

**A.14 WESTERN POND TURTLE
(ACTINEMYS MARMORATA)**

A.14.1 Legal and Other Status

The western pond turtle previously included two subspecies, the northwestern pond turtle (*Clemmys marmorata marmorata*) and the southwestern pond turtle (*C. m. pallida*). Both were petitioned for federal listing as endangered or threatened on January 29, 1992. In 1993, the USFWS determined that there was insufficient information to propose listing. Recent phylogenetic research combines the two subspecies into a single species (*A. marmorata*) (Bury and Germano 2008, Spinks and Shaffer 2005). The western pond turtle is a California Species of Special Concern.

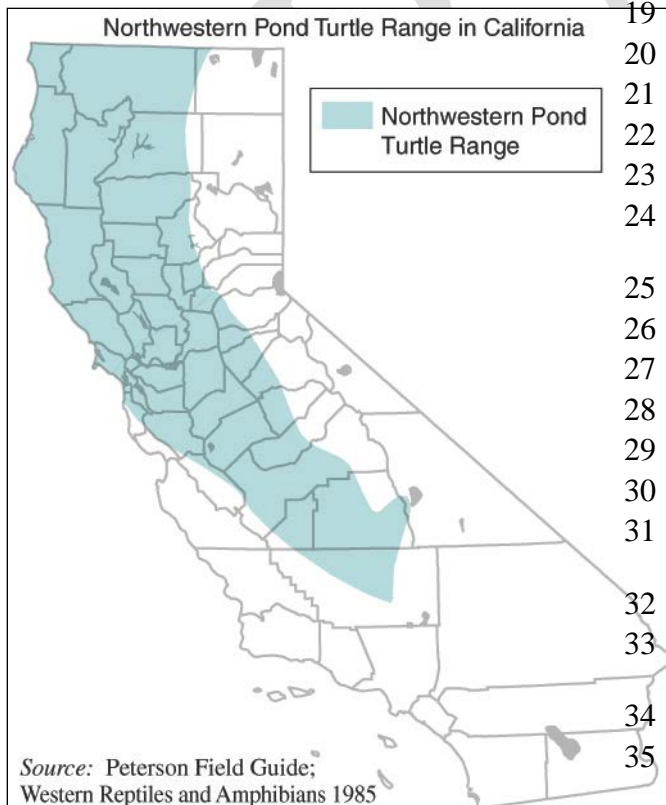


photo courtesy Gary R. Zahm

A.14.2 Species Distribution and Status

A.14.2.1 Range and Status

Historically, the western pond turtle was relatively continuous in most Pacific slope drainages from Washington along the Columbia River to northern Baja California, Mexico (Jennings and Hayes 1994). In California, this species historically occurred in most Pacific slope drainages between the Oregon and Mexican borders and in only two drainages on the desert slope: the



Mojave River (San Bernardino County) and Andreas Canyon (Riverside County) (Jennings and Hayes 1994). Elevation range for the species extends from near sea level to 4,690 feet (1,430 meters) (Jennings and Hayes 1994).

The distribution of the western pond turtle extends from the Oregon border to the San Francisco Bay Area through San Joaquin and Tuolumne County to the east. The southwestern pond turtle is known from Santa Clara County south to the Mexican border.

A.14.2.2 Distribution and Status in the Plan Area

California Department of Fish and Game has five records of the western pond turtle

1 within Butte County (CNDDDB 2006). Two records are located west of Gridley, one within the Gray
2 Lodge Wildlife Area and the other in the Butte Sink area southeast of Butte Creek.

