STATE OF CALIFORNIA

Energy Resources Conservation and Development Commission

In the Matter of: APPLICATION FOR CERTIFICATION FOR THE IVANPAH SOLAR ELECTRIC GENERATING SYSTEM	DOCKET NO. 07-AFC-5

REBUTTAL TESTIMONY OF INTERVENOR WESTERN WATERSHEDS PROJECT

January 5, 2010

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Intervenor Western Watersheds Project provides the following rebuttal testimony and updated list of exhibits pursuant to the *Revised* Notice of Prehearing Conferences and Evidentiary Hearing.

This rebuttal testimony was prepared by Michael J. Connor (Connor Declaration attached). His statement of qualifications was provided with Western Watersheds Project's *Opening Testimony for Topics to be Heard in January, 2010* submitted December 14, 2009. Western Watersheds Project herein incorporates its Opening Testimony into this Rebuttal Testimony since it also addresses many of the issues raised by the Applicant in their Testimony.

1. REBUTTAL STATEMENT

The record shows that the proposed project would eliminate a broad expanse of relatively undisturbed Mojave Desert habitat and would significantly affect many sensitive plant and wildlife species. In addition to direct loss of habitat on these public lands, the Project would fragment and degrade adjacent habitat, which is also relatively undisturbed. FSA/DEIS at 6.2-1.

California's Northeastern Mojave desert tortoise population will suffer massive direct, indirect, and cumulative impacts from the proposed project. The cumulative effects of this project in conjunction with other proposed projects threaten the integrity of the entire North Ivanpah Valley unit. These concerns have not been addressed in the FSA/DEIS nor in the Applicant's Testimony. Indeed, the Applicant in its testimony continues to downplay both the significance of the desert tortoise population that would be impacted by the proposed project and the significance of the habitat that would be lost. The Applicant makes repeated assertions and unwarranted claims in its testimony to the effect that the affected habitat is of "the lowest quality" and even that the ISEGS project is not

within protected habitat. The Applicant further asserts in its testimony that it has no need to mitigate for streambed alteration impacts.

The following facts address these claims and assertions. Quotations from the unpaginated Applicant's Testimony are taken from pages 38-60 of the pdf file of the applicant's Testimony and cited herein as pages of the "pdf".

A. The applicant continues to confuse BLM desert tortoise habitat management categories with quality of habitat - for example "In the Final EIS for the NEMO, the BLM has designated the Ivanpah site the lowest habitat value as Category III." [pdf at 42] In the NEMO planning area, the designation Category III does not mean that the habitat is degraded or that it contains low tortoise densities, it simply means it is not currently within a designated DWMA.

B. The assertion that "The location of the proposed Ivanpah SEGS project is not within protected habitat for the desert tortoise" [pdf at 41] is simply untrue. The BLM manages all categorized desert tortoise habitat to protect desert tortoise. BLM manages Category III habitat to limit tortoise habitat and population declines.

C. The North Ivanpah Valley Unit was classed as Category I desert tortoise habitat by the BLM in 1988 and managed as such until the signing of the ROD for the NEMO Plan Amendment in December 2002. The change in designation had no effect on the habitat *per se*. It remains good quality desert tortoise habitat.

D. The USFWS 1994 *Desert Tortoise (Mojave Population) Recovery Plan* included the North Ivanpah Valley within the proposed Ivanpah DWMA. Exhibit 503.

E. The NEMO Desert Tortoise Biological Team, which included a representative of CDFG, recommended consideration of the North Ivanpah Unit by the BLM for desert tortoise conservation in the NEMO Planning Area. NEMO Plan at A3.

