

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN: 1018-AB35

Endangered and Threatened Wildlife and Plants; Desert Tortoise

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) proposes to determine the Mojave population of the desert tortoise (*Gopherus* (= *Xerobates*, = *Scaptochelys*) *agassizii*) as an endangered species pursuant to the Endangered Species Act of 1973, as amended (Act). The Service proposes to determine the Sonoran population of the desert tortoise found outside its natural range in Arizona (south and east of the Colorado River) and Mexico as a threatened species due to similarity of appearance to the Mojave population. Desert tortoises belonging to the Sonoran population remaining in their natural range in Arizona (south and east of the Colorado River) and in Mexico are not covered by this proposed rule.

An emergency rule was published on August 4, 1989, listing the Mojave population of the desert tortoise as an endangered species which expires on August 2, 1990. An emergency situation in the form of a recently documented outbreak of a virulent respiratory disease, currently known as Upper Respiratory Disease Syndrome (Respiratory Disease Syndrome), has been identified and has caused significant declines to certain tortoise subpopulations and threatens to become pandemic in subpopulations already stressed as a result of habitat degradation, predation, and other factors. The Beaver Dam Slope desert tortoise is proposed to be upgraded from threatened to endangered with the critical habitat remaining as previously designated. The Service seeks data and comments from the public on this proposed rule.

DATES: Comments from all interested parties must be received by January 11, 1990. The Act requires the Service to promptly hold at least one public hearing on the proposed listing regulation, if requested by any person by November 27, 1989. Because of anticipated widespread public interest, the Service has decided to hold three public hearings. See **SUPPLEMENTARY INFORMATION** for dates and locations of hearings.

ADDRESSES: Comments and materials concerning this proposal should be sent to the Regional Director (Attn: Listing Coordinator), U.S. Fish and Wildlife Service, 1002 NE. Holladay Street, Portland, Oregon 97232-4181. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Mr. Robert P. Smith, Assistant Regional Director for Fish and Wildlife Enhancement, at the above address (telephone (503) 231-6131 or FTS 429-6131).

SUPPLEMENTARY INFORMATION:**Hearing Information**

November 20, 1989, 7:00 to 11:00 p.m., Riverside Convention Center at Raincross Square, 3443 Orange Street, Riverside, California.

November 28, 1989, 2:00 to 5:00, and 7:00 to 10:00 p.m., Clark County Commission Chambers, Bridger Building, 225 Bridger Avenue, First Floor, Las Vegas, Nevada.

November 29, 1989, 7:00 to 9:00 p.m., St. George City Offices, Council Chambers, 175 East 200 North, St. George, Utah.

A public hearing will be conducted at each of these locations at the times indicated. Oral statements may be limited to 3 or 5 minutes, if the number of parties present desiring to give such statements necessitates limitation. There are no limits to the length of any written statement presented at a hearing or mailed to the Service. Written comments are given the same weight and consideration as oral comments presented at the public hearings.

Background

The desert tortoise is one of three species in the genus *Gopherus* found in the United States. The Berlandier's tortoise (*G. berlandieri*) is found in northeastern Mexico and southern Texas. The gopher tortoise (*G. polyphemus*) is found in the hot, humid portions of southeastern United States. *G. agassizii* is relatively large, with adults measuring up to 15 inches in shell length and inhabits the Mojave, Colorado, and Sonoran deserts in the southwestern United States and adjacent Mexico.

Recent studies based on shell shape and variations in genetic composition indicate that the desert tortoise has two distinct populations, one of which is divided into two subpopulations (Spang et al. 1988). A summary of this information is as follows:

The Colorado River has been an effective geographic barrier, isolating the Mojave and the Sonoran populations for millions of years. The Mojave population is found to the west and the north of the river and the Sonoran population is found to the east and south. The Mojave population is further divided into two subpopulations.

The western Mojave subpopulation includes parts of the west Mojave, east Mojave, and Colorado Deserts in California and extreme southern Nevada. Tortoises occur in creosote bush (*Larrea tridentata*), cactus, and shadscale (*Atriplex confertifolia*) scrub habitats, and Joshua tree (*Yucca brevifolia*) woodlands (Dodd 1986).

Study plot data from eight sites in the western Mojave region indicate that populations have declined at rates of 10 percent or more per year for the last six to eight years. Vandalism, collections, raven predation, and disease are a few of the many factors that have resulted in population declines. Habitat conditions have deteriorated and/or habitat has been lost in certain localities due to urban, energy, and mineral development, vehicle-oriented recreation, grazing, military activities, and other uses.

The eastern Mojave subpopulation includes tortoises in eastern California, southern Nevada, and the Beaver Dam Slope and the Virgin River Basin of southwestern Utah and extreme northwestern Arizona (north of the Colorado River). Eastern Mojave tortoises occur in creosote bush-burro bush (*Ambrosia dumosa*) or creosote bush-Joshua tree vegetation types. Downward trends in this subpopulation and its habitat are believed to be a result of urban development, long-term livestock grazing, mining, large-scale water development, off-road vehicle use, collecting, military activities, and many other human-related uses.

The Sonoran population is found in Arizona, south and east of the Colorado River, and in Mexico. Tortoises in this area are found predominantly on steep, rocky slopes of mountain ranges, primarily in Arizona upland vegetation dominated by palo verde and saguaro cactus. The distribution of the present population and habitat is disjunct. Some habitat has been lost to expansion of urban areas. Grazing, mining, and fire have adversely affected some areas of tortoise habitat.

