

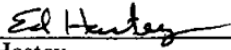
COMPENSATION FOR THE DESERT TORTOISE

**A Report Prepared For the
Desert Tortoise Management Oversight Group**

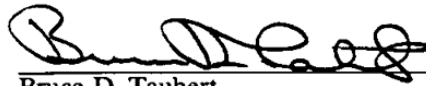
**By the
Desert Tortoise Compensation Team**

**Approved by the
Desert Tortoise Management Oversight Group
November 1991**

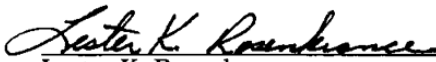
Final Report on "Compensation for the Desert Tortoise"
Approved by the Desert Tortoise Management Oversight Group
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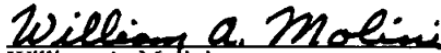
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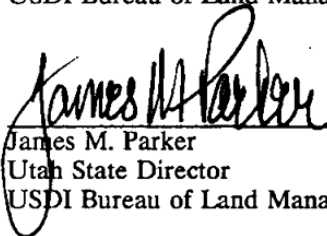
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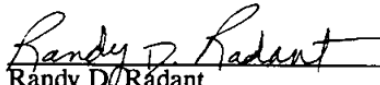
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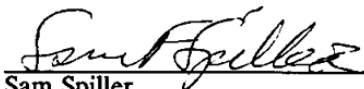
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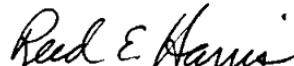
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COMPENSATION FOR THE DESERT TORTOISE

EXECUTIVE SUMMARY

The Bureau of Land Management (BLM) determined through its Desert Tortoise Habitat Management on the Public Lands: A Rangewide Plan that compensation was a valid method for mitigating residual impacts to tortoises after other mitigation measures were incorporated into proposed actions. The Desert Tortoise Management Oversight Group (MOG) established a Desert Tortoise Compensation Team to prepare a report describing a proposed set of standards and uses for compensation with respect to the desert tortoise. The report was prepared primarily for implementation by BLM, and the U.S. Fish and Wildlife Service and State wildlife agencies, when applicable.

This report is a recommendation to the MOG and describes the purpose and need for compensation, how to determine when compensation is needed, the factors used in determining compensation rates, the process for determining compensation rates, how to convert compensation rates to acreage or funding, compensation in special situations, and uses of compensation.

Key features of the report include:

1. A standard process, as defined in this report, is used by all BLM States, the Fish and Wildlife Service, and the State wildlife agencies, as appropriate, to determine tortoise compensation requirements.
2. The standard process includes determining values for five factors: Category of Habitat, Term of Effect, Existing Disturbance on Site, Growth Inducement, and Effect on Adjacent Lands. Values for the factors are added together to arrive at a Compensation Rate. Multiplying the Compensation Rate by the acreage affected results in the Compensation Amount (acres or funds).
3. Exceptions to use of the standard process are described, within certain defined parameters.
4. Compensation, when required, is provided in either of two ways, as determined by the agencies: 1) the direct purchase of privately owned desert tortoise habitat for transfer to conservation management, or 2) the direct payment of funds to an appropriate land management agency or entity for purchase of tortoise habitat or other tortoise management actions.

5. Appropriate use of compensation funds includes the following array of options: 1) tortoise habitat acquisition; 2) tortoise habitat enhancement; 3) tortoise population enhancement; 4) educational activities directly related to the enhancement of habitat or populations; and 5) research, studies, and monitoring.

It is incumbent upon managing agencies that potential compensation uses be for the best use toward desert tortoise recovery or habitat improvement.