F. The 2002 EIS for the NEMO Plan recognized the value of the North Ivanpah Valley for desert tortoise. It considered an alternative (Alternative 2 "Desert Tortoise Recovery") that included designating the North Ivanpah Unit as an Area of Critical Environmental Concern (ACEC) and part of the Ivanpah DWMA. However, the NEMO Plan's preferred and adopted alternative focused on the Eastern Mojave Recovery Unit to the detriment of the Northeastern Mojave Recovery Unit in California – "The preferred alternative is to propose that USFWS modify recovery unit boundaries so that all of NEMO is part of the Eastern Mojave Recovery Unit. Currently a portion of the planning area is in the Northern and Eastern Mojave Recovery Unit, but it forms a cohesive unit with the rest of the Eastern Mojave Desert tortoise habitat. Strategies for the Northern and Eastern Mojave Recovery Unit are focused firstly in areas northeast of Las Vegas, and secondarily, in an area north of Nipton Road in an area of Nevada that is not adjacent to the state line." NEMO Plan at 1-3.

G. The NEMO Plan did not address California State interests in the Northeastern Mojave desert tortoise population. The NEMO Plan does not even list CDFG as one of the agencies consulted. See NEMO Plan Chapter 7. Like the FSA/EIS, the NEMO Plan failed to address impacts to California's population of Northeastern Mojave desert tortoises.

H. The Applicant argues that critical habitat is "one primary tool for protection" and that because the North Ivanpah Valley was not designated as critical habitat it is not critical to the survival of the species [pdf at 41]. I agree that critical habitat is important for species recovery. Unfortunately, the USFWS, the agency that designates critical habitat, does not share this position,

> [T]he critical habitat designation usually affords little extra protection to most species, and in some cases it can result in harm to the species. This harm may be due to negative public sentiment to the designation, to inaccuracies in the initial area designated, and to the fact that there is often a misconception among other Federal agencies that if an area is outside of the designated critical habitat area, then it is of no value to the species. USFWS July 2009 Critical Habitat What is it? 2pp.[1]

I. The Applicant argues in its testimony that,

> *For areas like the Ivanpah site that are located outside of Areas of Critical Environmental Concern and outside "critical habitat" for endangered species, the BLM's Final EIS for the NEMO calls for a 1:1 mitigation ratio, indicating the lowest quality habitat: Compensation shall be required by BLM for disturbances of desert tortoise habitat at the rate of 1 acre for each acre disturbed*; this is the same as the current requirement in BLM's Desert Tortoise Statewide Management Policy. Funds collected from project proponents shall be directed to habitat enhancement, rehabilitation or acquisition in the Eastern Mojave Recovery Unit. Proponents may also implement enhancement or rehabilitation projects or donate lands directly, at BLM discretion. (BLM Final EIS for NEMO, p. A-18, emphasis added.)

In making these statements, the Applicant again confuses management categories with habitat quality, and utterly ignores the magnitude of the impacts of the proposed project. The NEMO Plan's mitigation for Category III habitat applies to projects of less than 100 acres. NEMO at 2.27. The proposed project is <u>over forty times the maximum acreage for projects covered under the NEMO Plan</u>.

J. The Applicant states, "At the time of its inception, the Ivanpah DWMA (located south of I-15) was determined to contain between 5 and 250 tortoises per square mile." [pdf at 41]. The "Ivanpah DWMA (located south of I-15)" was established by the BLM in December 2002 in its Record of Decision for NEMO. That decision established a single,

[1] Available at: http://www.fws.gov/endangered/factsheets/critical_habitat.pdf

small 37,280 acre DWMA on public lands managed by the BLM in the Northeastern Mojave Recovery Unit. The NEMO Plan did not determine the tortoise abundance in the DWMA at the time of designation. The Applicant appears to be relying on the 1994 Recovery Plan description of its proposed DWMA which includes habitat on the Mojave National Preserve south of the BLM's DWMA and the North Ivanpah Valley.