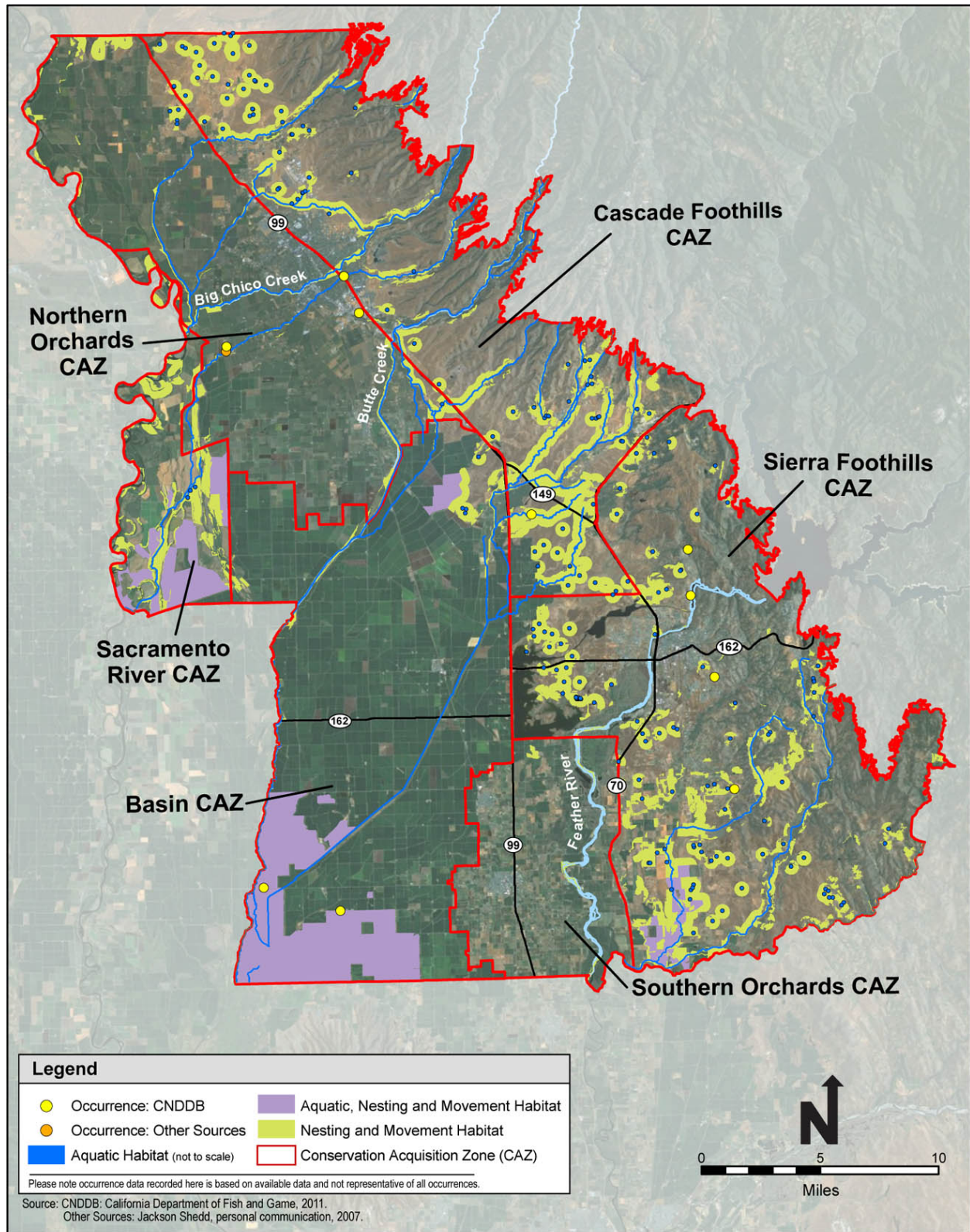
3 The remaining three are located near Oroville; one is 0.5 mile north of the Thermalito Diversion
4 Dam, and another is north-northeast of South Table Mountain in the ephemeral Chevereaux
5 ponds. The final record is located along Gold Run Creek, east of Highway 99, north of
6 Cottonwood Road, and about 7 miles northwest of Oroville (see Figure A-14).

7 **A.14.3 Habitat Requirements and Special Considerations**

8 The western pond turtle requires stagnant or slow-moving water in aquatic habitats. This species is
9 uncommon in high gradient streams most likely due to low water temperatures, high current
10 velocity, and low food resources, which may limit their local distribution (Jennings and Hayes
11 1994). Habitat quality may be dependent on the availability of basking sites, such as locations
12 along the bank or in shallow water where the turtles can bask in the sun. Local populations of
13 western pond turtles can increase according to the availability of basking sites (Jennings and Hayes
14 1994). Hatchlings forage in shallow water areas with dense submergent or short emergent
15 vegetation, where small aquatic organisms are likely to be in abundance.

