

Appendix C

C.0 Description and Strategy for Addressing Major Desert Tortoise Issues

The following tables describe 18 issues (listed below) in desert tortoise conservation. These issues are regarded as significant in the range of the tortoise, but many are relatively unimportant at this time in tortoise management in the Northern and Eastern Mojave planning area. The issues are generally the result of conflicting human uses (e.g. cattle grazing, mineral extraction, vehicle access), natural processes that have strong human influences (e.g., fire, disease, subsidized predation), and management activities (e.g., monitoring, wildlife management).

For each table there is a description of the current situation; this is largely a summary of information in “Current Desert Tortoise Management Situation in BLM-Administered Lands Portion of Northern and Eastern Mojave planning area (Foreman, 1998)”. The description applies to only BLM-administered lands in the NEMO planning area.

The potential effects of the issue on desert tortoise populations are also described. For conflicting activities the effects focus on those that will influence tortoise population density and distribution.

Lastly, the management strategy developed for the NEMO planning area is presented. For brevity, the strategy and rationale reflect only the preferred alternative. Brief summaries of the Desert Tortoise Recovery Plan recommendations are presented for comparison. Following is a list of the 18 issues addressed:

1. Urbanization and Agricultural Development
2. Military Operations
3. Cattle Grazing
4. Wild Horses and Burros
5. Mineral Extraction
6. Utilities and Other Rights-of Ways and Permits
7. General Recreation
8. Recreational Vehicle Riding/Competitive Events
9. Vehicle Access
10. Vandalism and Collecting
11. Vegetation Harvesting
12. Wildlife Management
13. Subsidized Predation
14. Disease
15. Fire
16. Alien Plants
17. Drought
18. Monitoring

C.1 Issue: Urbanization and Agricultural Development

Scope of Issue: This issue includes residential, commercial (e.g., stores and gas stations), industrial (e.g., power plants), and agricultural development.

C.1.1 Current Situation

Current Situation in NEMO Planning Area: Most residential development is focused around the small towns of Needles, Baker, and Kelso; only Kelso is near a current or proposed tortoise DWMA. Commercial development occurs at these towns and at other small service areas such as Essex, Chambliss, Goffs, Ivanpah, Cima, and various Interstate Highway exits; development at these sites is generally limited to a few buildings and a few acres. Housing and services associated with the MolyCorp Mine at Mountain Pass are larger but are above than significant tortoise habitat. Recent development around and near Primm (Stateline), Nevada, has resulted in a golf course and increased recreational use in northern Ivanpah Valley, within BLM Category I tortoise habitat and near critical habitat. There is virtually no agricultural development in or near important tortoise habitat, but interest has been expressed for some development in northern Piute Valley, which is critical habitat.

C.1.2 Effects

Primary Effects: Where it occurs within tortoise habitat, there is a direct loss and alteration of habitat value as plant cover is removed and compaction of soils occurs. Illegal trash dumping (see Issue: Landfills and Waste Sites) around towns and residences as well as agricultural crops and irrigation water also artificially subsidizes raven populations (also see Issue: Subsidized Predation).

Other Effects: Tortoises may be killed directly by vehicles or dogs. Developments may promote introduction and spread of alien plants.

Information Needs: There is a need for additional research on the urban/wildland interface and ecological effects there.

C.1.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Cumulative new surface disturbing projects on BLM lands in each tortoise DWMA would be limited to 1 percent of BLM lands in that area. The size of each project would be minimized, and other mitigation measures would be applied to limit effects. Compensation would assist in accomplishing other tortoise conservation objectives (e.g., consolidation and rehabilitation of habitat). No vegetation harvesting would be allowed in tortoise DWMA. Lands will not be available for disposal under various land disposal laws (e.g., agricultural land laws, recreation and public purposes, FLPMA leases and sales, and airports).

Rationale for Selected Strategy: Much of the residential, commercial, industrial, and agricultural development will occur on private inholdings. Therefore, land consolidation efforts in key areas and retention of existing lands may help limit the effects of these activities in DWMA. Otherwise, control of these activities by BLM is negligible and is primarily limited to mitigation measures applied to local utilities.

Recovery Plan Recommendations: No agricultural clearing would be allowed in tortoise DWMA. New surface disturbances that diminish tortoise habitat value would be prohibited. Uncontrolled dogs out of vehicles would be prohibited. Fencing would be added around Ivanpah Dry Lake and Stateline to keep vehicles out of the DWMA. DWMA boundaries would be signed around Nipton and other settlements.

C.2 ISSUE: Military Operations

Scope of Issue: This issue includes activities on military bases and temporary operations off of bases. Also included are low-level aircraft flyovers.

C.2.1 Current Situation

Current Situation in NEMO Planning Area: There are currently no military installations or bases in the NEMO Planning area. One alternative for the proposed expansion of Ft. Irwin would be eastward into Silurian Valley. This area is not in critical habitat or in a proposed tortoise DWMA.

C.2.2 Effects

Primary Effects: Tank maneuvers during World War II and in 1964 disturbed significant areas of the desert, including training areas in Piute Valley. The residual effects of crushing of vegetation and the compaction of soil remain after 50 years. However, no new military operations within tortoise DWMA are expected to occur.

