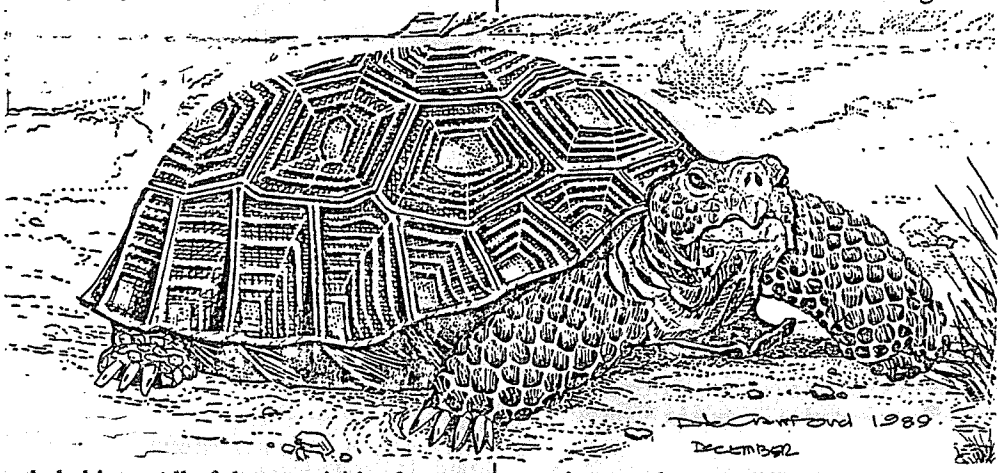
Attachment 3
Recommended Specifications for Desert Tortoise Exclusion Fencing

The Threatened Desert Tortoise

Legal Status

The desert tortoise (Gopherūs agassizii) in the Mojave desert (north and west of the Colorado River) was Federally listed under emergency provisions of the Endangered Species Act of 1973 as endangered on August 4, 1989 and permanently listed as a threatened species on April 2, 1990. The tortoise was listed because of direct losses and threats to tortoise populations and habitat. Desert tortoises are directly impacted by increased raven predation on juveniles, collection by humans, vandalism, losses on roads and to off highway vehicle activities, and the Upper Respiratory Disease Syndrome. Tortoise habitat is lost directly to urbanization, agriculture, road construction, military activities, and other uses. Off highway vehicle use, rights-of-way, and grazing degrade habitat. All of these activities fragment tortoise habitat which may reduce a tortoise population below the level necessary to maintain a minimum viable population.



The U.S. Endangered Species Act makes it illegal to harass, collect, or harm tortoises and provides for penalties of up to $50,000 in fines and one year in prison for each count. Nevada State law 503.080.1a also affords protection to the desert tortoise.

The Endangered Species Act allows for individuals of an endangered or threatened species to be taken incidentally to an otherwise lawful activity; as long as the conditions of the Fish and Wildlife Service's (Service) Biological Opinion are followed. "Take" includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing or collecting, or attempting to engage in any such conduct. Harm includes significant habitat modification or degradation that impacts a listed species by interfering with breeding, feeding, or sheltering behavior. The threatened listing of the desert tortoise occurred because of widespread habitat destruction and degradation, illegal collection, an upper respiratory disease, raven predation, and other factors.

Tortoises in captivity prior to the initial listing of August 4, 1989 are not protected by the Act. If you are interested in having a pet tortoise, you may obtain one from someone that has acquired their pet legally or from Tort-Group; a private organization dedicated to preservation of wild tortoises and to the welfare of captive ones.

Life History

The desert tortoise is the largest reptile and the only wild land tortoise found in southern Nevada. The tortoise occurs in southern Nevada, western California, southwestern Utah, western Arizona, and northwestern Mexico. In Nevada, tortoises are found in creosote bush, cactus and shadscale scrub, and Joshua tree woodland habitats below 5000' elevation.

Tortoise populations are patchily distributed and densities range from a few per square mile to 200 per square mile. A tortoise will live in the same general area of less than one square mile during its lifespan of 50 to 100 years. This slow moving desert reptile ranges in size from 2 to 15 inches long and is soil colored. Because of their color and shape, tortoises can be very difficult to see.

