# ARIZONA GAME AND FISH DEPARTMENT
# HERITAGE DATA MANAGEMENT SYSTEM

**Animal Abstract** **Element Code:** ARAAF01010
**Data Sensitivity:** Yes

## CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

**NAME:** *Gopherus morafkai*
**COMMON NAME:** Sonoran Desert Tortoise
**SYNONYMS:** *Gopherus agassizii, Xerobates agassizii, Scaptochelys agassizii*
**FAMILY:** Testudines: Testudinidae

**AUTHOR, PLACE OF PUBLICATION:** Brown. 1912. Proceedings of the Californian Academy of Natural Science Identified by R.W. Murphy et al., 28 Jun 2011.

**TYPE LOCALITY:** From Tucson (approximate location 32°7'N, 110°56'W, elevation 948 m), Pima County, Arizona, U.S.A.

**TYPE SPECIMEN:** CAS (California Academy of Sciences) 33867; juvenile collected on 9 July 1912 by H. Brown and preserved in ethanol.

**TAXONOMIC UNIQUENESS:** The genus *Gopherus* contains five extant species in the southern US and Mexico (Crumly 1994). Although previously recognized as being taxonomically unique, "Mojave" and "Sonoran" populations of the desert tortoise differ genetically (Jennings 1985; Lamb et al. 1989; Glenn et al. 1990) and morphologically (Germano 1993). These two species are distinctly recognized under the Endangered Species Act (USDI, FWS 1990).

**DESCRIPTION:** Adults reach sizes of about 20-36 cm (8-15 in) and flat, pear-shaped shell, usually a brownish carapace, with definite pattern and prominent growth lines on both the plastron and carapace (Stebbins 1985). The plastron is yellowish without a hinge. The limbs are very stocky, including elephant-like rear limbs; the forelimbs are covered with large conical scales. The tail is short. Males have elongate gular (throat) shields, and chin glands on each side of the lower jaw are larger than that of the female.

**AIDS TO IDENTIFICATION:** Two species occur in Arizona. Individuals from the Sonoran desert tortoise tend to be more pear-shaped, with more narrow front ends, wider (flared) rear ends, and flatter carapaces. Mojave desert tortoises tend to be more oval and have a higher domed carapace (Germano 1993).

**ILLUSTRATIONS:**
Black and white drawing (Stebbins 1966: plate 15)
Color photo (Behler and King 1979: plate 328)
Black and white photos (Bury and Germano 1994: pp. vi, 56, 72, 94, 108)

**TOTAL RANGE:** *Gopherus morafkai* occurs south and east of the Colorado River through Arizona and Mexico. This species occurs from Northern Sinaloa north to Northern Arizona. The distribution of the desert tortoise covers the broadest range of latitude, climate, habitats, and biotic regions of any North American tortoise (Germano et al. 1994).

**RANGE WITHIN ARIZONA:** *Gopherus morafkai* includes those tortoises south and east of the Colorado River, from locations near Pearce Ferry in Mojave County, to the south beyond the International Boundary, and at many scattered locations in between (Arizona Interagency Desert Tortoise Team [AIDTT] 2000). The northeastern-most tortoise records in Arizona occur along the Salt River near Roosevelt Lake in Gila County, although populations here have not been confirmed with recent observations. The middle San Pedro River drainage in Cochise County harbors the eastern-most substantial tortoise populations. Desert tortoise observations have been confirmed in extreme southeastern Cochise County, but most probably represent released captives (pets). Tortoises have been found as far southwest as the Barry M. Goldwater Range, Yuma Proving Ground, and the Cabeza Prieta National Wildlife Refuge.

## SPECIES BIOLOGY AND POPULATION TRENDS

**BIOLOGY:** Adequate shelter is one of the most important habitat features of the Sonoran desert tortoises in the Sonoran Desert (Averill-Murray et al., *in press* a). Tortoises escape extreme temperatures in burrows, which stay cooler in the summer and warmer in winter than outside temperatures. Tortoises require loose soil to excavate (usually shallow) burrows below rocks and boulders, but they may also use rock crevices, which they may or may not be able to modify. Tortoises occasionally burrow under vegetation, less often dig soil burrows on more or less open slopes, and use caliche caves in incised wash banks. They will also rest directly under live or dead vegetation without constructing a burrow.

