

Courtship: Courtship occurs over a wide range of the year, and is not strictly tied to one or more seasons. The species occurs over a large latitudinal area, and southern populations have greater opportunity for mating across seasons simply because it is warmer than in northern populations. Females have complex reproductive systems that allow for delayed fertilization, multiple donor storage, and other related adaptations.

Nesting: Females choose to nest in open canopy sites, including agricultural fields and the edges of roads, which can lead to mortalities of both adults and hatchlings. Nests are constructed in loose soils, such as sands and loams with few large roots. Nests are constructed in the summer, most likely to be observed from April to August, depending on the location within the species range. Activity peaks in June and July between late afternoon and early morning in low light (but can happen at any time of the day). Most reproductive females oviposit annually, and some can oviposit twice a year.

Eggs are typically laid in nests dug in soft soil in open areas within 100 meters of water. Eggs in nests incubate by the heat of the sun (via the soil) and hatch in approximately 75 days (up to 125 days). Clutch size ranges from 3-13 eggs, with 4-7 being the average (Holland 1994). Hatchlings may emerge from the nest September to October and head to water, but most overwinter in the nest, hatching from the egg and remaining in the soil until the following spring.

Feeding: Western pond turtles are omnivores and forage underwater (it appears the species can't swallow in air), eating vegetation, aquatic invertebrates, eggs, and small vertebrates when available. They prefer live prey, but will feed on carrion. The most preferred foods are insect larvae, crustaceans, and annelids.

Threats:

The threats to Western pond turtles are mainly anthropogenic. Major factors cited as limiting western pond turtle populations include loss and degradation of aquatic habitats, reduced availability of nest habitat, elevated hatchling and nest predation, and disease. Declines have been most severe in the northern and southern parts of the range, specifically in Washington, Southern California, and Baja California.

- Habitat loss, degradation, and fragmentation are the biggest threats to western pond turtles. Extensive losses have occurred in the past and continue as land is converted for human use such as urbanization and agriculture. Drought, intense wildfire, and invasive vegetation continue to increase and are a direct threat to western pond turtles, as well as altering the habitats they require. Western pond turtle populations are also becoming

increasingly isolated because upland travel corridors are blocked by barriers such as roads, urbanized areas, and extensive agricultural lands.

- Predation of hatchlings by introduced American bullfrogs (*Rana catesbeiana*), smallmouth bass (*Micropterus dolomieui*), crayfish (e.g, *Procambarus clarkii*) and largemouth bass (*Micropterus salmoides*) is significant in some areas. Predation of nests may be greater than historical levels in human-altered landscapes due to an increase in medium-sized predators, such as raccoons (*Procyon lotor*), that thrive in these situations.
- Disease in western pond turtles is not well-understood, but is of great concern in WA and could threaten the species locally or range-wide, including upper respiratory disease and shell disease.
- Road mortality is a threat, particularly in urban and recreational areas. The effects of road mortality, along with the effects of nest habitat degradation, nest predation, and increasing temperatures, has led to skewed demographic ratios in many western pond turtle populations.
- Release of pet turtles to the wild is a growing threat and may result in increased competition and disease transmission.
- Past exploitation and current illegal collection has reduced western pond turtle numbers at many sites.
- Recreational activities such as hiking, biking, fishing, boating, and off-highway vehicles, and the associated disturbance within or adjacent to aquatic and nest habitats are an important concern in some parts of the species' range. Western pond turtles will rapidly flee from their basking sites into water when disturbed by the sight or sound of people and are sensitive to human disturbance even at relatively long distances (≥100 m, ≥328 ft) (Bury and Germano 2008).
- Climate change is expected to alter hydrology, increase temperatures, and increase the range of non-native species. Climate change could also impact turtle sex ratios, resulting in skewed populations and ultimate population decline.
- Small population sizes can lead to inbreeding depression, Allee effects, and increased risk from stochastic events.

