# INFORMATION HANDOUT

**For Contract No. 08-1E8704**
**At 08-SBd-395-40.6/73.5**

**Identified by**
**Project ID 08-14000116**

## WATER AVAILABILITY

Mojave Water Agency

## DESERT TORTOISE

Desert Tortoise Protection Brochure

## BIOLOGICAL OPINION

USFWS programmatic biological opinion for desert tortoise (Gopherus agassizii) and designated critical habitat for the desert tortoise

Mojave Water Agency

# FAX TRANSMISSION

Date:

To:

From: Kurt Carlson
Director of Operations
Mojave Water Agency

Re: **Construction Water**

Contractor,

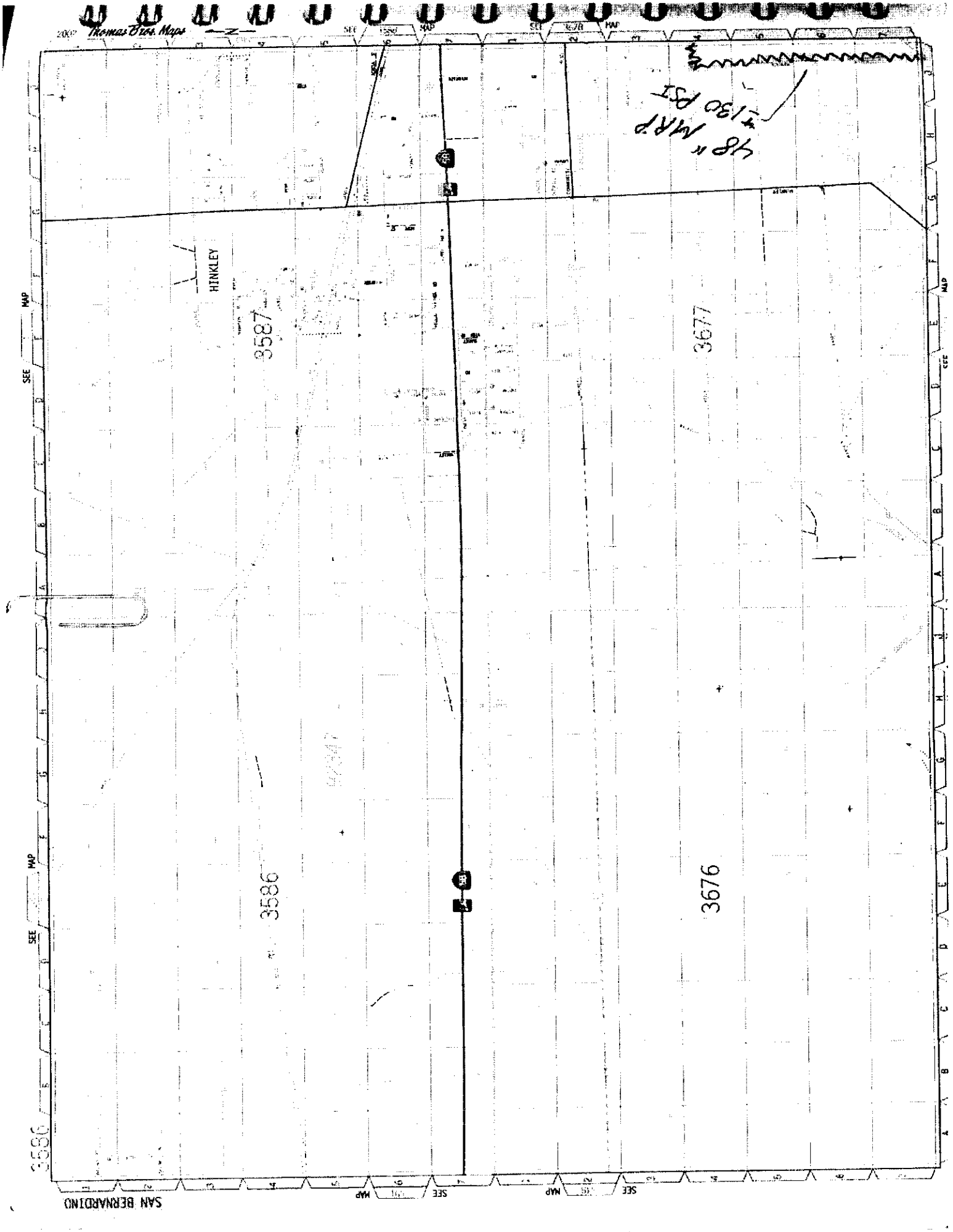
Pursuant to a Board of Director's resolution the items that you will need to do in order to purchase water are as follows:

