ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** ARAAD08020

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME:	*Terrapene ornata* Agassiz, 1857
COMMON NAME:	Ornate Box Turtle
SYNONYMS:	*Cistudo ornata* Agassiz, 1857
	Terrapene ornata luteola Smith and Ramsey, 1952
	Terrapene ornata cimarronensis Cragin, 1894
	Terrapene longinsulae Hay, 1908
	Terrapene whitneyi Hay, 1916
OTHER COMMON NAMES:	Plains Box Turtle
	Western Box Turtle
	Desert Box Turtle
	Desert Ornate Box Turtle
	Tortuga de Caja Ornamentada (Spanish)
	Tortuga adornada (Spanish)
FAMILY:	Emydidae

AUTHOR, PLACE OF PUBLICATION: Agassiz, 1857. Contributions to the Natural History of the United States of America Vol. 1, Part II: North American Testudinata.

TYPE LOCALITY: Van Horn, Culberson County, Texas, USA.

TYPE SPECIMEN: TCU 1280. W. Elton Smith. October 22-24 1950.

TAXONOMIC UNIQUENESS: The genus *Terrapene* contains seven total species (Turtle Taxonomy Working Group (TTWG) 2025). Three of these are present in the U.S. (*T. carolina, T. ornata,* and *T. triunguis*) (Nicholson 2025), and only *T.ornata* is present in Arizona (Holycross et al. 2022). *T. ornata* was previously recognized as having two subspecies, *T. o. ornata* and *T. o. luteola* (Crother 2012), until Martin et al. (2013) found no support for a distinction between them and recommended their synonymy. However, because their analysis was based on only one mitochondrial and one nuclear gene, Crother (2017) cautiously retained both subspecies, pending further geographic and molecular sampling. The TTWG (2021) synonymized *luteola* with *ornata*, but states that more complex genetic sampling may revise this decision. HDMS follows TTWG (2025) in not recognizing the subspecies.

DESCRIPTION: The Ornate Box Turtle is a relatively small turtle (Murphy 2019). It is sexually size dimorphic, with females larger than males (Hall and Seidl 2004); females growing to 154 mm (6.1 in) and males growing to 130 mm (5.1 in) in total length (Murphy 2019). Hatchling carapaces are 28–32 mm (1.1–1.3 in) in length (Murphy 2019). They have a dark brown, dome-shaped shell often patterned with yellow lines, although this coloration fades with age (Degenhardt et al. 1996; Holycross et al. 2022). Their skin color is dark brown to reddish-brown, with yellow or orange spots (Degenhardt et al. 1996).

Males often have orange-red irises, a slight concave in the hind portion of the plastron, and a thicker tail with the cloaca extending past the distal end of the plastron. Females tend to be larger in size, have a more domed carapace and proportionally larger pelvic canal than males, and yellow-brown irises (Murphy 2019, Holycross et al. 2022, Hughes et al. 2024). For males, the first toe on each hindfoot is thicker and turned inwards to assist in holding a female's shell during copulation (Degenhardt et al. 1996, Stebbins and McGinnis 2018, Hughes et al. 2024). Compared to adults and juveniles, hatchling colors are generally more muted, with a lighter brown carapace and yellow lines appearing more cream-colored (Hughes et al. 2024). Juvenile Ornate Box Turtles have a cream-colored plastron with a large and dark central blotch (Stebbins and McGinnis 2018).

A distinguishing feature of the Ornate Box Turtle is the singular plastron hinge at the junction between the pectoral and abdominal scutes, allowing the shell to fully enclose when the turtle needs to retreat (Degenhardt et al. 1996, Murphy 2019, Holycross et al. 2022). Ornate Box Turtles found in Arizona have more prominent yellow lines on their shell (11–14 on second costal scute) than box turtles found elsewhere (5–10 on second costal scute) (Behler and King 1979).

AIDS TO IDENTIFICATION: In Arizona, the Ornate Box Turtle is the only fully terrestrial turtle and the only turtle that has a plastron with only a single hinge (Holycross et al. 2022). The radiating yellow lines on the shell are also diagnostic (Holycross et al. 2022).