The Beaver Dam Slope subpopulation of the Mojave population of desert tortoises in Utah was listed as threatened with critical habitat on August 20, 1980 (45 FR 55654).

The Service received a petition on September 14, 1984, from the Environmental Defense Fund, Natural Resources Defense Council, and Defenders of Wildlife to list the desert tortoise in Arizona, California, and Nevada as endangered under the Endangered Species Act. The Service determined in September 1985 that the proposed listing of the tortoise within the three petitioned States was warranted but precluded by other listing actions of higher priority under authority of section 4(b)(3)(B)(iii) of the Act. Annual findings of warranted but precluded have been made in each subsequent year since 1985 under authority of section 4(b)(3)(C) of the Act.

Data collection on the Mojave population in recent months indicate that many local tortoise subpopulations throughout the range of the species have declined precipitously. The rapid spread of Respiratory Disease Syndrome, rarely seen before in wild tortoises, has been identified as a significant contributing factor in the current high level of tortoise losses.

On May 31, 1989, the same three environmental organizations that petitioned the Service in 1984 provided substantial new information and again petitioned the Service to list the desert tortoise as an endangered species throughout its United States range under the expedited emergency provisions of the Act. This second petition, treated by the Service as a petition under the Administrative Procedure Act, was received on June 2, 1989. In response to this petition, the Service conducted an extensive review of existing information on the Respiratory Disease Syndrome, other reported diseases in Arizona, and the current status of the tortoise. As a result of this and other information, the Service determined the Mojave population of the desert tortoise to be an endangered species under an emergency rule published on August 4, 1989 [54 FR 32326]. The emergency rule provides protection under the Act for the Mojave population of tortoises for 240 days (until April 2, 1990). The Service did not take emergency action to reclassify the Beaver Dam Slope subpopulation in Utah to endangered because it is already protected by the Act.

This proposal constitutes the final finding on the petitioner's request to list the desert tortoise throughout its range in the United States as an endangered species.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations promulgated to implement

the listing provisions of the Act (50 CFR part 424) set forth the procedures for adding species to the Federal list. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). The Act defines species to include subspecies and any distinct population segment of any species of vertebrate fish or wildlife that interbreeds when mature. The factors and their application to the Mojave population of the desert tortoise are as follows:

A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

As indicated above, habitat is deteriorating and has been lost in many parts of the tortoise's range due to an accelerating rate of urban, energy, and mineral development, military activities, vehicle-oriented recreational activities, grazing, and land exchanges.

For an animal such as the tortoise, which must consume its annual forage requirement in no more than five months out of the year (March to June, and September), it is apparent that meeting this need can become critical if forage has not been produced, is unavailable, or is of poor nutritive quality.

Changes in perennial vegetation, especially the reduction in cover of small and large shrubs and perennial grasses, are believed to be the result of cattle and sheep grazing pressures. These changes have created openings and barren areas in the desert landscape and have deteriorated the quality of habitat for the tortoise. Losses of plant cover may contribute to the excessive raven predation on small tortoises, making the tortoise more exposed and vulnerable as raven prey.

Changes in annual vegetation, also thought to be mostly connected to grazing, have also affected food supplies for tortoises. Weedy plant species that have been introduced for grazing, such as red brome (*Bromus rubens*), filaree (*Erodium cicutarium*), and abu mashi (*Schimus arabicus*), can germinate, flower, and fruit before native plants. Native plant species are essential to meet the nutritional needs of the tortoise and are their favored forage. Exotic, weedy plant species are outcompeting many native plant species (Berry 1988). Additional potential adverse impacts to the tortoise from cattle and sheep grazing include: damage to shrubs used for tortoise shelter, crushing of burrows and nests, and trampling of young tortoises. The degree and nature of impacts from cattle grazing are dependent upon habitat, grazing history, seasons of use, stocking rates, and

density of the tortoise population (Sievers et al. 1988).

Livestock grazing is thought to be a factor contributing to tortoise habitat degradation in portions of all four States covered by this proposed rule: Nevada, Utah, Arizona, and California. No formal research has been conducted in Nevada on effects of livestock grazing on tortoises. However, both the Final Statement for the Proposed Domestic Livestock Grazing Management Program for the Caliente Area, Nevada, and the Final Environmental Impact Statement for the Clark County, Nevada Grazing Program concluded that conflicts between livestock and desert tortoises would be reduced by grazing reductions and/or livestock removal during portions of the growing season (Bureau of Land Management (BLM) 1979, BLM 1982).

One BLM-funded research study on the Crescent Peak grazing allotment in Piute Valley near Searchlight, Nevada in 1983, concluded that an observed die-off of tortoises was "aggravated by the long-term grazing intensity that had occurred in the area" (Mortimer and Schneider 1983). An unusually high mortality rate in desert tortoises was found while the authors were investigating a permanent tortoise study plot in the valley. The plot is located in an ephemeral pasture used by livestock in the winter and early spring. From the data collected, the authors inferred that a major population change of tortoises occurred between 1979 and 1983. The population sustained a very high mortality rate (23.8 percent) with a resultant decline in the number of sexually mature individuals. Heavy spring grazing pressure had occurred for several years before 1980 and little or no annual forage was produced on the allotment in 1980 and 1981. The authors concluded that the decade of spring grazing had reduced the quality of the habitat and the ability of the tortoises to withstand the drought years of 1980 and 1981, even when cattle were not turned into the pasture during those years.