There are several clues that can be used to tell male and female tortoises apart. However, only tortoises greater than seven inches long can be sexed reliably. Males tend to be larger than females, have a longer tail, have longer upward curving gular horns, have larger chin glands, and have a concave plastron (bottom portion of shell).

Tortoises are well adapted to their desert environment and spend up to 98% of their time in burrows they dig. Burrows are crescent shaped and are most often found at the base of desert shrubs or in wash banks. A tortoise may excavate and use many burrows during the year. Some burrows are used for only a short period of time and others may be used for several years. Some researchers believe that some winter dens on the Beaver Dam Slope in Utah may be 5000 years old. Many mammals, birds, reptiles, and invertebrates utilize tortoise burrows. Burrows and tortoises in Nevada are most often found on valley floors and slopes, but they may also be found on the less precipitous slopes and ridges of desert mountain ranges.

Besides tortoises, burrows, and remains; another method that biologists use to determine if tortoises exist in an area is the presence of scat (feces). Fresh scat is dark brown or black, but turns gray as it weathers. Scat length varies, from one half to four inches, depending on the size of the tortoise. Scats usually contain coarse plant fibers.

Tortoises are inactive from mid November until February. The activity period for desert tortoises is from March until late October when they usually spend part of

each day above ground. Tortoises are especially active during warm days when it is overcast or raining, when they seek water that collects in natural depressions or in depressions the tortoises dig themselves. Available drinking water is essential to tortoise survival. The diet of tortoises, which are vegetarians, includes a wide variety of herbs, grasses, cacti, and flowers. Since droughts are common in the deserts that tortoises inhabit, they rely on the erratic years of good rainfall and the ensuing growth of palatable plants.

Sexual maturity for tortoises occurs at 15-20 years of age. Breeding occurs in March and April and egg laying is from May to July. Nests are almost always located at the entrance of burrows. Clutches contain 1 to 14 eggs and a mature female may lay 0 to 3 clutches annually. The eggs are covered with soil and hatch after 80 to 130 days in August or September.

Predators are usually only a problem for young tortoises. Predation is the greatest cause of mortality for hatchlings. Eggs are eaten by Gila monsters, foxes, coyotes, snakes, and badgers. The shell of juvenile tortoises does not harden for five or more years and young tortoises may fall prey to ravens, hawks and eagles, coyotes, foxes, bobcats, badgers, skunks, and feral dogs and cats. Up to 200 young tortoise carcasses have been found under raven perches and nests. While successful predation on adults is rare; coyotes, foxes, bobcats, eagles, and feral dogs have been known to prey on tortoises. Habitat quality can affect perdation in certain habitats.

Research

There are many ongoing research projects that are addressing various aspects of tortoise management and physiology. Research is being conducted on the Upper Respiratory Disease Syndrome and on health baselines. Research will continue in 1991 on those topics and on livestock grazing, predator-prey relationships, genetics, tortoise translocation/relocation, research protocols, and habitat restoration. The Bureau of Land Management will be actively involved in funding and participating in these research projects. This is especially true in the Las Vegas District, where the BLM is facility manager of the Desert Tortoise Conservation Center in cooperation with the Nevada Department of Wildlife and The Nature Conservancy.

Construction Activities

When preconstruction activities such as driving off of established roads, construction layout, and flagging of the rights-of-way (ROW) occurs, a qualified biologist must accompany each work crew. Vegetation should be avoided to the extent possible to reduce impacts to the habitat. When a tortoise is sighted within the job site or near construction activities, the on site biologist must be contacted immediately.

Immediately prior to site preparation and excavation; backfill, grading, and restoration; or other construction activity; a qualified biologist must conduct a thorough survey of the job site. All burrows will be conspicuously flagged.