ILLUSTRATIONS

Color photo (Heymann 1975, page 60)
Color photo (Behler and King 1979, plate 307)
Color photo (Degenhardt 1996, plate 30)
Color photo (Stebbins and McGinnis 2018, page 210)
Color photos (Murphy 2019, pages 80–81)
Color photo (Holycross et al. 2022, page 55)
Color photos (Arizona Game and Fish Department (AZGFD) 2023, https://live-reptilesofaz.pantheonsite.io/turtle-amphibs-subpages/h-t-ornata/)
Color photos (TTWG 2025, page 219)

Color photo (Arizona Wildlife Conservation Strategy 2026, https://awcs.azgfd.com/species/reptiles/terrapene-ornata)

TOTAL RANGE: The Ornate Box Turtle ranges from southern Wisconsin and western Indiana west to southeastern Wyoming, south to Louisiana and southeastern Arizona into north-central Mexico (Ward 1978, Degenhardt et al. 1996). It can be found in the US states of southeastern Arizona, central and western Arkansas, Colorado, Illinois, western Indiana, Iowa, Kansas, western Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, southern South Dakota, Texas, Wisconsin, and extreme southeastern Wyoming. In Mexico, it is present in Chiapas, Chihuahua, and Sonora (TTWG 2025, Uetz et al. 2026).

RANGE WITHIN ARIZONA: In Arizona, the Ornate Box Turtle occurs in the southeast corner of the state at lower elevations in Cochise, Galiuro, Graham, Pima, Pinal, and Santa Cruz counties (Holycross et al. 2022). There is a single report of the species from Greenlee County (iNaturalist 2026). It occurs in Aranaipa, San Bernadino, San Pedro, San Simon, and Sulphur Springs valleys and at lower elevations in the Chiricahua, Dos Cabezas, Dragoon, Huachuca, Mule, Pajarito, Pinaleno, Rincon, Santa Catalina, and Santa Rita mountains (Heritage Data Management System (HDMS), AZGFD, unpublished data accessed 2026-07-08).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The Ornate Box Turtle is a diurnal species that rises with the morning sun to begin foraging and remains active for about 3 hours (Degenhardt et al. 1996, Plummer 2003, Murphy 2019). After sheltering in the shade to escape the mid-day heat, they will often return to foraging in the late afternoon for about 1.5 hours (Degenhardt et al. 1996, Plummer 2003, Murphy 2019). Cloudy or rainy weather may extend this foraging period (Degenhardt et al. 1996). These turtles can quickly withdraw into their fortified shells and will often hiss, bite, and musk or urinate when threatened (Heymann 1975, Dodd 2001, Gangloff and Nash 2010).

Ornate Box Turtles are only active above-ground for about four months out of the year. A five-month hibernation period followed by a three-month estivation period combine for a total of eight months in subterranean refuge, usually from November to June (Plummer 2004). Ornate Box Turtles take refuge in the burrows of Banner-Tailed Kangaroo Rats (*Dipodomys spectabilis*) or in self-created burrows or burrows excavated by other animals (Nieuwolt 1996, Hall and Steidl 2004, Plummer 2003, Murphy 2019, Holycross et al. 2022). High temperatures and humidity prompt box turtles to use self-dug dig forms more frequently, indicating that shallow burrowing helps them escape sudden heat spikes that approach the species' upper thermal limits (Hall and Steidl 2004).

Ornate Box Turtles have been documented using water for drinking and soaking, and although primarily terrestrial, they are capable of swimming and moving through shallow wetlands/drainages (Norris and Zweifel 1950, Gehlbach 1956, Legler 1960, Blair 1976). In western Nebraska, box turtles will frequently migrate to water sources up to a kilometer away after waking up from hibernation, then return to their home range (Degenhardt et al. 1996).