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INTRODUCTION

Compensation is a mitigation technique used to make up for residual impacts of an action¹ that remain after other mitigation measures are incorporated. Compensation is implemented off-site from the action (i.e. project) area. Compensation has been used for species of special concern for many years. The Bureau of Land Management (BLM) and other agencies in the four desert tortoise States (Arizona, California, Nevada, and Utah) have used different methods to determine compensation needs and amounts. The Desert Tortoise Management Oversight Group (MOG) recognized the need for consistency of application among BLM, the Fish and Wildlife Service (FWS), and the State wildlife agencies. The MOG, on May 16, 1990, assigned its Technical Advisory Committee (TAC) the task of reviewing compensation methods used for the desert tortoise, determining what criteria, standards, and techniques were used, and recommending any needed changes. At the November 7, 1990 MOG meeting, the TAC reported on its findings and recommended improvements in determining amounts and uses of compensation for the desert tortoise. The MOG chairman assigned a team to develop recommended techniques and uses of compensation. Participants on the interagency team included Ted Cordery, BLM-Arizona; Dave Harlow replaced by Sherry Barrett, FWS-Reno; Frank Hoover, California Department of Fish and Game; Bill Lamb, BLM-Arizona; John Payne, BLM-Utah; Gary Ryan, BLM-Nevada; Alden Sievers, BLM-California; and Sid Slone, BLM-Nevada.

PURPOSE AND NEED

BLM's Desert Tortoise Habitat Management on the Public Lands: A Rangewide Plan (Rangewide Plan) identifies a policy of "no net loss in quantity or quality of important desert tortoise habitats." Since actions requiring compensation result in a net loss of habitat to the desert tortoise, the objective of compensation is to put additional tortoise habitat under conservation management, remove deterministic factors adversely affecting the viability of the populations, or improve habitat conditions to the benefit of the desert tortoise.

The Endangered Species Act of 1973 (ESA), as amended, and its implementing regulations, require Federal agencies to determine whether their actions may affect listed species. Prior to consulting with FWS on these actions, federal agencies routinely place measures into actions that eliminate or significantly lessen effects to threatened or endangered species. Compensation is one such measure. Compensation is applied after all other possible mitigating measures, particularly avoidance, are considered and

¹ "Action," in the context of this report, means an activity or program of any kind having surface disturbing characteristics that is authorized, funded, or carried out by an agency. In this document it is often used synonymously with "project."

integrated. Section 7(a)1 of the ESA also directs all Federal agencies to utilize their authorities in furtherance of the purposes of the Act. Requiring compensation as a mitigating measure defined by the Council on Environmental Quality (CEQ) is a way to achieve the purposes of the ESA. Compensation is a type of mitigation measure described in the CEQ regulations for implementing the National Environmental Policy Act (NEPA). The CEQ regulations allow "compensating for the impact by replacing or providing substitute resources or environments."

BLM's Manual Section 6840 covering special status species also identifies the need to use compensation to offset residual impacts to threatened or endangered species.

There is a need for consistent and objective processes and standards to use in determining the need and amount of compensation, and in determining how compensation can be used. The compensation procedures recommended in this report will fulfill this need.

The purpose of this report is to:

1. Apply these procedures to both the Mojave and Sonoran desert tortoise populations;
2. Apply these procedures by BLM for actions affecting the desert tortoise on public lands and by the FWS and State wildlife agencies (if applicable) for actions affecting the desert tortoise on other lands; and
3. Allow incorporation of these procedures into appropriate directives by the applicable agencies.

Implementing these procedures by all the agencies will result in consistency of approach and equity in application of desert tortoise compensation requirements.

DETERMINING THE NEED FOR COMPENSATION

Compensation is to be used to offset the residual impacts after all reasonable on-site mitigation measures are incorporated into an action. This is determined through the Environmental Analysis and Biological Assessment (or Evaluation) process. The goal of compensation is to make an action's net result neutral or positive to the desert tortoise. If an action can be fully mitigated (no net impact to the tortoise) without compensation, then no compensation need be required. Likewise, if a "no effect" determination is appropriate for an action in threatened desert tortoise habitat, then compensation for the tortoise is not necessary.

The following steps will normally be used, as a part of the environmental assessment and/or biological assessment (evaluation) processes, to determine the need for compensation:

1. Determine if the action may have an effect upon the desert tortoise. If the answer is no, then neither on-site mitigation nor compensation will be required for the tortoise.
2. If the action may have an effect upon the tortoise, develop an appropriate on-site mitigation package. Determine whether implementation of the action with the on-site mitigation measures will result in residual impacts. If no residual impacts will remain, then compensation will not be required.
3. If the action with the on-site mitigation measures will result in residual impacts, then compensation will be required.
4. If compensation is required, then the standard process, as explained below, will be followed.