K. The project site supports a breeding population of Northeastern Mojave desert tortoises. This desert tortoise ESU occurs in only a small area of California and the North Ivanpah Valley accounts for about a quarter of the entire range of the ESU in California. The applicant claims that "The Ivanpah SEGS site is not located within critical wild lands nor is it located within one of the last habitats of any endangered species." [pdf at 41] While I am not sure what is meant by the terms "critical wild lands" or "last habitats", it is clear that the proposed ISEGS project site would have significant impacts on the limited habitat for the Northeastern Mojave desert tortoise ESU within California. Since the Northeastern Mojave population is the most genetically distinct desert tortoise population in California, protection of these tortoises may well be critical to the survival of the entire species in California.

L. The Applicant states, "Only twenty-five (25) live Desert Tortoises were encountered on the 4,062 acre Ivanpah Solar Project Site during the 2007 and 2008 USFWS protocol tortoise surveys. USFWS recommends a maximum Desert Tortoise density of 39 Desert Tortoise per Square Kilometer. (USFWS 2008b.) The Ivanpah Solar Project site is approximately 16.45 Square Kilometers. Based on USFWS's recommended maximum density, the Ivanpah site could support six hundred fifty-one (651) Desert Tortoise, not twenty-five (25). This is twenty-six times the number of Desert Tortoises actually found during on-the-ground surveys of the Project site." [pdf at 41] The Applicant does not cite USFWS 2008b in the references but this appears to be the same reference I addressed in comments on the original proposed translocation plan and relates to estimated carrying capacities of habitat in the West Mojave Recovery Unit and not in the Northeastern Mojave Recovery Unit. If so, I doubt that the calculated number of 651 tortoises is applicable. The Applicant should provide estimates of the actual tortoise abundance on the site and in the area. The only estimates of abundance at the proposed project site that I have seen were those presented in the Supplemental Data Response, Set 2I at 9 which I addressed in my Testimony - however, it should be noted that those calculations were based on 18 not 25 tortoises having been found on the site.

M. The proposed project would destroy 4,000 acres of public land. The Applicant seeks relief from some of the proposed mitigations on the grounds that it has to provide a restoration bond to the BLM and that some of the project site such as the proposed plant nursery will not be cleared of all vegetation. The Applicant seems to be confusing the expected life span of the project and its obligations to clean up the project site with the requirement for compensation lands acquired as mitigation for impacts to listed species to be protected in perpetuity to meet the fully mitigated standard of CESA.

O. The primary mitigation for impacts to desert tortoise should be acquisition of replacement habitat in keeping with the intent of the California legislature expressed in

CESA. Other proposed mitigations for impacts to the Northeastern Mojave desert tortoise population in California's Ivanpah Valley include erecting tortoise barrier fencing along major roads. Fencing reduces tortoise loss, reduces road kill (and thus foraging opportunities for ravens), and effectively increases habitat available for use by tortoises. Based on my visits to the area, the busy Ivanpah Road should be added to list of roads to be fenced.

N. The FSA/DEIS and Applicant's testimony completely ignores the alternative of locating the project on Ivanpah Dry Lake bed as suggested by the Sierra Club in its June 22, 2009 letter and commented on by CDFG in its October 27, 2009 letter. In my opinion this alternative would have minimized biological concerns and would have reduced many of the Applicant's concerns over the restoration bond and other issues.

O. I have experience in working with developers to fulfill the compensation requirements under streambed alteration agreements and am very concerned that the Applicant is proposing deleting Condition of Certification BIO-20. Desert washes, drainage systems, and washlets are very important habitats for plants and animals in arid lands. Water concentrates in such places, creating greater cover and diversity of shrubs, bunch grasses, and annual grasses and forbs. The topography is often more varied, as are soil types and rock types and sizes, creating diverse sites for burrows, caves, and other shelters. The resulting "habitats" tend to attract more birds, mammals, reptiles, and invertebrates. Desert tortoises, for example, spend disproportionately much more time in wash habitat than they do in "flat" areas.[2] The wash habitat impacted by each alternative should be evaluated and full mitigations proposed for these streambed alterations.