The Goffs tortoise study plot is located 26 miles to the south of the Piute Valley site and in 1980 was estimated to have a 2 percent annual mortality rate (Turner and Berry 1984). The major difference between the two plots is that the Goffs site is not grazed. The tortoises on that site were able to withstand the adverse weather conditions because they were in better physical condition than those in Piute Valley.

The majority of Utah's Beaver Dam Slope allotment is in the Southern Desert Shallow Hardpan Range Site as

identified by the Soil Survey of Washington County (United States Department of Agriculture 1977). The potential vegetation for this site is approximately 15 to 25 percent grasses, 2 to 5 percent forbs, and 40 to 80 percent shrubs. If the site is in excellent condition, the total annual production of air-dried herbage available as forage is about 400 pounds per acre in good moisture years and 250 pounds per acre under poor moisture years. The median production of annuals on the Beaver Dam Slope between 1980 and 1986 was 83 pounds per acre; half of the time forage production was more and half of the time it was less. The mean (average) production of annuals during that time period was 191 pounds per acre.

It is possible that the forage requirements of the tortoise may never be met on the Beaver Dam Slope. The BLM (BLM 1987) stated that 47 percent of the Beaver Dam Slope allotment is considered to be in fair forage condition while 53 percent is in poor forage condition. This estimate was based on desirable forage for livestock, and hence tortoises because of the dietary overlap. Additionally, the overall range trend has been static, no improvement has occurred.

Another important facet of tortoise feeding behavior is food preferences. Like livestock, tortoises prefer some plants over others and will go out of their way to consume them even if the plant is in low abundance. Coombs (1977b) observed in his study on the Beaver Dam Slope that bush muhly (*Muhlenbergia porteri*) was sought out more than any other plant even though it was one of the least available. This perennial grass has been greatly reduced in abundance by livestock grazing (Stoddart et al. 1975). The second most important plant was cheatgrass (*Bromus tectorum*) and was also one of the least common plants available to the tortoise. Minden (1980) found that a milk-vetch (*Astragalus nuttallianus*) was by far the most commonly consumed plant in his study (59 percent). This annual plant was not mentioned by Coombs (1977). Apparently, the year of Minden's study (1980) was one of above normal rainfall which allowed this annual forb to grow. It is, therefore, believed that the tortoise has food preferences and that total forage production is not an accurate gauge of food availability.

In Arizona, the habitat of the Mojave population of tortoises has experienced alteration of plant species composition and density. This floristic change has been attributed, in part, to livestock grazing. The area has been overgrazed

by cattle, sheep, and horses since the 1850's. Examination of livestock use in some of this area plus changes in plant densities and species composition indicate that adequate nutritional forage for tortoises may be lacking because of past overgrazing practices (Hohman and Ohmart 1978).

Vehicle free-play in tortoise habitat results in cumulative adverse impact to tortoise habitat. Impacts vary from minor habitat alteration and vehicle route proliferation to total denudation of extensive areas created by intensive vehicle play, parking, and camping. Concentrated vehicle play areas may eliminate all but the most hardy shrubs. Other impacts include soil compaction and erosion. Tortoises suffer from loss of forage, loss of vegetative cover, and loss of burrow sites and then become subject to increased mortality from crushing, collection, and vandalism (Sievers et al. 1988).

The increasing use of off-road vehicles appears to be having a significant effect on tortoise abundance and distribution. Not only may direct mortality result through crushing of tortoises either above ground or in their burrows, but the desert ecosystems may be degraded as a result of off-road vehicle use (Luckenbach 1982). Growth of annuals and herbaceous perennials may be severely reduced. The basic energy fixation and transfer systems of the desert can be disrupted or destroyed by vehicular activities. The tortoises in the St. George area of Utah are particularly vulnerable because of their proximity to an expanding urban population.

Competitive off-highway vehicle racing events adversely impact tortoise habitat. They often involve several hundred race participants and thousands of spectators. The camping and race start and finish areas receive intensive vehicle use and become devoid of vegetation. Tortoises are eliminated from these areas entirely due to the loss of food, cover, and burrow sites. Affected areas become enlarged with continued use (Sievers et al. 1988).

Competitive off-highway vehicle racing events have adversely impacted tortoise habitat in Nevada. Vehicles operated by racers and pit crews, as well as spectators, have been known to cut across desert habitat off-road, and racers frequently pass other vehicles in vegetated areas (Burge 1986; U.S. Fish and Wildlife Service 1989).

Vehicle route proliferation has occurred in many areas and can result in a significant cumulative loss of habitat. Human access increases the incidence of tortoise mortality from

collection, gunshot, and crushing by vehicles. Soil compaction results in loss of vegetation and increases in erosion (Sievers et al. 1988).

Road construction and vehicle use appear to have a long-ranging impact on the tortoise. Besides the immediate loss of tortoise habitat from road construction, paved roads and vehicular traffic affect tortoise populations within about one kilometer (km) (0.62 mile) of a road. For new roads, the extent of impact is up to 0.4 km (0.29 mile) away, while older roads may reduce tortoise numbers up to 2 km (1.24 miles) away (Nicholson 1978).

Large surface disturbances (e.g., power plants, mining, agricultural developments, military activities, and urbanization) cause long-term, permanent loss of habitat. Both large and small developmental activities often induce further surface disturbing activities with resulting habitat loss and tortoise population reduction. Increased human activity results in increased vehicle kills, vandalism, and collecting of tortoises (Sievers et al. 1988).