In practice, most actions can not be fully mitigated through on-site mitigation measures. Some level of compensation will often be needed.

DETERMINING COMPENSATION RATES

As with determining the need for compensation, determining compensation rates must not be done in a vacuum. This should be accomplished through a group-interdisciplinary process to ensure interpretations are carefully evaluated.

DEFINITION OF FACTORS USED IN DETERMINING COMPENSATION RATES

Five factors-- Category of Habitat, Term of Effect, Existing Disturbance On Site, Growth Inducing Effects, and Impacts to Adjacent Habitat are used to determine the amount of compensation needed. Each of these factors is defined in the following discussion. All definitions, except Categories (after Spang et. al. 1988), are designed to allow for site-specific determination. A "best fit"² examination is required to resolve which characteristic listed under the factors applies.

CATEGORY OF HABITAT. The BLM document entitled Desert Tortoise Habitat Management on the Public Lands: A Rangewide Plan (Spang et. al. 1988) was released. This plan directed each BLM State with desert tortoise populations to categorize tortoise habitat based on the criteria outlined in the Rangewide Plan. Those criteria include: (1) importance of the habitat to maintaining viable populations, (2) resolvability of conflicts, (3) tortoise population density and (4) population status (stable, increasing or

² "Best Fit," as used in this section, implies that each determination must be examined on the merits of which characteristic best describes existing situations and/or anticipated impacts.

decreasing).

Three categories were identified and the criteria included within each category were ranked by importance to the categorization process, with Criterion 1 being the most important (Table 1). The intent of the Category goals is to have a protection gradient from Category I (the most valuable and protected habitat, to Category III the least valuable and protected). Category I habitats must be kept as inviolate as possible from deleterious impacts to the tortoise. The criteria definitions recognize that Category I habitats are not necessarily synonymous with high tortoise density areas. If they are not of high density, they have other characteristics that make them important to the long term viability of desert tortoise populations.

Table 1. Desert Tortoise Habitat Categories (after Spang et al. 1988).

Items	Category I Habitat Areas	Category II Habitat Areas	Category III Habitat Areas
Category Goals	Maintain stable, viable populations and protect existing tortoise habitat values; increase populations where possible	Maintain stable, viable populations and halt further declines in tortoise habitat values	Limit tortoise habitat and population declines to the extent possible by mitigating impacts
Criterion 1	Habitat area essential to maintenance of large, viable populations	Habitat area may be essential to maintenance of viable populations	Habitat area not essential to maintenance of viable populations
Criterion 2	Conflicts resolvable	Most conflicts resolvable	Most conflicts not resolvable
Criterion 3	Medium to high density or low density contiguous with medium or high density	Medium to high density, or low density contiguous with medium or high density	Low to medium density, not contiguous with medium or high density
Criterion 4	Increasing, stable or decreasing population	Stable or decreasing population	Stable or decreasing population

Category III habitats are less stringently protected through compensation. Categories of desert tortoise habitat on public lands may be changed with addition of new information through BLM's land use planning process.

Actions spanning more than one Category of habitat need to be evaluated based on the impact to each of the Categories. Actions located in one

Category but also affecting another Category may require evaluation based on the highest Category (eg. an action in Category III that affects adjacent Category II may require evaluation as Category II habitat).

TERM OF EFFECT. This factor evaluates the length of time required for the affected site to reach a condition substantially similar in tortoise habitat value (i.e. soil characteristics and vegetative cover, diversity, and productivity) as existed prior to the proposed action. Desert ecosystems are slow to recover from disturbance. A ten-year recovery is used as a gauge between "short-term effect" and "long-term effect."

A. SHORT-TERM EFFECT: The site disturbed will require less than 10 years to reach a condition substantially similar in tortoise habitat value to that which existed immediately prior to project initiation. Often this means there is little disturbance to shrubs or their root systems so that they can readily resprout, and that topsoil, litter and seed source remain in place.

B. LONG-TERM EFFECT: The site disturbed will require more than 10 years to return to a condition substantially similar (in terms of vegetative diversity, cover and productivity, and suitability to tortoises) to that which existed immediately prior to project initiation.