2. UPDATED LIST OF EXHIBITS

Exhibit Number	Author and Title
500	Letter submitted March 4, 2009 by Western Watersheds Project to John Kessler, Project Manager, California Energy Commission Re: Ivanpah Solar Electric Generating System (ISEGS) (07-AFC-5) Preliminary Staff Assessment.
501	Letter submitted May 13, 2009 by Western Watersheds Project RE: Draft Desert Tortoise Translocation/Relocation Plan for the Ivanpah Solar Electric Generating System March 2009.
502	Berry, K. H., Morafka, D. J. and Murphy, R. W. 2002. Defining the desert tortoise(s): our first priority for a coherent conservation strategy. Chelonian Conservation and Biology 4: 249-262.
503	U.S. Fish and Wildlife Service. 1994. Figure 9 from: Desert Tortoise (Mojave Population) Recovery Plan. USFWS, Portland, Oregon.
504	U.S. Fish and Wildlife Service. 2009. Range-wide Monitoring of the Mojave

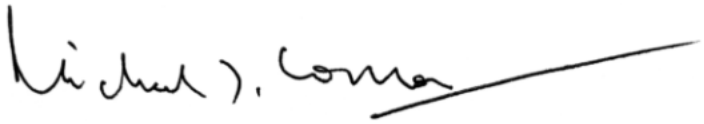
[2] Jennings, B.J. 1997. Habitat Use and Food Preferences of the Desert Tortoise, *Gopherus agassizii*, in the Western Mojave Desert and Impacts of Off-Road Vehicles. Proceedings: Conservation, Restoration, and Management of Tortoises and turtles—An International Conference, pp. 42–45. New York Turtle and Tortoise Society. WWP Exhibit 515.

Population of the Desert Tortoise: 2007 Annual Report. Report by the Desert Tortoise Recovery Office, USFWS, Reno, Nevada.
505 Lamb, T. 1986. Genetic variation in mitochondrial DNA of the Desert Tortoise, *Gopherus agassizii*, in California. Proc. Desert Tortoise Council Symp. 1986: 45-52.
506 Lamb, T., Avise, J. C. and Gibbons, J. W. 1989. Phylogeographic patterns in mitochondrial DNA of the desert tortoise (*Xerobates agassizi*), and evolutionary relationships among the North American gopher tortoises. Evolution. 43(1): 76-87.
507 Murphy, R. W., Berry, K. H., Edwards, T. and Mcluckie, A. M. 2007. A Genetic Assessment of the Recovery Units for the Mojave Population of the Desert Tortoise, *Gopherus agassizii*. Chelonian Conservation and Biology 6(2): 229–251.
508 CNDDB 2009. Report for Desert Tortoise Occurrence 2. California Natural Diversity Database, California Department of Fish and Game.
509 CNDDB 2009a. Map showing the polygon for Desert Tortoise Occurrence 2. California overlaid on a topographic base-map from the Natural Diversity Database, California Department of Fish and Game.
510 Britten, H. B., Riddle, B. R., Brussard, P. F., Marlow, R. and Lee, Jr., T. E. 1997. Genetic delineation of management units for the desert tortoise, *Gopherus agassizii*, in the northeastern Mojave Desert. Copeia 1997: 523-30.
511 Berry et al., 1984. Plate 6-13 "Desert Tortoise Crucial Habitat in California Ivanpah Valley" from Berry, K. H. (1984) The Status of the Desert Tortoise (*Gopherus agassizii*) in the United States. US Fish and Wildlife Services on Purchase Order No. 11210-0083-81, Page 6-30.
512 Spang, E.F., Lamb, G. W., Rowley, F., Radtkey, W. H., Olendorff, R. R., Dahlem, E. A. and Sloane, S. 1988. Desert Tortoise Habitat Management on the Public Lands: a Rangewide Plan. USDI Bureau of Land Management, November 1988. 23 pp.
513 Oftedal, O. T. and Allen, M. E. 1996. Nutrition as a Major Facet of Reptile Conservation. Zoo Biology 15: 491 - 497.
514 Letter submitted December 18, 2009 by the Desert Tortoise Council to John Kessler, Project Manager, California Energy Commission, Re: Ivanpah Solar Electric Generating System (07-AFC-5). 4 pp.
515 Jennings, B.J. 1997. Habitat Use and Food Preferences of the Desert Tortoise, *Gopherus agassizii*, in the Western Mojave Desert and Impacts of Off-Road Vehicles. Proceedings: Conservation, Restoration, and Management of Tortoises and turtles—An International Conference, pp. 42–45. New York Turtle and Tortoise Society.