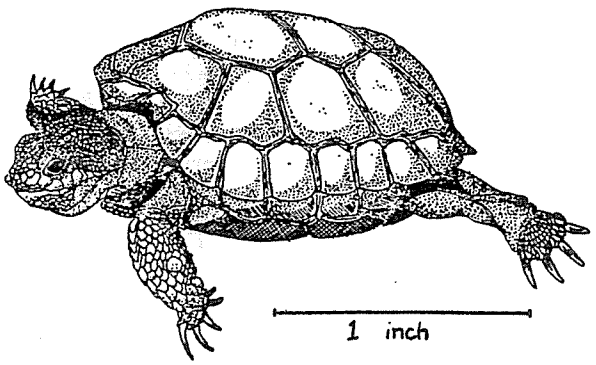
All tortoises found on the job site and associated access roads will be moved 150 to 300 feet outside the site by a qualified biologist. All activity that may harm the tortoise will cease until the tortoise has been moved. Tortoises found in the open will be placed in the shade of a shrub and tortoises removed from burrows will be placed in a similar unoccupied burrow or in an artificial burrow. Tortoises will not be placed on lands not administered by the BLM without written permission from the landowner. Tortoise handling, moving, data collection, and artificial burrow construction shall follow the procedures outlined in the Interim Techniques Handbook for Collecting and Analyzing Data on Desert Tortoise Populations and Habitats.

All vehicle traffic during construction will be confined to existing roadways and to areas that have been cleared of tortoises. Speed limits in undeveloped areas of tortoise habitat will not exceed 10 MPH from 1 March to 15 November, except in emergency situations. Vehicles within tortoise habitat must have the ground beneath them checked for tortoises before the vehicle is moved.

If a live tortoise is in danger, a construction worker may move the tortoise out of harms way using approved methods.

Tortoise Handling

Handle all tortoises carefully and only if authorized to do so! Tortoises can be injured and can die from improper handling. Do not approach tortoises unless absolutely necessary, as your presence can induce stress in the animal. When you must approach a tortoise, move slowly and approach from the rear of the animal. Pick up the tortoise gently and keep it level at all times. When handling large tortoises, grasp the animal with both hands, one at each side of the animal. When moving tortoises longer distances, a cardboard box should be used. Boxes will be used for only one tortoise. All personnel handling tortoises will wear surgical type gloves to inhibit the transmission of diseases among tortoises. Not more than one tortoise can be handled with each pair of gloves. The Upper Respiratory Disease Syndrome is not transmissable to humans.



Typical hatchling tortoise.

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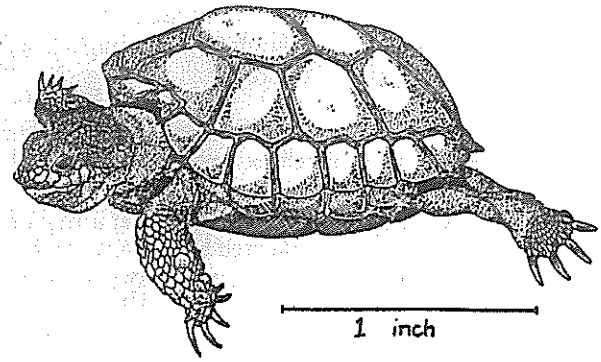


Typical hatchling tortoise.

RECOMMENDED SPECIFICATIONS FOR
DESERT TORTOISE EXCLUSION FENCING
September 2005

These specifications were developed to standardize fence materials and construction procedures to confine desert tortoises or exclude them from harmful situations, primarily roads and highways. Prior to commencing any field work, all field workers should comply with all stipulations and measures developed by the jurisdictional land manager, the U.S. Fish and Wildlife Service, and state wildlife resource agency for conducting such activities in desert tortoise habitat, which will include, at a minimum, completing a desert tortoise education program.

FENCE CONSTRUCTION

Materials

Fences should be constructed with durable materials (*i.e.,* 16 gauge or heavier) suitable to resist desert environments, alkaline and acidic soils, wind, and erosion. Fence material should consist of 1-inch horizontal by 2-inch vertical, galvanized welded wire, 36 inches in width. Other materials include: Hog rings, steel T-posts, and smooth or barbed livestock wire. Hog rings should be used to attach the fence material to existing strand fence. Steel T-posts (5 to 6-foot) are used for new fence construction. If a fence is constructed within the range of bighorn sheep, 6-foot T-posts should be used (see New Fence Construction below). Standard smooth livestock wire fencing should be used for new fence construction, on which desert tortoise-exclusion fencing would be attached.