16 For reproduction, the western pond turtle requires upland habitat adjacent to the aquatic habitat
17 for oviposition (i.e., egg laying). Suitable oviposition sites must have the proper thermal and
18 hydric environment for incubation of the eggs (Jennings and Hayes 1994). The eggs are best
19 suited for development in dry, warm places because of their thin shells. The female typically
20 digs the nest in soil with high clay or silt content on an unshaded slope. The slope with the nest
21 is most likely south-facing to ensure that the substrate temperatures will be warm enough from
22 the direct sunlight to incubate the eggs (Jennings and Hayes 1994). Proximity of the nesting site
23 to aquatic habitat is reliant on availability, and the nest site is generally within 656 feet (200
24 meters) from the aquatic habitat, but can be up to 1,319 feet (402 meters) away (Storer 1930,
25 Jennings and Hayes 1994).

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Figure A-14. Western Pond Turtle Modeled Habitat and Recorded Occurrences

1 **A.14.4 Life History**

2 The western pond turtle is primarily aquatic and leaves the water only to reproduce, aestivate,
3 and to overwinter (Jennings and Hayes 1994). The activity level of the western pond turtle
4 dramatically increases when the surface water temperature reaches 15°C (59°F) consistently
5 (Jennings and Hayes 1994); in northern California, this temperature regime occurs in March or
6 April. In October or November, the turtles disappear to find adequate sites to spend the winter.
7 Daily behavior of the western pond turtle revolves around thermoregulation. Turtles consistently
8 bask on logs and other objects protruding from the water surface when the air temperatures are
9 warmer than the water temperatures (Holland 1985, Jennings and Hayes 1994). Mats of
10 submergent vegetation also create good water basking locations because the dense vegetation
11 traps surface water allowing higher surface water temperatures (Holland 1985). When air
12 temperatures rise above 40°C (104°F), western pond turtles typically bask in the warmer surface
13 water (Holland 1985). Turtle tend to avoid water with temperatures greater than 39°C–40°C
14 (103-104°F) (Jennings and Hayes 1994).

15 Mating usually occurs in late April or early May and oviposition can occur as early as late April
16 and as late as early August, but most eggs are deposited during May and June (Jennings and
17 Hayes 1994). Females leave the aquatic habitat to find an upland location to nest. The female
18 will construct the nest about 3.9–4.7 inches (10–12 centimeters [cm]) deep and deposit one to 13
19 eggs with a thin, hard outer shell (Jennings and Hayes 1994). Females can lay more than one
20 clutch a year (Jennings and Hayes 1994).

21 After the eggs hatch, the hatchlings appear to remain in the nest through the fall and winter
22 because there have been very few observations of hatchlings during this time (Holland 1985).
23 Most hatchlings will emerge in the spring from the nest and move to aquatic habitats. The young
24 turtles will spend most of their time feeding in shallow waters with dense vegetation on small
25 aquatic organisms. Young turtles tend to grow slower when food resources are scarce and at
26 higher latitudes and altitudes. Typically, hatchlings will double in size during the first year and
27 continue to increase in size over the following four to five years (Storer 1930; Holland 1985).
28 Turtles reach sexual maturity at 7 to 11 years of age. Turtles in northern California mature later
29 and at a larger size compared to turtles in the south. Western pond turtles are thought to be long-
30 lived.

31 Western pond turtles are dietary generalists and highly opportunistic and will consume almost
32 anything that they are able to catch and overpower (Jennings and Hayes 1994). The turtles
33 pursue their prey relatively slowly, thus their diet typically consists of relatively slow-moving
34 aquatic invertebrates (e.g., the larvae of many aquatic insects), carrion, and aquatic vegetation
35 (Jennings and Hayes 1994).

1 **A.14.5 Threats**

2 The main factors contributing to the decline of the western pond turtle population include loss of
3 aquatic and nesting habitat from urban development and conversion of native habitats to
4 agricultural lands; the increase of introduced nonnative predators (i.e., exotic turtles); predation
5 on young, especially by raccoons; and commercial harvest (Jennings and Hayes 1994, Gale
6 2004).

7 **A.14.5.1 Habitat Loss and Fragmentation**

8 Habitat loss and fragmentation produce small populations that are increasingly isolated and
9 limited in space, thus reducing the movement of individuals and genetic exchange between
10 populations. These small, isolated populations are highly susceptible to extinction caused by
11 catastrophic or stochastic events. Isolation limits the ability of the population to recolonize areas
12 with suitable habitat where western pond turtles may have been present in the past.