Other Effects: Even though toxic substances are suspected as a causative agent for tortoise shell diseases, the effects of fuel and chemical spills associated with military activities, if any, are unknown.

Information Needs: The relationship between shell diseases and various toxic substances, if any, needs to be determined.

C.2.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: No new military activities are expected for the DWMA.

Rationale for Selected Strategy: Military maneuvers would be incompatible with tortoise conservation.

Recovery Plan Recommendations: Military maneuvers that disturb habitat would be prohibited in tortoise DWMA.

C.3 Issue: Cattle Grazing

Scope of Issue: This issue includes only cattle grazing; there is no sheep grazing in the NEMO planning area.

C.3.1 Current Situation

Current Situation in NEMO Planning Area: About 114,500 acres of BLM land in the Piute Valley Allotment are in the Piute-El Dorado Critical Habitat Unit. About 137,100 acres of BLM land in the Valley Wells, Jean Lake, Valley View, and Kessler Springs Allotments are in the Ivanpah Critical Habitat Unit. All allotments except Piute Valley are perennial/ephemeral; Piute Valley is ephemeral only. A programmatic biological opinion on cattle grazing in the CDCA specifies interim terms and conditions for mitigating cattle grazing effects on desert tortoise. These measures specify minimum forage utilization levels, limit grazing seasons for Jean Lake and Valley Wells Allotments, and restrict grazing areas in Valley View, and Piute Valley Allotments.

C.3.2 Effects

Primary Effects: In years of low annual plant production, cattle can compete with tortoises for food. There is forage overlap even in years of abundant forage, but there is probably no competition in these years. It is likely that past cattle grazing has altered the perennial plant composition. Study in the East Mojave has documented that cattle may trample and kill or injure tortoises or trample tortoise burrows, destroying the burrow and possibly entombing a live tortoise. Juveniles are at greater risk because they have soft shells and shallower burrows. The introduction and spread of alien grasses in the Planning area may be partially due to cattle grazing.

Other Effects: Hoof action may also increase compaction and reduce ground cover resulting in increased erosion and decreased water infiltration; effects are most severe around troughs and corrals and less severe in lightly grazed areas further from water. An overall reduction in perennial plant cover from grazing may reduce tortoise cover sites and may alter soil temperature regimes both for plants and tortoises.

Information Needs: The effect of grazing under varying stocking rates needs further analysis. Additional information on the effects of cattle grazing on cryptogamic crusts is needed.

C.3.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Grazing allotments would be relinquished at the request of the lessees (e.g., a conservation buyer). The terms and conditions of the biological opinion would be adopted as permanent grazing stipulations. Ephemeral grazing use would be unavailable in ephemeral allotments within DWMAs. In years of low ephemeral forage production, cattle would be substantially removed from the tortoise DWMAs. No temporary non-renewable perennial authorizations would be made in tortoise DWMAs.

Rationale for Selected Strategy: The strategy continues the strong mitigation measures currently in place. In addition, it allows the elimination of current grazing operations to promote tortoise conservation if a conservation buyer desires it. It also reduces potential competition between cattle and tortoises in dry years.

Recovery Plan Recommendations: The Recovery Plan recommends the complete elimination of cattle grazing in tortoise DWMAs.

C.4 Issue: Wild Horses and Burros

Scope of Issue: Only burros, and no wild horses, occur in tortoise habitat in the Planning area.

C.4.1 Current Situation

Current Situation in NEMO Planning Area: The Clark Mountain Herd Management Area was designated in the CDCA Plan for retention of burros. The appropriate management level (AML) was set at 44; current populations are at about 150 burros after a recent removal of about 150. The Clark Mountain HMA includes about 85,000 acres (13%) of the Ivanpah Critical Habitat Unit. In addition, two concentration areas are located on the east side of the Clark Mountains, outside of the Clark Mountain Herd Management Area but within the larger Clark Mountain Herd Area. These two concentration areas in Northern Ivanpah Valley currently are designated for no retention of burros. An additional population of approximately 126 burros occupies the two concentration areas. Drift of burros between the concentration areas and the HMA across the Clark Mountains was fairly regular until the National Park Service fenced the higher altitude springs. The Dead Mountains Herd Management Area as designated for no retention of burros. The AML was set at 0, but about 30 burros occur there now. The Dead Mountains HMA includes about 6,600 acres (1%) of the Piute-El Dorado Critical habitat Unit.

C.4.2 Effects

Primary Effects: Impacts are presumably similar to those described for cattle grazing; however, there are no studies describing the impacts on desert tortoise.

Other Effects: Presumably similar to those described for cattle grazing.

Information Needs: Information on the preferred foods of burros and on potential forage competition with desert tortoise at varying burro-stocking rates is needed.

C.4.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Burros would be substantially removed from the Clark Mountains HMA. Existing strategies to remove burros from the Clark Mountain Herd Area concentration areas and Dead Mountains HMA would be implemented to prevent repopulation of these and adjacent DWMA areas. A monitoring strategy would be developed to assess progress in reducing burro population.

