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BEFORE THE
SECRETARY OF THE UNITED STATES
DEPARTMENT OF THE INTERIOR

AND

THE DIRECTOR OF THE UNITED STATES
FISH AND WILDLIFE SERVICE

PETITION TO LIST THE EASTERN POPULATION OF THE GOPHER TORTOISE AS A THREATENED SPECIES

SAVE OUR BIG SCRUB, INC. AND WILD SOUTH,

Petitioners.

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PETITION TO LIST THE EASTERN POPULATION OF THE GOPHER TORTOISE AS A THREATENED SPECIES

Save Our Big Scrub, Inc., pursuant to Section 4(b)(3)(A) of the Endangered Species Act ("ESA"), 16 U.S.C. § 1533(b)(3)(A), and the Administrative Procedure Act ("APA"), 5 U.S.C. § 553(e), hereby petitions the Secretary of the United States Department of the Interior ("Secretary") and the Director of the United States Fish and Wildlife Service ("Service" or "FWS") to formally list the eastern population of the gopher tortoise (*Gopherus polyphemus*), east of the Mobile and Tombigbee rivers in Alabama, Florida, Georgia and South Carolina, as a threatened species under the ESA and to designate critical habitat as required by Section 4(2), 16 U.S.C. § 1533(b)(2).

I. PETITIONERS

Save Our Big Scrub, Inc., is a Florida incorporated not-for-profit, environmental organization dedicated to protecting and restoring the quality of the Ocala National Forest and adjacent areas. Its main address is P.O. Box 5430, Salt Springs, Florida 32134. Save Our Big Scrub has members who reside near, use, and enjoy the Ocala National Forest and adjacent areas that are at issue in this petition for outdoor recreation and scientific study of various kinds, including nature study, bird watching, photography, fishing, canoeing, hunting, backpacking, camping, solitude, and a variety of other activities. These recreational, aesthetic, scientific, business and/or environmental interests have been, are being, and will be, adversely affected by the imperilment of the gopher tortoise.

Wild South is a regional nonprofit organization based in Alabama and active in the protection of the National Forests and native species of Alabama, Mississippi, Louisiana, Florida and other states in the South. Its main address is P.O. Box 117, Moulton, Alabama 35650. Wild

South is involved in a broad range of environmental issues, and its members have dedicated themselves to preserving and enhancing the South's environment. Wild South's members regularly use and enjoy the environment, waters, forests, air and lands of the National Forests. Wild South's members recreate in the National Forests and other public lands, and they enjoy the biological diversity found there.

Any contact with Save Our Big Scrub, Inc. or Wild South regarding this petition should be made through the undersigned counsel for the Petitioners.

II. SPECIES DESCRIPTION

A. TAXONOMY

The gopher tortoise (*Gopherus polyphemus*) was described in 1802 by F.M. Daudin. It is the only tortoise indigenous to the southeastern United States.[1] A phylogeny study based on mtDNA variation identified the four living North American tortoises as a monophyletic group consisting of two well-defined clades, the *Agassizii* clade and the *Polyphemus* clade.[2] MtDNA and osteological data indicate that *G. polyphemus* is more closely related to *G. flavomarginatus* of Mexico than it is to the other two species of *Gopherus*. *Gopherus polyphemus* is only slightly distinct from *G. flavomarginatus* based on allozymes.[3]

A range-wide assessment of genetic variation using mtDNA found three major assemblages: (1) a western assemblage consisting of seven haplotypes (Louisiana eastward to Taylor County, Florida, and along the Chattahoochee River drainage north to Talbot County, Georgia); (2) an eastern assemblage containing the two most common haplotypes (South Carolina

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[1] U.S. FISH AND WILDLIFE SERVICE, GOPHER TORTOISE RECOVERY PLAN at 1 (1990) (hereinafter "RECOVERY PLAN").

[2] Trip Lamb and Charles Lydeard, *A Molecular Phylogeny of the Gopher Tortoises, with Comments on Familial Relationships within the Testudinoidea*, 3 MOLECULAR PHYLOGENETICS AND EVOLUTION 283-91 (1994).

through peninsular Florida) and (3) a mid-Florida assemblage consisting of seven haplotypes (along the Gulf coast from southern Levy County south to Pinellas County, then east to north of the Hillsborough River, and northeast into Orange/Osceola counties).[4]

B. PHYSICAL DESCRIPTION

The gopher tortoise is a large terrestrial turtle with a carapace or shell length averaging 23-28 cm (9-11 inches)[5] and ranging between 15-37 cm (5.9-14.6 inches).[6] It is dark-brown to grayish-black characterized by stumpy, elephantine hind feet, and flattened, shovel-like forefeet adapted for digging.[7] The domed and oblong carapace is generally tan, brown or gray and the hingeless plastron or undershell is yellowish or mottled with gular scutes which project anteriorly.[8] The Gopher tortoise's head is wide and scaled, with well-developed integumentary glands beneath the chin.[9] Hatchlings are yellowish-orange, have a soft shell, and are approximately 4.4 cm (1.7 inches) in length.[10]

C. DISTRIBUTION

The Gopher Tortoise occurs in the Southeastern Coastal Plain, from southern South Carolina[11] through southern Georgia to southern Florida, west through southern Alabama and

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[3] D.J. Morafka *et al.*, *Allozyme Differentiation Amoung Gopher Tortoises (*Gopherus*): Conservation Genetics and Phylogenetic and Taxonomic Implications*, 73 CANADIAN J. ZOOLOGY 1665-71 (1994).

[4] Matthew F. Osentoski, MtDNA Variation in the Gopher Tortoise, *Gopherus Polyphemus* (1993) (unpublished M.S. thesis, East Carolina University).

[5] Joan E. Diemer, *Threatened: Gopher Tortoise,* Gopherus Polyphemus *(Daudin), in* RARE AND ENDANGERED BIOTA OF FLORIDA; VOLUME 3: AMPHIBIANS AND REPTILES 123-27 (Paul E. Moler ed., 1992).

[6] RECOVERY PLAN, *supra* note 1 at 1.

[7] Joan E. Diemer, *supra* note 5.

[8] *Id.*; RECOVERY PLAN, *supra* note 1 at 1 *citing* CARL H. ERNST AND ROGER W. BARBOUR, TURTLES OF THE UNITED STATES (1972).

[9] *Id.*

[10] *Id.*

[11] E.E. Clark *et al.*, *Geographic Distribution:* Gopherus Polyphemus, 32 HERPETOLOGICAL REVIEW 191 (2001).

southeastern Mississippi to eastern Louisiana.[12] In Florida, gopher tortoises occur on coastal islands as far south as Cape Sable.[13] At the northern end of the range in South Carolina, four disjunct populations remain in Jasper County and a few tortoises occur in southern Hampton County,[14] and tortoises have recently been documented in Aiken County.[15] In Georgia, the largest populations occur in the western Fall Line Sand Hills and the central Tifton Uplands,[16] while severely fragmented populations occur in the Coastal Plain. In Mississippi, the largest remaining population is in Desoto National Forest. In the western edge of the tortoise's range, a few populations remain in eastern Louisiana.

D. HABITAT

Gopher tortoises live in a wide range of upland habitat types. However, three environmental conditions characterize the most suitable habitat: (1) the presence of well-drained, sandy soils, which allow easy burrowing; (2) an abundance of herbaceous ground cover for food; and (3) a generally open canopy and sparse shrub cover, which allow sunlight to reach the forest floor, for nesting.[17] The gopher tortoise is primarily associated with longleaf pine (*Pinus palustris*) – xeric scrub oak (*Quercus* spp.) woodlands (sandhills and clayhills), but are also found in live oak and red oak woods, sand pine scrub, wire grass flatwoods, dry prairies, coastal dune

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[12] Joan E. Diemer, *Gopherus Polyphemus*, *in* THE CONSERVATION BIOLOGY OF TORTOISES 14-19 (Occasional Papers IUCN Species Survival Commission 5, I. R. Swingland and M. W. Klemens, eds., 1989).

[13] Joan E. Diemer, *supra* note 5; James A. Kushlan and Frank J. Mazzotti, *Environmental Effects on a Coastal Population of Gopher Tortoises*, 18 J. HERPETOLOGY 231-39 (1984); Henry R. Mushinsky and Earl D. McCoy, *Comparison of Gopher Tortoise Populations on Islands and on the Mainland in Florida*, *in* BIOLOGY OF NORTH AMERICAN TORTOISES 39-47 (R. B. Bury and D. J. Germano, eds., National Biological Survey, Fish and Wildlife Research 13, 1994).

[14] J.S. Wright, Distribution and Population Biology of the Gopher Tortoise, *Gopherus Polyphemus*, in South Carolina (1982) (unpublished M.S. thesis, Clemson).

[15] E.E. Clark *et al.*, *supra* note 11.

[16] J. Larry Landers and James A. Garner, *Status and Distribution of the Gopher Tortoise in Georgia*, *in* PROCEEDINGS OF THE NONGAME AND ENDANGERED WILDLIFE SYMPOSIUM (R. Odum and J. Guthrie eds., 1981).

