

## Appendix F

### F.0 New Surface Disturbances and Rehabilitation Strategies

#### F.1 Cumulative Surface Disturbances

New surface disturbance on lands administered by federal and state agencies within any desert tortoise ACEC will have a cumulative limitation. This limitation is proposed to be one percent of suitable habitat in the preferred alternative. The amount that may be disturbed will be apportioned among the various participating agency jurisdictions.

##### F.1.1 Rationale

The limit of 1 percent on cumulative surface disturbance is intended to show a high level of commitment to conservation of natural habitats. Although the 1 percent level may seem arbitrary to some, it is expected to accommodate the needs of those activities that must occur in the ACEC based on low historic levels of use in these areas. Among these are communication sites, maintenance of existing and construction of new utilities in designated utility corridors, dispersed recreation, and mining. It is anticipated that retaining 99 percent of what is presently in natural condition will be sufficient for maintaining viable populations of all species that are dependent upon the ACEC; conserving lesser amounts might be arguable. The commitment to limiting cumulative disturbance is an alternative to the prohibition on specific classes of activities based primarily on our ability to prohibit them rather than on their expected level of occurrence and size, their need, their public value, etc. It gets us closer to the direct effect on species that we are attempting to address: prevention of loss of habitat.

##### F.1.2 Specifics

Surface disturbing activities are those that result in elimination of perennial plant cover over an area. Elimination may result from blading or otherwise destroying plant roots and severely disturbing soil structure or it may be less severe in the form of crushing of above ground plant parts. The localized effects of new corrals or livestock watering sites will be considered surface disturbing, but general grazing will not be. Burned areas will not be included under the one percent limit.

Surface disturbing activities will be recorded on 7.5-min. topographic maps and entered into a GIS database. Disturbances will be recorded as they are permitted. Unauthorized disturbances will also be entered as they are identified. Disturbances on private lands may also be recorded but will not be limited to one percent cumulative disturbance.

Lands acquired by an agency will be added to the base in their condition at the time of acquisition. That is, disturbance present on the parcel at the time of acquisition will not be added to the cumulative new disturbance.

If an interstate highway or state highway is widened and creates new surface disturbance in an ACEC, the new disturbance will not be covered by the cumulative limit if highway fencing is added. The fencing will result in increased tortoise populations along the highway due to decreased tortoise mortality on the road. In addition, there may be a decrease in raven populations as roadkills supporting ravens are reduced.

## **F.2 Rehabilitation strategies**

### **F.2.1 Trigger for Evaluation of Rehabilitation**

As disturbed lands are restored, it would be practical that they may be subtracted from the cumulative total of disturbed lands. Lands may be evaluated for removal only after they meet the following “40% criteria” (or *evaluation trigger*); passing of the evaluation trigger alone will not remove the disturbed lands, it is the point at which evaluation of lands would be initiated:

Perennial plants are present in densities and sizes so that impacts are substantially unnoticeable in the area as a whole and so that the area provides food and shelter for key wildlife species in the area. More specifically, each species in a suite of the most dominant perennial plants prior to disturbance must be reestablished to at least 40 percent of its original density (i.e., number of plants/hectare) and at least 30 percent of its original total cover. The choice of the suite of dominant perennial plants is any combination of perennial plants that originally accounted cumulatively for at least 80 percent of relative density<sup>1</sup>. There will be no less than two dominant perennial species.

The use of only perennial plant cover in the evaluation trigger allows calculation of the restoration requirement in any year (wet or dry) and any season. The use of specific numbers allows the evaluation trigger for a particular site to be known prior to the disturbance. It should be noted that some important plants, such as Joshua trees, which are important as an overstory plant but are not dominant, would not be a part of the evaluation trigger. Reestablishment of such plants could, of course, be a restoration requirement for a particular project, but they would not be used to trigger an evaluation for the purposes of reducing the cumulative disturbance total. Annual plants are difficult to use in evaluating restoration progress because 1) the number of species is very high, 2) identification is difficult, and 3) the presence of a given species is highly variable from year to year based on factors (e.g., rainfall) unrelated to habitat restoration. The evaluation trigger does not preclude the possibility that annual weeds may be present or even prevalent. Once an evaluation is triggered, many factors would be considered in the analysis of the site.