Rationale for Selected Strategy: Impacts of competition, especially in years of low annual production, and trampling would be eliminated.

Recovery Plan Recommendations: The Recovery Plan recommends the complete elimination of burros from tortoise DWMA's.

C.5 Issue: Mineral Extraction

Scope of Issue: This issue includes all mineral resource classifications - metallic, industrial, construction, and energy. It includes all mineral disposal classifications - locatable, leasable, and salable.

C.5.1 Current Situation

Current Situation in NEMO Planning Area: Those portions of the Planning area within wilderness are withdrawn from mineral entry excepting valid existing rights; new leases and sales are not allowed in wilderness. About 44,000 acres of critical habitat in the Planning area are in five wilderness areas. For mineral exploration and small mining operations under 10 acres, the BLM has received from USFWS a programmatic biological opinion. It gives terms and conditions for mitigating and compensating impacts on desert tortoise. For larger operations, project-specific stipulations are developed through consultation with USFWS. There are currently no active mining claims in critical habitat in the NEMO Planning area. There are 118 inactive (mostly small and historic) mining operations in critical habitat (16 in Piute-El Dorado and 102 in Ivanpah Critical Habitat Units). Most large mining operations are in mountains (e.g., Mountain Pass Mine, Coliseum Mine, Morning Star Mine), but access may cross critical tortoise habitat. Although there was once some interest in oil and gas exploration in Ivanpah Valley, interest is now very low. Waste spills from Mountain Pass Mine have resulted in habitat loss for clean-up and monitoring well fields.

C.5.2 Effects

Primary Effects: Exploration activities may disturb or crush small amounts of habitat, commonly less than an acre. Mining development commonly disturbs more habitats and results in removal of vegetation and disturbance of soils. Reclamation of modern mine sites is often better than other disturbances due to growing of nursery plants, replacement of topsoil, and irrigating. Vehicles on access roads to mine sites or off-road in exploration may run over and kill or injure tortoises.

Other Effects: In larger operations, residential development may occur (See Issue: Urbanization and Agricultural Development). Access roads may fragment populations. Toxins emitted through fugitive dust or spills may contaminate large areas; the effects are not well understood but are implicated in shell diseases.

Information Needs: The relationship between shell diseases and various toxic substances, if any, needs to be determined. Restoration techniques need refinement.

C.5.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Cumulative new surface disturbing projects on BLM lands in each tortoise DWMA would be limited to 1 percent of BLM lands in that area. The size of each project would be minimized, and other standard mitigation measures would be applied. Compensation would assist in accomplishing other tortoise conservation objectives (e.g., land acquisition, habitat rehabilitation). No additional withdrawals are proposed. Changes to Class L would necessitate plans of operation even for small mines. Sale of materials at new or expanded pits would be allowed.

Rationale for Selected Strategy: Large-scale mining operations are not anticipated in the DWMA's in the NEMO Planning area. Small mining operations are small and usually temporary, and existing mitigation techniques are sufficient. Oil and gas development in Ivanpah Valley would be discretionary.

Recovery Plan Recommendations: Ivanpah Valley would be withdrawn from mineral entry and leasing. Mining would be allowed if carefully mitigated. New surface disturbing activities that significantly diminish tortoise habitat value would be prohibited.

C.6 Issue: Utilities and Other Rights-of-Ways and Permits

Scope of Issue: This issue includes Utility Corridors designated in the CDCA Plan and the resulting transmission facilities and service roads. It includes construction of new facilities and maintenance of existing facilities. Also included are various permitted activities such as filming and apiary sites.

C.6.1 Current Situation

Current Situation in NEMO Planning Area: Utility Corridors D and BB cross the Ivanpah Critical Habitat Unit, and Corridors E and R cross the Piute-El Dorado Critical Habitat Unit. Even though about 112,500 acres of critical habitat are in these corridors, the actual acreage occupied by utilities is much smaller. Each corridor includes electric transmission lines, pipelines, and fiber-optic cables. Some utilities occur outside the corridors, but no additional facilities can be constructed alongside them. All utilities have service roads. Mitigation and compensation measures are applied to both construction and maintenance activities. Restoration has been poor, especially for pipelines. The BLM has programmatic biological opinions covering the maintenance of most utility systems. There is increasing demand for communication sites. Most of these are located on high points outside of critical habitat, and acreage disturbed is small but permanent. There are few requests for other special use permits in the Planning area.

C.6.2 Effects

Primary Effects: Habitat loss in construction is often severe. Fiber-optic cables have often been placed in or along service roads. Pipeline construction can denude large strips up to 200 feet wide, and habitat restoration is very slow with current methods. Direct mortality during construction can occur and was very high on at least one pipeline project. Direct mortality can also occur in utility inspection and repair.

Other Effects: Service roads increase human access with impacts associated with various legal and illegal activities. Transmission towers create nesting and perhaps foraging perches for ravens that prey on hatchling and juvenile tortoises.

Information Needs: Site restoration techniques need to be improved. The effects of utilities on raven predation and methods for reducing it are not well known.