Retrofitting Existing Livestock Fence

Option 1 (see enclosed drawing). Fence material should be buried a minimum of 12 inches below the ground surface, leaving 22-24 inches above ground. A trench should be dug or a cut made with a blade on heavy equipment to allow 12 inches of fence to be buried below the natural level of the ground. The top end of the desert tortoise fence should be secured to the livestock wire with hog rings at 12 to 18-inch intervals. Distances between T-posts should not exceed 10 feet, unless the desert tortoise fence is being attached to an existing right-of-way fence that has larger interspaces between posts. The fence must be perpendicular to the ground surface, or slightly angled away from the road, toward the side encountered by desert tortoises. After the fence has been installed and secured to the top wire and T-posts, excavated soil will be replaced and compacted to minimize soil erosion.

Option 2 (see enclosed drawing). In situations where burying the fence is not practical because of rocky or undigable substrate, the fence material should be bent at a 90 degree angle to produce a lower section approximately 14 inches wide which will be placed parallel to, and in direct contact with, the ground surface; the remaining 22-inch wide upper section should be placed vertically against the existing fence, perpendicular to the ground and attached to the existing fence with hog rings at 12 to18-inch intervals. The lower section in contact with the ground should be placed within the enclosure in the direction of potential desert tortoise encounters and

level with the ground surface. Soil and cobble (approximately 2 to 4 inches in diameter; can use larger rocks where soil is shallow) should be placed on top of all of the lower section of fence material on the ground t to a height 4 inches,, leaving a minimum of 18 inches of open space between the top of the cobble surface and the top of the vertical portion of the desert tortoise-exclusion fence. Care should be taken to ensure that the fence material parallel to the ground surface is adequately covered and is flush with the ground surface.

New Fence Construction

Options 1 or 2 should be followed except in areas that require special construction and engineering such as wash-out sections (see below). T-posts should be driven approximately 24 inches below the ground surface spaced approximately 10 feet apart. Livestock wire should be stretched between the T-posts, 18 to 24 inches above the ground to match the top edge of the fence material; desert tortoise-exclusion fencing should be attached to this wire with hog rings placed at 12 to 18-inch intervals. Smooth (barb-less) livestock wire should be used except where grazing occurs.

If the fence is constructed within the range of bighorn sheep, two smooth-strand wires are required at the top of the T-post, approximately 4 inches apart, to make the wire(s) more visible to sheep. A 20 to 24-inch gap must exist between the top of the desert tortoise exclusion fence material and the lowest smooth-strand wire at the top of the T-post. The lower of the top two smooth-strand wires must be at least 43 inches above the ground surface(i.e., 72-inch T-posts: 24 inches below ground + 18 inches of desert tortoise exclusion fence above ground + 20 to 24-inch gap to lower top wire + 4 inches to upper top wire = 66 to 70 inches).

INSPECTION OF DESERT TORTOISE BARRIERS

The risk level for a desert tortoise encountering a breach in the fence is greatest in the spring and fall, particularly around the time of precipitation including the period during which precipitation occurs and at least several days afterward. All desert tortoise fences and cattleguards should be inspected on a regular basis sufficient to maintain an effective barrier to tortoise movement. Inspections should be documented in writing and include any observations of entrapped animals; repairs needed including bent T-posts, leaning or non-perpendicular fencing, cuts, breaks, and gaps; cattleguards without escape paths for tortoises or needed maintenance; tortoises and tortoise burrows including carcasses; and recommendations for supplies and equipment needed to complete repairs and maintenance.