[17] RECOVERY PLAN, *supra* note 1 at 2; Joan E. Diemer, *supra* note 5.

and mixed pine-hardwood communities.[18] Tortoises can also occur in some disturbed habitats, such as pastures, old fields and grassy roadsides.[19]

E. DEMOGRAPHY AND REPRODUCTION

The gopher tortoise exhibits deferred sexual maturity, low fecundity, and a long life span.[20] Females reach sexual maturity at 10-21 years of age, depending on latitude, while males mature at a slightly younger age.[21] The breeding season is roughly April–July, but males may attempt to breed throughout the active season, April–November.[22] Dominant males may breed with several females.[23] When seeking a female, males move to the mouth of a burrow occupied by a female and display head bobbing behavior.[24] Upon the female exiting the burrow, the male walks in a circle around the female and periodically stops and performs the head bobbing behavior. When the female approaches the male, he bobs his head violently, and bites her on the forelegs, head, anterior edge of the carapace, and gular projection. The female then backs in a semicircle, stops, and extends her hindlimbs, then she rotates her body about 180 degrees, so that

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[18] *Id.*

[19] *Id.*

[20] J. Larry Landers, *Recent Research on the Gopher Tortoise and Its Implications*, *in* THE DILEMMA OF THE GOPHER TORTOISE–IS THERE A SOLUTION? PROCEEDINGS OF THE 1ST ANNUAL MEETING, GOPHER TORTOISE COUNCIL 8-14 (R. Franz and R. J. Bryant eds., 1980); Joan E. Diemer, *supra* note 5.

[21] J. Larry Landers *et al.*, *Reproduction of the Gopher Tortoise (*Gopherus polyphemus*)*, 103 AM. MIDL. NAT. 353-359 (1980); Joan E. Diemer and C. T. Moore, *Reproduction of Gopher Tortoises in North-Central Florida*, *in* BIOLOGY OF NORTH AMERICAN TORTOISES 129-37 (R. B. Bury and D. J. Germano, eds., National Biological Survey, Fish and Wildlife Research 13, 1994); Joan E. Diemer, *supra* note 5.

[22] Joan E. Diemer, *supra* note 5.

[23] John F. Douglass, *Patterns of Mate Seeking and Aggression in a Southern Florida Population of the Gopher Tortoise*, Gopherus Polyphemus, *in* PROCEEDINGS OF THE 1986 DESERT TORTOISE COUNCIL ANNUAL SYMPOSIUM 155-99 (1990).

[24] Walter Auffenberg, *On the courtship of* Gopherus polyphemus, 22 HERPETOLOGICA 113-17 (1966); J.S. Wright, *supra* note 14.

her posterior end is near the male's head. The male then attempts to mount the female, and repeats the courting behavior if unsuccessful.[25]

Nests are constructed, typically in burrow mounds, from mid-May to mid-June. Incubation periods range from 80-90 days in northern Florida,[26] 97-106 days in Georgia,[27] to 110 days in South Carolina, the northern limit of the gopher tortoise's range.[28] Only one clutch is produced annually.[29] Clutch size usually ranges 3-12,[30] averaging 3.8 in South Carolina, 5-6 in Florida,[31] 7 in Georgia[32] and 4.8 in Mississippi.[33] However, clutch size increases with increasing female size,[34] and large female from central Florida was found to produce an unusually large clutch of 25 eggs.[35] Adult females produce one clutch per year, though some adults do not nest every year. Incubation lasts between 80-110 days, lasting approximately 110 days in South Carolina, 80-90 days in northern Florida,[36] and averaging 105 days in northeastern Florida[37] and 88 days in Mississippi.[38]

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[25] Walter Auffenberg, *id.*; CARL H. ERNST AND ROGER W. BARBOUR, *supra* note 8.

[26] John B. Iverson, *The Reproductive Biology of* Gopherus polyphemus, 103 AM. MIDL. NAT. 353-59 (1980).

[27] J. Larry Landers *et al.*, *supra* note 21.

[28] J.S. Wright, *supra* note 14.

[29] *Id.*; J. Larry Landers *et al.*, *supra* note 21.

[30] Joan E. Diemer, *supra* note 5; Joan E. Diemer and C.T. Moore, *supra* note 21.

[31] Joseph A. Butler and Todd W. Hull, *Reproduction of the Tortoise,* Gopherus polyphemus, *in Northeastern Florida*, 30 J. HERPETOLOGY 14-18 (1996).

[32] Joan E. Diemer and C. T. Moore, *supra* note 21.

[33] Deborah M. Epperson and Colleen D. Heise, *Nesting and Hatchling Ecology of Gopher Tortoises (*Gopherus polyphemus*) in Southern Mississippi*, 37 J. HERPETOLOGY 315-324 (2003).

[34] Joan E. Diemer and C.T. Moore, *supra* note 21; J. Larry Landers *et al.*, *supra* note 21.

[35] J.S. Godley, *A Comparison of Gopher Tortoise Populations Relocated onto Reclaimed Phosphate-mined Sites in Florida, in* GOPHER TORTOISE RELOCATION SYMPOSIUM PROCEEDINGS 43-58 (J. E. Diemer *et al.* eds., Fla. Game and Fresh Water Fish Comm'n, Nongame Wildlife Program Technical Report 5, 1989).

[36] John B. Iverson, *supra* note 26; J. Larry Landers *et al.*, *supra* note 21.

[37] Joseph A. Butler and Todd W. Hull, *supra* note 31.

[38] Deborah M. Epperson and Colleen D. Heise, *supra* note 33.

Gopher tortoise eggs are white, nearly spherical and brittle-shelled, with an average maximum egg diameter of 42-43 mm and an average wet mass of 40.9 g.[39] Hatching occurs from August through September. In northeastern Florida, hatchlings emerged from the nest from late August through early October.[40] At hatching, and about 24-48 hours prior to emergence, hatchlings exhibit a large external yolk sac.[41] The external yolk sac is absorbed as the hatchlings remain in the nest cavity prior to emergence. After emergence a deep transverse groove across the plastron is visible, disappearing two to three days after emergence as the anterior-posterior axis of the body becomes straight and the plastron flattens.[42] The gopher tortoise exhibits temperature-dependent sex determination.[43]

Predation on nests and hatchlings is heavy.[44] Predators include raccoons (*Procyon lotor*), grey foxes (*Urocyon cinereoargenteus*), striped skunks (*Mephitis mephitis*), armadillos (*Dasypus novemcinctus*), opossums (*Didelphis virginianus*), coachwhips (*Masticophis flagellum*), Eastern indigo snakes (*Drymarchon couperi*) and various raptors.[45] In fact, most gopher tortoise eggs

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[39] John B. Iverson, *supra* note 26; J. Larry Landers *et al.*, *supra* note 21.

[40] Joseph A. Butler and Todd W. Hull, *supra* note 31.

[41] T.A. Linley and Henry R. Mushinsky, *Organic Composition and Energy Content of Eggs and Hatchlings of the Gopher Tortoise*, *in* BIOLOGY OF NORTH AMERICAN TORTOISES 113-28 (R. B. Bury and D. J. Germano, eds., National Biological Survey, Fish and Wildlife Research 13, 1994).

[42] CARL H. ERNST AND ROGER W. BARBOUR, *supra* note 8.

[43] R.L. Burke *et al.*, *Temperature-dependent Sex Determination and Hatching Success in the Gopher Tortoise (*Gopherus polyphemus*)*, 2(1) CHELONIAN CONSERVATION AND BIOLOGY 86-88 (1996).

[44] Joan E. Diemer, *supra* note 5; Ross A. Alford, *Population Structure of* Gopherus polyphemus *in Northern Florida*, 14 J. HERPETOLOGY 177-82 (1980); Joseph A. Butler and Scott Sowell, *Survivorship and Predation of Hatchling and Yearling Gopher Tortoises,* Gopherus polyphemus, 30 J. HERPETOLOGY 455-58 (1996); Lora L. Smith, *Survivorship of Hatchling Gopher Tortoises in North-Central Florida*, *in* CONSERVATION, RESTORATION, AND MANAGEMENT OF TORTOISES AND TURTLES 100-03 (1997).

[45] Joan E. Diemer, *supra* note 5; *see also* CARL H. ERNST AND ROGER W. BARBOUR, *supra* note 8; John F. Douglass and C. E. Winegarner, *Predators of Eggs and Young of the Gopher Tortoise,* Gopherus polyphemus *(Reptilia, Testudines, Testudinidae), in Southern Florida*, 11 J. HERPETOLOGY 236-38 (1977); J. Larry Landers *et al.*, *supra* note 21.

never hatch because of predation.[46] For example, in South Carolina, 17 of 24 (74 percent) nests were destroyed over a two-year period.[47] In Georgia, females are estimated to produce a successful clutch of eggs (eggs are not destroyed prior to hatching) only once a decade, because about 90 percent of their nests are destroyed annually.[48] Hatchling gopher tortoises also are subjected to high levels of predation in their first year of life. In their first year of life, gopher tortoises in northern Florida have been estimated to have a mortality rate of 94.2 percent.[49] In central Florida, a study which combined mortality of eggs and hatchlings, found an annual mortality rate of 92.3 percent.[50]

Predation of juvenile tortoises has been found to be higher in October-November and April-May than any other two month interval of the year. Juvenile tortoises are known to bask at the openings of their burrows more often in the spring and fall of the year than during the summer or winter months. When positioned at the mouth of the burrow to thermoregulate during the cool months of the year, juvenile tortoises appear to be quite vulnerable to predation by avian and mammalian predators.[51]

The first years of life are the most critical for the gopher tortoise. If a tortoise grows to a moderate size, requiring 10 to 15 years, the chance for survival increases.[52] Life expectancy is

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[46] RECOVERY PLAN, *supra* note 1 at 6.