C.6.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Existing utility corridors would be retained, and new utilities would be placed within them. Cumulative new surface disturbing projects on BLM lands in each tortoise DWMA would be limited to 1 percent of BLM lands in that area. The size of each project would be minimized, and other standard mitigation measures would be applied to limit effects. Compensation would assist in accomplishing other tortoise conservation objectives (e.g., land acquisition, habitat rehabilitation).

Rationale for Selected Strategy: The effects of utilities on tortoise conservation and other resources would be restricted to existing, discrete locations.

Recovery Plan Recommendations: New access would not be developed in DWMA. Disturbed areas would be restored to pre-disturbance condition. New surface disturbing activities that diminish tortoise habitat value would be prohibited. Fencing with underpasses would be constructed along the Union Pacific Railroad.

C.7 Issue: General Recreation

Scope of Issue: This issue includes hunting, shooting, nature study, rock collecting, rock climbing, recreational touring, and other activities. Camping is not included (see Issue: Access), and motorcycle riding and competitive events are not included (see Issue: Riding and Competitive Events).

C.7.1 Current Situation

Current Situation in NEMO Planning Area: Almost all recreation in the desert includes a vehicle as a means of accessing a remote area. BLM lands are generally available for all forms of such destination recreation. Wilderness areas are available only for non-mechanical recreation and activities with low user density and low impacts by foot or horseback. Various public education outreach programs and printed materials have been developed to promote, enhance, and direct recreational opportunities and to gain visitor compliance with conservation of resources. Recreation use in tortoise critical habitat in the Planning area is relatively low and widely dispersed compared with other desert areas. There are no developed campgrounds in or near critical habitat.

C.7.2 Effects

Primary Effects: Legal recreational activities probably have little or no effect on desert tortoise. Illegal activities such as shooting or collecting tortoises may have seriously reduced populations in some areas (see Issue: Vandalism and Collecting). Evidence for shooting and the low level of recreation use indicate that these illegal activities are not significant in the NEMO Planning area.

Other Effects: None.

Information Needs: No significant needs.

C.7.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: General recreational activities would be allowed. Public education programs and ranger contacts would be continued and increased.

Rationale for Selected Strategy: Impacts, if any, are not significant. General recreation is widely dispersed and has low impacts usually associated with access.

Recovery Plan Recommendations: General non-consumptive (e.g., hiking, horseback riding) recreational activities would be allowed. Discharge of firearms except for certain hunting (i.e., from September through February) would be prohibited. New visitor centers, campgrounds, and other visitor facilities would be allowed where appropriate. An environmental education program would be developed.

C.8 ISSUE: Recreational Vehicle Riding and Competitive Events

Scope of Issue: This issue includes motorcycle riding on routes, organized motorcycle trail-riding events, and competitive speed events.

C.8.1 Current Situation

Current Situation in NEMO Planning Area: Competitive speed events may be allowed on approved routes of travel by permit. In multiple-use class L, only short distances and no start, finish, pit, or spectator areas are allowed. Occasionally, motorcycle trail-riding events have been permitted in critical habitat; the BLM has a programmatic biological opinion from USFWS covering such events. These events are few, and they are permitted only in the winter. The CDCA Plan designated one long-distance, point-to-point, competitive event corridor through what is now critical habitat. This “Barstow-to-Vegas” Corridor passes through the Ivanpah Critical Habitat Unit (in Shadow Valley). No race has been authorized in the Corridor for many years due to issues of competitor and spectator compliance and the listing of the desert tortoise. There is one off-highway vehicle free-play area in the NEMO planning area. Dumont Dunes OHV Area is 10,058 acres in size, and was doubled in size when the management plan was adopted in 1990. The area is a dune environment adjacent to the lower Amargosa River. There is no desert tortoise habitat in the immediate area. It is the most popular destination for recreational vehicle riding and large group camping in this part of the desert. Competitive events are limited in size and scope, based on the relatively small size of the OHV area.

C.8.2 Effects

Primary Effects: Vehicles, especially those in speed events, can run over and kill or injure tortoises. Organized trail rides have stipulations to reduce the likelihood of tortoise mortalities. In speed events, vehicles often leave the traveled portion of the course resulting in route-widening, vegetation loss, crushing of tortoises and burrows, increased compaction, loss of soil and nutrients, and destruction of cryptogamic crusts. Compaction of soils reduces water absorption, increases surface temperatures, and increases the difficulties in digging burrows. Destruction of vegetation reduces tortoise protection from predators and weather and reduces annual plant habitat suitability and productivity. When winds are moderate to high, racers leave the marked course entirely to avoid wind-blown dirt.

Other Effects: The spread of alien plants is aided by surface disturbance and, possibly, fugitive dust along route edges. New disturbance may destroy cryptogamic crusts that are important in reducing erosion, controlling water infiltration, regulating soil temperatures, fixing atmospheric nitrogen, pre-adapting soils for plant growth, and accumulating organic matter. Campsite debris associated with large organized or unorganized groups can provide food sources for ravens that forage miles from their home territories, if appropriate measures are not taken.