Threats to breeding individuals pose threats to populations because the species takes years to become sexually mature, has low fecundity, and low survival rates for juveniles. Annual survivorship of breeding adults is critical for population persistence. Small losses to breeding-age adults that are sexually mature can irreversibly drive local extirpations.

Conservation Status

At the Federal level, the Center for Biological Diversity petitioned for listing the Western pond turtle (*Actinemys marmorata,* sic) in 2012. The USFWS may make determination(s) on splits or subspecies, but the petition covered the historical species. Bureau of Land Management and United States Forest Service consider the species Sensitive.

The species was also petitioned in 1992, but USFWS found the species was not warranted for listing at that time. COSEWIC has designated the species extirpated from Canada. The Western pond turtle is considered Vulnerable (VU) on the IUCN Red List (Tortoise and Freshwater Turtle Specialist Group 1996) and has a NatureServe Global Rank of G3-Vulnerable.

State Conservation Status:

Washington – State Endangered, no take/no possession. Last status review was 2017 (Hallock, McMillan, and Wiles 2017).

Oregon – Strategy Species, Sensitive-Critical, no take/no possession. Last status review was 2009 (Rosenberg et al. 2009).

Nevada – State Watch List, no season. No status review.

California – State Special Species of Concern (as 2 subspecies), no take/no possession. Last status review is unknown.

The State Natural Heritage Program databases rank the Western pond turtle as the following: S1: Critically Imperiled: WA; S2: Imperiled: NV and OR; and S3: Vulnerable: CA

Recommended Conservation Implementation Strategies and Best Management Practices for Western Pond Turtles on Military Sites

The below list is provided, and should not necessarily be considered prioritized as shown. All listed BMP's have value. Habitat management practices, while serving long-term benefits, should be carefully planned prior to their implementation to minimize potentially adverse impacts to turtle activity periods and locations. Make sure to document performance of any of the following BMPs, whether current or future, in your installation's INRMP. The USFWS may consider these proactive conservation actions prior to making a listing determination for this species.

1. **Define Western pond turtle occupation.** Documenting the occurrence or continued occurrence of Western pond turtles on DoD installations mentioned in this document can be achieved by conducting visual surveys and/or trapping. See *Inventory and Monitoring Techniques* below for more information.

2. **Monitor population trends.** As needed, collaboration with herpetological experts can assist in design of monitoring protocols for Western pond turtles. The Western Pond Turtle Rangewide Conservation Coalition (RCC) will be using similar monitoring techniques across the range of the species as part of their Rangewide Management Strategy. Surveys will include taking direct measurements or mark-recapture, which will provide measures of true population size, sex ratios, demography (i.e., representation of different age classes, and reproduction), growth, and survivorship. Telemetry studies can also help determine local movement patterns of pond turtles, especially overland between

aquatic habitats, and thus help identify barriers and hazards along movement corridors. Any monitoring should include observations of sick or diseased turtles so that information can inform management actions.

3. **Reduce invasive species and introduction mechanisms.** Invasive predators of hatchlings such as bullfrogs, snapping turtles, nonnative game fish, and exotic crayfish can be removed by targeted culling and pointed restrictions and information campaigns to end their release. Consider regulations for artificial lures, bans on use of these species, or restricting recreation from turtle-inhabited waters.

   Invasive plants such as bamboos and reeds crowd out bank and basking habitat and can bind soils that would be useful for nesting or block access to nesting habitat. They can also shade out basking sites, create toxic conditions in the water, or outcompete native vegetation food sources. Herbicide and root destruction may or may not be appropriate for the environment. Be sure to consult the label for aquatic use restrictions and consider erosion and sediment control before initiating some activities. Consider prioritizing Western pond turtle habitat in your weeds management program.

   Invasive competitors, including red-eared sliders (*Trachemys scripta elegans*), and other commonly released turtle pets, may reduce Western pond turtle populations. Pet policies and education programs for housing units, signs around occupied waters, and regulations against releasing turtles on base are effective strategies.