[47] J.S. Wright, *supra* note 14.

[48] J. Larry Landers *et al.*, *supra* note 21.

[49] Ross A. Alford, *supra* note 44.

[50] Brian W. Witz *et al.*, *Estimating Population Size and Hatchling Mortality of* Gopherus polyphemus, 55 FLA. SCIENTIST 14-19 (1992).

[51] Dawn S. Wilson, *Estimates of Survival for Juvenile Gopher Tortoises,* Gopherus polyphemus, 25 J. HERPETOLOGY 376-79 (1991); *see also* John W. Fitzpatrick and Glen E. Woolfenden, *Red-tailed Hawk Preys on Juvenile Gopher Tortoise*, 6 FLA. FIELD NAT. 49 (1978).

[52] CHRISTINE R. SMALL AND LAURIE ANN MACDONALD, REPRODUCTION AND GROWTH IN RELOCATED AND RESIDENT GOPHER TORTOISES (*GOPHERUS POLYPHEMUS*) ON RECLAIMED PHOSPHATE-MINED LANDS at 7 (Fla. Inst. of Phosphate Res. Project No. 93-03-105R, 2001).

estimated at 40-60 years[53] and may extend to 80-100 years.[54] Growth annuli on scutes become worn at 20-40 years, making age determination imprecise.[55]

F. FORAGING AND DIET

The gopher tortoise is the primary grazer in its xeric habitats.[56] In general, feeding is restricted to within 50 m of the burrow.[57] Gopher tortoises feed primarily on broadleaf grasses, wiregrass, grass-like asters, legumes, and fruits, including blackberry (*Rubus cuneifolius*), flatwoods plum (*Prunus umbellata*), blueberry (*Vaccinium* spp.), maypop (*Passiflora incarnata*) and hawthorn (*Crataegus* spp.).[58] Tortoises generally ingest fruits of plants in the same proportions in which the plants occur immediately around active burrows.[59] Wiregrass (*Aristida stricta*) is often considered an important food plant and is a common member of the longleaf-scrub oak community.[60] Regardless of the specific plants available for forage, the "grasses, grass-like plants and legumes are the most important food plants and evidently determine carrying capacity."[61]

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[53] Joan E. Diemer, *supra* note 5; J. Larry Landers, *supra* note 20.

[54] J. Larry Landers *et al.*, *supra* note 21.

[55] RECOVERY PLAN, *supra* note 1 at 5.

[56] J. Larry Landers, *supra* note 20.

[57] Joan E. Diemer, *supra* note 5.

[58] James A. Garner and J. Larry Landers, *Foods and Habitat of the Gopher Tortoise in Southwestern Georgia, in* 35 PROCEEDINGS OF THE ANNUAL CONFERENCE SOUTHEASTERN ASSOCIATION FISH WILDLIFE AGENCIES 120-34 (1981); Laurie A. Macdonald and Henry R. Mushinsky, *Foraging Ecology of the Gopher Tortoise,* Gopherus polyphemus, *in a Sandhill Habitat*, 44 HERPETOLOGICA 345-353 (1988).

[59] Roger D. Birkhead *et al.*, *Patterns of Folivory and Seed Ingestion by Gopher Tortoises (*Gopherus polyphemus*) in a Southeastern Pine Savanna*, 154(1) AM. MIDL. NAT. 143-51.

[60] RECOVERY PLAN, *supra* note 1 at 6.

[61] James A. Garner and J. Larry Landers, *supra* note 58.

One study of juvenile gopher tortoises found juveniles to eat 26 plant genera.[62] This same study found that plants of 16 genera were selected positively, while the most abundant plant genus along the foraging paths, *Aristida*, was selected negatively. Other grasses (*Poaceae*) were consumed mostly during the cool months when forbs, several of which were selected positively, were in decline. Grasses mostly were eaten in proportion to their availability. Juvenile gopher tortoises foraged only for brief time periods and traveled short distances during a foraging excursion.

G. HOME RANGE AND MOVEMENT

Gopher tortoise individuals usually maintain a well-defined home, or activity, range. While activity ranges have been found to be larger than 6 hectares (ha),[63] most are much smaller. Male activity ranges generally are larger than those of females.[64] For example, one study of a large, contiguous area of habitat in Georgia, found the mean annual home range size of females was 0.4±0.08 ha (range: 0–3.4 ha) and that of males was 1.1±0.13 ha (range: 0–4.8 ha).[65] Home ranges are generally larger in the summer months than in other seasons.[66] However, since home range size is inversely correlated with the amount of herbaceous ground cover, home ranges may vary depending on the quality of the habitat.[67]

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[62] Henry R. Mushinsky *et al.*, *Diet and Dietary Preferences of the Juvenile Gopher Tortoise (*Gopherus polyphemus*)*, 59 HERPETOLOGICA 475-83 (2003).

[63] John F. Douglass, *supra* note 23.

[64] Walter Auffenberg and John B. Iverson, *Demography of Terrestrial Turtles, in* TURTLES: PERSPECTIVES AND RESEARCH 541-69 (M. Harless and H. Morlock, eds., 1979); W. Allen McRae *et al.*, *Movement Patterns and Home Range of the Gopher Tortoise*, 106 AM. MIDL. NAT. 165-79 (1981); Joan E. Diemer, *Home Range and Movements of the Tortoise* Gopherus polyphemus *in Northern Florida*, 26 J. HERPETOLOGY 158-65 (1992); Rebecca B. Smith *et al.*, *Home Range Characteristics of Radiotagged Gopher Tortoises on Kennedy Space Center, Florida*, 2(3) Chelonian Conservation and Biology 358-62 (1997); Jeannine O. Eubanks *et al.*, *Patterns of Movement and Burrow Use in a Population of Gopher Tortoises (*Gopherus polyphemus*)*, 59 HERPETOLOGICA 311-21 (2003).

[65] Jeannine O. Eubanks *et al.*, *supra* note 64.

[66] *See, e.g.*, Jeannine O. Eubanks *et al.*, *supra* note 64.

[67] Joan E. Diemer, *supra* note 64; Henry R. Mushinsky and Earl D. McCoy, *supra* note 13.

The home ranges of juveniles are much smaller than those of adults, 0.36 ha or less.[68] In northern Florida, mean home range of hatchlings during the active period was 363 m^2, the mean annual range of individuals surviving a year was 2032 m^2, and their mean total range after about two years was 2554±1382 m^2.[69]

In the Georgia study of gopher tortoise movements, females traveled a mean distance of 54.0±3.36 m per move and males traveled a mean distance of 85.2±1.73 m per move. The longest distance between subsequent tracking locations was 592 m by a female tortoise and 638 m by a male tortoise.[70] In northern Florida, the calculated mean moved distance from and between burrows was 37.0 m for adult females and 79.0 m for adult males.[71] For juveniles, mean moved distance has been found to be 16.0 m in northern Florida.[72]

A study of a Georgia population of tortoises found a mean feeding radius of 13.0 m for adults with 95 percent of all feeding activity took place within 30 m of the burrow being used.[73] Juveniles have been found to travel only short distances from their burrows during foraging.[74]

Gopher tortoises excavate burrows, averaging 4.5 m in length and 2 m in depth.[75] A study in northern Florida found that adult male tortoises use an average of 5.5 burrows and adult female tortoises use 2.7 burrows per activity season.[76] In Georgia, males tortoises have been

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[68] W. Allen McRae *et al.*, *supra* note 64; Terry J. Doonan and I. Jack Stout, *Effects of Gopher Tortoise (*Gopherus polyphemus*) Body Size on Burrow Structure*, 131 AM. MIDL. NAT. 273-80 (1994); Joan E. Diemer, *supra* note 64.

[69] Joseph A. Butler *et al.*, 1995. *Movements and Home Range of Hatchling and Yearling Gopher Tortoises, Gopherus polyphemus*, 1(3) CHELONIAN CONSERVATION AND BIOLOGY 173-80 (1995).

[70] Jeannine O. Eubanks *et al.*, *supra* note 64.

[71] Joan E. Diemer, *supra* note 64.

[72] *Id.*

[73] W. Allen McRae *et al.*, *supra* note 64.

[74] Henry R. Mushinsky *et al.*, *supra* note 62.

[75] Joan E. Diemer, *supra* note 5; Joan E. Diemer, *supra* note 12.