Information Needs: Additional information is needed on the effects of toxins from vehicle exhaust. The effects of increases in fugitive dust on cryptogamic crust, soil nutrient content, and annual plant production are not known.

C.8.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: No competitive events would be allowed in tortoise DWMA or in other desert tortoise habitat in the planning area. Competitive events would be restricted to OHV Open Areas and courses dedicated for such use in the CDCA Plan. The Barstow-to-Vegas course would be eliminated from the CDCA Plan and would not be one of these courses. Organized trail-riding events would be allowed outside the tortoise season on open and seasonally limited routes with standard mitigation measures applied. No cross-country travel would be allowed.

Rationale for Selected Strategy: The negative effects of competitive events are incompatible with tortoise conservation. Effects of organized trail-riding events, properly stipulated (e.g., only between November 1 and March 1, pre-event sweep and lead rider, 500 riders maximum), are similar to other vehicle use of routes in desert tortoise habitat.

Recovery Plan Recommendations: Competitive and organized events would be prohibited in DWMA's. No cross-country travel would be allowed. Fencing would be added around Ivanpah Dry Lake and Stateline area to keep vehicles out of the DWMA's. DWMA boundaries would be signed around Nipton and other settlements.

C.9 Issue: Vehicle Access

Scope of Issue: This issue includes legal use of authorized routes of travel on the public route network and on State and Federal Highways. It also includes stopping, parking, and camping along these routes. It does not include use of utility service roads or access to permitted activities, such as mining.

C.9.1 Current Situation

Current Situation in NEMO Planning Area: Wilderness areas have no general motorized access by the public. Outside of wilderness, legal routes of travel on public lands include all existing routes and all washes showing signs of use. Route density is low relative to other desert areas. Stopping, parking, and camping on public lands are allowed within 300 feet of any route of travel. No BLM routes in tortoise habitat are paved. Most routes are maintained by repeated use; a few are maintained by blading. A few paved State and Federal highways pass through tortoise critical habitat - Interstate 40, Highway 95, and Goffs Road in the Piute-El Dorado Critical Habitat Unit and Interstate 15, Excelsior Mine Road, and Nipton Road in the Ivanpah Critical Habitat Unit. Some of these carry very heavy traffic.

C.9.2 Effects

Primary Effects: Tortoises can be crushed or injured by vehicles on roads. On paved highways where vehicle speeds and traffic volume are high, virtually no tortoise may pass over the highway. Tortoise populations are severely depressed for at least 0.5 to 1 mile along heavily used highways. This not only reduces tortoise overall populations, but fragments the populations.

Other Effects: Toxins emitted from vehicle exhaust may be a causative agent for shell diseases. Highways also serve as dispersal corridors for alien plants. Roadkills of reptiles and mammals serve as raven food, thereby artificially subsidizing the populations of an important tortoise predator (see Issue: Subsidized Predation). Fires occur most commonly along paved highways; fires promote alien plants, decrease native perennial cover, and kill tortoises (see Issue: Fire).

Information Needs: The effects of varying levels (i.e., light to heavy) of vehicle use of routes on desert tortoise populations are not understood. The effects of legal and illegal activities at campsites along routes (e.g., collecting, vandalism of tortoises, trash, pets) are not known. The effects of toxins in vehicle exhaust are not well understood.

C.9.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: All routes in tortoise DWMA's would be designated open, closed, or limited use. Closed routes would be rehabilitated. Interstate highways and other heavily traveled, paved highways through tortoise DWMA's (i.e., I-15, I-40, Highway 95, Nipton Road) would be fenced to exclude tortoise access. Culverts to allow passage across these highways would be provided. Stopping, parking, and camping would be allowed only within 100 feet of route centerline or within banks of wash.

Rationale for Selected Strategy: The CDCA Plan calls for the designation of routes on public lands throughout the CDCA. Fencing of highways has been shown to greatly reduce the mortality of tortoises and other reptiles and mammals.

Recovery Plan Recommendations: Routes of travel would be designated individually. Fencing and culverts would be required along most paved highways (i.e., I-15, I-140, Highway 95) in critical habitat. Parking and camping would be restricted to designated sites. Speeds would be limited on designated routes.

C.10 Issue: Vandalism and Collecting

Scope of Issue: This issue refers to the illegal harming or collecting of desert tortoises. It does not include the authorized handling of tortoises to remove tortoises from a hazardous site as project mitigation.

C.10.1 Current Situation

Current Situation in NEMO Planning Area: Although tortoises are sometimes shot, the incidence of gunshot is very low in the NEMO Planning area. Tortoises are collected for pets and for cultural observances. The amount of collecting and its significance is unknown, but the high number of tortoises in captivity is one indication that collecting may be occurring. However, it is believed to be minimal in the NEMO Planning area due to remoteness.

C.10.2 Effects

Primary Effects: Both collecting and vandalism remove tortoises from the population. Any such artificial mortality is potentially significant due to the tortoise's very low reproductive capacity.

Other Effects: In some areas immigrants seek tortoises for cultural observances. Burrows are destroyed in large numbers in the search for tortoises. This potentially exposes tortoises to increased predation and exposure to other natural elements.