4. **Identify nesting locations and protect nests.** During May-July, seek information on observations of large freshwater turtles walking across roads, parking lots, lawns, and golf courses. These turtles are likely females in search of suitable nesting sites. Several actions/alternatives can be taken once female turtles are observing digging a nest and depositing eggs. First, observe the process without disturbing the female, note the location of the nest, and protect it with signage or fencing. Second, should resources and priorities allow, cover the nest with wire mesh to protect the egg contents from predation. To be at all effective, this must be done as soon as the nest is discovered, as most turtle nests are depredated by mammalian predators (mostly raccoons) the first night after the eggs are deposited. Covering the nest with a 3 ft x 3 ft flat piece of half-inch wire mesh protects the nest for the duration of incubation, but must either be removed, or modified prior to the baby turtles hatching and emerging from the nest, lest they become trapped by the wire covering.

5. **Identify nesting hazards and enhance nesting habitat.** Although Western pond turtles are known to inhabit man-made lakes and reservoirs, preferred nesting areas consist of areas of open soft soil with sparse canopy cover. The best habitat includes sparse vegetation in a southern aspect within 100 m of the occupied water feature. Larger nesting areas attract more females, have higher nest densities, and reduce overall predation.

Remove any woody plants that move into these areas annually, preferably at the height of summer or mid-winter when above-ground activity is low to nonexistent. Nesting mounds of soil can be created that attract female pond turtles. Studies show that broken soil releases chemical cues to native predators. Avoid unnecessary ground-breaking activities in nesting locations during nesting and hatchling seasons.

For high-predation nesting sites, consider predator control if necessary, but try to avoid damaging large predator populations with sophisticated social networks. These predators, such as canines and native felines, may increase predator numbers in the absence of mature, well defended territorial claims. More common predators, such as raccoons, opossums, skunks, feral cats, etc. have more impact on turtle hatchlings than tertiary predators do.

6. **Maintain and increase transitory and overwintering habitat.** Maintain and increase deep pool structures in streams and channels by reducing sedimentation and restoring natural flow regimes. Manage and maintain open fields and woodlands within 500 m of streams, rivers, ponds, and wetlands for over-wintering. Consider low-intensity burns in wetter seasons if possible to reduce threat of fire when turtles are exposed and out of the water and limit intensity to maintain forest canopy

7. **Enhance Western pond turtle basking habitat.** The addition of basking sites may be helpful to a turtle population. Trees or logs, floating platforms, stumps and rootballs, or small rock islands separated from the shoreline may provide both protective basking sites as well as sites visible for monitoring purposes. Turtles will spend more time basking if nearby human activities are obscured. One important key to use is the ability to mount the basking structure. While turtles are excellent climbers, grading a slope or a few steps from subsurface to platform surface helps to diversify the age structure using the platform. Platforms may also attract other wildlife to consider, such as nesting waterfowl and other amphibian and reptile species.

8. **Maintain the integrity of shoreline areas.** Often shoreline banks provide protected shade and shelter for both Western pond turtles and some of their prey. Rootwads and leaning trees may also provide basking platforms for certain angles of light during the day. Coarse woody debris from vegetation often provides natural basking in the open water as debris gets redistributed during high water and storm events. Shoreline vegetation is important in anchoring soils and sediment that otherwise bury useful underwater features and habitats for turtle food sources.

9. **Remove barriers and dams between ponds, streams, and nesting habitats**. Barriers may be physical blockages such as resource protection fencing, or hazards such as roads and potential entrapments. Where hazards can’t be removed, signs or temporary seasonal closures may be effective in reducing upland turtle mortality. Crossings such as elevated roadways and small gaps in fencing may allow enough migration to continue to allow cross-site gene flow to persist.

10. **Implement design modifications for artificial ponds used for irrigation, stormwater mitigation, golf courses, or other human needs so that they can support wildlife**. Often these ponds have limited human visitation and use. They can be perfect, quiet locations for Western pond turtles to carry out life activities without human interruption. Consider hydroperiod, ramifications of potential vegetation, and the use of artificial basking structures in determining suitability for these pools. Consider placement of these pools near other aquatic features for connectivity between habitats and long-term population benefits.