The metropolitan Las Vegas, Nevada, area has experienced rapid expansion in recent years, climbing from 241,000 people in 1980 to 335,000 in 1987; an increase of 28 percent (Walker and Cowperthwaite 1988). In the four years between 1982 and 1986, 10,000 acres of desert (tortoise habitat) were converted to urban uses (Clark County Department of Comprehensive Planning, pers. comm. 1989). City and county planners assume the ultimate limits of growth are set at the effective topographic limits of construction; planning maps indicate that the metropolitan area could eventually cover approximately 390 square miles (Clark County Regional Flood Control District 1986).

In northeast Arizona, additional habitat loss and fragmentation has occurred from mining, off-road vehicle activities, road and powerline construction and maintenance, agricultural development, and commercial, residential, and recreational developments. Currently, there is a proposal to develop 2,000 acres of tortoise habitat near Littlefield, Arizona for commercial purposes. Other developments are also planned for this area. Long-term plans call for development of a community of 250,000 people in the Littlefield area. Other potential habitat degradation activities include a BLM proposal for a utility corridor alternative across the Beaver Dam Slope in Arizona that would be two miles wide.

Land exchanges may result in habitat loss and increased fragmentation of

populations. Even where tortoise habitat is exchanged by the BLM for other tortoise habitat, there is an increased likelihood of development, resulting in loss of habitat, on the new private holdings (Sievers et al. 1988).

Three thousand sixty seven acres of moderate tortoise density lands, west of Las Vegas, Nevada, were recently transferred from BLM to Summa Corporation. The Desert Tortoise Council (Council) estimated that from 300 to 800 tortoises would be displaced by the exchange, and 3,470 acres of crucial tortoise habitat, as defined by the Council, would be lost to private development (Desert Tortoise Council 1987).

Recent legislation directs the Secretary of the Interior (Secretary) to sell 3,700 acres of moderate-to-high tortoise density lands, 20 miles northeast of Las Vegas, to Clark County. The Secretary is also authorized to offer for sale up to 17,000 additional acres in the same area (Pub. L. 101-67, Apex Project, Nevada Land Transfer and Authorization Act of 1989, July 31, 1989).

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Desert tortoises have long been a popular pet in the southwest. It is not currently known to what extent collecting has impacted wild populations. It is estimated that at least 100,000 desert tortoises exist in captivity. Many tortoises held in captivity, however, are known to exhibit signs of the contagious Respiratory Disease Syndrome. The release of diseased captive tortoises is considered by the BLM to be the source of introduction of the currently identified Respiratory Disease Syndrome found in wild populations.

Vandalism, including shooting and crushing of tortoises under vehicles, has been documented by the BLM and is considered a factor in reducing the number of tortoises in their natural habitat. BLM studies in the western Mojave Desert of California on 11 permanent study plots showed 14.3 percent of the carcasses with evidence of gunshot. At one plot, carcasses with evidence of gunshot was as high as 28.9 percent (Sievers et al. 1988).

Loss of tortoises from vandalism has also been reported in northwest Arizona. Approximately 10 percent of shell remains from a tortoise study plot near Littlefield, Arizona, had gunshot wounds (Charles Pregler, BLM 1989).

Luckenbach (1982) concluded that human activity is the most significant cause of tortoise mortality. The Beaver Dam Slope subpopulation of the Mojave

tortoise population has been subjected to collecting pressure in the past, and although the species is now protected in Utah, some collecting may still occur. On the Beaver Dam Slope in Arizona, heavy collection for the pet trade took place until the 1970s (Coombs 1977). Automotive stations paid children to collect tortoises and sold them to passing motorists (Coombs 1977a).

C. Disease or Predation

Predation of young tortoises by ravens (*Corvus corax*) is a growing threat to the species. Common raven populations in the southwestern deserts have increased significantly since the early 1940's, presumably in response to expanding human use of the desert. Sewage ponds, landfills, power lines, roads, and other uses have increased available foraging, roosting, and nesting opportunities for ravens. In recent years, raven predation on juvenile desert tortoises has increased to a point where recruiting of young tortoises into the adult population has been significantly reduced or eliminated in certain localities. Ravens are highly adaptable as to their feeding patterns, and concentrate on easily available seasonal food sources such as juvenile tortoises, including live, healthy animals. In the Desert Tortoise Natural Area, a protected area of 21,320 acres in the western Mojave Desert in California, even though tortoise eggs are still being laid and hatched, as shown by the presence of very small tortoises, raven predation appears to have severely curtailed the recruitment of the young into the adult population (BLM 1989).

The BLM's 1989 Environmental Assessment (BLM 1989) for the Selected Control of the Common Raven to Reduce Desert Tortoise Predation in the Mojave Desert, California, further summarizes the annual trend (percent annual change) and the change (percent) of raven numbers in the last 20 years. In the Mojave Desert, raven populations have increased 1528 percent between 1968 and 1988, at a rate of nearly 15 percent per year. In the Colorado-Sonoran Deserts, raven populations have increased 474 percent in 20 years, at a rate of over 9 percent per year. In the Great Basin Desert, raven populations have increased by 168 percent in the last 20 years, at a rate of over 5 percent per year. In the Southern California Basin, raven populations have increased by 328 percent, at a rate of over 7.5 percent per year.