Activity begins in the spring as temperatures warm, then decreases as the season moves into the summer drought in May and June (Averill-Murray et al., *in press* a). Much more time is spent in burrows where they conserve water and energy. The onset of the summer monsoon season signals the beginning of peak tortoise activity, dramatically rising in early August and peaking during August-September (Averill-Murray et al., *in press* a). Activity decreases sharply after mid-October, as tortoises withdraw to winter hibernacula, which are similar shelters to those they use during activity seasons (Averill-Murray et al., *in press* a). Even during the winter, some individuals may bask, move, or even forage on warm winter days. Females may terminate hibernation as early as late February, while some males may remain inactive through the entire spring (Bailey 1992; Martin 1995; Vaughan 1984).

Tortoises grow relatively rapidly early in life and reach about 1/2 their maximum size at 5-10 years of age (Murray and Klug 1996). The growth rate tapers off as individuals slowly approach their maximum size. After 10-20 years of age, tortoises reach sexual maturity at about 220 mm (8.7 in) carapace length. Males reach larger sizes than females in some populations but not in others.

Some hatchlings emerge in late summer, but some may overwinter in the nest before emerging in the spring (Averill-Murray et al., *in press* b). Little information exists on survivorship of young tortoises, but given adult longevity and their capacity to produce more offspring than necessary to replace mortalities in the population, juvenile survivorship is probably very low (Averill-Murray et al., *in press* b). The Adult tortoise carapace provides protection against potential predators, contributing to their high survivorship. Mountain lions appear to be the primary natural predator on adult tortoises in the Sonoran Desert, but lions usually have not contributed to elevated rates of mortality in population studies so far (Averill-Murray et al., *in press* b).

**REPRODUCTION:** Mating occurs during the summer monsoon season. Females begin laying eggs, which are fertilized by sperm stored from the previous summer's mating, just before or during the onset of the summer rains in late June or early July (Averill-Murray and Klug 2000). They lay only one clutch of about six eggs, although larger clutch sizes have been reported. The proportion of females reproducing is related to the amount of recent rainfall and vegetation available for forage. Females usually lay their eggs inside burrows with adequate soil development, and many remain at and defend their nests against predators.

**FOOD HABITS:** Desert tortoises eat a variety of annual and perennial grasses, forbs, and succulents (see references in Grover and DeFalco 1995). Sonoran tortoise forage includes (in order of relative abundance in scat fragment analysis) dicot annuals, grasses, herbaceous perennials, trees and shrubs, subshrubs/woody vines, and succulents (Van Devender and Schwalbe 1999). The most common food items in microhistological analyses included the woody vine *Janusia gracilis* and various mallows (Malvaceae) (Van Devender and Schwalbe 1999).

**HABITAT:** *Gopherus morafkai* occurs primarily on rocky slopes and bajadas of Mojave and Sonoran desertscrub (see references in AIDTT 2000). In the Lower Colorado River Valley subdivision, caliche caves in cut banks of washes (arroyos) are also used for shelter sites. Shelter sites are rarely found in shallow soils.

**ELEVATION:** *Gopherus morafkai* occurs at elevations ranging from about 155 m (510 ft) in Mojave desertscrub to semidesert grassland and interior chaparral at about 1615 m (5300 ft; AGFD unpubl. data).

**PLANT COMMUNITY:** *Gopherus morafkai* is found within Sonoran and Mojave desertscrub, including a variety of biotic communities within or extending from the Sonoran Desert but most often in paloverde-mixed cacti associations. Tortoises are found in the Arizona Upland and Lower Colorado River subdivision of the Sonoran Desert, desert grassland, and ecotonal areas consisting of Sonoran desertscub with elements of Mojave desertscrub and juniper woodland, interior chaparral, and desert grassland (Averill-Murray and Klug 2000).

**POPULATION TRENDS:** *Gopherus morafkai*'s density varies greatly among 18 tortoise plots surveyed in Arizona, ranging from about 15 to over 150 adult tortoises per square mile (Averill-Murray and Klug 2000). Abundance at 17 of these sites appears to be stable or increasing; only one (Maricopa Mountains) has been observed to decrease radically in size. A localized die-off also apparently occurred in the late 1990s at Ragged Top Mountain on the Ironwood Forest National Monument (R. Repp, pers. comm. 1999).