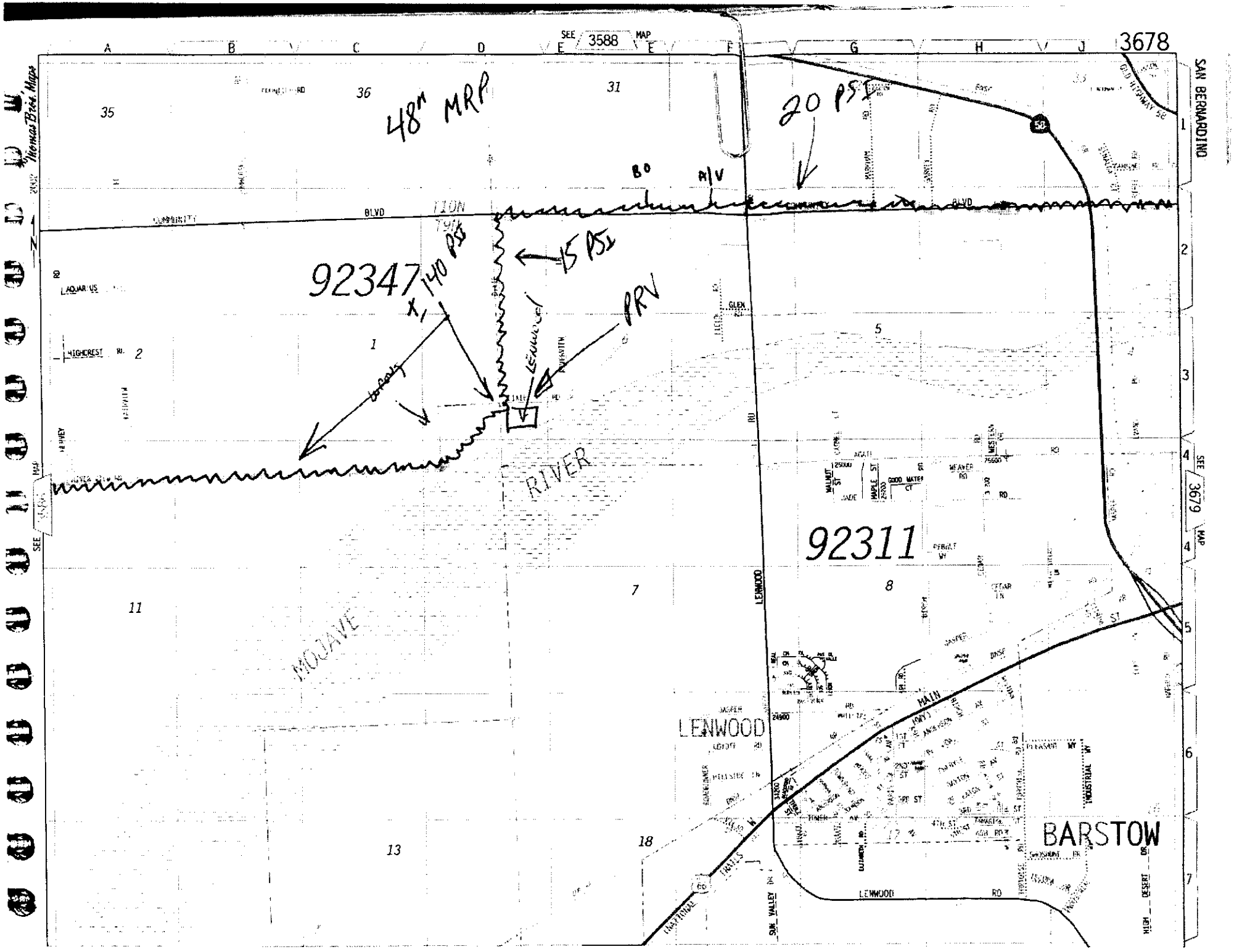
1. Submit a letter to the MWA to the attention of Kirby Brill with a request to purchase water for construction use. Please note location, duration and quantity of anticipated usage.
2. Provide proof that no local water entity has a desire or ability to supply the project with water. The agency will not deliver construction water in an area that is served by a local district.
3. Deposit with MWA a sum equivalent to the amount of water you anticipate using during construction. The price per acre foot varies with location, please contact Kathy Cortner, CFO for the price/acre foot for the location in which you will be using the water.
4. Provide a certificate of insurance with a general liability provision not less than $1,000,000 with MWA as an insured.
5. Provide a suitable water meter with an Eddy valve to connect to the blow-off. The agency valves shall not be used to regulate or control rate of flow (MWA has a 4" Jones head with 2 1/2" male hose thread)

The water from the MWA pipelines is non-potable and is interruptible. Water may not be available during drought conditions.