[76] Joan E. Diemer, *supra* note 64.

found to use a mean of a mean of 10.0±0.53 burrows (range: 2–22) and females used 5.2±0.32 (range: 1–13) burrows, during a 13-month study period.[77] Use of individual burrows by several tortoises at different times and occupation of individual burrows by two tortoises at the same time has also been documented.[78] The average number of burrows used by juvenile tortoises has found to be much less, 1.1 by 0-1-year-olds, 2.2 by 2-year-olds and 1.7 by 4-5-year-olds in a southern Georgia population.[79]

Despite generally staying relatively close to active burrows, gopher tortoises sometimes make long distance movements. In Georgia, two adult males dispersed 1.2 km and 1.5 km (straight-line distance to final known location).[80] As emigrating subadults, radio-tagged tortoises have been documented to emigrate 0.74 km.[81] Juveniles also may make long distance movements following some type of disturbance to the resident burrow.[82] However, in Mississippi, 7 hatchlings surviving 41-736 days dispersed a mean of 130-160 m (range: 17.5 to 458 m) from their nest.[83]

The gopher tortoise Recovery Plan defined a "colony" of tortoises as "three or more active adult burrows... within 300 feet of each other."[84] This concept was thought to distinguish groups of interacting individuals from other such isolates. However, given the dispersal distances of 1.2 km and 1.5 km documented on high-quality habitat, nomadic or emigration movements

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[77] Jeannine O. Eubanks *et al.*, *supra* note 64.

[78] Rebecca B. Smith *et al.*, *supra* note 64.

[79] W. Allen McRae *et al.*, *supra* note 64.

[80] Jeannine O. Eubanks *et al.*, *supra* note 64.

[81] Joan E. Diemer, *supra* note 64.

[82] *See id.*

[83] Deborah M. Epperson and Colleen D. Heise, *supra* note 33.

[84] RECOVERY PLAN, *supra* note 1 at 16.

may unite populations over fairly large distances.[85] Thus, it seems unlikely that two locations separated by less than several kilometers of suitable habitat would represent independent colonies over an extended period of time.

H. SOCIAL STRUCTURE

Gopher tortoises have a well-developed social structure, courtship, and territorial combat.[86] When males confront each other, there is usually some manifestation of dominance or submissive behavior, with a dominance hierarchy in males based on size.[87] In dense populations, smaller males are found around the colony's periphery rather than in the middle, close to the breeding females, as is the case with larger males.

I. RELATIONSHIP TO OTHER SPECIES

Gopher tortoise burrows not only protect tortoises from extreme temperatures, desiccation and predators, but also provide habitat or refuge for over 360 other species.[88] These include many imperiled species, such as the Eastern indigo snake (*Drymarchon corais couperi*),[89] gopher frog (*Rana capito*),[90] Florida mouse (*Podomys floridanus*),[91] Florida pine snake (*Pituophis melanoleucus mugitus*),[92] burrowing owls (*Athene cunicularia*),[93] as well as skunks,

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[85] Jeannine O. Eubanks *et al.*, *supra* note 64.

[86] RECOVERY PLAN, *supra* note 1 at 5 *citing* Walter Auffenberg, *supra* note 24, John F. Douglass, Mating System of the Gopher Tortoise (*Gopherus polyphemus*) in Southern Florida (1976) (unpublished M.S. thesis, Univ. South FL, Tampa); W. Allen McRae *et al.*, *supra* note 64. *See* discussion *supra* Part II.E for a brief description of the courtship behavior.

[87] *Id. citing* W. Allen McRae *et al.*, *supra* note 64.

[88] Dale R. Jackson and Eric G. Milstrey, *Fauna of Gopher Tortoise Burrows* (Fla. Game and Freshwater Fish Comm'n, Nongame Wildlife Program Tech. Rep. 5, 1989).

[89] Listed as a threatened species by the FWS and the States of Florida, Georgia and endangered by the State of South Carolina.

[90] Listed as a species of special concern by the State of Florida and endangered by the State of South Carolina.

[91] Listed as a species of special concern by the State of Florida.

[92] Listed as a species of special concern by the States of Florida and South Carolina.

[93] Listed as a species of special concern by the State of Florida.

opossums, rabbits, quail, armadillos, snakes, lizards, frogs, toads and many invertebrates. Many of these commensals use tortoise burrows to escape predators, adverse weather conditions, and fire; some cannot exist without the burrows. Furthermore, the mound of sand deposited at the mouth of a burrow during its construction disrupts groundcover vegetation and affects the understory community in a way that may promote high plant species richness.[94] Thus, gopher tortoises are truly a keystone species.[95]

III. STATUTORY REQUIREMENTS AND PREVIOUS ADMINISTRATIVE ACTIONS

A. LISTING

Species[96] are not protected under the ESA until they are formally listed under the Act. 50 C.F.R. §§ 17.11, 17.12. A species is listed under the ESA due to any one of the following factors:

> (A) the present or threatened destruction, modification, or curtailment of its habitat and range;
>
> (B) overutilization for commercial, recreational, scientific, or educational purposes;
>
> (C) disease or predation;
>
> (D) the inadequacy of existing regulatory mechanisms; or
>
> (E) other natural or manmade factors affecting its continued existence.

16 U.S.C. § 1533(a)(1).

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[94] S.A. Kaczor and David C. Hartnett, *Gopher Tortoise (*Gopherus polyphemus*) Effects on Soils and Vegetation in a Florida Sandhill Community*, 123 AM. MIDL. NAT. 100–111 (1990); Sharon M. Hermann, *Small-scale Disturbances in Longleaf Pine Forests*, *in* THE LONGLEAF PINE ECOSYSTEM: ECOLOGY, RESTORATION AND MANAGEMENT: PROC. 18TH TALL TIMBERS FIRE ECOLOGY CONF. 265–74 (S.M. Hermann ed., 1993).

[95] *See, e.g.*, Craig Guyer and M.A. Bailey, *Amphibians and Reptiles of Longleaf Pine Communities*, *in*. THE LONGLEAF PINE ECOSYSTEM: ECOLOGY, RESTORATION AND MANAGEMENT: PROC. 18TH TALL TIMBERS FIRE ECOLOGY CONF. 139-58 (S.M. Hermann ed., 1993).

[96] Under the ESA, the term species "includes any subspecies of fish or wildlife or plants, and any distinct population of vertebrate fish or wildlife which interbreeds when mature." 16 U.S.C. § 1532(16).

Species are listed under the ESA as either threatened or endangered. Under the Act, endangered species "means any species which is in danger of extinction throughout all or a significant portion of its range." 16 U.S.C. § 1532(6). A threatened species "means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20).

The western population of the gopher tortoise was listed as a threatened species on July 7, 1987. 52 Fed. Reg. 25,376 (July 7, 1987). The only justification for not listing the gopher tortoise over its entire range was a lack of data.

> Although the same threats are impacting the species rangewide, there are insufficient data to support listing populations east of the Tombigbee and Mobile Rivers in Alabama. Eastern populations will remain in category 2 of the Candidate List until data show that these populations warrant listing, or that they should be dropped from consideration.

Id. at 25,377.

Unfortunately, the data now shows that listing the eastern populations of the gopher tortoise as threatened is now warranted. As this petition demonstrates, the eastern populations of the gopher tortoise have continued to decline, suffered further habitat loss, degradation and fragmentation, and the gopher tortoise should now be listed as a threatened species throughout its entire range.

B. CRITICAL HABITAT DESIGNATION

For species listed after October 13, 1982, the Secretary must designate critical habitat for a species at the time that it is listed as threatened or endangered. 16 U.S.C. § 1533(a)(3)(A). However, the Secretary has the discretion to refrain from designating critical habitat if such designation is deemed "not prudent" or "not determinable". *Id.* §§ 1533(b)(2), (b)(6)(C)(ii). As defined under the ESA:

The term "critical habitat" for a threatened or endangered species means—

> (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
>
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species

16 U.S.C. § 1532(5)(A).

The ESA provides for limited circumstances when critical habitat designations are not required. These exceptions were intended to provide the Secretary with emergency means of avoiding negative treatment of the ESA. Congress assumed that in most cases critical habitat designation would be beneficial to listed species. Thus, critical habitat designation is meant to be the norm, but it has become the exception. As the Tenth Circuit has stated,

> The root of the problem lies in the FWS's long held policy position that CHDs are unhelpful, duplicative, and unnecessary. Between April 1996 and July 1999, more than 250 species had been listed pursuant to the ESA, yet CHDs had been made for only two. S. Rep. No. 106-126, at 2 (1999). Further, while we have held that making a CHD is mandatory once a species is listed, *Forest Guardians v. Babbitt*, 174 F.3d 1178, 1186 (10th Cir. 1999), the FWS has typically put off doing so until forced to do so by court order. S. Rep. No. 106-126, at 2 (1999).

New Mexico Cattle Grower's Ass'n v. FWS, 248 F.3d 1277, 1283 (10th Cir. 2001).