## SPECIES PROTECTION AND CONSERVATION

**ENDANGERED SPECIES ACT STATUS:** CCA (USDI, FWS, 2015)

Status Listings as subspecies:
[Mohave Desert pop. LT (USDI, FWS 1990)]
[Sonoran Desert pop. C (USDI, FWS 2010)]
[Sonoran Desert pop. C (USDI, FWS 2011)]
[Sonoran Desert pop. None (USDI, FWS 1996)]
[Sonoran Desert pop. C2 USDI, FWS 1991, 1994]
[Both populations C2 USDI, FWS 1985, 1989]

**STATE LIST STATUS:** 1A (AGFD SWAP 2012)
[WSC (AGFD, WSCA in prep)]
[State Candidate AGFD, TNW 1988]

**OTHER STATUS:**
Not Bureau of Land Management Sensitive – Sonoran Pop. (USDI, BLM AZ 2010)
[Bureau of Land Management Sensitive – Sonoran Pop. (USDI, BLM AZ 2008)]
Forest Service Sensitive for Sonoran Desert pop. (USDA, FS Region 3 2007; Coronado, Prescott & Tonto National Forests)
Determined Threatened (Secretaria de Medio Ambiente 2000)
[Determined Threatened, Secretaria de Desarrollo Social 1994]

**MANAGEMENT FACTORS:** The *Management Plan for the Sonoran Desert Population of the Desert Tortoise in Arizona* provides a list of recommendations from which managers may choose when developing management prescriptions for specific areas (AIDTT 1996). These recommendations include options for species management (including collecting; reintroduction, repatriation, and translocation; and predator control) and habitat management (including forage and surface management and spatial considerations).

**PROTECTIVE MEASURES TAKEN:** Desert tortoises may not be collected from the wild in Arizona (Arizona Game and Fish Commission Order 43). Desert tortoises possessed without a special license prior to April 28, 1989, may be possessed, transported, and given away (Arizona Game and Fish Commission Rule R12-4-407.A.1). Desert tortoises possessed pursuant to R12-4-407.A.1 may be propagated, progeny may be held in captivity for 24 months from the date of hatching, when they shall be disposed of by gift or as directed by the Arizona Game and Fish Department. The person receiving a desert tortoise given away pursuant to this rule is also exempt from special license requirements.

**SUGGESTED PROJECTS:** A continuing state-wide monitoring program is of primary importance in collecting the data necessary for effective desert tortoise management in Arizona (AIDTT 1996). Additional research is also necessary to develop a more complete understanding of tortoise populations and how they respond to different land management actions, including research on population dynamics (reproductive ecology, life tables, population viability, population genetics), habitat (effects of exotic vegetation, fire, and grazing), disease (URTD, cutaneous dyskeratosis), and effectiveness of mitigation measures (AIDTT 1996). The extent of desert tortoise distribution in extreme northwest, southwest, southeast Arizona is needs extensive survey efforts and monitoring.

**LAND MANAGEMENT/OWNERSHIP: Bureau of Indian Affairs**: Fort McDowell Reservation, Gila River Reservation, Salt River Pima Reservation, San Carlos Apache Reservation, San Xavier Reservation, Tohono O'Odham Nation. **Bureau of Land Management**: Kingman Field Office, Lake Havasu Field Office, Phoenix Field Office, Tucson Field Office, Safford Field Office, Tucson Field Office, Yuma Field Office. **Department of Defense**: Barry M. Goldwater Range, Yuma Proving Ground. **US Forest Service**: Coronado National Forest, Prescott National Forest, Tonto National Forest. **US Fish and Wildlife Service**: Buenos Aires National Wildlife Refuge, Cabeza Prieta National Wildlife Refuge, Cibola National Wildlife Refuge, Havasu National Wildlife Refuge, Imperial National Wildlife Refuge, Kofa National Wildlife Refuge. **National Park Service**: Organ Pipe Cactus National Monument, Saguaro National Park, Lake Mead National Recreation Area. **State Land Department**. **Arizona Game and Fish Department:** Powers Butte Wildlife Area. **Arizona State Parks Department**: Picacho Peak State Park. **Private land**. **Other lands**: McDowell Mountain Regional Park, Phoenix South Mountain Park, White Tank Regional Park.

## SOURCES OF FURTHER INFORMATION

**REFERENCES:**


Arizona Game and Fish Department. 1988. Threatened Native Wildlife in Arizona. p. 12.

Arizona Game and Fish Department. In prep. Wildlife of special concern in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. 32 pp.

Arizona Interagency Desert Tortoise Team. 1996. Murray, R.C., and V. Dickinson (eds.). Management Plan for the Sonoran Desert population of the desert tortoise in Arizona. Arizona Interagency Desert Tortoise Team. 55pp.