EXISTING DISTURBANCE ON SITE. The degree of existing surface disturbance on a proposed project site is a function of its land use history. Two characteristics are established to help define the previous land uses.

A. MODERATE TO HEAVY EXISTING DISTURBANCE: The existing habitat has been modified to such an extent that the proposed project would not significantly add to habitat degradation. Examples include gravel pits, high-use off-highway vehicle areas, utility corridors that have been disturbed by pipelines, and sites that have been cleared of vegetation.

B. LITTLE OR NO EXISTING DISTURBANCE: The existing habitat has not received significant degradation of habitat from previous activities. Examples include an area which has vehicle imprints from occasional off-highway vehicle use, a utility corridor which is restricted to overhead utilities with minimal tower disturbance, mining claims (but not mining operations) and other minor modifications to the vegetation and soils. No existing disturbance is defined as a site which appears relatively undisturbed.

GROWTH INDUCING EFFECTS. This terminology defines what effects the proposed project will have, both immediately and in the foreseeable future and includes cumulative impacts on the site in terms of human population increase or development. For example, if the construction of a domestic water pipeline adjacent to a community has the potential to cause growth (residential, business or industrial) because of water availability, then

the effect would be considered growth inducing. In contrast, if the same water pipeline is proposed in an area that is impractical to construct homes or other structures because of poor soils, then there would be no growth inducing effect. Two characteristics are established to define growth inducing effects.

A. GROWTH INDUCING: The proposed action will likely support human population growth, community expansion, development, or other related activities in the vicinity.

B. NOT GROWTH INDUCING: The proposed action is not anticipated to encourage human population growth, community expansion, development, or other related activities in the vicinity.

ADJACENT HABITAT IMPACTS: In addition to direct impacts on a site, a proposed project can indirectly affect adjacent tortoise habitat. For example, a major highway dissecting tortoise habitat may have the effect of fragmenting the population so severely that gene flow would likely result between the remaining population units causing a long-term (indirect), deleterious impact on population fitness. This effect would be additional to the direct traffic hazards to individual animals attempting to cross the highway. Additionally, a landfill may attract ravens, which could increase tortoise mortality on adjacent habitat. Conversely, the construction of a little used access track to a powerline structure would probably have little direct or indirect effect on adjacent habitat or populations. Two characteristics are used to define impacts to adjacent habitat.

A. ADJACENT HABITAT NOT AFFECTED: The proposed action is not anticipated to have either direct or indirect effects on adjacent desert tortoise habitat or populations.

B. ADJACENT HABITAT AFFECTED: The proposed action is anticipated to have either direct or indirect deleterious impacts on adjacent habitat or tortoise populations.

HOW COMPENSATION RATES ARE DETERMINED

The above section described the factors involved in determining a compensation rate. These factors are evaluated and documented in writing. In this evaluation, the factors are given number values reflecting the characteristic best matching each factor (Table 2). The values are added together resulting in the Compensation Rate. The Compensation Rate is multiplied against the amount of habitat to be impacted by the proposed action. As described in the next section, the result is the number of acres needed to compensate for the residual impacts of the action after on-site mitigating measures are applied.

Compensation Rates can range higher than 1 because of the differing values of lands as desert tortoise habitat. Additionally, impacts or factors

Table 2. Description of Factors Used to Compute Compensation Rates for Residual Impacts.

<u>Code</u>	<u>Factor</u>	<u>Value</u>
C	Category of habitat:	
	a) The lands are in Category III desert tortoise habitat	*
	b) The lands are in Category II desert tortoise habitat	2
	c) The lands are in Category I desert tortoise habitat	3
T	Term of effect:	
	a) The effects of the proposed action are expected to be short term (<10 years)	0
	b) The effects of the proposed action are expected to be long term (> 10 years)	1
E	Existing disturbance on site:	
	a) There is moderate to heavy existing habitat disturbance	0
	b) There is little or no existing habitat disturbance	1
G	Growth inducing effects:	
	a) The proposed action will have no growth inducing effects	0
	b) The proposed action will have growth inducing effects	0.5
A	Adjacent habitat impacts:	
	a) Adjacent habitat will not be affected	0
	b) Adjacent habitat will receive direct or indirect deleterious impacts	0.5