In 1989, BLM funded a tortoise study at the Piute Valley study plot in Nevada. Preliminary indications include a relatively large number of young tortoise mortalities due to ravens. The carcasses have not yet been extensively examined

in the laboratory. Evidence of raven predation on young tortoises at another study plot (Christmas Tree Pass in Nevada) was observed in 1986, as evidenced by tortoise remains around a raven nest and roost site (Sid Sloan, BLM, pers. comm. 1989).

Predation studies on the Mojave population of the tortoise in Arizona have not been formally conducted. The proximity of tortoises to local dumps and a dairy, however, indicates that increased predation by ravens on juvenile tortoises, if not already a problem, may result in increased mortality of tortoises in the future.

A new threat to certain desert tortoise subpopulations has recently been identified. A fatal disease, currently referred to as Desert Tortoise Respiratory Disease Syndrome, has been observed in animals in a number of widely dispersed locations throughout the Mojave Desert. It currently appears to be spreading and the mature, reproductively active segment of the population may be most vulnerable.

The disease has been known for some time in captive tortoises throughout the world (Snipes et al. 1980), although the exact cause, or etiological agent, has not been clearly identified. The disease is probably the result of multiple factors working in concert. It is known that the disease may be readily transmitted from an infected tortoise to a non-infected tortoise (Roskopf 1988). A virus (herpes-like) has been observed by electron microscopic studies in other species of turtles with respiratory tract infections (Jacobson et al. 1986). A paramyxovirus is also considered as a primary pathogen capable of initiating the disease (Jacobson, pers. comm., in Roskopf 1988). Infected animals may not necessarily exhibit obvious signs of the disease.

Once the disease is initiated, bacteria may invade and become the primary pathological agent. *Pasturella testudinatus* was recently isolated from a series of sick tortoises collected for disease study from the Desert Tortoise Natural Area in California. Species of *Pasturella* bacteria are commonly associated with disease syndromes initiated or enhanced by other predisposing factors, including poor nutrition, stress, and immune system compromise.

The disease appears to be spread via physical contact between infected and non-infected animals (Roskopf 1988). Adult male tortoises may contact many females in a single breeding season and, thus, the occurrence of the disease in the adult breeding population would reinforce the conclusion that direct nose

contact during courtship activities could spread the pathogen to susceptible tortoises. Once the disease is contracted, there appears to be little chance of full recovery and the affected individual eventually becomes debilitated and dies. Even individuals given extensive treatment in captivity usually succumb to the disease eventually. Furthermore, if an individual appears to overcome the disease, relapse may occur under stress conditions (Roskopf 1988).

Although the transmittance of an infectious agent from one tortoise to another occurs by contact, the actual infection of the newly inoculated individual may be associated with other factors that increase its susceptibility. Some of the original information published about this disease suggested a nutritional and/or stress-related cause with a secondary bacterial infection of debilitated animals (Fowler 1977). The combination of an infectious agent along with lowered resistance is typical of these types of disease syndromes in many other animals.

Based on current knowledge of the incidence, morbidity, and the mortality rates, the disease appears to be escalating in surveyed populations in the western Mojave Desert. The disease was first recognized as a major problem in wild populations in the spring of 1988 (Fauna West Wildlife Consultants 1989). Signs of the disease were observed in up to 46 percent of adult tortoises examined during surveys of the Desert Tortoise Natural Area in the western Mojave Desert in southern California in the spring of 1988. In one portion of this range, the infection rate went from 9 percent in a 1988 survey to 52 percent of all tortoises in a 1989 survey. A loss of about 20 percent of the marked tortoise population with disease signs occurred in one year in this plot.

While not all populations surveyed have such high mortality rates, these figures demonstrate the potential impact the disease can have on any given area. Infection rates in multiple grid areas in the southern California study area range from 7 to 50 percent. The disease signs have also been observed in individual tortoises from a variety of populations (Berry 1989) including the Fremont Valley (50 percent infection rate), Saguara National Monument in Arizona (2 of 12 radio-tagged infected, and died), and Beaver Dam Slope, Utah-Arizona (10 to 20 percent infection rate with high mortality in radio-tagged animals). Interviews of personnel at veterinary hospitals in the Las Vegas, Nevada, area by Service personnel have revealed that most cases of Respiratory Disease

Syndrome are found in captive tortoises, but that wild tortoises have been brought in with signs of respiratory disease. The potential exists for the Respiratory Disease Syndrome to reach epidemic proportions throughout the Mojave population. There appear to be no natural barriers that would prevent transfer of infectious agents from California subpopulations to Nevada, Utah, and Arizona subpopulations in the Mojave desert. The release of diseased captive animals may, however, spread the disease faster than the natural movement of tortoises between States.

In addition to the identified respiratory disease in the Beaver Dam Slope subpopulation of the Mojave tortoise population, an apparent nutritional disease causing osteoporosis of the bones has been identified (Jarchow 1988).