ATTACHMENTS: Declaration of Michael J. Connor
Certificate of Service
WWP Exhibit 515

Dated: January 5, 2010

Respectfully submitted,



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IVANPAH SOLAR ELECTRIC GENERATING SYSTEM (ISEGS)
(Docket 07-AFC-5)

INTERVENOR WESTERN WATERSHEDS PROJECT
Declaration of Michael J. Connor
Rebuttal Regarding Impacts to Desert Tortoise

I, Michael J. Connor, declare as follows:

1) I am the California Director for Western Watersheds Project. I have worked for Western Watersheds Project since spring 2007.
2) My relevant professional qualifications and experience are set forth in the *curriculum vitae* and the testimony that were submitted on December 18, 2009 and are incorporated herein by reference.
3) I prepared the rebuttal testimony attached hereto and incorporated herein by reference, relating to the impacts of the Project on desert tortoise.
4) I prepared the rebuttal testimony attached hereto and incorporated herein by reference relating to the proposed Project in the Ivanpah Valley in San Bernardino County.
5) It is my professional opinion that the attached rebuttal testimony is true and accurate with respect to the issues that they address.
6) I am personally familiar with the facts and conclusions described within the attached testimony and if called as a witness, I could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 01/05/10

Signed: Michael J Connor

At: Reseda, California

Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles—An International Conference, pp. 42–45

Habitat Use and Food Preferences of the Desert Tortoise, *Gopherus agassizii*, in the Western Mojave Desert and Impacts of Off-Road Vehicles

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ABSTRACT: **The desert tortoise, *Gopherus agassizii*, and its habitats in the western Mojave Desert and elsewhere are negatively affected by off-road vehicles (ORVs). Data from a study conducted at the Desert Tortoise Research Natural Area during 1992 provide insights into why ORVs are likely to affect tortoises. To determine habitat use and food preferences, 18 large immature and adult tortoises were observed. The study site contained four subhabitats or strata: washes (comprising 7.9% of the area), washlets (2.4%), hills (42.3%), and flats (47.4%). The tortoises used the four habitat strata differentially, spending significantly more time (92%) in washes, washlets, and hills throughout spring than in the flats (8%). They were observed to take bites from 2,423 individual plants of at least 43 plant species (37 annual, 6 perennial). They showed preferences for native plants (95.3% of bites) compared to non-native plants. Some of the ten most-preferred food plants were uncommon to rare in the environment. Three of the ten most-preferred food plants occurred largely in the wash strata, and an additional four species were found only in hill strata. Users of recreational vehicles also prefer washes and hills in this region, where they are more likely to encounter tortoises, increasing the possibility of direct mortality, and where they are more likely to have a greater impact upon preferred forage and habitats.**

Recreational use of off-road vehicles (ORVs), popular since the late 1960s in the southwestern deserts of the United States, poses significant threats to desert tortoises in some parts of their geographic range (U. S. Fish and Wildlife Service [USFWS], 1994). The threats are both direct and indirect: direct encounters, damage to and loss of habitat, damage to or loss of burrows, and loss or changes in both the composition of the forage and the quality of shrub cover. In this paper, I report findings from research conducted in the western Mojave Desert in and adjacent to the Desert Tortoise Research Natural Area (Jennings, 1993), specifically, desert tortoise use of different habitat types, their preferred forage plants, and the possible impacts of ORVs on these two critical aspects of desert tortoise ecology.