"Not prudent" findings are more common than "not determinable" findings. Regulations implementing the ESA set out two situations in which critical habitat designations may be found to be not prudent. The first is when "[t]he species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of such threat to the species." 50 C.F.R. § 424.12(a)(1)(i). In other words, when critical habitat designation would provide poachers and vandals with easy access to a species' habitats, resulting in an actual

increased risk of extinction for the species, FWS is not required to designate critical habitat. While this may have been the case for the western population of the gopher tortoise, increased risk is simply not apparent for most species. This would be the case for the eastern populations of the gopher tortoise because the location of many—if not most—of the remaining gopher tortoise colonies is readily available in Alabama, Georgia, Florida and South Carolina. Thus, critical habitat designation would not give any increased knowledge to those individuals who would seek to poach or otherwise take gopher tortoises.

The second situation in which the regulations state that critical habitat designation may be not prudent is when "[s]uch designation of critical habitat would not be beneficial to the species." 50 C.F.R. § 424.12(a)(1)(i). However, "[n]either the Act nor the implementing regulations sanctions nondesignation of habitat when designation would be merely less beneficial to the species." *Natural Resource Defense Council v. DOI*, 113 F.3d 1121, 1127 (9th Cir. 1997). As this petition demonstrates, habitat loss and degradation is a key factor in the decline of the gopher tortoise, and critical habitat designation would therefore clearly benefit this species.

When FWS finds that critical habitat designation would not benefit listed species, it often claims that the adverse modification prohibition in Section 7 of the ESA would not provide greater protection than the jeopardy standard, with its consultation requirement. This reasoning completely disregards the actual construction of the ESA.[97] Critical habitat designation was added to the ESA's mandates precisely because it does provide more protection than mere listing of the species.

Additionally, the Fifth Circuit held that FWS's reasoning equating jeopardy to adverse modification in its regulations was invalid.

> [T]he Services' evaluation of the merits of critical habitat designation was premised on the view that jeopardy consultation was "functionally equivalent" to consultation under the destruction/adverse modification standard. This position was based on the fact that 50 C.F.R. § 402.02 defined both standards in terms of survival and recovery. As we have concluded that the regulatory definition of the destruction/adverse modification standard is flawed, this "functional equivalence" argument is untenable.

Sierra Club v. FWS, 245 F.3d 434, 445 (5th Cir. 2001) (citations omitted).

It is important that critical habitat petitions not be neglected. Instead, FWS has relegated critical habitat petitions to its lowest priority. While other ESA petition actions such as listing are vital for species to receive protection under the ESA, some scientists argue that the benefits of listing may be nominal at best without the protection of critical habitat. In *Sierra Club v. FWS*, the Fifth Circuit discussed how critical habitat strengthens the protection granted to a listed species.

> Critical habitat designation primarily benefits listed species through the ESA's consultation mechanism. Section 7(a)(2) of the statute requires federal agencies to consult with the Secretary to "insure that any action authorized, funded, or carried out by such agency... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification" of that species's critical habitat. Thus, regardless of whether critical habitat is designated, an agency must consult with the Secretary where an action will "jeopardize the continued existence" of a species. If critical habitat has been designated, the statute imposes an additional consultation requirement where an action will result in the "destruction or adverse modification" of critical habitat.

245 F.3d at 439 (citation omitted).

An important justification for this additional protection is that the detrimental effects of proposed actions on species are not always apparent at the onset. Section 7 consultation requirements and take prohibitions offer specific protections, but they are limited in scope. For example, in *Riverside Irrigation Dist. v. Andrews*, 758 F.2d 508 (10th Cir. 1985), developers

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[97] *See, e.g.*, STANFORD ENV'L L. SOC'Y, THE ENDANGERED SPECIES ACT HANDBOOK (2000).

applied for a permit to deposit dredge materials upstream from the designated critical habitat of the endangered whooping crane. The Army Corps of Engineers, the agency responsible for permitting, found that the proposed action would adversely modify the critical habitat and place the species in jeopardy. The dredging and deposit itself were not found to pose an actual risk to the critical habitat and the developer sued for the permit. However, the Corps had found that the dam itself, which did not require a permit, would have presented a threat to the endangered species. Consequently, the dredge fill permit was not granted. The court found that the ESA required the Corps to investigate all possible effects of the development, both direct and indirect. *Id.* at 512-13. Critical habitat designation thus makes the ESA a multi-layered and comprehensive protective device. Without critical habitat designation, consultation would not address adverse modification of essential habitat. Thus, the FWS would not be required to suggest "reasonable and prudent alternatives" to the proposed action.

Protection associated with critical habitat designation is not analogous to the protection of federally lands such as national parks or monuments. When critical habitat is designated, the land itself is not given blanket protection. Rather, the sole purpose of designation is to protect endangered species that are endemic to the area. To invoke the protection of a critical habitat designation, one must first prove adverse habitat modification. The standard to prove adverse habitat modification is quite high. "Habitat modification or degradation alone is not enough. There must be some proof of 'the critical link between habitat modification and injury to the species'" for an activity to be restricted on land designated as critical habitat. *Palila v. Hawaii Dep't of Human Resources*, 649 F. Supp. 1070, 1077 (D. Haw. 1996).

C. PROTECTION FROM JEOPARDY THROUGH CONSULTATION

As previously stated, the ESA's consultation requirement is another important protective measure of the Act. In order to limit government activity in areas sensitive to listed species, the Act provides that

> [e]ach Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary... to be critical.

16 U.S.C. § 1536(a)(2). If an agency determines that a proposed action may affect a listed species, that agency must engage in formal consultation with the FWS. 50 C.F.R. § 402.14. As part of consultation, the FWS must provide that agency with a biological opinion explaining how the proposed action will affect the species or its habitat. If the FWS determines that the proposed action will jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat, the biological opinion must suggest any "reasonable and prudent alternatives" that the FWS believes will avoid jeopardy or adverse modification. 16 U.S.C. § 1536(b)(3)(A).

Alternatively, if the biological opinion concludes that the agency action will not result in jeopardy or adverse modification, or if it offers reasonable and prudent alternatives to avoid those consequences, the FWS must provide the agency with a written statement (known as an "Incidental Take Statement") that specifies the "impact of such incidental taking on the species," any "reasonable and prudent measures that the [FWS] considers necessary or appropriate to minimize such impact," and sets forth "the terms and conditions... that must be complied with by the Federal agency... to implement" those measures. 16 U.S.C. § 1536(b)(4).

Besides providing additional protection to listed species, critical habitat designation gives government and private parties fair warning of a listed species' presence when activities are proposed. This is a valuable resource that gives federal agencies, industry, conservation groups, and the interested public confirmation of Section 7 risk. "Critical habitat designation provides informational benefits to the public, state and local governments, and scientific organizations." *Sierra Club v. FWS*, 245 F.3d at 446.

D. PROHIBITIONS ON TAKE

In addition to the habitat protection measures of the ESA, Congress also included protective measures for individuals of listed species. Thus, it is unlawful for any person to "take" a listed species. 16 U.S.C. § 1538(a)(1). Under the ESA, "[t]he term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Id.* § 1532(18). FWS regulations defined "harm" to mean "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." 50 C.F.R. § 17.3.

As recognized in the 1987 listing rule, "[t]aking gopher tortoises for sale or use as food or pets has also had a serious effect on some populations." 52 Fed. Reg. at 25,376. While protections for individual gopher tortoises from direct harm and killing is vital, habitat protection is also very important for the gopher tortoise's survival. Critical habitat designation would provide a means by which the FWS could curtail many of these impacts on gopher tortoise habitat.

E. RECOVERY PLANNING

Another major protective measure of the ESA is recovery plans. When a species is listed, the FWS must "develop and implement plans... for the conservation and survival" of the species. 16 U.S.C. § 1533(f)(1). The first recovery plan for the western population of the gopher tortoise was approved by FWS on December 26, 1990.[98] "The two objectives of this plan consist of an immediate objective which is prevention of the listed population from becoming endangered and a long-term objective which is delisting."[99]

IV. STATUS AND TRENDS OF THE EASTERN POPULATION OF THE GOPHER TORTOISE

The decreasing trend of the eastern population of the gopher tortoise is closely correlated with habitat loss, degradation and fragmentation. Between 1900 and 2000, the human populations of the states containing gopher tortoises increased from 8,855,858 to 39,941,577 people, a 351 percent increase.[100] While in some states, most of the human population growth has occurred in counties outside the historic range of the gopher tortoise, growth in areas currently occupied by gopher tortoises has also been tremendous. Overall, counties in the six states in the entire range of the gopher tortoise have seen human population increases from 1,657,402 to 19,238,814 people between 1900 and 2000, an increase of 1061 percent. Human population growth in the counties supporting the eastern population of the gopher tortoise has been much more significant than those counties in the western population of the tortoise. *See* Tables 1 and 2.

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[98] RECOVERY PLAN *supra* note 1.

[99] *Id.* at Executive Summary.

[100] The states are Alabama, Florida, Georgia, Louisiana, Mississippi and South Carolina. Population numbers calculated using information from the U.S. Census Bureau. http://www.census.gov.