If you have any questions or need clarification please don't hesitate to give me call at 760-946-7035.

Kurt Carlson


Thomas Bros. Maps
HINKLEY
3587
3586
3677
3676
SEE MAP
SAN BERNARDINO



3678
SEE 3588 MAP
SAN BERNARDINO
48" MRP
20 PSI
BO
A/V
15 PSI
92347
140 PSI
PRV
Lenwood
92311
RIVER
MOJAVE
LENWOOD
BARSTOW
LENWOOD RD
MAIN
SEE 3679 MAP

# *Caltrans*

# Information Brochure

# Protection
# Of the
# DESERT TORTOISE
*(Gopherus agassizii)*

# During

# LIMITED SCOPE PROJECTS

**WEG/TortoiseBrochure (Limited Scope Projects)**

# THE

# DESERT TORTOISE

**(A THREATENED SPECIES)**

# "IS PROTECTED BY LAW"

**ANY UNAUTHORIZED PERSON
WHO COLLECTS, HANDLES
OR DELIBERATELY MOLESTS A
TORTOISE
CAN
BE
PROSECUTED**

## VIOLATIONS CAN RESULT IN

## 1) FINES UP TO $50,000

**AND/OR**

## 2) IMPRISONMENT UP TO 1 YEAR

***APPLICABLE LAWS INCLUDE:***

The Federal Endangered Species Act of 1973
(16 U.S.C. 1531-1543)

and

The California Endangered Species Act

THIS BROCHURE IS INTENDED TO PROVIDE YOU WITH INFORMATION AND GUIDANCE TO AVOID VIOLATION OF THE ENDANGERED SPECIES ACTS

**RESOURCE AGENCY FORMAL CONSULTATION**

Limited scope projects normally have a low risk of encountering or harming a tortoise and no "TAKE" is anticipated. Therefore, Formal Consultation between Caltrans and the U.S. Fish and Wildlife Service under Section 7 of the federal Endangered Species Act has not been undertaken for this project to authorize "TAKE" during the conduct of this project.

**"TAKE" is defined as:**

**Harassing, Harming, Pursuing, Hunting, Shooting, Wounding, Killing, Capturing, Collecting, or attempting to engage in any such conduct. Engaging in any of these activities can place you in violation of the law.**

Tortoises found within Caltrans Right of Way are not exempt from this protection.

# WHAT TO DO AND NOT DO.

**CHECK UNDER MOTORIZED EQUIPMENT & VEHICLES** – that have been parked over night or stationary for some length of time before moving the vehicle.

**CHECK AROUND MATERIAL STACKS & UNITS** - that have been stored in the open before moving them.

**VISUALLY CHECK AROUND THE WORK AREA** – for the presence of live tortoise that may have wandered into the disturbance zone. It is not intended to divert your attention from your work tasks and create a hazard for your or others on the job, but it is good practice to utilize a few seconds and visually scan the area around you when it is safe to do so.

**IF A TORTOISE IS PRESENT** – stop all work activities that could harm the tortoise and contact the Resident Engineer or designated contact person, or on-site biologist to have the tortoise removed to safety. Contact your supervisor (contractor's) for direction on proceeding with work activities.

**DO NOT HANDLE OR MOVE A TORTOISE** – yourself. Only a qualified biologist is authorized to do so.

**DO NOT RETURN A TORTOISE** – to the wild that has been held in captivity. They may have been infected with a pneumonia type virus that is the cause of pneumonia infections in humans. The tortoise is highly susceptible to this virus which attacks the lungs and the tortoise has no means to cure itself. More tortoises die from pneumonia than any other cause. Symptoms of infection include runny or bubbly nose, loss of appetite and gasping for breath. Returning them to the wild increases the potential for exposure of the virus into an otherwise healthy tortoise population.

**HELP MAKE THE LITTER CONTROL REQUIREMENTS ON THIS PROJECT** – work by using the closeable trash containers to dispose of left over food scraps, wrappers, cans bottles, etc., or secure and remove them from the project with you when you leave the job site. The purpose of litter control is to avoid attracting Ravens which are highly efficient hunters and killers of baby tortoises.