METHODS

The study area was typical of the western Mojave Desert, a topographic and vegetational mosaic of subhabitats or strata that includes washes, sandy flats, low hills, and rocky slopes where the most common vegetation types are saltbush (*Atriplex* spp.) scrub and creosote bush (*Larrea tridentata*) (U. S. Bureau of Land Management and California Dept. of Fish and Game, 1988; USFWS, 1994). Specifically, the 2.6 km² study area was composed of four strata or subhabitats, each with its unique composition of perennial and ephemeral plants (Jennings, 1993). The four strata were flats (comprising 47.4% of the study area), hills (42.3%), washes (7.9%), and washlets (2.4%). Wash and washlet strata were lumped for a portion of the analyses. In the flats, the dominant species were three shrubs: goldenhead (*Acamptopappus sphaerocephalus*), burro bush (*Ambrosia dumosa*), and creosote bush. In the hills the most diverse of the strata with 11 species, five species of shrubs were dominant: burrobush, California buckwheat (*Eriogonum fasiculatum*), goldenhead, Mojave aster (*Xylorhiza tortifolia*), and creosote bush. Shrubs in wash and washlet strata were burrobush, cheesebush (*Hymenoclea salsola*), goldenhead, bladdersage (*Salazaria mexicana*), creosote bush, and Anderson thornbush (*Lycium andersonii*). Data on absolute and relative densities of plant species were collected once for the perennial shrubs using linear transects and 2 × 5 m quadrats. Similar data were collected using the same method for herbaceous perennial and ephemeral plant species on 17–20 April, 12–15 May, and 12–13 June. Details of methodology are in Jennings (1993). Scientific names of plants are taken from Hickman (1993).

To determine how the tortoises used the four habitat strata, I observed 18 large immature and adult tortoises (8 females and 10 males), which ranged from 179 to approximately 380 mm in carapace length at the midline (Jennings, 1993). Most tortoises had been fitted with radio transmitters as part of other research programs. The tortoises were tracked from the time they emerged from hibernation through the spring (1 March–30 June), and their activities, use of habitat, and forage items were recorded. Because the

ephemeral and herbaceous perennial plants on which tortoises feed have different growth, flowering, and fruiting periods during the year, I grouped the species into three phenological periods for analysis: 1 March to 30 April, 1 to 31 May, and 1 to 30 June. The use of phenological periods for data analysis also provided a better understanding of when and where tortoises were foraging, how they were using the habitats, and when the different forage plants were consumed.

RESULTS

The tortoises made differential use of the four habitat strata (Jennings, 1993). Between 1 March and 30 April, they spent a disproportionately longer time within the hill and washlet strata (84%; $\chi^2 = 1353.01$, d.f. = 2, $P = 0.0001$) and foraged on preferred food plants located exclusively in hill areas (*Mirabilis bigelovii, Astragalus didymocarpus*) and washlet margins (*A. layneae, Camissonia boothii*). During the second phenological period, the use of hill, wash, and washlet areas continued to be important (100%; $\chi^2 = 1405.8$, d.f. = 2, $P = 0.0001$). Tortoises foraged on *A. layneae* and *C. boothii* and then moved into the hills to eat the preferred *Lotus humistratus* and *Prenanthella exigua*. (Both *Lotus* and *Prenanthella* were restricted to the hills.) During the third phenological period, tortoise activity declined markedly because of heat and dry weather, and the few tortoises that remained above ground used primarily washes and washlets (68%; $\chi^2 = 753.83$, d.f. = 2, $P = 0.0001$), drawing on plants confined to those areas (*Euphorbia albomarginata* and *C. boothii*). Overall, tortoises made little use of the more common flat stratum.