Arizona Game and Fish Department. 2012. Arizona's State Wildlife Action Plan 2012-2022, Phoenix, AZ.

Arizona Interagency Desert Tortoise Team. 2000. Averill-Murray, R.C. (ed.). Status of the Sonoran populations of the desert tortoise in Arizona: an update. Arizona Interagency Desert Tortoise Team and Arizona Game and Fish Department, Phoenix. 48 pp.

Auffenberg, W., and R. Franz. 1978. *Gopherus agassizii*. Catalogue of American Amphibians and Reptiles 212.1-212.2.

Averill-Murray, R.C., and C.M. Klug. 2000. Monitoring and ecology of Sonoran desert tortoises in Arizona. Nongame and Endangered Wildlife Program Technical Report 161. Arizona Game and Fish Department, Phoenix. 104pp.

Averill-Murray, R.C., B.E. Martin, S.J. Bailey, and E.B. Wirt. *In press* a. Activity and behavior of the Sonoran Desert tortoise in Arizona. *In* Van Devender, T.R. (ed.), The Sonoran Desert Tortoise: Natural History, Biology, and Conservation, University of Arizona Press, Tucson.

Averill-Murray, R.C., A.P. Woodman, and J.M. Howland. *In press* b. Population ecology of the Sonoran Desert tortoise in Arizona. *In* Van Devender, T.R. (ed.), The Sonoran Desert Tortoise: Natural History, Biology, and Conservation, University of Arizona Press, Tucson.

Bailey, S.J. 1992. Hibernacula use and home range of the desert tortoise (*Gopherus agassizii*) in the San Pedro Valley, Arizona. M.S. Thesis, University of Arizona, Tucson. 82pp.

Barrett, S.L., and T.B. Johnson. 1990. Status summary for the desert tortoise in the Sonoran Desert. Report to US Fish and Wildlife Service, Albuquerque, New Mexico.

Behler, J.L. and F.W. King. 1979. The Audubon Society field guide to North American reptiles and amphibians. Houghton Mifflin Company, Boston. pp. 471-473.

Black, J.H. 1976. Observations on courtship behavior of the desert tortoise. Great Basin Naturalist 36:467-470.

Burge, B.L. 1978. Physical characteristics and patterns of utilization of cover sites used by *Gopherus agassizii* in southern Nevada. Proceedings of the Desert Tortoise Council Symposium 1978:80-111.

Bury, R.B. (ed.). 1982. North American Tortoise Conservation and Ecology. U.S. Fish and Wildlife Service, Wildlife Research Report 12, Washington, DC.

Bury, R.B., and D.J. Germano (eds.). 1994. Biology of North American Tortoises. US Department of the Interior National Biological Survey, Fish and Wildlife Research 13, Washington, D.C. 204pp.

Cochran, D.M. 1961. Type specimens of reptiles and amphibians in the U.S. National Museum. US National Museum Bulletin 220:1-291.

Collins, E., T.P. O'Farrell, and M.L. Sauls. 1986. Survey for desert tortoise on the possible site of a high-level nuclear waste repository. Proceedings of the Desert Tortoise Council Symposium 1983:19-26.

Coombs, E.M. 1977. Implications of behavior and physiology on the desert tortoise *(Gopherus agassizii*) concerning their declining populations in southwestern Utah, with inferences on related desert ectotherms. Report to US Bureau of Land Management, St. George.

Cooper, J.G. 1863. New Californian animals. Proceedings of the Californian Academy of Natural Science 2:118-123.

Crumly, C.R. 1994. Phylogenetic systematics of North American tortoises (genus *Gopherus*): evidence for their classification. pp. 7-32 *In* Bury, R.B., and D.J. Germano (eds.), Biology of North American Tortoises. US Department of the Interior National Biological Survey, Fish and Wildlife Research 13, Washington, D.C.

Desert Tortoise Council Symposium Proceedings. Printed annually, 1976-present.

Germano, D.J. 1993. Shell morphology of North American tortoises. American Midland Naturalist 129:319-335.

Germano, D.J. 1994a. Growth and age at maturity of North American tortoises in relation to regional climates. Canadian Journal of Zoology 72:918-931.

Germano, D.J. 1994b. Comparative life histories of North American tortoises. pp. 175-185 *In* Bury, R.B. and D.J. Germano (eds.), Biology of North American Tortoises. National Biological Survey, Fish and Wildlife Research 13, Washington, DC.