Compensation Rate = C + T + E + G + A

Range of Rates: Category I: 3 - 6
Category II: 2 - 5
Category III: 1

* Category III habitats receive a Compensation Rate of 1 only (see discussion in text).

described above (other than Category) reflect impacts that affect the surrounding habitat or population to a greater degree than just direct loss of a certain amount of acreage. It must be recognized that with any action requiring compensation, there is a net loss of habitat usable by the desert tortoise, and there may be no way to completely regain this habitat. Compensation allows for more habitat to be placed under active management or protection for the tortoise, however. Where compensation through habitat acquisition is not a viable or reasonable alternative, there are improvements to habitat or tortoise populations that can be made on managed areas. Experience with other species has shown that efforts to improve managed habitat to the extent that they replace individuals lost to an action can take 5 times or more effort (with deer, for example) to effectively compensate for the original loss, hence the need for compensation rates to vary above 1.

The Compensation Rates for Category I habitats (ranging from 3 to 6) and Category II habitats (ranging from 2 to 5) were established as ranges in recognition of the importance of the various factors. Thus, the Compensation Rate for the worst situation in Category II would be higher than the best situation in Category I, factors of 5 and 3, respectively. The high ranges in Category I reflect the extreme importance of Category I habitats to the perpetuation of the species. The moderate ranges in Category II also reflect the greater importance of Category I habitats. The low value in Category III habitats recognizes that they are not as valuable for the perpetuation of the species; but it also recognizes that, in fact, habitat as well as tortoises are being lost and those lost resources must be off-set. Actions in Category III habitats are given a Compensation Rate of one regardless of other factors, as BLM's Rangewide Plan identified a lesser degree of protection to these habitats.

Examples using this standard process are found in Appendix 1.

DETERMINING COMPENSATION AMOUNTS

Compensation Rates can be used two ways: 1) to determine the amount of needed replacement habitat in terms of land, or 2) to determine funding amounts to compensate for other tortoise resource needs. The assumption is that acquisition of habitat with appropriate management prescriptions beneficial to the desert tortoise, would result in overall improved habitat conditions. Habitat acquisition need not be the sole use of compensation, as there are other actions that can be taken to benefit the tortoise. The compensation amount is calculated differently for each of the two basic uses. Once the basic use is determined, the compensation amounts are determined as follows. Note that when compensation is required by both Federal and State agencies, a single compensation amount will be assessed as mutually agreed upon by the applicable agencies, and only applies to the desert tortoise. Possible compensation requirements for other species are not covered in the scope of this report.

DETERMINING COMPENSATION AMOUNT FOR HABITAT ACQUISITION

Acquired habitat must be of equal or greater value as tortoise habitat than that being lost, or must meet other recovery objectives for the tortoise. Habitat acquisition is to be in fee title (both surface and subsurface estate).

If compensation is to be used to acquire tortoise habitat and if the project proponent is to purchase the habitat and transfer it to a conservation agency, then the compensation amount (number of acres) will be, at a minimum, the number of acres affected multiplied by the compensation rate. For example, if the project will affect 40 acres and the compensation rate is 3, then the project proponent will be required to purchase 120 acres of habitat at a location determined (either generally or specifically) by the cooperating agencies.

If compensation is to be used to acquire habitat and if the action proponent is to provide compensation funds to an agency to purchase the habitat, then the compensation amount (number of dollars) will be the number of acres affected by the project multiplied by the estimated land value of the habitat to be acquired multiplied by the computed compensation rate, with that amount then added to the direct costs expected to be incurred by the agency in purchasing the land (such as appraisals, personnel time, title search, and deed recordation). The estimated land value of the habitat to be acquired will be determined using normal realty procedures.

DETERMINING COMPENSATION AMOUNTS FOR PURPOSES OTHER THAN ACQUISITION

If compensation is required for purposes other than habitat acquisition and if the project proponent is to provide compensation funding to an agency for these purposes, then the compensation amount (number of dollars) will be derived as follows: The number of acres affected by the project will be multiplied by the estimated land value of the habitat within the geographic unit nearest the project multiplied by the Compensation Rate. The estimated land value of the nearest geographic unit will be determined as described above.