Table 1. Human population change in the counties within the range of the eastern population of the gopher tortoise, 1900-2000.[101]

	1900	2000	Percent change
Alabama	103,553	306,095	196%
Florida	528,542	15,982,378	2924%
Georgia	508,091	1,024,226	102%
South Carolina	138,482	330,504	139%
	1,278,668	**17,643,203**	**1280%**

Table 2. Human population change in the counties within the range of the western population of the gopher tortoise, 1900-2000.[102]

	1900	2000	Percent change
Alabama	73,874	417,940	466%
Louisiana	40,588	335,782	727%
Mississippi	264,272	841,889	219%
	378,734	**1,595,611**	**321%**

Recent range-wide population estimates are not readily available for the gopher tortoise. Based on the accessible population data, some of which is more than two decades old, there are 1,674,034 tortoises throughout the entire range of the species, and 1,649,903 in the eastern population. *See* Table 3.

[101] The counties within the range of the eastern population of the gopher tortoise are as follows:

Alabama: Baldwin, Conecuh, Covington, Escambia, Russell and Geneva
Florida: all 67 counties
Georgia: Appling, Atkinson, Baker, Berrien, Brantley, Bryan, Calhoun, Candler, Charlton, Chatham, Clay, Colquitt, Crisp, Effingham, Emanuel, Evans, Glynn, Grady, Irwin, Jeff Davis, Lanier, Laurens, Lee, Liberty, Long, Lowndes, McIntosh, Miller, Montgomery, Pierce, Screven, Seminole, Tattnall, Taylor, Toombs, Ware, Wayne, Wheeler and Wilcox

Distribution by county from NatureServe, http://www.natureserve.org; human population numbers calculated using information from the U.S. Census Bureau, http://www.census.gov.

[102] The counties within the range of the western population of the gopher tortoise are as follows:

Alabama: Mobile and Washington
Louisiana: St. Tammany, Tangipahoa and Washington Parishes
Mississippi: Clarke, Covington, Forrest, George, Greene, Hancock, Harrison, Jackson, Jasper, Jefferson Davis, Jones, Lamar, Lauderdale, Marion, Pearl River, Perry, Stone, and Wayne

Distribution by county from NatureServe, http://www.natureserve.org; human population numbers calculated using information from the U.S. Census Bureau, http://www.census.gov.

Table 3. Most recent number of estimated gopher tortoises.

	Number of Tortoises	Number of Mature Tortoises[103]
Alabama[104]	482,848	193,139
Florida[105]	763,784	305,513
Georgia[106]	400,000	160,000
South Carolina[107]	3,271	1,308
Eastern Population	**1,649,903**	**659,960**

	Number of Mature Tortoises
Alabama[108]	12,900
Louisiana[109]	0
Mississippi[110]	11,231
Western Population	**24,131**

V. THE EASTERN POPULATION OF THE GOPHER TORTOISE WARRANTS LISTING AS A THREATENED SPECIES

Save Our Big Scrub, Inc. hereby petitions to list the eastern population of the gopher tortoise as a threatened species under the ESA. Existing data suggests that the eastern population of the gopher tortoise "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20). The eastern population of the gopher tortoise warrants listing as threatened primarily due to "the present or threatened destruction, modification, or curtailment of its habitat or range." *Id.* at §

[103] Number of adult individuals calculated as 40% of the total population. *See* Joan E. Diemer, *supra* note 64.

[104] DANIEL M. SPILLERS AND DAN W. SPEAKE, STATUS AND DISTRIBUTION OF THE GOPHER TORTOISE (*GOPHERUS POLYPHEMUS*) IN SOUTHERN ALABAMA (Final Report Work Order No. 4, Contract 14-16-0009-1546, Ala. Coop. Fish & Wildlife Res. Unit, 1986).

[105] FLORIDA FISH & WILDLIFE CONSERVATION COMMISSION ("FWC"), BIOLOGICAL STATUS REPORT: GOPHER TORTOISE (*Gopherus polyphemus*) (2001).

[106] No actual estimate available. See *id.*

[107] J.S. Wright, *supra* note 14.

[108] Ren Lohoefener and Lynne Lohmeier, The Status of *Gopherus polyphemus* (Testudinides, Testudinidae) West of the Tombigbee and Mobile Rivers (Report presented in conjunction with a petition to list the gopher tortoise west of the Tombigbee and Mobile rivers as an endangered species without critical habitat, 1984).

[109] *Id.*

[110] *Id.*

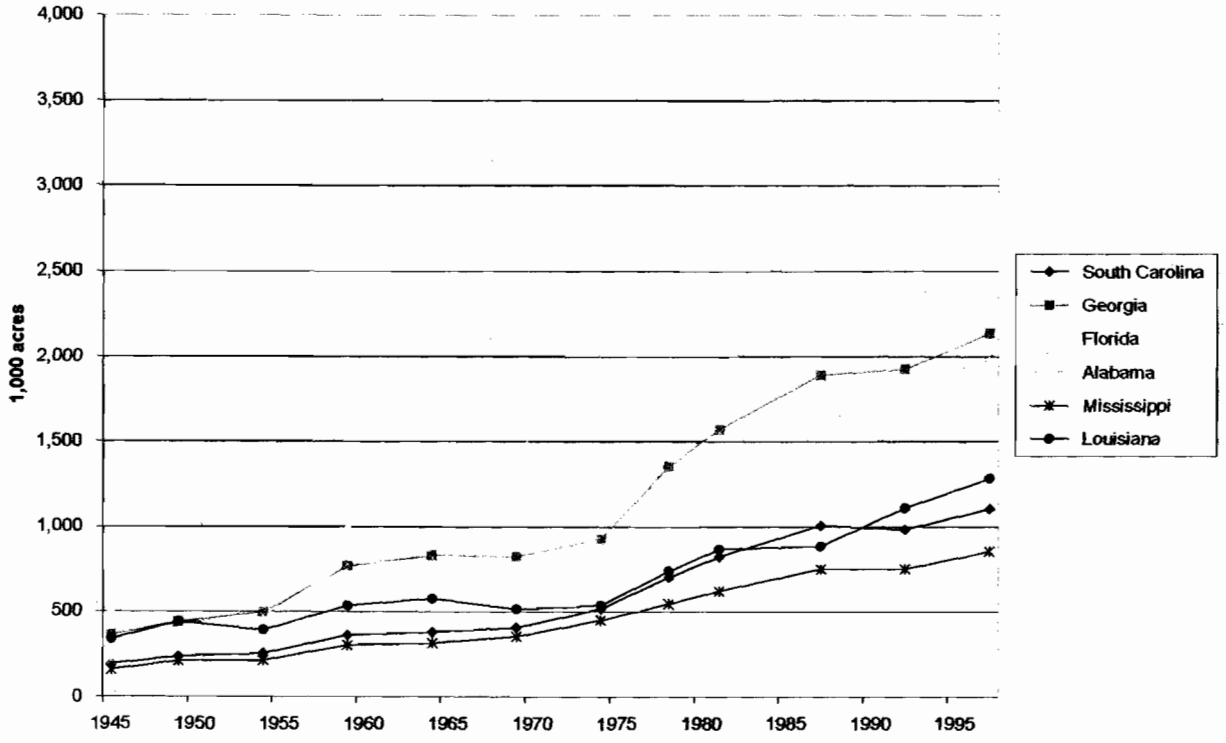
1533(a)(1)(A). However, all five statutory criteria are implicated in the need for listing the eastern population of the gopher tortoise as threatened: "overutilization for commercial, recreational, scientific, or educational purposes," "disease or predation," "the inadequacy of existing regulatory mechanisms" and "other natural or manmade factors affecting its continued existence." *Id.* at § 1533(a)(1)(B)-(E).

A. THE PRESENT OR THREATENED DESTRUCTION, MODIFICATION, OR CURTAILMENT OF ITS HABITAT OR RANGE

The area of urban lands in the states in the gopher tortoises range has also increased dramatically. Over the entire range of the gopher tortoise, land in urban areas has increased from approximately 1.8 million acres to 11.3 million acres between 1945 and 1997, an increase of more than 534 percent.[111] As with population growth, the increase has been more dramatic within the range of the eastern population of the gopher tortoise, where land in urban uses increased by approximately 614 percent, compared to the western population of the tortoise, where land in urban use increased 483 percent. *See* Fig. 1.

[111] Compiled from data from the U.S. Department of Agriculture (USDA) Economic Research Service. ECONOMIC RESEARCH SERVICE, MAJOR LAND USES (1996) < http://www.ers.usda.gov/data/sdp/view.asp?f=land/89003/>; Marlow Vesterby and Kenneth S. Krupa, *Major Uses of Land in the United States, 1997* (Resource Economics Division, Economic Research Service, Stat. Bull. No. 973, 2001).

Figure 1. Land in urban areas, 1945-1992.



Besides direct conversion to urban land uses, gopher tortoise habitat has been impacted by dramatic changes in land management in the last 50 years. Between 1952 and 1999, natural pine habitat declined by more than 61 percent in the states in the range of the eastern population of the gopher tortoise, while the decline has been 41 percent in the range of the western population of the tortoise. *See* Tables 4 and 5. The loss of natural pine stands was accompanied by extensive conversion to pine plantations, which have extremely limited use to gopher tortoises. Across the entire range of the gopher tortoise, the amount of pine plantations increased from 1.4 million acres in 1952 to nearly 22 million acres in 1999, an increase of more than 1400 percent. *See* Tables 6 and 7.