Berry and Coffeen (1987) analyzed 100 remains of desert tortoises collected between 1982 and 1988 on the Beaver Dam Slope, Utah. Almost all of the remains were collected from two permanent study plots: Woodbury-Hardy and Beaver Dam Slope. Of the 72 tortoises found on the Woodbury-Hardy plot and one off the plot, fifteen (20.6 percent) of the specimens showed thinning of the plastron and/or carapace, holes in the bone, or a honeycomb structure. An additional five specimens (6.9 percent) had deformed bones (pelvic girdle) or eroded bones. Another 15 tortoises (20.6 percent) showed no evidence of abnormalities or thinning of bones. The remaining 38 specimens (52 percent) could not be evaluated. Of the 23 tortoises from the Beaver Dam Slope plot and 5 from nearby, 9 (32.1 percent) showed evidence of thin bones and/or holes on the plastron and/or carapace or honeycombing on the girdles. Nine (32.1 percent) had normal bones and an additional nine could not be classified.

In 2,300 tortoise specimens observed in California, Berry found very few cases of bone abnormality, bone disease, and thinning of bones in young individuals. In contrast, young to middle-aged tortoises from Utah were found in substantial numbers with thin bones or bone disease. Dr. J. Fischer, an orthopedic surgeon, speculated that poor nutrition was the cause for thin bones and osteoporosis in young tortoises.

A study by Jarchow (1987) indicated that osteoporosis (porous bones) and associated osteomalacia (soft bones) in tortoise shells and skeletons found on the Beaver Dam Slope could be attributed to long-term malnutrition. He suggested that the reduction in abundance of bush muhly may be the

primary cause. This perennial grass is highly palatable to livestock, as well as to the tortoise. Bush muhly, once occurred in extensive stands throughout the southwest, but is now found only in the protection of shrubs due to grazing pressure (Cronquist et al. 1977).

D. The Inadequacy of Existing Regulatory Mechanisms

All four States in which the Mojave tortoise population occurs have laws that provide varying levels of protection for the desert tortoise. Even with State protective measures, subpopulations of the tortoise have continued to decline.

State of Nevada laws concerning fish, game, and watercraft, as amended, afford limited protection to the desert tortoise. Nevada Revised Statutes (NRS), section 501.110.1(d) sets forth that reptiles must be classified as either protected or unprotected. NRS section 501.110.2 states that protected wildlife may be further classified as either sensitive, threatened, or endangered. The Nevada Administrative Code (NAC), section 503.080.1(a) classifies the desert tortoise as protected and rare outside the urban areas of Clark County (Las Vegas). NRS section 503.597, states that it is unlawful, unless with written consent of the Nevada Department of Wildlife, to transport a desert tortoise from one portion to another portion of the State or across State lines.

The California Fish and Game Commission adopted a regulation change on June 22, 1989, to amend the California Code of Regulations, section 670.5(b)(4) of title 14, to add the desert tortoise as a State threatened species. Under the Fish and Game Code, Article 3, section 2080 prohibits the import or export of endangered or threatened species. This section also indicates that no person shall take, possess, purchase, or sell within the State, any listed species, or any part or product thereof, except as otherwise provided in State law or regulation.

The California Fish and Game Code, Article 4, section 2090 requires that each State agency shall consult with the California Department of Fish and Game to ensure that any action authorized, funded, or carried out by that State lead agency is not likely to jeopardize the continued existence of any State listed species.

On January 1, 1988, the Arizona Game and Fish Commission (Commission) prohibited the take of desert tortoises from the wild (Arizona Game and Fish Commission 1989). The Commission also prohibits the sale of tortoises and the export of tortoises from the State. Prior to that date, anyone with an Arizona

hunting license could take and possess one tortoise for each person in that household. No provisions have been made to permit or otherwise identify those tortoises that were in possession prior to January 1, 1988. Thus, enforcement of the State ban on take may not be possible unless the actual taking of a tortoise from the wild is observed. There is no State authority in Arizona to regulate the take of desert tortoise habitat.

Unlike many other States, Utah does not have special regulations designating certain species as either threatened or endangered, thereby affording them additional protection. All Utah wildlife species are classified as prohibited, controlled, or noncontrolled. The desert tortoise is considered a "prohibited reptile" under Utah Rule *R608-3 Collection, Importation, Transportation, and Subsequent Possession of Zoological Animals* (Utah Division of Wildlife Resources 1987). Prohibited species are zoological animals that are prohibited from collection, importation, transportation possession, sale, transfer, or release because they pose unacceptable disease, ecological, environmental, or human health or safety risks. No state regulations exist to stop loss of tortoise habitat through land development or other habitat degradative actions.

E. Other Natural or Manmade Factors Affecting its Continued Existence

An ancillary effect of continued declines in populations and loss of habitat is the fragmentation of remaining populations. Long-term survival of these fragmented populations will be aggravated by normal random fluctuations in the population and environment that could lead to extirpation of subpopulations.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the Mojave population of the desert tortoise in determining to propose this rule. Based on this evaluation, the preferred action is to list the Mojave population of the desert tortoise as endangered. The Act states that the term "endangered species" means any species that is in danger of extinction throughout all or a significant portion of its range. Given the loss of a substantial number of tortoises due to the respiratory disease, loss and degradation of habitat over much of their range, and losses due to raven predation, it is considered that some subpopulations could be extirpated within one year. If the declining trend is not turned around,

eventual extinction of the population may be unavoidable.

Listing of Sonoran Population Still Precluded

The Service declined to emergency list the Sonoran population of the desert tortoise in response to the petition. The rationale leading to this decision was as follows:

1. Historically, desert tortoises in the Sonoran population occur in numerous small groups, more or less patchy or disjunct, inhabiting steep-sided canyons. This habitat is less subject to disturbance than is more level terrain.