13 Agricultural practices such as disking, intensive livestock grazing, and trampling have degraded
14 many remaining vernal pools and wetland habitats, as have off-road vehicle use and
15 contaminated runoff.

16 Roads can create a barriers to dispersal movements of western pond turtle and contribute to the
17 isolation of populations. Contaminants from road materials, leaks, and spills could further
18 degrade aquatic habitats used by this species. Corridors from aquatic habitat to historical and
19 long-term nesting sites can be blocked by roads and development. Movement of adult females to
20 and from the nesting location and the movement of hatchlings from nests to aquatic sites can be
21 impeded and impacted (Jennings and Hayes 1994).

22 **A.14.5.2 Predation**

23 Predation, especially of hatchlings and eggs, is a major mortality factor for western pond turtles
24 (Holland 1994). Raccoons (*Procyon lotor*), bullfrogs (*Rana catesbeiana*), largemouth bass
25 (*Micropterus salmoides*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), and feral
26 and domestic dogs (*Canis familiaris*) are known to be major predators of western pond turtles
27 (Holland 1994). Other known predators include osprey (*Pandion haliaetus*), bald eagle
28 (*Haliaetus leucocephalus*), river otter (*Lutra canadensis*), and mink (*Mustela vison*) (Manning
29 1990 in Holland 1994). It is though that many other fish, amphibian, bird, and mammal species
30 also prey on western pond turtle (Holland 1994). Raccoons, in particular, are known to
31 depredate nests, sometimes destroying all nests in an entire communal nesting area (Yolo Natural
32 Heritage Program 2009). In urban areas, litter and pet food can increase the presence of some
33 predators, potentially leading to increased predation on turtles.

1 **A.14.5.3 Exotic Species**

2 Western pond turtles can be crowded out of suitable aquatic habitat by invasive, nonnative
3 turtles. These exotic turtles are the descendants of released household pets (Gale 2004). “Red-
4 eared sliders” and spiny softshell turtles can introduce diseases to the western pond turtle and
5 compete for resources.

6 **A.14.6 Relevant Conservation Efforts**

7 Conservation efforts for the western pond turtle are largely limited to those proposed under
8 habitat conservation planning efforts. Conservation actions can include preservation of occupied
9 and potentially-occupied habitats, management of watercourses and water bodies to protect
10 existing populations and encourage reestablishment of populations, and restoration or
11 enhancement of channel, riparian, and adjacent upland habitats to benefit pond turtles. The
12 western pond turtle is a covered species under several plans including the Natomas Basin Habitat
13 Conservation Plan, the East Contra Costa County Habitat Conservation Plan/Natural Community
14 Conservation Plan, and the San Joaquin County Multi-Species Habitat Conservation and Open
15 Space Plan; and is proposed for coverage under the South Sacramento County Habitat
16 Conservation Plan, Yolo County Natural Heritage Program Plan, Solano County Multispecies
17 Habitat Conservation Plan, and Bay Delta Conservation Plan.

18 DFG recently commissioned the U.S. Forest Service’s Redwood Sciences Lab to prepare a
19 conservation strategy for the western pond turtle in California.

20 **A.14.7 Species Habitat suitability Model**

21 **A.14.7.1 Aquatic Habitat**

22 Foraging habitat for the western pond turtle includes the following land cover types and
23 conditions:

- 24 • Perennial streams, excluding the Sacramento and Feather Rivers;
- 25 • Managed wetland (Aquatic, Nesting, and Movement Habitat);
- 26 • Emergent wetland; and
- 27 • Stock ponds located in blue oak savanna, grassland, and grassland with vernal swale
28 complex land cover types.

29 **A.14.7.2 Assumptions**

30 Western pond turtles reside in stagnant or slow-moving water in aquatic habitats. The species is
31 uncommon in high gradient streams (Jennings and Hayes 1994). High gradient streams,
32 however, cannot be distinguished from low gradient streams in the GIS database. Consequently,
33 the model likely overestimates the extent of stream habitat. The Sacramento River and Feather

1 River are excluded from the model because, with perhaps the exception of low velocity
2 backwater areas, flow velocities are considered to be too high to provide habitat. Perennial stock
3 ponds also provide habitat when located within blue oak savanna and grassland land cover types
4 that support nesting habitat (see below). The model overestimates the extent of stock pond
5 habitat because stock ponds that maintain water perennially cannot be distinguished from ponds
6 that maintain water intermittently in the GIS database.