The tortoises' diet and preferred foods were determined from observations of a total of 34,657 bites taken from 2,423 individual plants between 24 March and 21 June of 1992 (Jennings, 1993). Tortoises foraged from at least 43 species of plants (37 species of winter-spring annuals and 6 perennial species) as well as a dead leopard lizard (*Gambelia wislizenii*) and tortoise scat. Some important patterns emerged. These tortoises were highly selective foragers and preferred to consume native plants (33,712 bites or 95.3%) over non-native species (1,644 bites, 4.1%). The non-native species were filaree (*Erodium cicutarium*), Mediterranean grass (*Schismus arabicus, S. barbatus*), and foxtail chess (*Bromus madritensis* ssp. *rubens*), and were readily available. The tortoises also took more bites from annuals (69.2%) than from perennial plants (30.8%); with the exception of four bites from cheesebush, all bites of perennial plants were from herbaceous or suffrutescent perennial plant species. Tortoises took more bites from legumes (44%) than from any other plant family.

Some of the ten most-preferred food plants consumed during 1992 were uncommon to rare in the environment (Jennings, 1993). For example, during the first phenological period, plants of the suffrutescent perennial *M. bigelovii* constituted 29.7% of the bites taken by tortoises, yet *M. bigelovii* constituted <1% of the perennial plants in the environment and far less of the total biomass of both ephemeral and perennial plants. *A. layneae* was also an important forage plant (3.9% of bites) but was not found on plant transects. During the second phenological period the annual *L. humistratus* constituted 63.9% of bites taken, yet was not found in annual plant samples. During the third phenological period, the herbaceous perennial *Euphorbia albomarginata* constituted 57.4% of bites but did not appear on any plant transects. Overall, >25% of all the plants on which tortoises fed were in the washes and washlets, about twice the number as might be expected considering that washes and washlets comprised only 10.3% of the study area habitats. Three of the ten most-preferred plants, *E. albomarginata*, *A. layneae*, and *C. boothii*, were largely confined to washes.

DISCUSSION

Desert vertebrates and their habitats are vulnerable to and negatively affected by ORVs (Busack and Bury, 1974; Bury et al. 1977; Luckenbach, 1982; Webb and Wilshire 1983). The desert tortoise is not exempt from these effects (Berry et al., 1986). In the western Mojave Desert where the use of ORVs is prevalent, tortoise populations have undergone steep declines, compared to relatively undisturbed desert tortoise populations and in habitat in the eastern parts of their geographic range (USFWS, 1994).

Hills and washes are favored in the western Mojave Desert for use by ORV recreationists (U.S. Bureau of Land Management, 1980). Four major ORV recreation areas with hills, washes, and canyons are adjacent to the Desert Tortoise Research Natural Area (Rand Mountains) or are within 50 km (Jawbone Canyon, Dove Springs, and Spangler Hills). The users of motorcycles, trail bikes, all-terrain vehicles, and other four-wheel vehicles prefer the washes, washlets, canyon bottoms, and hilly country for riding (see Goodlett and Goodlett, 1993 for an example of trail densities in flats, hills, and wash habitats). They gradually widen trails and create more individual tracks and trails, which damages or destroys increasing amounts of habitat. The flats are used primarily for camping, as staging areas for competitive events, and as play areas.

Desert tortoises are vulnerable to negative effects from ORVs because of their habitat preferences. The tortoises in this study spent significantly more time traveling and foraging in hills, washes, and washlets than on the flats, the same areas preferred by ORV users. In other parts of the species' geographic range (the southern, eastern, and northeastern Mojave and the Sonoran deserts), washes are also important

in the ecology and behavior (Woodbury and Hardy, 1948; Burge, 1978; Baxter, 1988). The tortoises use the washes for travel, excavation of burrows or dens, and for feeding. Because tortoises spend so much more time in washes and hills, they are also more likely to suffer direct mortality from vehicles than if they used the habitat randomly.