**DO NOT NEEDLESSLY VENTURE OUT OF THE DESIGNATED WORK AREA** – into adjoining habitat areas unless directed to do so after the area has been approved for such activity. Doing so, disturbs habitat which is also protected under the Endangered Species Acts.

**ASK YOUR SUPERVISOR** - if any other environmentally related special provisions have been placed in the contract exist that you should know about. We do recommend that environmental protection measures be reiterated and discussed at on-site "tail gate" meetings with safety and other project related issues brought up by your supervisor(s).

**WE THANK YOU FOR YOUR COOPERATION AND CARE**

**IN KEEPING WITH AMERICA'S DESIRE TO PROTECT THE ENVIRONMENT**

**WEG/Tortoise Brochure (Ltd Scope)**

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2007-F-0270

November 5, 2013

David Bricker, Deputy District Director
Attn: Mahmoud Sadeghi
Caltrans, District 8, Environmental Division
464 West 4th Street, 6th Floor
San Bernardino, California 92401-1400

Subject: Biological Opinion for Routine Highway Improvement, Maintenance Activities, and Safety Projects in Imperial, Inyo, Kern, Los Angeles, Riverside, and San Bernardino Counties, California (8-8-10-F-59)

Dear Mr. Bricker:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion regarding the effects of routine highway improvement, maintenance activities, and safety projects, funded under the Federal Highway Administration's (FHWA) Federal aid program, on the federally threatened desert tortoise (*Gopherus agassizii*) and its critical habitat, in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.). This document also contains our programmatic concurrence regarding projects funded under the FHWA's Federal aid program that are not likely to adversely affect the desert tortoise or its critical habitat.

This biological opinion is based on information contained in a previous biological opinion for small projects and routine operational highway improvement activities (Service 2006), personal communications with staff from the California Department of Transportation (Caltrans), and information contained in our files. A complete record of this consultation can be made available at the Ventura Fish and Wildlife Office (VFWO).

## CONSULTATION HISTORY

The FHWA previously consulted with the Service regarding routine highway maintenance activities and their effects on the desert tortoise and its critical habitat (Service 1994, 1995). On January 12, 2006, the Service replaced the previous two biological opinions with a new programmatic biological opinion (Service 2006) for maintenance activities, and other similar scale projects, in the transmontane portions of Imperial, Riverside, Los Angeles, San Bernardino, Inyo, and Kern counties. During 2006, Caltrans identified issues in the new biological opinion that required clarification from our office on several different occasions. As a result of these discussions, we met with representatives from the FHWA and Caltrans in December 2006 to

discuss the potential for further streamlining the consultation process. Following this meeting, Caltrans and the Service began to collaborate on the development of a revised consultation process that would replace the 2006 biological opinion.

**Review of the Draft Biological Opinion**

We provided a draft biological opinion for your review on July 29, 2013. We received your comments on the draft document by memorandum, dated August 29, 2013. We have incorporated your comments into this final biological opinion, as appropriate.

ADMINISTRATION OF THE CONSULTATION

Caltrans has assumed FHWA's responsibilities under the Act for this consultation in accordance with Section 1313, Surface Transportation Project Delivery Program, of the Moving Ahead for Progress in the 21st Century Act (MAP-21) of 2012, as described in the National Environmental Policy Act assignment Memorandum of Understanding between FHWA and Caltrans (effective October 1, 2012) and codified in 23 U.S.C. 327. As this programmatic biological opinion extends over the jurisdictions of the VFWO and Palm Springs Fish and Wildlife Office (PSFWO), which is under the Carlsbad Fish and Wildlife Office, any Caltrans activity in Imperial and Riverside counties will be coordinated with the PSFWO, and activities in Los Angeles, San Bernardino, Inyo, and Kern counties will be coordinated with the VFWO Desert Division.

Caltrans will prepare all required environmental documents for individual projects that may be conducted pursuant to this biological opinion, including those needed to satisfy its responsibilities under the Act and the National Environmental Policy Act. Based upon the appropriate documentation, the consultation process will proceed as follows:

1. A Caltrans biologist will make a determination of not likely to adversely affect or likely to adversely affect for a proposed action and then notify the senior biologist in the VFWO Desert Division or the PSFWO via electronic mail, using a standardized notification form (Appendix 1).