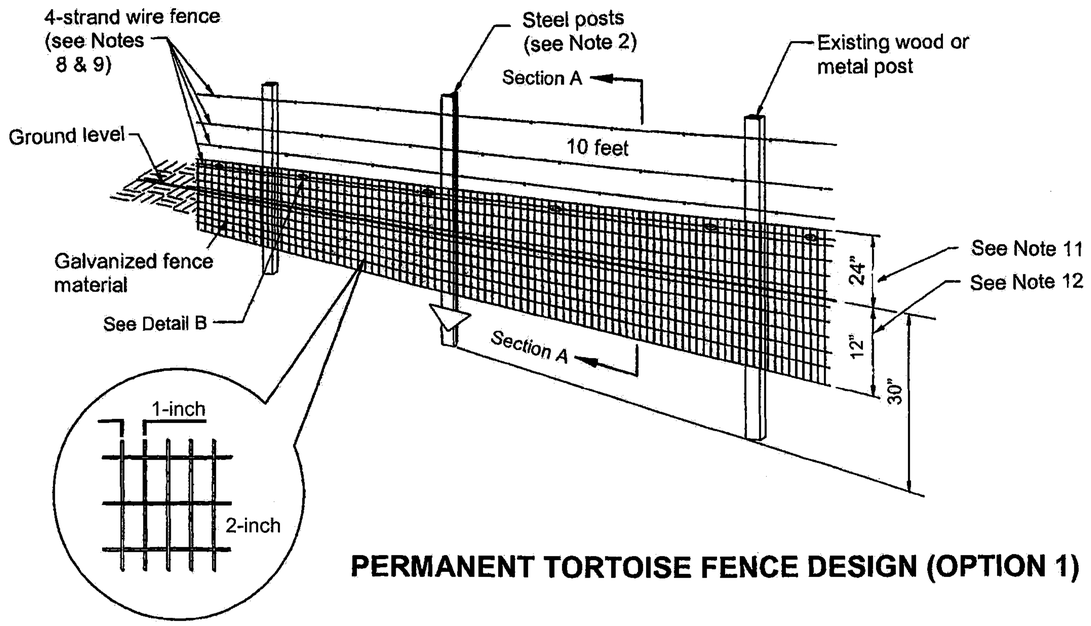
All fence and cattleguard inventories should be inspected at least twice per year. However, during the first 2 to 3 years all inspections will be conducted quarterly at a minimum, to identify and document breaches, and problem areas such as wash-outs, vandalism, and cattleguards that fill-in with soil or gravel. GPS coordinates and mileages from existing highway markers should be recorded in order to pinpoint problem locations and build a database of problem locations that may require more frequent checking. Following 2 to 3 years of initial inspection, subsequent

inspections should focus on known problem areas which will be inspected more frequently than twice per year. In addition to semi-annual inspections, problem areas prone to wash-outs should be inspected following precipitation that produces potentially fence-damaging water flow. A database of problem areas will be established whereby checking fences in such areas can be done efficiently.

REPAIR AND MAINTENANCE OF DESERT TORTOISE BARRIERS

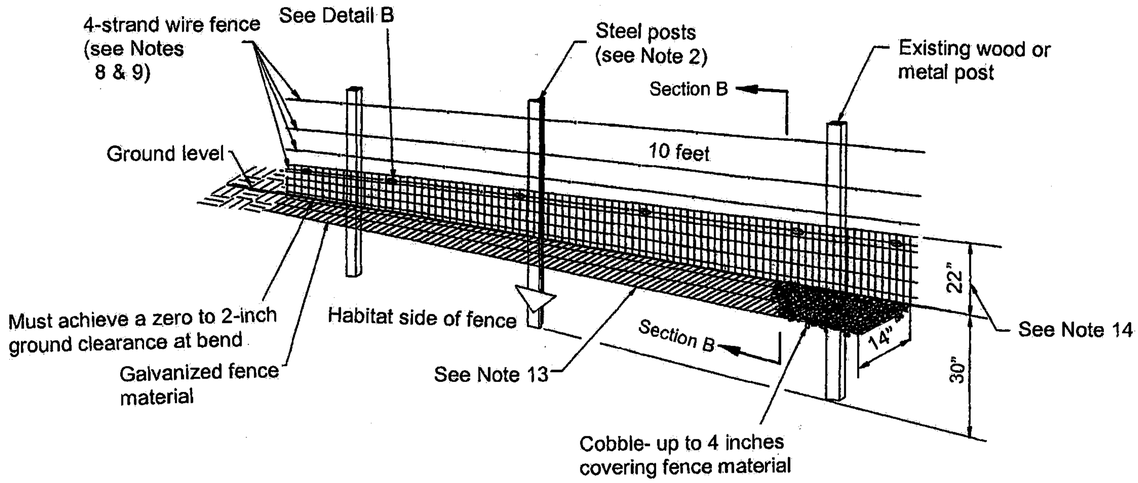
Repairs of fence wash-outs: (1) realign the fence out of the wash if possible to avoid the problem area, or (2) re-construct tortoise-proof fencing using techniques that will ensure that an effective desert tortoise barrier is established that will not require frequent repairs and maintenance. Gaps and breaks will require either: (a) repairs to the existing fence in place, with similar diameter and composition of original material, (b) replacement of the damaged section to the nearest T-post, with new fence material that original fence standards, (c) burying fence, and/or (d) restoring zero ground clearance by filling in gaps or holes under the fence and replacing cobble over fence constructed under Option 2. Tortoise-proof fencing should be constructed and maintained at cattleguards to ensure that a desert tortoise barrier exists at all times.