Habeck et al. (2019), using a synthesis of 22 different home range estimates, found that Ornate Box Turtles have a mean home range of 4.94 ha (12.2 ac) (range 0.825–19.097 ha (2.1–47.2 ac)). They also noted that males have an average home range that is 6% larger than females. In Arizona, mean home range size was 5.2 ha (12.8 ac) with a range of 0.44–17.3 ha (1.8–42.8 ha) with larger home ranges if a perennial water source was within 2 km (Hall and Steidl 2004). Ornate Box Turtles show strong home-range philopatry, often traveling towards the same home range, nesting, and overwintering sites after translocation (Doroff and Keith 1990, Redder et al. 2006, Bernstein et al. 2007). Individuals are non-territorial and home ranges often overlap with other individuals (Legler 1960, Nieuwolt 1996, Refsnider et al. 2012).

Both males and females continue to grow until ages 10–15, reaching carapace lengths of around 110 mm (Blair 1976). Estimates of Ornate Box Turtle's lifespan range from 45–57 years, and one female was confirmed to be at least 50 years old (Lewis and Iverson 2018).

Ornate Box Turtle eggs, hatchlings, and juveniles are much more likely prey than adults (Hughes et al. 2024). Documented predators of subadults and adults are mostly medium-sized mammals including: American Badgers (*Taxidea taxus*), Coyotes (*Canis latrans*), Domestic Cats (*Felis catus*), Feral Hogs (*Sus scrofa*), Nine-banded Armadillos (*Dasypus novemcinctus*), Raccoons (*Procyon lotor*), Red Foxes (*Vulpes vulpes*), Red-tailed Hawk (*Buteo jamaicensis*), Striped Skunks (*Mephitis mephitis*), and Virginia Opossums (*Didelphis virginiana*) (Legler 1960, Dodd 2001, Redder et al. 2006). Many of these mammals are also nest and egg predators, especially raccoons and other mesopredators. Avian predators include American Crows (*Corvus brachyrhynchos*), Common Ravens (*Corvus corax*), Golden Eagles (*Aquila chrysaetos*), Turkey Vultures (*Cathartes aura*), and White-necked Ravens (*Corvus cryptoleucus*) (Legler 1960; Dodd 2001; Redder et al. 2006; Ernst and Lovich 2009, in Hughes et al. 2024). Other nest and egg predators include Eastern Copperhead (*Agkistrodon contortrix*), Gopher Snake (*Pituophis catenifer*), Western Hognose Snake (*Heterodon nasicus*) Prairie Vole (*Microtus ochrogastor*), Prairie Mole (*Scalopus aquaticus*), and possibly Short-tailed Shrew (*Blarina brevicauda*) (Legler 1960, Durso and Mullin 2017, Bernstein et al. 2023). The only amphibian recorded as a predator is the American Bullfrog (*Rana catesbeiana*) (Ernst and Lovich 2009, in Hughes et al. 2024). The Ornate Box Turtle is also reported to exhibit cannibalism (Ernst and Barbour 1972).

Myiasis is the most common form of documented parasitism in Ornate Box Turtles. *Cistudinomyia cistudinis* larvae, a turtle specific parasite, infests limbs and other areas of exposed skin, resulting in limited movement and sometimes death (Rodeck 1949, Smith et al. 2024). Other documented Ornate Box Turtle parasites include sarcophagid botflies, possibly resulting in mortality (Iverson 2024a), Smooth Turtle Leech (*Placobdella parasitica*) attached to the carapace (Otten and Becker 2023), and chiggers (Rose 1984, in Hughes et al. 2024). Two species of apicomplexan from the genus *Eimeria* have been reported in box turtle feces (McAllister and Upton 1989, McAllister et al. 2017)).

REPRODUCTION: Ornate Box Turtles typically lay eggs in June-July. However, timing in southwest populations can extend until August due to a longer estivation period and later annual rain than in northern populations (Germano 2014, Nieuwalt-Ducanay 1997). Nest construction often begins shortly before dark and eggs are laid at night (Legler 1960, Hughes et al. 2024). Ornate Box Turtles prefer soft, well drained soil or sand for digging egg chambers 50–60 mm deep (Legler 1960, Ernst and Barbour 1972). Female box turtles have been documented digging a vertical body pit for themselves before digging the egg chamber beneath (Murray 2013; Legler and Vogt 2013, in Hughes et al. 2024).