### **Rehabilitation Factors**

Many of the ideas and information described below come from the Desert Restoration Task Force, a committee to the Desert Managers Group (DMG). This committee has developed publications on the subject. One part of the array of management initiatives of the DMG includes restoration of disturbed sites. This is being specifically addressed through the DMG subcommittee for the Desert Restoration Task Force. This group has published a technical manual on the subject. In it tried and tested site planning and application techniques as well as experimentation are encouraged. Much more will be learned and written over time. The intent of this discussion is not to review the technology or “cook-book” restoration design on a species and habitat basis, but to review some thought considerations and convey an intent that more sophisticated and effective rehabilitation measures are needed and expected for future authorized disturbances. In the final analysis it will be left to case-by-case field applications to evaluate the specific needs, actions, expense that will result in site conditions which approximate natural disturbance, and identify priorities for restoration.

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<sup>1</sup> For example, if perennial plants A, B, and C have relative densities of 70, 13, and 12 percent, respectively, the dominant species could be species A and any one (or more) of species B or C.

The Northern and Eastern Colorado Desert Science Panel that met on November 12, 1998, noted that disturbance is not entirely a negative ecological condition or just human-caused. Wash, wind, tectonic, fire and other violent natural forces cause episodes of natural disturbance and are forces of natural ecological processes. Variables to consider in restoration may include the amount, location, nature, and effects of disturbance and other constraints. Disturbances that pose serious problems and that do not lend themselves to a “construction” solution are not addressed here. These include disease, unnatural change to fire regime, and exotic plants. To meet this mandate decision makers must apply site planning and consider a variety of technical applications. Site planning and restoration considerations may include:

- Special Status Species
  - Listed, proposed for listing, sensitive
  - Species-habitat relationships that apply
- Plant Community
  - Common, rare
  - Site quality
- Management Goals
  - General management goals
  - Special management goals (e.g., DWMA, WHMA, species and sensitive habitats). This consideration is critical and can make the difference between minimally necessary and special needs restoration and cost.
- Ecological Processes
  - Determine the preexisting condition, distribution of species and habitats
  - Most important to restore and that humans can effect
  - Commonly considered are soil, hydrologic, wind functions, movement of animals, sources and movement of seed.
- Conservation Principles
  - Patch size (fragmentation)
  - Plant cover
  - Corridors
  - Habitat conversion to exotic species.
- Site Context
  - Site in area of habitat
  - Site in the range(s) of species
  - Site quality
  - Cumulative situation, if any, of this site, with others of a permanent/temporary disturbance nature.

- Site Analysis/Pre-existing Site Condition - constraints and objectives
  - Topography, slope, aspect
  - Landforms (e.g., washes, desert pavement, sand systems)
  - Surface and Subsurface Soils
  - Vegetation
  - Subsurface organic matter
  - Surface texture/micro-habitat: organic debris, soil, sand, rock texture.
- Constraints
  - Can approximate original topography be achieved?
  - Is compaction a problem?
  - Historic use patterns
  - Are materials on hand to recreate original surface texture?
  - Are there uses to prevent or that could impair restoration efforts?
  - Time
  - Cost.
- Common applications (not for all situations)
  - Grading (topography, landform, micro topography, surface texture)
  - Replacing topsoil
  - Increasing soil moisture through mulching surface or subsurface (non contaminated with chemicals or weed seeds), imprinting, pitting
  - Treating compacted soils
  - Capturing and holding seeds through imprinting and pitting
  - Seeding (seed treatment) with locally gathered/commercially available seed
  - Individual plantings/Irrigation (costly, uncommon)
  - Erosion control.

The evaluation criteria are an initial trigger upon which an evaluation of both the productivity and the visual aspect of the vegetative community would take place, considering targets set for the rehabilitation, such as pertinent factors identified above. Specified levels are those levels where the impact may be unnoticeable and the area may be productive for wildlife in terms of food and shelter. At these levels it is likely that soil condition is returning, and annual plant cover is probably present; therefore ecosystem processes are beginning to successfully operate again.