Germano, D.J., R.B. Bury, T.C. Esque, T.H. Fritts, and P.A. Medica. 1994. Range and habitats of the desert tortoise. pp. 73-84 *In* Bury, R.B., and D.J. Germano (eds.), Biology of North American Tortoises. US Department of the Interior National Biological Survey, Fish and Wildlife Research 13, Washington, D.C.

Goodlett, G., P. Woodman, M. Walker, and S. Hart. 1996. Desert tortoise population survey at Beaver Dam Slope exclosure desert tortoise study plot; spring, 1996. Report to Arizona Game and Fish Department, Phoenix.

Grover, M.C., and L.A. DeFalco. 1995. Desert Tortoise (*Gopherus agassizii*): status-of-knowledge outline with references. US Department of Agriculture Forest Service, Intermountain Research Station, General Technical Report INT-GTR-316, Ogden, UT. 134pp.

Hohman, J.P., R.D. Ohmart, and J. Schwartzmann. 1980. An annotated bibliography of the desert tortoise (*Gopherus agassizii*). Desert Tortoise Council Special Publication No. 1, Long Beach, California.

Jennings, R.D. 1985. Biochemical variation of the desert tortoise, *Gopherus agassizii*. M.S. Thesis, University of New Mexico, Albuquerque. 72pp.

Johnson, T.B. et al. 1990. Summary of literature on the Sonoran Desert population of the desert tortoise. Report for US Fish and Wildlife Service, Office of Endangered Species, Albuquerque, New Mexico.

Karl, A.E. 1998. Reproductive strategies, growth patterns, and survivorship of a long-lived herbivore inhabiting a temporally variable environment. Ph.D. dissertation, University of California, Davis.

Ladehoff, N.M., T.B. Johnson, B.K. Palmer, and C.R. Schwalbe. 1990. Bibliography of published and unpublished references pertinent to management and conservation of the desert tortoise in Arizona. Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Phoenix, Arizona.

Lamb, T., J.C. Avise, and J.W. Gibbons. 1989. Phylogeographic patterns in mitochondrial DNA of the desert tortoise (*Xerobates agassizii*), and evolutionary relationships among the North American gopher tortoises. Evolution 43:76-87.

Luckenbach, R.A. 1982. Ecology and management of the desert tortoise (*Gopherus agassizii*) in California. pp.1-37 In Bury, R.B. (ed.), North American Tortoise Conservation and Ecology. U.S. Fish and Wildlife Service, Wildlife Research Report 12, Washington, DC.

Martin, B.E. 1995. Ecology of the desert tortoise (*Gopherus agassizii*) in a desert grassland community in southern Arizona. M.S. Thesis, University of Arizona, Tucson. 112pp.

Minnich, J.E. 1977. Adaptive responses in the water and electrolyte budgets of native and captive desert tortoises, *Gopherus agassizii*, to chronic drought. Proceedings of the Desert Tortoise Council Symposium. 1977:102-129.

Mueller, J.M., K.R. Sharp, K.K. Zander, D.L. Rakestraw, K.R. Rautenstrauch, and P.E. Lederle. 1998. Size-specific fecundity of the desert tortoise (*Gopherus agassizii*). Journal of Herpetology 32:313-319.

Murray, R.C., and C.M. Klug. 1996. Preliminary data analysis from three desert tortoise long-term monitoring plots in Arizona: sheltersite use and growth. Proceedings of the Desert Tortoise Council Symposium 1996:10-17.

Murray, R.C., and C.R. Schwalbe. 1993. The desert tortoise on national forest lands in Arizona. Unpublished report to US Department of Agriculture Coronado National Forest, Prescott National Forest, and Tonto National Forest. 51pp.

Nagy, K.A., D.J. Morafka, and R.A. Yates. 1997. Young desert tortoise survival: energy, water, and food requirements in the field. Chelonian Conservation and Biology 2:396-404.

Peterson, C.C. 1996a. Ecological energetics of the desert tortoise (*Gopherus agassizii*): effects of rainfall and drought. Ecology 77:1831-1844.

Peterson, C.C. 1996b. Anhomeostasis: seasonal water and solute relations in two populations of the desert tortoise (*Gopherus agassizii*) during chronic drought. Physiological Zoology 69:1324-1358.

Rostal, D.C., V.A. Lance, J.S. Grumbles, and A.C. Alberts. 1994. Seasonal reproductive cycle of the desert tortoise (*Gopherus agassizii*) in the eastern Mojave Desert. Herpetological Monographs 8:72-82.