11. **Be alert for poaching activity**. Presumably, many aquatic water bodies on DoD facilities are open to legal fishing and recreation. Be aware, that collection of turtles by individuals, especially commercial collection for food or the pet trade, would represent a serious threat to maintaining stable, viable populations of Western pond turtles. Entanglement and drowning in fishing line and nets is unfortunately common in some areas with heavy fishing recreation pressure. Basking turtles of many species, including Western pond turtles, have been the target of "plinking" where individual recreationists with guns shoot basking turtles from logs, usually from boats. DoD Natural Resource managers should be alert for any signs of poaching activity. Non-targeted, passive poaching also occurs when Western pond turtles are accidentally hit by motor boats.

12. **Consider population manipulations that aid recovery.** Various methods of population manipulations include nest protection, captive rearing, and head-starting of hatchling turtles (i.e., raising hatchling turtles in captivity for their early vulnerable periods of life to increase their size and thus survivorship). Thus, a larger number of juvenile turtles are released and placed on a trajectory to adulthood. If increasing the numbers of turtles in a population is a goal, seek advice from conservation ecologists associated with DoD who have experience with these methods.

13. **Seek collaborations with species conservation and recovery-focused scientists**. Working with scientists, such as those associated with DoD and regional PARC networks can lead to discussions, brainstorming, and efficient and effective methods to help DoD natural resource managers obtain the information they need to manage and recover endangered and threatened species, minimize conflicts with the military mission, and maintain military readiness. The Western Pond Turtle Rangewide Conservation Coalition can also provide a wealth of information and help to connect you with regional experts and stakeholders for the species.

Inventory and Monitoring Techniques for the Western Pond Turtle

Basking or Visual Encounter Surveys

Visual surveys of artificial or natural basking sites (i.e. logs, banks and sandbars, etc.) can be conducted with speed, efficiency, and a much shorter duration than other ground survey methods. This method is not ideal for quantification, but it requires much less effort than other survey methods such as mark-recapture. Surveys should be conducted when environmental

conditions are suitable for turtle basking activity (minimum temperatures of 10° C at time of survey, more suitable approaching 21° C).

Researchers should stagger survey timing to find optimum basking conditions. For instance, as maximum daytime temperatures rise, turtles will often bask earlier in the morning and begin other activities such as underwater foraging during the warmest parts of the day.

Anchored basking platforms and other artificial structures can standardize surface area and other variables to compare abundance and make turtles easier to see, size, and identify. They also provide additional basking space and predator protection. Pond turtles are very wary and will dive at first notice of human presence. Align visual barriers for approach to any viewing points. Combining obstructed approach with open viewing of the actual basking feature yields the best opportunity for success.

Hand Catch and Release

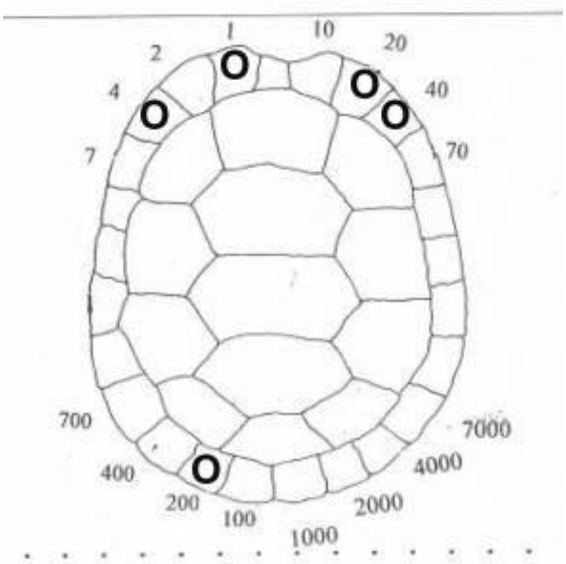
If trapping surveys will not be conducted, due to difficult terrain, inadequate water depths, insufficient funding, etc., visual surveys with catch and release by hand may provide estimates of relative abundance and size classes.