COMPENSATION FUND ACCOUNTS

When it is determined that compensation requirements will be met through provision of funds (rather than land) from a project proponent, care must be taken as to where the funds will be deposited. Three basic options exist: deposition into special escrow accounts the project applicant and BLM (or other conservation agency), deposition into escrow accounts in the name of a third party (local government or conservation group) and BLM (or other conservation agency), or deposition into the BLM's 7100 -- Land and Resource

Management Trust Fund Account.

Individual accounts can be established for individual projects, or master accounts can be established where compensation funds resulting from many actions can be deposited cumulatively for implementing a variety of management activities beneficial to the tortoise.

Establishing accounts and determining use of the compensation funds are normally described in Biological Opinions and should be mutually agreed upon by BLM, the FWS, and the State wildlife agency (when appropriate) during the consultation process.

COMPENSATION IN SPECIAL SITUATIONS

Although all BLM offices that manage tortoise habitat will normally use the standard compensation process as described above, there will be instances when it need not be used. Deviation from the standard may be appropriate:

1. When unusual circumstances -- such as the size of project area or a cooperative relationship with a local government -- warrant determination of compensation amounts through some other means. Examples of unusual circumstances include the proposed Fort Irwin expansion (potential transfer of 250,000 acres) and the Las Vegas Valley land developments (development of land within an exploding metropolitan area); or
2. When a tortoise management plan (such as a Habitat Management Plan, Recovery Plan, or a Habitat Conservation Plan) has been prepared for an area and the plan includes a determination of compensation amounts through some means other than the standard process. An example of an appropriate alternative approach is a compensation amount derived from the total expected implementation costs of the plan prorated against the total acres of habitat expected to be lost. This process may also include an endowment for operation and maintenance of the management area for the desert tortoise.

Under these circumstances when the standard process will not be used, the compensation amount must be determined cooperatively between BLM, FWS, and the State wildlife agency, if applicable, through informal consultation.

USES OF COMPENSATION

Compensation funds will be used for management actions expected to provide a benefit to the desert tortoise over time. Actions may involve habitat acquisition, population or habitat enhancement, increasing knowledge of the species' biological requirements, reducing loss of individual animals, documenting the species' current status and trend, and preserving distinct

population attributes.

Although securing tortoise habitat is ultimately the cornerstone of any long-term management program, all the major category of actions listed below have significant merit and therefore should be a part of any long-term management effort:

- Habitat Acquisition
- Habitat Enhancement
- Population Enhancement
- Education
- Research, Studies, and Monitoring

The above actions are not all inclusive, but lay a foundation for the effective use of compensation funding. Each desert tortoise habitat area has management issues, concerns, and strategies specific to its situation that should enter into the decision-making process when determining how to use compensation funds. Each agency should have the flexibility to use compensation funds according to the particular priority needs of specific habitat areas so long as those actions chosen are consistent within the broad framework described below.

HABITAT ACQUISITION

Replacing lost resources through habitat acquisition is the most obvious and direct means of compensation because it results in replacing lost habitat under management. Under this strategy, the recovery of the species could be assisted if the gain in habitat more than offsets the loss of habitat under management. This would be most evident if the tortoise habitat lost is of lesser quality than that gained, and improved management on the gained habitat can improve habitat conditions and increase tortoise populations. Habitat acquisition can be accomplished through purchase by an action proponent or management agency, exchange, donation, or easement. Habitat to be acquired should be identified in a land use plan, habitat conservation plan, or meet recovery objectives.

In acquiring land, a variety of factors must be considered, including:

1. Land acquisition will result in additional habitat requiring management. The management may require higher intensity to facilitate recovery of tortoise populations. In order to accommodate these increases, endowment fees for operations and maintenance activities may need to accompany land acquisitions.
2. Land uses that will or may conflict with tortoise habitat management must be evaluated. Land uses may need to be changed to meet tortoise management objectives.

3. Land proposed for acquisition must meet the objectives of protecting habitat and of recovering or improving the status of the desert tortoise.