All fence damage should be repaired in a timely manner to ensure that tortoises do not travel through damaged sections. Similarly, cattleguards will be cleaned out of deposited material underneath them in a timely manner. In addition to periodic inspections, debris should be removed that accumulates along the fence. All cattleguards that serve as tortoise barriers should be installed and maintained to ensure that any tortoise that falls underneath has a path of escape without crossing the intended barrier.

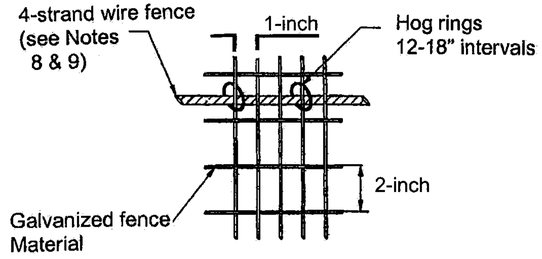


PERMANENT TORTOISE FENCE DESIGN (OPTION 1)

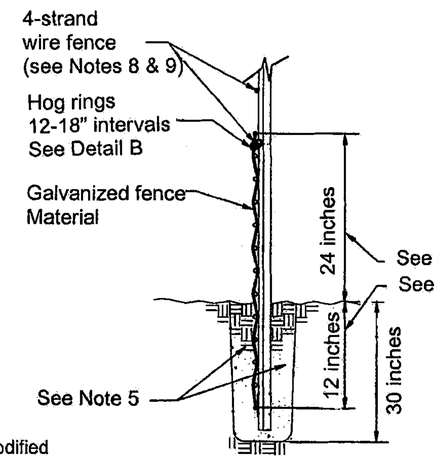
DETAIL A



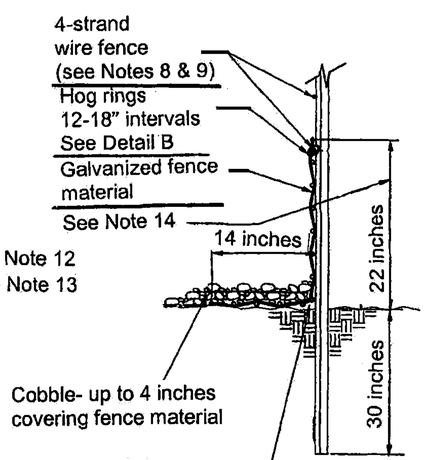
PERMANENT TORTOISE FENCE DESIGN (OPTION 2)



DETAIL B



SECTION A



SECTION B

GENERAL NOTES:

1. Use Option 2 when fence material cannot be placed 6 inches below existing ground level due to rock or caliche substrate
2. Install steel posts when span between existing fence posts exceed 10 feet.
3. Fence posts and materials shall conform with the standards approved by the U.S. Fish and Wildlife Service.
4. Fence material shall be attached to existing fence or wire using hog rings at 12 to 18-inch intervals.
5. Backfill trench with excavated material and compact.
6. Fence material shall be fastened to posts with 3 tie wires with a wire near the top, bottom, and center of the fence material.
7. Attach fence material to all gates. Clearance at base of gate should achieve zero ground clearance.
8. Substitute smooth wire for barbed wire if additional support wires are necessary.
9. The number and placement of support wires may be modified to allow sheep and deer to pass safely through.
10. Fence should tie into existing culverts and cattleguards when determined necessary to allow tortoise passage underneath roadways.
11. Option 1: height above ground level should be no less than 18 inches and no higher than 24 inches.
12. Option 1: depth of fence material below ground level should be no less than 6 inches.
13. Erosion at the edge of the fence material where the fence crosses washes may occur and require appropriate monitoring and repair.
14. Option 2: height above ground level should be no less than 22 inches.