Table 4. Area of natural pine (thousand acres) within the states in the range of the eastern population of gopher tortoise, 1952-1999.[112]

	1952	1999	Percent change
Alabama	6,672	4,015	-39.82%
Florida	10,311	2,547	-75.30%
Georgia	13,260	4,570	-65.54%
South Carolina	5,888	2,847	-51.65%
	36,131	**13,979**	**-61.31%**

Table 5. Area of natural pine (thousand acres) within the states in the range of the western population of gopher tortoise, 1952-1999.[113]

	1952	1999	Percent change
Alabama	6,672	4,015	-39.82%
Louisiana	4,625	2,837	-38.66%
Mississippi	5,147	2,788	-45.83%
	16,444	**9,640**	**-41.38%**

Table 6. Area of pine plantations (thousand acres) within the states in the range of the eastern population of gopher tortoise, 1952-1999.[114]

	1952	1999	Percent change
Alabama	165	3,432	1980.00%
Florida	291	4,627	1490.03%
Georgia	357	6,070	1600.28%
South Carolina	233	2,672	1046.78%
	1,046	**16,801**	**1506.21%**

Table 7. Area of pine plantations (thousand acres) within the states in the range of the western population of gopher tortoise, 1952-1999.[115]

	1952	1999	Percent change
Alabama	165	3,432	1980.00%
Louisiana	103	2,160	1997.09%
Mississippi	284	2,960	942.25%
	552	**8,552**	**1449.28%**

[112] Roger C. Conner and Andrew J. Hartsell, *Forest Area and Conditions, in* SOUTHERN FOREST RESOURCE ASSESSMENT 357-402, Table 16.8 (D.N. Wear and J.G. Greis eds., 2002).

[113] *Id.*

[114] *Id.*

[115] *Id.*

Human population growth in the states in the range of the eastern population of the gopher tortoise is projected to continue into the future. By 2020, the populations of these states are expected to increase by 24 percent, or an additional 7.8 million people. *See* Table 8. By 2021, natural pine forests are expected to disappear from all commercial forest land in Florida.[116] Although the other states in the range of the eastern population of the gopher tortoise may not experience the dramatic growth that Florida has seen over the last 50 years, the prospects for loss of natural pine forests significant. In 2000, natural pine made up 11 percent of the forest industry's land holdings throughout the Southern United States; by 2020, only 2 percent of the forest industry's land holdings will be in natural pine.[117] The same is true for non-industrial private forest ("NIPF") owners. In 2000, natural pine consisted of 14 percent of NIPF land holdings, whereas only 10 percent will be in natural pine in 2020. The amount of planted pine over this same period is projected to increase from 63 percent to 81 percent of the forest industry's holdings and from 10 to 14 percent of the NIPF owners' holdings. The growing share of planted pine will also accompanied by more intensive management.[118]

These dire projections led the Florida Fish and Wildlife Conservation Commission ("FWC") to conclude that "[i]t may be inevitable that gopher tortoises will be largely eliminated from private lands in Florida within the next 3 generations, which would represent a 60-65% decline of tortoise habitat. We anticipate similar losses in the other range states."[119]

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[116] Randy S. Kautz, *Land Use and Land Cover Trends in Florida 1936-1995*, 61 FLA. SCIENTIST 171-87 (1998).

[117] Jacek P. Siry, *Intensive Timber Management Practices*, *in* SOUTHERN FOREST RESOURCE ASSESSMENT 327-40, 335 (D.N. Wear and J.G. Greis eds., 2002). The Southern United States includes the Southeast Region (Florida, Georgia, North Carolina, South Carolina and Virginia) and the South-Central Region (Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Oklahoma, Tennessee and Texas).

[118] *Id.*

[119] FWC *supra* note 105 at 5.

Table 8. Projected human population change in the states within the range of the eastern population of the gopher tortoise, 2000-2025.[120]

	2000	2025	Percent change
Alabama	4,447,100	5,224,000	17%
Florida	15,982,378	20,710,000	30%
Georgia	8,186,453	9,869,000	21%
South Carolina	4,012,012	4,645,000	16%
	32,629,943	**40,450,025**	**24%**

This habitat loss and conversion, combined with the tremendous number of roads throughout the Southeast, causes habitat fragmentation, which accentuates the impacts of habitat loss. 52 Fed. Reg. 25,376. Throughout most of the range of the eastern population, the widespread development and destruction of upland habitats has resulted in fragmentation of large tortoise populations and forces individual tortoises into unsuitable habitats and onto highways.[121] As the quality of isolated patches of gopher tortoise habitat is degraded, mature adults may be forced to abandon a site in search of better habitat quality. "Such individuals, which may be forced to abandon isolated patches of habitat in areas surrounded by human dwellings, seem doomed."[122]

B. OVERUTILIZATION FOR COMMERCIAL, RECREATIONAL, SCIENTIFIC, OR EDUCATIONAL PURPOSES

Some people consider tortoises a delicacy and some mistakenly believe tortoise flesh is an aid in relieving high blood pressure and impotence.[123] In fact, during the Great Depression, gopher tortoises were known as "Hoover Chickens." When the western population of the gopher

[120] Projected human population numbers from the U.S. Census Bureau, http://www.census.gov.

[121] DAWN S. WILSON *ET AL.*, SPECIES PROFILE: GOPHER TORTOISE (*GOPHERUS POLYPHEMUS*) ON MILITARY INSTALLATIONS IN THE SOUTHEASTERN UNITED STATES (U.S. Army Corps of Engineers Tech. Rep. SERDP-97-10, 1997) *citing* Joan E. Diemer, *supra* note 12; J. Larry Landers and James A. Garner, *supra* note 16.

[122] *Id.*

tortoise was listed in 1987, the FWS recognized that "[t]aking gopher tortoises for sale or use as food or pets has also had a serious effect on some populations." 52 Fed. Reg. 25,376. In 1981, Research in Florida has shown up to 20 percent of a colony has been taken at one time by "gopher pullers." *Id.* at 25,378.[124] In Florida, there is a long history of human predation on tortoises, especially in the western Panhandle, and prior to the closure of tortoise harvest in the late 1980s, one community in Okaloosa County held an annual tortoise cookout.[125] Because of human predation, tortoise populations in longleaf pine-turkey oak habitat in the Florida Panhandle averaged only 20 percent of the density of populations in similar habitat in Peninsular Florida.[126] Although the harvest of gopher tortoise is prohibited by all the states throughout its range, illegal commercial hunters have destroyed entire colonies to supply the demand for gopher meat[127] and local customs of eating gopher tortoises continue.[128]

In addition to direct killing for food by humans, gopher tortoises are negatively impacted or killed by human activities focused on other species. Though their numbers have declined in recent years, "rattlesnake round-ups" still take place in the range of the gopher tortoise. There are annual round-up events in Whigham, Georgia, Claxton, Georgia, and Opp, Alabama.[129]

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[123] Catherine Puckett and Richard Franz, Gopher Tortoise: A Species in Decline (2001).

[124] *Citing* R.W. Taylor, Jr., *The Gopher Tortoise – Its Use as Food by Man, in* PROC. 2ND. ANN. MTG. GOPHER TORTOISE COUNCIL 56-65 (R. Lohoefener, L. Lohmeier. and C. Johnston eds., 1981)

[125] FWC, *supra* note 105 at 4.

[126] *Id. citing* Walter Auffenberg and Richard Franz, *The Status and Distribution of the Gopher Tortoise (*Gopherus polyphemus*), in* NORTH AMERICAN TORTOISES: CONSERVATION AND ECOLOGY 95-126 (FWS Wildlife Research Report 12, R. B. Bury ed., 1982).

[127] Catherine Puckett and Richard Franz, *supra* note 123.

[128] David Fleshler, *Facing a Slow Death: Florida Allows Developers to Bury Alive or Kill Gopher Tortoises in Return for Protection of Habitat Elsewhere in the State, But Officials Warn that the Species Now Faces a "Very High Risk of Extinction"*, SUN-SENTINEL (Fort Lauderdale) (August 21, 2005).

[129] Humane Society of the United States, Annual Rattlesnake Roundups in the United States (visited Sept. 1, 2005) <http://www.hsus.org/wildlife/issues_facing_wildlife/rattlesnake_roundups/the_truth_behind_rattlesnake_roundups/annual_rattlesnake_roundups_in_the_united_states.html>.

Collection methods for these round-ups include pouring gasoline into the snakes' hiding places, which include gopher tortoise burrows. While Florida has banned the use of gasoline to collect rattlesnakes from gopher tortoise burrows[130] and banned tortoise races,[131] these activities persist in other states. Furthermore, undetected impacts of past harvesting for food or death as a result of rattlesnake collecting undoubtedly help clarify why tortoises are absent from some seemingly appropriate habitat.[132]

C. DISEASE OR PREDATION

Emerging diseases represent one of the most severe threats to may wildlife populations.[133] Among turtles, the bacterial disease known as Upper Respiratory Tract Disease ("URTD") has become widespread among the gopher tortoise and the desert tortoise (*Gopherus agassizii*).[134] The fact that URTD has the potential for causing high levels of mortality among free-living desert tortoises was the main factor leading to the emergency listing Mojave population of desert tortoises as endangered and its final listing as threatened under the ESA.[135] Although the state of

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[130] FLA. ADMIN. CODE, 68A-4.001(2).