When habitat is acquired with, or dedicated in lieu of, compensation funds, there must be assurances that the requirements of the endangered species acts (both Federal and State) are met and that such acquired or dedicated habitat is managed for the tortoise. Potential conflicting uses will be determined prior to acquisition of land for off-site mitigation. Such conflicts will be reduced to acceptable levels for the desert tortoise, or eliminated on the compensation lands pursuant to case-by-case or office-by-office agreements among BLM, FWS and appropriate State agencies or pursuant to an approved management plan. On all compensation lands, the purpose for which the land was acquired and managed must be considered the dominant use. It is not intended that "islands" of acquired or dedicated habitat be created having management inconsistent with surrounding public lands. An interim management strategy would be developed among applicable agencies for such lands lying within existing BLM management units in which potentially conflicting uses exist.

HABITAT ENHANCEMENT

Habitat enhancement includes a broad spectrum of potential actions ranging from rehabilitation of degraded habitats to restricting uses that may have detrimental effects on habitat quality. Indirect actions such as increased law enforcement within particular tortoise habitat areas may sometimes be a habitat enhancement action if the increased law enforcement stops or reduces unauthorized activities detrimental to tortoise habitat quality or tortoise populations. The most obvious habitat enhancement actions include re-vegetation of disturbed areas, closure and rehabilitation of travel routes, reclamation of mining disturbances, signing of special management areas, roadway fencing, and changing management prescriptions.

POPULATION ENHANCEMENT

Like habitat enhancement, population enhancement also covers a broad spectrum of actions. Population enhancement can be directly affected by habitat enhancement actions. However, population enhancement can extend beyond the direct habitat/population relationships and include any activity that will ultimately have a positive effect on tortoise populations. This may include predator control programs where the goal is to reduce mortality, particularly of juvenile tortoises. Ultimately, captive breeding and relocation programs identified under a recovery plan or other tortoise management plan may also have a positive benefit to tortoise populations and consequently are appropriate activities for compensation funding.

PUBLIC INFORMATION AND EDUCATION

Developing and implementing education programs have a less direct but important effect benefiting the desert tortoise. Education programs can be geared toward specific target audiences such as school-aged children, community leaders, special interest groups, or the community at large. An education program may be purely informational or instructional in nature and may include the development of facilities, materials, programs, (i.e. kiosks, interpretive actions, videos, pamphlets, brochures, slide shows, displays, etc.). An education may include other activities associated with increasing the public's knowledge and understanding of the desert tortoise and its environment, of legal and policy issues and requirements, and of overall management of the tortoise. An enlightened public will ultimately result in reduced unintentional or intentional "take" (see definition in Federal Endangered Species Act) and habitat degradation.

RESEARCH, STUDIES, AND MONITORING

Research, studies, and monitoring are important components of any program for the recovery of a species. Research enhances our basic knowledge of tortoise biology and increases our understanding of inter-relationships between population viability and applied management of tortoise populations and their habitats. The MOG's Technical Advisory Committee has identified a host of research topics that will eventually provide answers benefiting tortoise management. Research concerning Upper Respiratory Tract Disease (URTD) and other diseases that affect desert tortoise populations are compatible with the long-term objectives of managing for viable tortoise populations and are therefore legitimate uses of compensation funds. Physiological, anatomical, and behavioral studies also have legitimate uses in understanding how best to meet the needs of the desert tortoise. Research implemented to evaluate the compatibility of other multiple uses with desert tortoise management are also important. In short, almost any research that increases our knowledge of desert tortoise biology or the affect of human activities on the desert tortoise qualifies for compensation funding.

Monitoring is essential to determine the success of management prescriptions or other pro-active tortoise efforts implemented to benefit the desert tortoise. Once many of the other compensation uses mentioned above have been implemented in an area, monitoring desert tortoise trends is another related activity that off-site compensation could benefit. Monitoring may include short and long-term studies that are used to evaluate current conditions or trends as it relates to the desert tortoise and its habitat. These studies may include monitoring vegetation, tortoise populations, predator populations, various multiple uses within key tortoise habitat areas, and other related attributes or activities.

It is incumbent upon managing agencies to use compensation lands or funds for their highest value toward desert tortoise recovery or improvement.

APPENDIX 1

EXAMPLES OF STANDARD COMPENSATION PROCESS

EXAMPLE 1.