2. The very patchiness of the distribution in the Sonoran population leads the Service to believe that the Respiratory Disease Syndrome affecting other subpopulations will not likely reach the epidemic proportions that it has in locations like the Desert Tortoise Natural Area in California. Although a few instances of a respiratory disease have been documented in the Sonoran population and are of concern to the Service, it appears that respiratory disease: (a) Is usually present in tortoise populations to varying degrees; (b) has not shown any evidence of becoming pandemic; (c) has not been shown to be Respiratory Disease Syndrome; and (d) is currently being addressed by the Service and the Arizona Game and Fish Department, who will continue to gather and evaluate data. A report on the results of these studies will be available in January 1991.

The report will contain information needed to determine whether the Sonoran population of the desert tortoise warrants listing. All available information on distribution, abundance, and threats will be summarized. This will include review of published and unpublished information and preparation of maps overlaying tortoise distribution with projected land use patterns. Results of field work to determine population status and trend with emphases on reproduction, disease, and mortality will be determined from revisiting previously sampled sites.

Similarity of Appearance Treatment of the Sonoran Population

Section 4(e) of the Endangered Species Act, as amended, provides that the Secretary of the Interior may, by regulation of commerce or taking, and to the extent he deems advisable, treat any species as an endangered or threatened species even though it is not listed pursuant to section 4(a)(1) of the Act if he finds that: (a) Such species so closely resembles in appearance an endangered or threatened species that enforcement personnel would have substantial

difficulty in attempting to differentiate between the listed and unlisted species; (b) the effect of this substantial difficulty is an additional threat to the endangered or threatened species; and (c) such treatment of an unlisted species will substantially facilitate the enforcement and further the policy of the Act.

The Service finds that there are no visual differences, readily discernible by law enforcement personnel or the general public, between the tortoises in the Mojave and Sonoran populations, that the similarity of appearance represents an additional threat to the Mojave population, and that treating the Sonoran population as threatened due to similarity of appearance, when located outside its natural range, would facilitate the enforcement of prohibitions under the Act regarding illegal trade in or possession of endangered Mojave desert tortoises. Treating the Sonoran population as threatened due to similarity of appearance when outside its natural range would eliminate the necessity of Service special agents having to determine the origin of each desert tortoise prior to enforcing the prohibitions in section 9 of the Act. Inability of the Service to enforce the prohibitions in the Act would represent an additional threat to the listed Mojave population of the desert tortoise. By treating members of the Sonoran population of tortoises as threatened under the similarity of appearance provisions of the Act, when located outside their natural range, the Service believes that enforcement problems can be minimized, while at the same time, the conservation of listed Mojave populations can be ensured.

Reclassification of the Beaver Dam Slope Population from Threatened to Endangered

The Beaver Dam Slope population of the desert tortoise was listed as threatened with critical habitat in 1980. The declining trend of this population appears to be continuing despite the protection afforded by the Endangered Species Act and efforts of State and Federal agencies to reverse the downward trend.

Minden and Keller (1981) surveyed a one square mile plot in the Woodbury Desert Study Area, which is located within designated critical habitat for the tortoise in southwestern Utah. They estimated a density of 109 to 136 tortoises per square mile based on the 74 live wild animals that were found. The average mortality rate for 1980 and 1981 was 6 percent.

The same one square mile study plot was resurveyed in 1986 (Welker 1986). Preliminary results indicate an estimated reduction of over 50 percent in numbers from Minden and Keller's work in 1981. The data in Welker's draft report indicates that only 27 tortoises were captured within the study plot; i.e., 6 released captives and 21 wild tortoises. The density of tortoises within the study area was estimated at between 34 and 47 per square mile. The population was dominated by adult (61.9 percent) and male (77 percent) tortoises. This is a complete reversal of the sex ratios found by Woodbury and Hardy (1948) of 36 percent males and 64 percent females. An animal population weighed heavily towards males is an indication of a population in poor reproduction condition. The average annual mortality rate in 1986 was 22 percent with the majority of deaths occurring in juvenile and female tortoises. This rate is considered high when compared to an average annual mortality rate of 1 to 5 percent in 1948; 6.86 percent by Coombs (1977b); and 6 percent in 1981.

A 50 percent population decline of the desert tortoise on a study plot on the Beaver Dam Slope, Utah has been documented between 1981 and 1986. This data appears to be representative of a continuing decline of the entire Beaver Dam Slope subpopulation of Mojave desert tortoises. The Act states that the term "endangered species" means any species or vertebrate population which is in danger of extinction throughout all or a significant portion of its range. As previously discussed herein, given the loss of a substantial number of Beaver Dam Slope tortoises due to disease, loss and degradation of habitat over much of their range, losses due to raven predation, and an escalating decline in the population, it is considered that the Beaver Dam Slope subpopulation of the Mojave desert tortoise population is in imminent danger of extinction.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that, to the maximum extent prudent and determinable, the Secretary propose critical habitat at the time a species is proposed to be endangered or threatened.

Critical habitat was designated for the Beaver Dam Slope subpopulation of the Mojave desert tortoise in 1980. The status of this previously designated critical habitat would not be changed with this proposal.