2. We will review the notification form and respond via electronic mail or other approved written format. In our response, we will concur or not concur with Caltrans' determination and proposed protective measures, as needed. If we determine that use of this consultation is appropriate for a proposed project, the provisions of this programmatic consultation will apply and no further communication would be needed (other than required reporting and notifications). We will attempt to respond within 30 days; however, if Caltrans does not receive a response from us within 30 days, it must not assume we concur.

3. In the event that Caltrans has not received a response from us within 30 days, Caltrans will contact, via telephone, the Desert Division senior biologist or Caltrans Liaison in the VFWO or the PSFWO, and ask us to clarify our position regarding its determination. (Note that our concurrence will cover all aspects of consultation; that is, our concurrence will be made with regard to the Caltrans proposal at hand according to the guidance contained in this document

and not merely with regard to 'not likely to adversely affect' situations, as would be expected in a standard consultation.)

4. If we believe protective measures, in addition to those proposed by Caltrans, are necessary, we will convey that information to Caltrans within 45 days of receipt of the notification form. We will insert any additional protective measures into our response with which Caltrans agrees. We will provide written documentation of any discussions or information regarding additional protective measures in the project file.

5. If we determine that use of this consultation is not appropriate for a proposed project, we will notify Caltrans, in writing within 45 days of receipt of the notification form, and the standard provisions for section 7 consultation will apply.

6. If the proposed project does not meet the criteria to be covered by the programmatic biological opinion, the regulations which implement section 7 allow the Service up to 90 days to conclude formal consultation and an additional 45 days to prepare our biological opinion. If we require additional information to complete our biological opinion, we will describe our needs in our letter; if additional information is not required, we will consider consultation to have been initiated on the date we received the original notification of Caltrans' intent to conduct its proposed project pursuant to this biological opinion.

7. Barring any unresolvable problems, and if stated thresholds for take and impacts to critical habitat are not reached, this biological opinion will be in effect for 5 years from the date it is issued. At the end of 5 years, if the programmatic biological opinion is working properly and impacts to the desert tortoise and its habitat are minor, as projected, the biological opinion may be renewed for 5 more years by mutual agreement between the Service and Caltrans. If reinitiation is required for whatever reason before the end of any 5-year period, the revised biological opinion would be in effect for 5 years starting on the date the new biological opinion is issued.

**Failure to Adhere to the Terms of the Biological Opinion**

In the event that a particular project being implemented under the auspices of this biological opinion fails to adhere to the protective measures and other conditions described below, that particular project must be suspended until the project is back in compliance with the biological opinion. If a project is suspended under this condition, any further action that would result in take of the desert tortoise would not be exempted from the prohibitions of section 9 (as described under Incidental Take Statement). Because several Caltrans Districts are covered within the scope of this biological opinion, other projects that are in compliance with this biological opinion may continue as long as none of the reinitiation criteria (defined later) are triggered (e.g., take limit exceeded). Those reinitiation criteria apply to the sum total of all actions undertaken pursuant to this biological opinion and are not parsed out by Caltrans District.

**Issue Resolution**

Issue resolution may be initiated by the FHWA, Caltrans, or the Service. Any issues that are not readily resolved at the staff or project manager level will promptly be referred to the supervisory level. The supervisory contact for the Service is the Assistant Field Supervisor of the Desert Division for the VFWO or Assistant Field Supervisor, PSFWO. The supervisory contact for Caltrans is the Deputy District Director for the Environmental Division in each District. The supervisory contact for the FHWA is the Division Administrator.

Any issues that cannot be resolved at the supervisory level will be referred to upper management. The Deputy Field Supervisor will be the upper management contact for the Service. Any issue that is not resolved with the Deputy Field Supervisor will be promptly referred to the Field Supervisor. Again, unresolved issues are directed to the Deputy District Director for the Environmental Division in each district. The FHWA, Caltrans, and the Service are responsible for ensuring timely elevation and resolution of issues.

**Criteria for Use in Reaching Appropriate Determinations**

Caltrans will use the following outline to determine the appropriate level of consultation required for each proposed action.

1) Projects that would occur outside of desert tortoise habitat or known range would have *no effect* on the species; Caltrans would not need to contact the Service. If Caltrans requires technical assistance from the Service to determine if suitable habitat for desert tortoises would be affected, it should contact us by electronic mail.