Across its geographic range, Ornate Box Turtle copulation has been observed in every month from April-October, but is most common during the spring and fall, and on emergence from hibernation or estivation (Degenhardt et al. 1996, Hughes et al. 2023). Both male and female Ornate Box Turtles reach sexual maturity at around 100 mm in carapace length and 7–8 years in age (Blair 1976).

In Arizona, the average clutch size of 16 female Ornate Box Turtles was 3.1 eggs (Legler and Vogt 2013, in Hughes et al. 2024). Across its range, average clutch size does not exceed 5, with a range of 1–8 eggs and most mean estimates of 2–4 eggs (Legler 1960, Edmonds 2020, Hughes et al. 2024). Under favourable conditions, incubation lasts about 65 days, but can range from 49–125 days depending on temperature (Legler 1960, Hughes et al. 2024). Hatchling success rates range from 42% to 67% (Doroff and Keith 1990, Converse et al. 2002). Sex of hatchlings is temperature dependent, as lower incubation temperatures produce more males and higher temperatures produce more females (Vogt and Bull 1982).

FOOD HABITS: Ornate Box Turtles are omnivores that use sight and olfactory senses to detect moving and still prey (Fitch 1965). Box turtle diet contains mainly arthropods, but they are generalists and the list of foods eaten is long (Degenhardt et al. 1996, Hughes et al. 2024). Arthropods consumed include ants, bees, beetles, caterpillars, cicadas, crickets, dipteran larvae, fireflies, grasshoppers, harvestmen, planthoppers, robber flies, spiders, stick insects, and thrips. Other invertebrates in the box turtle diet include crayfish, earthworms, millipedes, snails, and woodlice. (Legler 1960, Blair 1976, Sievers 2015, Worthington et al. 2017,

Forrester et al. 2019, Grose et al. 2021). Dung beetles found in cow manure, and sometimes the manure itself, have been documented extensively as one of their foods (Legler 1960, Suriyamongko et al. 2022).

Ornate Box Turtles also consume plants, mainly fruits, including blackberries, cantaloupes, dandelions, green bean pods, groundcherries, melons, mulberries, persimmons, prickly pear cactus, spiderworts, strawberries, and tomatoes (Legler 1960; Blair 1976; Ernst and Lovich 2009, in Hughes et al. 2024; Stone and Moll 2006, 2009; Sievers 2015). Some fruits like the Prairie Spiderwort (*Tradescantia occidentalis*) and Texas Prickly Pear Cactus (*Opuntia lindheimeri*) are speculated to provide a significant source of moisture for Ornate Box Turtles living in drier regions (Blair 1976, Nash and Gangloff 2010). Ornate Box Turtles may also be an important source of seed and spore dispersal for a variety of plants and fungi (Stone and Moll 2006, 2009).

Vertebrates in Ornate Box Turtle diets are mainly consumed as carrion; see Legler 1960, Blair 1976, Black 1987, Kolbe 1998, Dodd 2001, Ernst and Lovich 2009, in Hughes et al. 2024, Germano 2009, Murray et al. 2014, Forsberg and Geluso 2017, Hughes et al. 2024, and Myers and Davis 2025 for species which Ornate Box Turtles have been documented consuming. Metcalf and Metcalf (1970) observed Ornate Box Turtles consuming a minnow and unnamed fish, both as carrion.

HABITAT: Ornate Box Turtles are not dependent on free water and are habitat generalists with a strong preference for open grassland, flat terrain, and low valleys (Behler and King 1979, Degenhardt et al. 1996, Murphy 2019). Their primary habitats are Chihuahuan Desert grasslands and prairies, but they may also inhabit other grasslands, wooded plains, pastures, and wooded habitats (Hughes et al. 2024). Ornate Box Turtles depend on three distinct microhabitat components for survival: foraging areas dominated by prairie or grassland habitats with available open water; nesting sites that generally coincide with soft overwintering soils; and shallow subterranean retreats (known as "forms") composed of soft substrate or plant litter, which facilitate thermoregulation, hydration management, predator avoidance, and nocturnal resting. (Degenhardt et al. 1996, Redder et al. 2006). In New Mexico, they prefer microhabitats with lower surface temperatures, higher atmospheric temperatures, and slightly lower relative humidities than other nearby sites (Nieuwolt 1996).