The Service finds that designation of critical habitat for the remainder of the Mojave desert population is not

presently determinable. The Service's regulations (50 CFR 424.12(a)(2)) state that critical habitat is not determinable if information sufficient to perform required analyses of the impacts of the designation is lacking or if the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat. The range of the Mojave desert tortoises is extensive. Much of this habitat has been fragmented and degraded by a number of land-disturbing activities. Some remaining areas of good habitat are isolated from each other or are of such small size as not to support viable subpopulations of the tortoise. The specific size and spatial configuration of these essential habitats, as well as vital connecting linkages between areas necessary for ensuring the conservation of the Mojave desert population throughout its range, cannot be determined at this time.

During the proposed comment period, the Service will seek additional agency and public input on critical habitat, along with information on the biological status of and threats to the Mojave desert tortoise. The Service intends to use this and other information in formulating a decision on critical habitat designation for the Mojave population of the tortoise.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with States, and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing.

Such increased recognition and conservation efforts would provide a means to ensure survival for the desert tortoise. Available funding would be used on research to determine the causes of and possible treatments for the disease currently infecting tortoise populations and to determine whether the disease can be passed on to hatchlings by infected females. Available funding would also be used for, but would not necessarily be limited to, the identification and isolation of healthy populations, carrying out predator control to reduce loss of immature tortoises, public education to

discourage further releases of diseased captive tortoises, and to address habitat issues including land acquisition, fencing, and habitat improvement.

The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. Regulations governing these conferences are found at 50 CFR 402.10. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

At least 50 percent of occupied habitat within the range of the Mojave population of the desert tortoise is managed by the BLM. Other Federal managers of tortoise habitat include the Department of Defense, National Park Service, and the Fish and Wildlife Service. Tortoises are also found on lands managed by Indian tribes. Federal activities may include, but may not be limited to, actions resulting in grazing, off-highway-vehicle use, mining, construction of developments and rights-of-way, and military activities.

The act and implementing regulations found at 50 CFR part 17 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), import or export, ship in interstate or foreign commerce in the course of a commercial activity, or sell or offer for sale any endangered species in interstate or foreign commerce. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been illegally taken. Certain exceptions apply to agents of the

Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing such permits are codified at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be suffered if such relief were not available.

All *Gopherus* tortoises, including the desert tortoise, were listed on July 1, 1975, as Appendix II species under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Convention). The only exception within the genus is *G. flavomarginatus*, which was listed as an Appendix I species. The CITES Convention, as implemented by the Act and various regulations (50 CFR part 23), imposes restrictions on importation and exportation of Appendix I and II species.

Status of Feral Tortoises and Tortoises Currently Held in Captivity

Feral desert tortoises, which have been released inside the native habitat of the Mojave desert tortoise, would be classified endangered species in the area north and west of the Colorado River and would be protected under the Act.

Under section 9(b)(1) of the Act, prohibitions applicable to the Mojave population will not apply to tortoises that were held in captivity or in a controlled environment on the date of the publication of the emergency rule (August 4, 1989), provided, that such

holding and any subsequent holding or use of the tortoise was not in the course of a commercial activity.

Public Comments Solicited

The Service intends that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions for the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning:

- (1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to this species;
- (2) The location of any additional populations of this species and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;
- (3) Additional information concerning the range, distribution, and population size of this species; and
- (4) Current or planned activities in the subject area and their possible impacts on this species.

Final action concerning this proposal will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, pursuant to the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the

Service's reasons for this determination was published in the *Federal Register* on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited herein is available upon request from the Regional Director (Attention: Listing Coordinator) at the address provided above (ADDRESSES section).

Author

The primary author of this proposed rule is Miss Jackie Campbell, Division of Endangered Species and Habitat Conservation, Regional Office, U.S. Fish and Wildlife Service, 1002 NE Holladay Street, Portland, Oregon 97232-4181, (503) 231-6131 or FTS 429-6131.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Fish, Marine mammals, Plants (agriculture).

Proposed Regulation Promulgation

PART 17—[AMENDED]

Accordingly, it is hereby proposed to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1543; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500, unless otherwise noted.

2. It is proposed to amend § 17.11(h) by revising the entry for "Tortoise, desert" under REPTILES to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *
[h] * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rule
Common name	Scientific name						
REPTILES							
Tortoise, desert.....	<i>Gopherus</i> (= <i>Xerobates</i> , = <i>Scaptochelys</i>) <i>agassizii</i> .	U.S.A. (AZ, CA, NV, UT), Mexico.	Entire area, except in AZ, south and east of the Colorado River, and Mexico.	E.....	103,357 ...	17.95(c)	NA.
Dodo.....do.....	U.S.A. (AZ, south and east of Colorado River) and Mexico when found outside of AZ, south and east of Colorado River, or Mexico.	T(S/A)	NA.....	17.42(e).

3. It is further proposed to amend § 17.42 by adding a new paragraph (e) to read as follows:

§ 17.42 Special rules—reptiles.

* * * * *

(e) Desert tortoise (*Gopherus* (= *Xerobates*, = *Scaptochelys*) *agassizii*)

(1) *Definition.* For the purposes of this paragraph (e) "desert tortoise" shall mean any member of the species *Gopherus* (= *Xerobates*, = *Scaptochelys*) *agassizii*, whether alive or dead, and any part, product, egg, or offspring thereof, found outside of Arizona (south and east of the Colorado River) and Mexico, regardless of natal origin or place of removal from the wild.

(2) *Applicable provisions.* The provisions of § 17.21-17.23 shall apply to any desert tortoise subject to this paragraph (e).

Dated: October 6, 1989.

Richard N. Smith,
Acting Director, U.S. Fish and Wildlife Service.

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