Information Needs: There is no information on the amount of tortoise collecting occurring or its relative significance compared to other mortality factors.

C.10.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Hunting would be permitted according to State regulation. Public education and law enforcement would be increased.

Plan Recommendations: Discharge of firearms, except for gamebird and big game hunting would be prohibited in the DWMA's. An environmental education program would be developed. Law enforcement would be increased to reduce illegal activities.

C.11 Issue: Vegetation Harvesting

Scope of Issue: This issue includes the authorized sale and illegal harvesting of whole plants or plant parts.

C.11.1 Current Situation

Current Situation in NEMO Planning Area: A permit is required in the CDCA for all vegetation harvesting except dead-and-down wood for campfire use. According to current BLM instructions in the CDCA, only creosote stems or salvage plants may be sold until an environmental assessment is prepared (none have been prepared for the NEMO Planning area). Only salvage from areas to be disturbed is currently considered and only if the plants are not needed for project restoration. Some illegal harvesting of Mojave yucca and barrel cactus has occurred in the Piute and Fenner Valleys.

C.11.2 Effects

Primary Effects: Sales of plant parts for the floral industry if properly mitigated and restricted should have little or no effect on vegetation resources or desert tortoise. Commercial harvesting of yuccas can reduce bird populations. Illegal harvesting can eliminate key tortoise forage species, such as cactus.

Other Effects: Illegal harvesting usually involves illegal cross-country travel by trucks that damage habitat.

Information Needs: None.

C.11.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Increased law enforcement would attack illegal harvesting. Permits for vegetation harvesting would be limited to salvage projects. Collection of dead-and-down wood (except Joshua trees and other yuccas) for personal campfire use would be allowed.

Rationale for Selected Strategy: The floral industry's needs for plant parts can be met in other areas. Commercial harvesting (e.g., yucca) has undesirable, negative effects on wildlife.

Recovery Plan Recommendations: No vegetation harvesting would be allowed except by permit (currently required throughout CDCA).

C.12 Issue: Wildlife Management

Scope of Issue: This includes various activities or habitat facilities (e.g., small game guzzlers) to enhance or stabilize wildlife (especially upland gamebird) populations.

C.12.1 Current Situation

Current Situation in NEMO Planning Area: There are numerous small game guzzlers in tortoise habitat in the NEMO Planning area. Most, if not all, have been modified so that animals, including tortoises, do not become entrapped.

C.12.2 Effects

Primary Effects: Tortoises can become entrapped and die due to plastic entry/exit ramps that are too slick.

Other Effects: Tortoise predators, such as coyote and common raven, can drink from the guzzlers. Where water limits these predators, their populations could be enhanced leading to increased tortoise predation (see Issue: Subsidized Predation). Cameras at guzzlers in the southern Colorado Desert have shown that many species use guzzlers; though present in that area, raven use has not been recorded. Ravens are known to use cattle troughs in the NEMO Planning area.

Information Needs: Additional information is needed on the use of small game guzzlers by coyotes and ravens and on the effects on their populations.

C.12.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Modify all small game guzzlers to facilitate exit by tortoises.

Rationale for Selected Strategy: The strategy addresses the known problem.

Recovery Plan Recommendations: Guzzlers and other wildlife facilities would be allowed. Enhancement of native gamebird populations would be allowed.

C.13 Issue: Subsidized Predation

Scope of Issue: This issue includes the predation of tortoises by predators whose populations are subsidized, and thereby elevated, by human activities that provide food or other essential habitat elements. Major predators include common ravens, coyotes, and domestic or feral dogs.

C.13.1 Current Situation

Current Situation in NEMO Planning Area: Raven populations are somewhat elevated in the NEMO Planning area, but not as much as the West Mojave. Raven numbers around Stateline near the Ivanpah Critical habitat Unit are likely to continue to increase with development there. Little is known about coyote populations in the planning area. Feral and domestic dogs are not known to be a problem in the NEMO Planning area. The only authorized solid waste landfills are local operations at Baker and Needles; both are some distance from critical habitat. Unauthorized public and open community dumps exist at eight sites, all near critical habitat. Some of these have been closed, and efforts are underway to close the remaining in favor of regional landfills. Roadkills, especially on well-traveled paved roads (e.g., Interstate Highways 15 and 40 and State Highways 66 and 95), provide food for ravens and coyotes. Multiple transmission line systems are present in all utility corridors in both the Ivanpah and Piute-El Dorado Critical Habitat Units; raven use of these towers for nesting has been documented.

C.13.2 Effects

Primary Effects: The subsidizing of tortoise predator populations results in increased mortality to tortoises, especially to hatchling and juvenile tortoises less than 100 mm in length (usually less than 7 years of age). Both ravens and coyotes are known to forage at dumps and landfills, especially those where trash is not covered properly. Roadkills similarly provide food for predators; most relevant information is from highway fencing studies. The incidence of nesting on transmission towers in the NEMO Planning area occurs at a low level.

Other Effects: None.