7 **A.14.7.3 Nesting and Movement Habitat**

8 Nesting habitat for the western pond turtle includes blue oak savanna, managed wetland
9 (Aquatic, Nesting, and Movement Habitat), grassland, grassland with vernal swale complex and
10 associated vernal and altered vernal pools, cottonwood-willow forest, valley oak riparian forest,
11 and willow scrub adjoining and within 500 meters of aquatic habitat (see above).

12 **A.14.7.4 Assumptions**

13 The western pond turtle is primarily aquatic and leaves the water only to reproduce, aestivate,
14 and overwinter (Jennings and Hayes 1994). Females leave the aquatic habitat to find an upland
15 location to nest; proximity of the nesting site to aquatic habitat is dependent on availability, and
16 the nest site is generally within 200 meters from the aquatic habitat, but can be up to 402 meters
17 away (Storer 1930, Jennings and Hayes 1994). A distance of 500 meters from aquatic habitat
18 was selected to better ensure that all likely habitat used for movement among aquatic habitat
19 areas as well as nesting habitat was encompassed in the model. Agricultural, urban, disturbed,
20 orchard and vineyard land cover types are not considered to support nesting habitat because they
21 are subject to regular disturbances that could destroy nests.

22 **A.14.8 Recovery Plan Goals**

23 A recovery plan has not been prepared for the western pond turtle because it is not federally
24 listed as threatened or endangered.

25 **A.14.9 References**

26 **Literature Cited**

- 27 Bury, R. B. and D. J. Germano. 2008. *Actinemys marmorata* (Baird and Girard 1852) – Western
28 Pond Turtle, Pacific Pond Turtle. Conservation of Freshwater Turtles and Tortoises: A
29 Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group,
30 edited by A. G. J. Rhodin, P. C. H. Pritchard, P. P. van Dijk, R. A. Samure, K. A.
31 Buhlmann, and J. B. Iverson. Chelonian Research Monographs No. 5.
- 32 CNDDDB (California Natural Diversity Database). 2006. Sacramento: California Department of
33 Fish and Game.

- 1 Gale, Ivan. 2004. A threat to native western pond turtles. Point Reyes Light, Tomales Bay
2 Publishing Co. April 29.
- 3 Holland, D. C. 1985. An ecological and quantitative study of the western pond turtle (*Clemmys*
4 *marmorata*) in San Luis Obispo County, California. Master's thesis, Fresno State
5 University, Fresno, CA.
- 6 Holland, D. C. 1991a. A synopsis of the ecology and status of the western pond turtle (*Clemmys*
7 *marmorata*) in 1991. Report prepared for the United States Fish and Wildlife Service,
8 National Ecology Research Center, San Simeon Field Station, San Simeon, California.
- 9 Holland, D.C. 1994. The Western Pond Turtle: Habitat and History. Final Report. DOE/BP-
10 62137-1. Bonneville Power Administration, U.S. Department of Energy, and Wildlife
11 Diversity Program, Oregon Department of Fish and Wildlife, Portland, OR.
- 12 Jennings, M. R., and M. P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in
13 California. California Department of Fish and Game. Rancho Cordova.
- 14 Manning, T. 1990. Summer feeding habits of the river otter (*Lutra canadensis*) on the
15 Mendocino National Forest, California. *Northwest Naturalist* 71:38-42.
- 16 Spinks, P. Q. and H. B. Shaffer. 2005. Range-wide molecular analysis of the western pond turtle
17 (*Emys marmorata*): cryptic variation, isolation by distance, and their conservation
18 implications. *Molecular Ecology* 14:2047-2064.
- 19 Storer, T. I. 1930. Notes on the range and life-history of the Pacific fresh-water turtle, *Clemmys*
20 *marmorata*. *University of California Publications in Zoology* 35(5):429-441.
- 21 Yolo Natural Heritage Program. 2009. Species account: western pond turtle. Yolo County, CA.