The food preferences and forage locations of the tortoises provide additional insights. A substantial portion of the food bites taken by tortoises were from plants that were infrequent to rare in the environment and occurred in the hill, wash, and washlet strata. Four of the ten most-preferred food plants were found exclusively in the hills, and an additional three were confined largely to washes. At least 25% of the forage plants were in or on the margins of washes or washlets. Vehicles disturb the soil and terrain in washes and other areas, which results in deterioration or denudation of vegetation (Burge, 1983; Woodman, 1983; Goodlett and Goodlett, 1993). They destroy the natural margins of washes and small washlets as the trails are widened over time (Berry et al., 1986). If the preferred forage plants are damaged or destroyed, tortoises will be forced to select other less-preferred and possibly less-nutritious species.

The 18 desert tortoises preferred native to non-native or alien plant species. The Desert Tortoise Reserve Natural Area has been protected from disturbance for almost two decades, and it has a relatively lower biomass of the alien plants than do the adjacent areas outside its protective fence (Brooks, 1995), where sheep grazing and uncontrolled ORV use occur. Most native desert plant species thrive in undisturbed habitats, in contrast to the alien species, which are common in disturbed lands. Some alien species, particularly the grasses, have invaded arid habitats, are fire prone, and have increased fire regimes globally (D'Antonio and Vitousek, 1992). The alien plant/fire cycle is prevalent throughout parts of the Mojave and Great Basin deserts, and wildfires burn thousands of hectares of desert annually (D'Antonio and Vitousek, 1992; USFWS, 1994). In areas disturbed by ORVs, these alien species are likely to constitute increasingly greater portions of the floral biomass, thus increasing the threat of fires.

Recommendations to Protect Desert Tortoises and Their Habitats

1. Reduce or prohibit vehicle travel off existing roads. Disturbance to desert soils increases the potential for alien plants to invade and become established, causing significant and deleterious alterations to the flora. And, although washes and washlets constitute only a small portion of desert habitats, they have a disproportionate share of the forage plants favored by tortoises and are frequented by tortoises a significantly greater amount of the time. Therefore, vehicle travel off existing highways and established roads—particularly in desert washes and washlets—in desert tortoise Critical Habitat should be minimized and, where possible, prohibited (see USFWS, 1994).

2. Investigate food habits of neonates and juveniles. The tortoises observed in this study were large immature and adult animals. Neonates and juveniles are likely to have different forage requirements and patterns of use because of their small body sizes, limited activity areas, and inability to travel great distances. The food habits of neonate and juvenile tortoises should therefore be determined also by desert region and habitat strata.

ACKNOWLEDGMENTS

Thanks are due to Dr. Michael Klemens and Dr. Kristin Berry for inviting me to participate in this conference and to Dr. Berry and Jim Van Abbema for valuable assistance on the manuscript. The U. S. Bureau of Land Management supported research on the foraging ecology and habitat utilization of the desert tortoise under Contract No. B950-C2-0014.

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California Energy Resources Conservation and Development Commission

In the Matter of: APPLICATION FOR CERTIFICATION FOR THE IVANPAH SOLAR ELECTRIC GENERATING SYSTEM	DOCKET NO. 07-AFC-5

DECLARATION OF SERVICE

I, Michael J. Connor, declare that on January 5, 2010, I served and filed copies of the attached Rebuttal Testimony dated January 5, 2010. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/ivanpah].

The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

FOR SERVICE TO ALL OTHER PARTIES:

__X__ sent electronically to all email addresses on the Proof of Service list;
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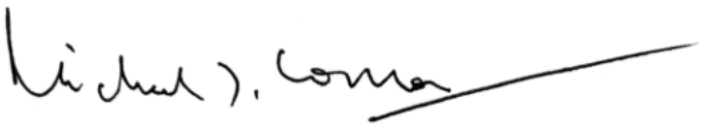
FOR FILING WITH THE ENERGY COMMISSION:

__X__ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (preferred method);

OR
_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No.
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.



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APPLICATION FOR CERTIFICATION FOR THE *IVANPAH SOLAR ELECTRIC GENERATING SYSTEM*

DOCKET NO. 07-AFC-5
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