2) If all of the following criteria are met, a determination of *may affect, not likely to adversely affect* the desert tortoise would be appropriate:

    a) The project is within the range of the desert tortoise;

    b) Desert tortoise habitat is present, but degraded or disturbed, in the project area. For the purposes of this consultation, Caltrans and Service consider degraded habitat to be habitat that has been affected by previous highway maintenance activities or routine use of the area by the public. *Degraded habitat* will generally exhibit a lower diversity and density of native shrubs and disrupted substrates than undisturbed habitat. The presence of ongoing human activity, such as residences or businesses will also be considered to be evidence of degraded habitat. In some washes, evidence of activities would no longer be visible after an event where water flows in the wash. Such washes would also be considered disturbed. The loss or disturbance of a minor amount of undisturbed habitat may also be considered as being not likely to adversely affect the species, when considered with regard to its distribution in the action area; and

c) Suitable desert tortoise habitat is present, but neither desert tortoises nor their diagnostic sign are observed during protocol-level surveys (Service 2010) or more current agency approved protocol.

3) If any of the following criteria are met, a determination of *not likely to adversely affect critical habitat* for the desert tortoise would be appropriate:

a) The project is within designated critical habitat, but the primary constituent elements of desert tortoise critical habitat are not present;

b) The primary constituent elements would not be affected by the proposed project; or

c) Effects to the primary constituent elements would be so minor that they cannot be meaningfully measured, detected, or evaluated when considered within the context of the critical habitat unit. Such effects may occur, for example, when a narrow strip of land supporting the primary constituent elements of critical habitat at the edge of an existing road may be affected by an action.

4) If all of the following criteria are met, a determination of *may affect, likely to adversely affect* the desert tortoise would be appropriate:

a) The project is within the range of the desert tortoise;

b) Suitable desert tortoise habitat is present in the project area and is not disturbed or degraded (as described under 1(b) above), and

c) Desert tortoises or their diagnostic sign are observed during surveys or a habitat assessment.

5) If any of the following criteria are met, a determination that a project *may adversely affect critical habitat* would be appropriate:

a) The project is within designated critical habitat and the primary constituent elements of desert tortoise critical habitat are present;

b) The primary constituent elements would be affected by the proposed project; or

c) Effects to the primary constituent elements could be meaningfully measured, detected, or evaluated, when considered within the context of the critical habitat unit. Such effects may occur, for example, when an area supporting the primary constituent elements of critical habitat, and not otherwise subject to disturbance, would be altered and the primary constituent elements would no longer be present over a measurable portion of the critical habitat unit.

In cases where a determination is not entirely clear from a verbal description, Caltrans will provide the Service with a photograph (aerial or otherwise, as appropriate) of the project site to assist in its determination.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

Actions that would be considered appropriate to conduct pursuant to this biological opinion are projects and operational improvements, such as road widening and lane additions associated with safety projects that would occur within the existing Caltrans rights-of-way (ROW), a limited amount of seismic work, and minor improvements to ports-of-entry that would be conducted outside the ROW (upon Service approval, pursuant to the administration of this consultation). All projects and activities associated with operational improvement, with the exception of the geotechnical studies proposed herein, would occur within the ROW fence or unmarked boundary. The projects considered in this biological opinion could occur anywhere within the Caltrans ROW; however, in any given year, most of the ROW included in the action area for this biological opinion is not likely to be disturbed. This biological opinion does not cover impacts associated with the realignment and widening of freeways outside the existing Caltrans ROW specifically intended to accommodate increased traffic.

#### Project Categories

Actions included in the following eight categories would be appropriate to conduct pursuant to this biological opinion:

#### TYPE 1: HIGHWAY REHABILITATION AND DRAINAGE AND SAFETY STANDARDIZATION

Highway rehabilitation consists of grinding existing road pavement, proper disposal of resulting waste, and overlaying the prepared surface with new asphaltic concrete. Actions include grading of shoulders and road embankments, placement of shoulder backing, striping or widening of existing shoulders, replacing or installing guardrails, trimming or removing vegetation, installing traffic signals or left/right turn lanes, re-striping, and instituting traffic control measures. Drainage standardization consists of grading existing roadside channels, installing new roadside channels or drainage devices, and extending culverts. Additionally, all activities related to the storage of equipment and materials, and to the disposal of spoils will be considered as Type 1 activities.

#### TYPE 2: CATCH DAM, CATCH BASIN, STILLING BASIN, OR DRAINAGE IMPROVEMENT

Type 2 projects consist of constructing new erosion control devices adjacent to existing culverts or bridges, or repairing existing facilities, and the installation or replacement of culverts and armoring including upgrading to larger sized culverts. Check dams and stilling basins require excavating soil within the wash or channel and its bank, and placing concrete or rock slope

protection. Sediment catch basins require excavating areas on the inlet side of culverts or ditches, and constructing dikes to direct the flow of water. This may include the replacement of in-kind culverts.