Secretaría de Desarollo Social. 1994. Diario Oficial de la Federacion. p. 41.

Secretaría de Medio Ambiente. 2000. Diario Oficial de la Federacion. p. 51.

Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts. 104pp.

Turner, F.B., P. Hayden, B.L. Burge, and J.B. Roberson. 1986. Egg production by the desert tortoise (Gopherus agassizii) in California. Herpetologica 42:93-104.

USDA, Forest Service Region 3. 2007. Regional Forester's Sensitive Animal List.

USDI, Bureau of Land Management Region 2. 2008. Arizona BLM Sensitive Species List.

USDI, Bureau of Land Management Region 2. 2010. Arizona BLM Sensitive Species List.

USDI, Fish and Wildlife Service. 1985. Endangered and Threatened Wildlife and Plants; Review of Vertebrate Wildlife; Notice of Review. Federal Register 50(181):37962.

USDI, Fish and Wildlife Service. 1989. Endangered and Threatened Wildlife and Plants; Animal Notice of Review. Federal Register 54(4):559.

USDI, Fish and Wildlife Service. 1990. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11:18.

USDI, Fish and Wildlife Service. 1991. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11:17-18.

USDI, Fish and Wildlife Service. 1994a. Desert tortoise (Mojave population) recovery plan. US Fish and Wildlife Service, Portland.

USDI, Fish and Wildlife Service. 1994b. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species; Notice of Review; Proposed Rule. Federal Register 59(219):58993.

USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants: Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species; Notice of Review; Proposed Rule. Federal Register 61(40):7596-7613.

USDI, Fish and Wildlife Service. 2010. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List the Sonoran Population of the Desert Tortoise as Endangered or Threatened; Proposed Rule. Federal Register 75(239):78094-78146.

USDI, Fish and Wildlife Service. 2011. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review. FR 76(207):66432.

USDI, Fish and Wildlife Service. 2015. Endangered and Threatened Wildlife and Plants; 12 – Month Finding on a Petition to List Sonoran Desert Tortoise as an Endangered or Threatened Species. Federal Register 80(193):60321.

Van Devender, T.R. (ed.). *In press*. The Sonoran Desert Tortoise: Natural History, Biology, and Conservation. University of Arizona Press, Tucson.

Van Devender, T.R., and C.R. Schwalbe. 1999. Diet of free-ranging desert tortoises (*Gopherus agassizii*) in the northeastern Sonoran Desert, Arizona. Report to Arizona Game and Fish Department, Phoenix.

Vaughan, S.L. 1984. Home range and habitat use of the desert tortoise (*Gopherus agassizii*) in the Picacho Mountains, Pinal Co., Arizona. M.S. Thesis, Arizona State University, Tempe. 111pp.

Wallis, I.R., B.T. Henen, and K.A. Nagy. 1999. Egg size and annual egg production by female desert tortoises (*Gopherus agassizii*): the importance of food abundance, body size, and date of egg shelling. Journal of Herpetology 33:394-408.

Woodbury, A.M., and R. Hardy. 1948. Studies of the desert tortoise, *Gopherus agassizii*. Ecological Monographs 18:145-200.

**MAJOR KNOWLEDGEABLE INDIVIDUALS:**

Roy Averill-Murray, USFWS, Reno, Nevada.
Kristin Berry, USGS, Western Ecological Research Center, Riverside, California.
Jeffrey Lovich, USGS, Western Ecological Research Center, Riverside, California.
Philip Medica, USFWS, Southern Nevada Field Office, Las Vegas, Nevada.
Cecil Schwalbe, USGS, Sonoran Desert Field Station, University of Arizona, Tucson, AZ.

**ADDITIONAL INFORMATION:**

The genus *Gopherus* is said to derive from gaufre (French)-a honeycomb-due to the many holes made by members of the genus (Gotch, A.F. 1995. Latin Names Explained: A Guide to the Scientific Classification of Reptiles, Birds, and Mammals. Facts on File, New York. p. 56.). The specific name *agassizii* is in honor of the Swiss zoologist J.L.R. Agassiz (1807-1873).

**Revised:** 1991-04-02 ( )
1993-05-25 (LAJ)
1997-11-13 (SMS)

2001-03-28 (RAM)
2010-12-14 (SMS)
2013-04-02 (CFP)
2015-10-07 (BDT)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX **(= year of last revision as idicated at end of abstract)**. X…X **(=taxon of animal or plant)**. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.