ELEVATION: In Arizona, this species can be found from roughly 560 m (1.850 ft) (HDMS, AZGFD, unpublished data accessed 2026) to 2,300 m (7,152 ft) in the Huachuca Mountains (Brennan and Feldner 2003). Across the Ornate Box Turtle's entire range, it can be found from near sea-level to 2,300 m (Stebbins and McGinnis 2018).

PLANT COMMUNITY: Semidesert Grasslands, Chihuahuan Desertscrub, Riparian Woodland, Lower Madrean Evergreen Woodland (Murphy 2019, Holycross et al. 2022).

POPULATION TRENDS: Ornate Box Turtles may be common in portions of their range (van Dijk and Hammerson 2011). Although Ornate Box Turtle populations may be stable or growing in portions of their range (Bowen et al. 2004, Converse et al 2005, Iverson 2024b), populations appear to be declining across much of its range, particularly outside its core range (Doroff and Keith 1990, Hammerson 1999,van Dijk and Hammerson 2011, Edmonds et al. 2024a). The Arizona Wildlife Conservation Strategy (AWCS) (AZGFD 2022) notes a population decline of over 30% in its criteria for evaluating Species of Greatest Conservation Need. Hall and Steidl (2004) found no Ornate Box Turtles in the Santa Cruz Valley where they were historically found.

SPECIES PROTECTION AND CONSERVATION

Status definitions: https://hdms.azgfd.com/species-list/columns
Heritage Network Conservation Status Rank definitions:
https://hdms.azgfd.com/species-list/columns/#SRANK

AGENCY STATUS

AZGFD:	1 (AZGFD, AWCS 2022)
UFWS (Endangered Species Act):	None
U.S. Forest Service:	None
Bureau of Land Management:	Sensitive (USDI, BLM 2010, 2017)
Navajo Nation:	None
Mexico:	PR, Subject to Special Protection (Secretaría de Medio Ambiente y Recursos Naturales 2018)

OTHER STATUS

Heritage Network Status:	G4G5 S2S3
IUCN:	NT (van Dijk and Hammerson 2011)

PREVIOUS STATUS

AGENCY STATUS

AZGFD:	1A (AZGFD, SWAP 2012)

MANAGEMENT FACTORS: Habitat loss and alteration are widely recognized as the main challenges in reptile conservation (Jones et al., 2016). To support land managers and property owners, Partners in Amphibian and Reptile Conservation (PARC) developed regional habitat

management guidelines for amphibians and reptiles. Specifically, the guidelines for the Southwestern United States outline major conservation challenges for local reptiles—including the Ornate Box Turtle—and provide actionable recommendations for managing habitats like grasslands (Jones et al. 2016). Because many Ornate Box Turtle populations are already small, isolated, and likely in decline, Edmonds et al. (2024a) urged managers to make protecting them on managed lands a top priority. They also recommended controlling vehicle use, fencing roadways, and building underpasses in order to reduce road mortality. Edmonds et al. (2024b) recommended avoiding prescribed burns during times of the year when Ornate Box Turtles are likely to be above ground.

Hughes et al. (2024) reported that direct threats to Ornate Box Turtles include predation on adults, nest and hatchling depredation, wildfires and controlled burns, succession to woody vegetation, road mortality from vehicle collisions, damage from agricultural machinery, and commercial exploitation. Hall and Steidle (2004) identified road mortality from vehicle collisions as the main threat, but also noted that box turtle populations may decline with the invasion of woody shrubs into grasslands. Hughes et al. (2024) suggested that future climate shifts are guaranteed to disrupt Ornate Box Turtle populations currently inhabiting regions that already strain their physiological tolerance. Climate modeling by Prowant (2014) suggests a northward expansion of suitable habitat for Ornate Box Turtles over the next 60 years; however, given its 28-year generation length, the species is unlikely to shift its distribution fast enough to offset climate-induced threats (Hughes et al. 2024).