TYPE 3: WIDENING HIGHWAYS FOR TURN POCKETS, ACCELERATION/ DECELERATION LANES, PASSING LANES, TWO-WAY LEFT TURN LANES, INTERSECTION WIDENING, CURVE REALIGNMENTS, REPAVING, AND PAVEMENT REHABILITATION.

Turn pockets and acceleration/deceleration lanes require widening both sides of the existing roadway and shoulder for up to 0.25 mile from an intersection. Passing lanes may consist of widening one side of the roadway by one lane. Two-way left-turn lanes require widening both sides of the roadway by a half-lane width and re-striping for the length of the project area. Curve realignment requires moving the roadway or excavation of the roadway and adjacent shoulders. Intersection widening usually consists of widening both sides of the roadway, adding shoulders and/or sidewalks, curb ramps, and signals.

TYPE 4: BRIDGE REHABILITATION AND REPLACEMENT

Bridge rehabilitation consists of removing the asphaltic concrete deck or replacing decks, reconstructing approaches, applying a seal coat, replacing/repairing guardrails, and sand blasting the underside of the bridge to inspect for damage. Bridge replacement consists of removing and replacing the entire bridge structure and its pillars and guardrails with a new bridge; pillar removal requires excavation. Temporary access roads may be needed to access the area underneath the bridges. Some bridge rehabilitation work may require installing temporary traffic detour crossovers across the highway median; crossovers would include construction of drainage structures to channel run-off from the construction site.

TYPE 5: PRELIMINARY PROJECT STUDIES AND SURVEYS

Geotechnical studies are required to provide information regarding the feasibility and/or best construction design for future projects. These early studies can assist with long- range planning to determine viable alternatives. Geotechnical boring typically entails drilling a test hole to analyze the subsurface geology and temporarily placing fill material adjacent to the boring activity. Immediately following the geotechnical study at a test pit, the borehole is filled and covered with surrounding material or bentonite. Cross-country travel may be required for geotechnical studies. Cross-country travel can either use the same route to return from the boring activities or continue forward in a linear fashion. Areas affected by geotechnical borings will include the entire width and length of the access route and all areas affected by vehicles and boring activities.

Archaeological studies are required to provide information and documentation of historical land use areas, archaeological sites (both prehistoric and historical), and areas of cultural concern (all of these are considered "historic resources"). Initial archaeological surveys are intended to inventory proposed project areas for historic resources, are non-intrusive (no surface collection or excavation), and include mapping and photographing of archaeological sites and resources.

Archaeological evaluations are intended to evaluate the previously inventoried historic resources; these evaluations generally require both mechanical (trenching) and hand-excavation to determine depth of archaeological sites and to find buried resources. These evaluations generally provide stratigraphic information based on depth of resource, and generally are conducted using 1-meter x 1-meter (1 meter$^2$) hand-excavated control units (may be multiple units depending on size and area of site). If mechanical trenching is used, the depth is generally 1 meter; any excavation deeper than 5 feet (1.524-m) requires shoring and exit ramps (also dependent upon site size). Archaeological data recovery uses the same methods as the above-mentioned evaluation efforts.

TYPE 6: RECONSTRUCTION OF EXISTING MAINTENANCE YARDS, PORTS OF ENTRY, REST AREAS, AND WEIGH STATIONS

Type 6 projects consist mainly of reconstructing or repairing existing maintenance yards, ports of entry, rest areas, and weigh stations to respond to legislative mandates or increased demands in geographical areas. As part of the process, Type 6 projects will require some limited road work.

TYPE 7: PERMANENT FENCE INSTALLATION, INSPECTION, AND MAINTENANCE

Type 7 projects consist of installing permanent fencing, cattle guards, and other features necessary to keep desert tortoises from entering the rights-of-way. Fence installation will follow the 2005 Recommended Design for Desert Tortoise Exclusion Fence, which is available through the VFWO website (http://www.fws.gov/ventura). Fence maintenance will occur when necessary to ensure that desert tortoises do not enter the ROW.

TYPE 8: SAFETY PROJECTS

Examples of safety projects include minor road realignments within the ROW, guard rail installation, California Highway Patrol enforcement areas/emergency passageways, glare screen, median barrier and cross slopes, remove/relocate or shield fixed objects, and traffic signs installation.