Information Needs: The relationship between raven populations that actually forage at landfills and dumps and those that prey on tortoises away from these sites is not well understood. The movements of ravens on a daily and seasonal basis (i.e., migratory behavior) are not known. Although highway fencing studies have quantified roadkills on some highways, the utilization by and importance of these roadkills to predators on heavily traveled highways is not known.

C.13.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: No new landfills would be authorized by BLM in the DWMA. Existing unauthorized dumps would be closed and reclaimed. The BLM would participate in regional raven depredation control programs. Major highways would be fenced to reduce Roadkills (see Issue: Vehicle Access).

Rationale for Selected Strategy: Elimination of unauthorized dumps in and near tortoise habitat and reduction of highway roadkills should aid in returning raven and coyote populations to natural levels.

Recovery Plan Recommendations: No new landfills would be allowed in DWMA. Existing unauthorized dumps would be closed and reclaimed. Raven population control would be implemented. Dogs would be required to be on leashes in DWMA.

C.14 Issue: Disease

Scope of Issue: At least three diseases, and possibly others, are affecting wild populations of desert tortoise.

C.14.1 Current Situation

Current Situation in NEMO Planning Area: The three main diseases affecting wild tortoise populations are upper respiratory tract disease (URTD), cutaneous dyskeratosis, and shell necrosis; the last two are often referred to collectively as shell diseases. Animals from study plots near Goffs and in Ivanpah Valley in the Mojave National Preserve have tested positive for URTD. Infection rates in samples have varied from year to year ranging from 5-39 percent at Goffs and 9-62 percent at Ivanpah Valley. High incidences of URTD occur in captives at Needles and Las Vegas just outside the planning area. Cutaneous dyskeratosis has been common in recent years at study plots in Shadow Valley, in Ivanpah Valley, and near Goffs (highest incidence). Environmental toxicants have been implicated in shell diseases.

C.14.2 Effects

Primary Effects: Large die-offs in the West Mojave have been largely attributed to URTD, and similar die-offs on Chuckwalla Bench have been attributed to shell diseases. Similar die-offs can be expected in the pin the future. At a minimum, diseases increase physiological stress that can result in starvation or dehydration especially during drought.

Other Effects: Disease may make sick animals lethargic or weak predisposing them to predation or exposure to weather.

Information Needs: Additional information is needed on the epidemiology of all diseases of wild tortoises. Additional information is needed on the causative agent of shell diseases. The importance of environmental toxicants in tortoise health has not been clarified. The importance of nutrition, especially relative to alien plants, in recovery rates of sick tortoises is not known.

C.14.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: The strategy would continue 1) disease research programs, 2) prohibitions on reintroduction of captive tortoises into the wild, 3) education of the public about the disease issue and particularly the prohibition on release of captives, and 4) allowing only local relocation of tortoises in project mitigation.

Rationale for Selected Strategy: The only known URTD defense is to inhibit the spread by restricting the relocation of infected tortoises and to limit physiological stress by maintaining habitat in good condition.

Recovery Plan Recommendations: Research programs on disease would continue. Relocations in projects would be localized.

C.15 Issue: Fire

Scope of Issue: This issue includes both the direct effects of burning the vegetation and the effects of fire suppression activities. Both natural and man caused fires are included.

C.15.1 Current Situation

Current Situation in NEMO Planning Area: Fire occurrence in tortoise habitat in the NEMO Planning area is relatively low, averaging about one fire per year. Fires below 3,000 feet are usually man caused, occur along highways, and rarely exceed 1 acre in size. Above 3,000 feet, fires are mostly ignited by lightning strikes and are usually less than 10 acres in size. The BLM has a *Fire Management Activity Plan for the California Desert*. It includes fire suppression guidelines for critical habitat and other tortoise habitat. The intent is to limit the fire size without unnecessarily disturbing habitat. Post-suppression restoration is also implemented.

C.15.2 Effects

Primary Effects: Tortoises can be killed directly by fires. The small size of fires in the Planning area limits the amount of mortality. Fires eliminate perennial plants used by tortoises as food and cover. If the fire is small, surviving tortoises may be able to move outside of the burned area for food and cover. Burned areas provide opportunity for the invasion and establishment of alien plants, perhaps degrading forage value over a wider area than the burn itself. Surface disturbance caused by equipment, if any, used in fire suppression would add to the habitat loss and alien plant invasion.

Other Effects: As a part of fire suppression, unburned fingers and islands between burned areas and firebreaks (i.e., roads) are sometimes burned to prevent flare-ups. This can increase the size of burned area.

Information Needs: Although some research has been conducted, there is much yet to learn about the relationship of fire and the spread and establishment of alien plant species.

C.15.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Suppression would include a mix of aerial attack, hand tools, and foam or fire retardant with engines restricted to roads unless life or properties are threatened. Post-suppression would include the obliteration of vehicle tracks off of roads, if any. Backfires and burning of unburned fingers and islands would be discouraged in DWMA's.

Rationale for Selected Strategy: There is a need to limit the burn size while limiting surface disturbance by equipment.

Recovery Plan Recommendations: Use of minimum impact fire suppression methods and restoration of disturbed areas would be required.