A major gas pipeline alternative would be routed through 3 miles of Category II habitat and 4 miles of Category III habitat. The Category II habitat is relatively undisturbed, while the Category III habitat is not. A nearby Category II area contains some inholdings of private land identified for acquisition.

The area within the right-of-way that would be disturbed after other mitigation is 18 acres in Category II and 24 acres in Category III.

For Category II habitat:

Category is II, $C = 2$

Term of effect is long-term, $T = 1$

Existing disturbance is nonexistent, $E = 1$

Growth inducement is negligible, $G = 0$

Adjacent lands are not affected, $A = 0$

Compensation Rate = $C+T+E+G+A = 2+1+1+0+0 = 4$

$4 \times 18 \text{ acres} = 72 \text{ acres}$

For Category III habitat:

Category is III, Compensation Rate is 1

$1 \times 24 \text{ acres} = 24 \text{ acres}$

Total compensation amount is 72 acres + 24 acres = 96 acres to be acquired

BLM would require acquisition of 96 acres in adjacent Category II desert tortoise habitat identified for acquisition to compensate for the residual effects of this action above and beyond other on-site mitigating measures.

EXAMPLE 2.

A landfill is proposed in an area of Category III habitat immediately adjacent to Category II habitat, rather than an area of Category I habitat which was originally the preferred site. The 100 acre landfill would be fenced to exclude tortoises, and other mitigation measures have been defined. However, desert tortoise predators such as common ravens and coyotes would be attracted to the landfill and their use of the area would increase, despite mitigation such as constant coverage of refuse. Refuse is expected to remain accessible to these scavenging animals. Illegal dumping when the landfill is closed is anticipated along the new access road that would run through 1/2 mile of Category III habitat. The area has experienced significant off-highway vehicle use.

There is no habitat in need of acquisition identified within a reasonable distance. Other improvements to desert tortoise habitat requiring funding have been identified.

The landfill is in Category is III, but since the project is affecting adjacent Category II habitat, it is treated as Category II. $C = \underline{2}$
Term of effect is long-term, $T = \underline{1}$
Existing disturbance on site is substantial, $E = \underline{0}$
Growth inducement to adjacent areas is nonexistent, $G = \underline{0}$
Adjacent lands will be affected, $A = \underline{0.5}$

Compensation Rate = $2 + 1 + 0 + 0 + 0.5 = 3.5$

Landfill is 100 acres. Road and adjacent illegal dumping is 1/2 mile X 200 feet wide, or 12 acres.

$3.5 \times 112 \text{ acres} = 352 \text{ acres of compensation}$

Land values identified in adjacent Category II habitat has been identified at \$200/acre. 352 acres worth of compensation X \$200/acre = \$70,400 in compensation funds would be required to improve off-site habitat.

EXAMPLE 3.

A mining plan of operation is submitted in an area of Category I habitat. There is no alternative to using this site. The proposal is for an open-pit gold operation covering 25 acres, 5 acres of which was already lost to previous activity. Living quarters would be on-site. A two-mile road would be upgraded into the site running through Category I habitat. Several mitigating measures would be instituted, but, 20 acres of habitat would still be lost, and an additional 20 foot width of disturbance along the two-mile road would occur. Active life of the mine is estimated at 15 years. The habitat is pristine. There will be open water on site. Despite stipulations that state no pets or other potential non-native predators will be allowed on the site, native predators are expected to increase in the vicinity because of the water and refuse, even though contained. There is no other Category I habitat nearby requiring acquisition, but several improvement measures requiring funding have been identified through a management plan.

Category is I, C = 3

Term of effect is long, T = 1

Existing disturbance on site is substantially lacking, E = 1

Growth inducement is nonexistent, G = 0

Adjacent lands are affected, A = 0.5

Compensation Rate = $3 + 1 + 1 + 0 + 0.5 = 5.5$

20 acres of mine and 5 acres of road would be lost to the tortoise

$5.5 \times 25 \text{ acres} = 137.5 \text{ acres}$ of compensation are needed to mitigate for the residual impacts of the action.

Nearby Category I lands would have an estimated land value of \$150/acre.
 $137.5 \text{ acres} \times \$150/\text{acre} = \$20,625$ in compensation funds would be required to improve off-site habitat.