Turtle races conducted at county fairs and other community entertainment events raise conservation concerns for Ornate Box Turtles because these events involve the capture of hundreds to thousands of individuals annually (Hughes et al. 2024). These concerns include habitat disturbance from collection, translocation if turtles are not returned to where they were collected, and the disruption of nesting, foraging, mating, and other essential behaviors. Hughes et al. (2024) suggested conducting public outreach and education to discourage the use of wild turtles in races.

PROTECTIVE MEASURES TAKEN: There is no open season for Ornate Box Turtles in Arizona so they may not be killed or collected from the wild without a Scientific Activity License (Arizona Game and Fish Department 2026b). The Ornate Box Turtle is included in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II (CITES 2026). CITES is an international treaty on trade in plants and animals, with Appendix II including species not currently threatened with extinction but may become so without trade controls (U.S. Fish and Wildlife Service 2024). The IUCN Red List assesses the species as Near Threatened (van Dijk and Hammerson 2011).

SUGGESTED PROJECTS: Hall and Steidl (2004) provided several research and management recommendations including:

- Develop an extensive monitoring program to provide data on changes in turtle density and distribution.
- Use line transect surveys to determine relative abundance counts of turtles for tracking population changes, with a suggested minimum of 4,000 m of transect per study area.
- Monitor changes in habitat characteristics, especially in woody shrubS.

Hughes et al. (2024) suggested the following research projects are needed:

- Survey peripheral edge populations (Louisiana, Wyoming, Indiana) and establish long-term monitoring across the south (Arizona, Texas, Oklahoma, Missouri, Colorado, Mexico) to define the species' southern distribution limit.
- Compile existing long-term datasets across multiple populations to model overall population trends and evaluate major threats, including road mortality, habitat loss, turtle races, disease, and environmental changes.
- Study nesting habits, microhabitats, and factors driving nest survival to design targeted conservation and land-management strategies, especially for populations in decline.

Hughes et al. (2024) also recommended that future research should assess the demographic impacts of predation and road mortality, highlighting the necessity of maintaining elevated adult survival rates to sustain isolated populations

LAND MANAGEMENT/OWNERSHIP[1]

BLM - Las Cienegas and San Pedro Riparian National Conservation Areas, Safford and Tucson Field Offices,

DOD - Fort Huachuca

NPS - Chiricahua National Monument, Saguaro National Park, Tumacacori National Historic Park

State - AZGFD Cluff Ranch and Whitewater Draw Wildlife Areas, San Rafael Ranch Natural Area, State Trust Land

USFS - Coronado National Forest

USFWS - Buenos Aires and Leslie Canyon National Wildlife Refuges

Private

[1] The list is based on where HDMS has records for the species and potentially may not be complete.

SOURCES OF FURTHER INFORMATION

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EXTERNAL LINKS:

Arizona Wildlife Conservation Strategy
Online Field Guide to the Reptiles and Amphibians of Arizona
NatureServe Explorer
iNaturalist

ADDITIONAL INFORMATION:

The etymology of the genus name *Terrapene* is not readily apparent. The name Terrapene has sometimes been considered to be derived from Algonquin words, but Dodd et al (2016) present reasoning that this is not the case. More likely, it traces back to the Powhatan word *torope*, meaning “turtle” or “little turtle.” Early English colonists adapted *torope* into spellings such as *tarapin*, *turapin*, and *terebin*, which later evolved into the scientific name *Terrapene* (Dodd et al. 2016). The species epithet *ornata* comes from the Latin word *ornatus* which means “decorated” or “adorned”, referring to the species’ carapace pattern (Ward 1978, Uetz et al. 2026).

Revised: 1991-03-28 ( )
2008-04-26 (TFH)
2013-08-14 (BDT)
2023-05-09 (MBL)
2026-07-24 (JKR)