[131] FLA. ADMIN. CODE, 68A-25.002(9), (10).

[132] Sharon M. Hermann *et al.*, *Sampling on Private Property to Evaluate Population Status and Effects of Land Use Practices on the Gopher Tortoise,* Gopherus polyphemus, 108 BIOLOGICAL CONSERVATION 289–98 (2002).

[133] *See, e.g.*, Peter Daszak *et al.*, *Emerging Infectious Diseases of Wildlife-Threats to Biodiversity and Human Health*, 287 SCIENCE 443-49 (2000).

[134] Richard A. Seigel *et al.*, *Swine Flu or 1918 Pandemic? Upper Respiratory Tract Disease and the Sudden Mortality of Gopher Tortoise (*Gopherus polyphemus*) on a Protected Habitat in Florida*, 37(1) J. HERPETOLOGY 137-44 (2003) *citing* Elliot R. Jacobson *et al.*, *Chronic upper Respiratory Tract Disease of Free-Ranging Desert Tortoises,* Xerobates agassizii, 27 J. Wildlife Diseases 296–316 (1991); Elliot R. Jacobson *et al.*, *Mycoplasmosis and the Desert Tortoise (*Gopherus agassizii*) in Las Vegas Valley, Nevada.* 1 CHELONIAN CONSERVATION AND BIOLOGY 279–84 (1995); Mary B. Brown *et al.*, Mycoplasma agassizii Causes Upper Respiratory Disease in the Desert Tortoise, 62 INFECTION AND IMMUNITY 4580–86 (1994); Rebecca B. Smith *et al.*, Occurrence of Upper Respiratory Tract Disease in Gopher Tortoise Populations in Florida and Mississippi, 32 J. HERPETOLOGY 426-30 (1998); Joan E. Berish *et al.*, *Distribution and Prevalence of Upper Respiratory Tract Disease in Gopher Tortoises in Florida*, 34 J. HERPETOLOGY 5-12 (2000).

[135] 54 Fed. Reg. 32,326 (Aug. 4, 1989) (Emergency Determination of Endangered Status for the Mojave Population of the Desert Tortoise); 55 Fed. Reg. 12, 178 (Apr. 2, 1990) (Determination of Threatened Status for the Mojave Population of the Desert Tortoise).

Florida now requires testing for URTD before tortoises can be relocated, no cure is available, few other conservation measures have been taken, and many scientists believe the testing has, at best, been ineffective.[136] Tortoises with URTD may or may not exhibit clinical signs, i.e., nasal and/or ocular discharge and swollen eyelids, thus increasing the chance of inadvertently translocating carriers of this disease. A blood test is presently the most effective, rapid, and cost-effective way to detect exposure to this disease; however, this test only indicates whether a particular tortoise has developed antibodies and does not indicate current infection.

In 1998, anecdotal reports of large-scale mortality of tortoises at several sites in Florida began to circulate among tortoise biologists. At the same time, unusually high mortality among gopher tortoises at a large protected habitat in Florida, the Kennedy Space Center, began to appear.[137] Between 1995 and 2000, there was an enormous increase in the number of tortoises exhibiting signs of URTD at the Kennedy Space Center, from less than 5 percent to approximately 30 percent. Between 1998 and 2000, 43 dead tortoises were found at the Kennedy Space Center, which researchers believed URTD was responsible.[138] Given that tortoises exemplify a demographic pattern that is highly sensitive to changes to adult and juvenile mortality, the level of mortality observed at the Kennedy Space Center has the potential to severely impact gopher tortoise population viability.[139] Data shows that both genders and all age classes of the Kennedy Space Center tortoise population are equally vulnerable to URTD related mortality, so that an "across the board" decrease in tortoise numbers as a result of URTD can be expected.[140]

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[136] *See, e.g.*, Lora L. Smith and Sharon Hermann, Gopher Tortoise Council Position Statement on Tortoise Relocation (2002).

[137] Richard A. Seigel *et al.*, *supra* note 134.

[138] *Id.*

[139] *Id.*

[140] *Id.*

Besides URTD, predators also pose a significant threat to gopher tortoise population viability. Because of high losses of nests to predators, gopher tortoise eggs from a specific female may actually survive as infrequently as once in every 10 years; predators destroy more than 80 percent of gopher tortoise nests.[141] In a study in Mississippi, 48 tortoise hatchlings were radio-tracked to determine survivorship and activity patterns. Survivorship of hatchlings was low, with most (65 percent) killed within 30 days of hatching and only one hatchling still alive after 736 days.[142] In that study, most mortality was attributed to mammals (54 percent), although predation by imported red fire ants (*Solenopsis invicta*) was considerable (27 percent).

D. THE INADEQUACY OF EXISTING REGULATORY MECHANISMS

Although the each state in the eastern population of the gopher tortoise affords some protection to the species,[143] such state protections have been ineffective at preventing further declines in the species. In Florida, for example, permits are required to take or kill gopher tortoises.[144] However, since 1991, the FWC has issued permits to "entomb or kill" an estimated 67,000 to 71,000 gopher tortoises for the construction of houses, strip malls, roads and schools.[145] In other words, despite the prohibition against killing tortoises, the State of Florida has authorized the direct killing of approximately 10 percent of state's entire gopher tortoise population over the span of less than one-half a generation for gopher tortoises. The FWC provides five options to address the presence of tortoises on lands slated for development: avoid development, avoid destruction of tortoise burrows, mitigate for incidental take of tortoises,

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[141] Catherine Puckett and Richard Franz, *supra* note 123.

[142] Deborah M. Epperson and Colleen D. Heise, *supra* note 33.

[143] The gopher tortoise is listed as a Species of Special Concern in Florida, a Threatened Species in Georgia, an Endangered Species in South Carolina, and is a protected non-game species in Alabama.

[144] FLA. ADMIN. CODE, 68A-25.002 (10).

[145] David Fleshler, *supra* note 128.

relocate tortoises on-site or relocate them off-site.[146] Relocation is labor-intensive and costly. Under current regulations, such efforts are frequently impractical and seldom serve intended conservation functions.[147]

E. OTHER NATURAL OR MANMADE FACTORS AFFECTING ITS CONTINUED EXISTENCE

As recognized by the FWS when listing the western population of the gopher tortoise as a threatened species, "The previously discussed threats are accentuated by the length of time required for gopher tortoises to reach sexual maturity and their low reproductive rate." 52 Fed. Reg. at 25,378. Females take 10-21 years to reach sexual maturity,[148] only produce one clutch annually,[149] and lay an average of only 3.8 to 7 eggs per clutch.[150]

VI. REQUEST FOR RELIEF

For the reasons set forth above, Petitioners hereby request that the Secretary of the DOI and Director of the FWS:

1. At the earliest possible time, but not later than 90 days after receiving this petition, find that this petition presents substantial scientific information indicating that adding the eastern population of the gopher tortoise to the list of threatened species may be warranted, and promptly publish such finding in the Federal Register, 16 U.S.C. § 1533(b)(3)(A);

2. At the earliest possible time, but not later than 12 months after receiving this petition, determine how the DOI and FWS intend to proceed with the requested revisions, and promptly

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[146] FWC, AVAILABLE OPTIONS TO ADDRESS THE PRESENCE OF GOPHER TORTOISES ON LANDS SLATED FOR DEVELOPMENT (2004) <http://myfwc.com/permits/Protected-Wildlife/policy/tortoise_relocation_guidelines.pdf>.

[147] *See, e.g.*, Lora L. Smith and Sharon Hermann, *supra* note 136.

[148] J. Larry Landers *et al.*, *supra* note 21; Joan E. Diemer and C. T. Moore, *supra* note 21; Joan E. Diemer, *supra* note 5.

[149] J.S. Wright, *supra* note 14; J. Larry Landers *et al.*, *supra* note 21.

[150] Joseph A. Butler and Todd W. Hull, *supra* note 31; Joan E. Diemer and C. T. Moore, *supra* note 21.

population of the gopher tortoise to the list of threatened species may be warranted, and promptly publish such finding in the Federal Register, 16 U.S.C. § 1533(b)(3)(A);

2. At the earliest possible time, but not later than 12 months after receiving this petition, determine how the DOI and FWS intend to proceed with the requested revisions, and promptly publish such determination in the Federal Register, 16 U.S.C. § 1533(b)(3)(B)(ii), 1533(b)(3)(D)(ii); and,

3. At the earliest possible time, give notice of intent to issue a regulation listing the eastern population of the gopher tortoise to as a threatened species and to designate critical habitat, and publish a general notice and complete text of the regulation in the Federal Register, 16 U.S.C. § 1533(b)(5).

Respectfully submitted, this 13th day of January, 2006.

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