Trapping

Baited hoop traps can provide the most effective trapping conditions in varying water depth, especially shallow conditions. Comparable methods for Spotted Turtles (*Clemmys guttata*) are well published and recommended traps are appropriate in size. Care must be taken to leave an exposed air gap at the top of the hoop even in conditions such as tidal influence or rainfall event-induced flooding to prevent turtles from drowning. Oily bait, such as sardines in oil, are best by providing a drifting slick to lure in turtles. Traps must be set far enough away from embankments to avoid becoming predator cafeterias, and any sign of predation should curtail trapping efforts long enough to deter the predator and remove likelihood of trap association. Basking traps are less effective, but they can be used in deeper water habitats.

Mark-recapture

Mark-recapture is still the most widely-used method to census turtle populations. This technique involves making permanent marks on the shell, such as notching or drilling the lateral scutes to provide long-term, distinctive visual indicators of individual turtles.



A marking system, such as the one illustrated, can be used to mark individual turtles. The 1-2-4-7 system allows for any number between 1 and 9 by marking or drilling. No more than two scutes on any of the four “corners” of the turtle are marked.

The identification code for this turtle is 265. Up to 9999 different turtles can be identified with this method. The marks on turtle shells can be made as notches from a knife or file or as holes drilled through the marginals (illustrated here). Hatchlings can be marked with small scissors or fingernail clippers. Marks on the shells of terrestrial and freshwater turtles do not damage the turtle but are permanent, being identifiable as many as 30 years after initial marking.

Genetics

Limited invasive specimen sampling such as shell filings, nail clippings, blood draws, or carcass tissue sampling can provide genetic markers for a locality. These markers can be used in a wider context with regional partners such as Southwest Partners in Amphibian and Reptile Conservation (SWPARC) to determine isolation, dispersal, and law enforcement functions such as poaching prosecution and return of seized turtles. Work with DoD PARC representatives to guide studies or link to state and regional studies already underway.

Benefits of Western Pond Turtle Best Management Practices to Military Training and Operations

1. Western pond turtles can co-exist with military training. Expanding and enhancing native habitat outside of mission space while providing ongoing mission habitat management and monitoring grows the population while growing the force.

2. Western pond turtle populations on military bases may also benefit from reduced poaching pressures by existing on secure or limited access military facilities.

3. Western pond turtles spend most of their time in habitats that are already protected under INRMPs, regulations, and Executive Orders such as ponds, streams, and wetlands that do not encounter military training activities.

4. Maintaining a viable population(s) of Western pond turtles on Defense lands may document reduced levels of endangerment for the species and reduce risk of listing under the ESA. Most sensitive herpetological species more often meet recovery criteria on DoD landscapes than other Federal, State, and private lands, and benefit from Sikes Act programs long before listing.

5. Basking turtles are of interest to people who appreciate the outdoors, especially to children, and enhance the quality of the living and working environment on military bases.

6. Western pond turtle habitat is beneficial for the military by providing erosion and sedimentation control, water storage, biosecurity, cover and concealment, aesthetics, and beneficial habitat conditions for other at-risk species.

7. Western pond turtles are found in states that already have high-profile, high-expenditure endangered species management programs that function in coordinating military training with species conservation at an extremely high level and benefit from umbrella-effects these other species carry. Conservation staff, military units, commands, and communication are prepared,

educated, and likely already providing services called for in this document. With adoption of this document for the Department, those bases and installations may be better prepared to gain credit for this work and avoid listing or critical habitat designations and their restrictions to the mission.

Military Points of Contact

Contact your Military Service headquarters natural resources personnel or DoD PARC contacts listed below with questions regarding Western pond turtle 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)

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DoD PARC

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For additional experts on turtles in general, search the Partners in Amphibian and Reptile Conservation (PARC) Expert Partner Database https://parcplace.org/network/parc-partners/

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