C.16 Issue: Alien Plants

Scope of Issue: This issue includes the effects of alien plants on tortoises.

C.16.1 Current Situation

Current Situation in NEMO Planning Area: The distribution of alien plant species has not been mapped in the Planning area. Most are highly competitive, and have the potential to replace native species. Many are associated with human disturbance and spread along corridors where soil and plant disturbance occurs, such as along streams, washes, roads, and utility lines. Among the most widespread in the Mojave Desert are Mediterranean (split) grass, various brome grasses, and filaree. Moroccan mustard has been spreading rapidly in recent years.

C.16.2 Effects

Primary Effects: The invasion of alien plant species has greatly altered plant composition in some areas. This could potentially effect tortoise populations as thermal cover and forage are modified. Although many alien plants have nutritional value comparable to native plants, there is a reduction in diversity in the diet. Some alien plants, such as Mediterranean grass create a dense ground cover that carries fire more readily. Although fires have been small and few in number in the past in the planning area, they may become larger as alien plants increase (see Issue: Fire).

Other Effects: As plant species composition is altered, changes can be expected in other ecosystem elements, such as animal community composition, soil structure and chemistry, and soil and surface hydrology.

Information Needs: The effects of alien plants on ecosystem processes and soil chemistry and thermodynamics are not known. The mutual effects of alien plants and fire have been studied, but much is not known. The nutritional value of many alien plants is known, but the overall effects on tortoise diet and health is not known. Aside from minimizing disturbances, methods for controlling the invasion of new alien plants species and the spread of all alien plants are not known. Methods for restoring vegetation and minimizing the invasion of alien plants in project areas needs improvement.

C.16.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: The frequency and extent of surface disturbing activities would be reduced. Vegetation restoration using the best available techniques would be required on projects.

Rationale for Selected Strategy: The invasion and spread of alien plants must be limited to the extent possible.

Recovery Plan Recommendations: None were given.

C.17 Issue: Drought

Scope of Issue: Drought refers to the absence or shortage of precipitation during seasons of normal occurrence such that the spring season has very low plant germination and growth.

C.17.1 Current Situation

Current Situation in NEMO Planning Area: Years with low precipitation in desert areas are common. Occurrences of successive years of low precipitation are not uncommon. Whether rainfall patterns have changed substantially through recent decades such that the occurrence of drought has increased is arguable.

C.17.2 Effects

Primary Effects: During years of low precipitation tortoises may be stressed due to a low internal water balance. In addition, the low forage availability may create nutritional deficiencies, such as low energy levels and/or low levels of essential nutrients. This can create stress or even starvation. Where stressed by lack of water or food, tortoises may be more susceptible to predation, disease, or exposure; presumably hatchling and juvenile tortoises are affected most. When water or food is low, both clutch size and number of clutches is reduced; reproduction may be eliminated. In some drought years, tortoises may be largely inactive in their burrows.

Other Effects: In years of low forage production, competition between tortoises and other species or cattle may occur.

Information Needs: Additional information is needed on the effects of precipitation on tortoise reproduction, alien plant populations, plant nutritional value, and other factors.

C.17.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: Cattle grazing would no longer be available in DWMA's when ephemeral forage production (i.e., annual plant germination and growth) is low. Where feasible, authorized projects would be restricted to the non-tortoise season.

Rationale for Selected Strategy: Although drought is beyond local control, activities that create additional physiological or behavioral stress can be reduced.

Recovery Plan Recommendations: None were given.

C.18 Issue: Monitoring

Scope of Issue: This issue includes only the monitoring of tortoise populations.

C.18.1 Current Situation

Current Situation in NEMO Planning Area: There are three tortoise permanent study plots in the NEMO Planning area - Ivanpah Valley, Goffs, and Shadow Valley. Only the last is on BLM land; the other two are in the Mojave National Preserve. The plots were surveyed regularly through the 1980's and early 1990's, but a lack of funds has prevented USGS from surveying these plots regularly since 1994. The plots were used to study population trends, demographics, and mortality factors. The Tortoise Management Oversight Group has approved an additional technique called line distance sampling. It will provide long-term population trend data on a recovery unit basis. Implementation of this program is awaiting refinement and funding.

C.18.2 Effects

Primary Effects: There are no negative effects of the monitoring programs.

Other Effects: None.

Information Needs: Additional information is needed on the application of the distance-sampling methodology, which has been field-tested only in limited situations.

C.18.3 Strategy

Strategy in Preferred Alternative for Addressing Issue: The BLM would resume funding of population studies at the Shadow Valley plot on a four-year cycle. The BLM would also participate in the rangewide-monitoring program employing distance-sampling methodology.

Rationale for Selected Strategy: The Shadow Valley plot was studied in 1979, 1988, and 1992; continued study of this plot can give important information on changes in tortoise populations and causes of mortality. It is important that the distance-sampling methodology be applied uniformly throughout the range of the tortoise. It will provide the basic trend data for determining recovery.

Recovery Plan Recommendations: Assessment of the permanent study plots would be continued. A second, new methodology, with sample plots randomly distributed over a wide area, would be applied range wide.