Protective Measures

Caltrans proposes to implement the following protective measures to avoid and minimize impacts to the desert tortoise and its critical habitat:

1. Caltrans will submit the names and qualifications of biologists that they believe meet the minimum requirements to serve as Authorized Biologists to the Service for review and authorization under this biological opinion prior to beginning on-site activities (forms at http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/). Once a biologist has been authorized by the Service, that individual may work on subsequent projects pursuant to this biological opinion without additional approval, provided that his or her performance remains satisfactory. Caltrans will maintain a record of all authorized biologists who work on its projects.

2. Caltrans will designate, on a project-by-project basis, an authorized biologist to be responsible for overseeing compliance with all protective measures and for coordination with the Service. The authorized biologist will immediately notify the resident engineer of project activities that may be in violation of this biological opinion. In such an event, the resident engineer can halt all construction activities until all protective measures are being fully implemented, as determined by the authorized biologist.

3. A resident engineer is, according to Caltrans' May 2006 Standard Specifications, "the Chief Engineer, Department of Transportation, acting either directly or through properly authorized agents, the agents acting within the scope of the particular duties delegated to them." The resident engineer has authority over the contract and is responsible for all aspects of the specific projects to which he or she is assigned. The resident engineer has the authority to stop work on a project. The authorized biologist will have the authority to halt any activity, through the Resident Engineer or other identified authority in charge of implementation that may pose a threat to desert tortoises and to direct movements of equipment and personnel to avoid injury or mortality to desert tortoise.

4. When handling desert tortoises, authorized biologists (and trained individuals) must follow the guidelines outlined in the Desert Tortoise Field Manual (Service 2010), chapters 6 and 7. The manual is available on the web through the VFWO website (www.fws.gov/ventura).

5. Immediately prior to the start of any ground-disturbing activities and prior to the installation of any desert tortoise exclusion fencing, clearance surveys for the desert tortoise will be conducted by the authorized biologist, as appropriate. The entire project area will be surveyed for desert tortoise and their burrows by an authorized biologist or approved desert tortoise monitor before the start of any ground-disturbing activities following the 2010 field survey protocol (Service 2010) or more current approved protocol. If burrows are found, they will be examined by an authorized biologist to determine if desert tortoises are present. If a tortoise is present and the burrow cannot be avoided, it will be relocated in accordance with Service protocol (Service 2010). If the authorized biologist determines clearance surveys are not needed, clearance surveys would not be required. If desert tortoises are found at a project site where Caltrans (or the authorized biologist) had previously concluded they were unlikely to occur, Caltrans will contact the Service to determine if the implementation of additional protective measures would be appropriate.

6. For construction projects determined likely to may affect desert tortoise, an education program will be developed and presented by the authorized biologist prior to the onset of ground-disturbing activities to be conducted under the auspices of this consultation. All onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel employed for a project will be required to participate in an education program regarding the desert tortoise before performing on-site work. The program will consist of a class presented by an authorized biologist or a video, provided the authorized biologist is present to answer questions. Wallet-sized cards or a one-page handout with important information for workers

to carry are recommended as a future reference and a reminder of the program's content. The program will cover the following topics at a minimum:

- the distribution, general behavior, and ecology of the desert tortoise;
- its sensitivity to human activities;
- the protection it is afforded by the Endangered Species Act;
- penalties for violations of State and Federal laws;
- notification procedures by workers or contractors if a tortoise is found in a construction area, and;
- protective measures specific to each project.

7. Whenever project vehicles are parked outside of a fence that is intended to preclude entry by desert tortoises, workers will check under the vehicle before moving it. If a desert tortoise is beneath the vehicle, the worker will notify the authorized biologist or an approved desert tortoise monitor to relocate the tortoise. If an authorized biologist is not present on-site, the Resident Engineer or supervisor must notify an authorized biologist. Workers will not be allowed to capture, handle, or relocate tortoises. Any such handling must be reported as described in the Reporting Requirements section of this biological opinion.

8. The area of disturbance will be confined to the smallest practical area, considering topography, placement of facilities, location of burrows, public health and safety, and other limiting factors. This measure includes temporary haul roads, staging/storage areas, or access roads. Work area boundaries will be clearly and distinctly delineated with flagging or other marking to minimize surface disturbance associated with vehicle movement. Special habitat features, such as desert tortoise burrows, will be identified and marked as environmentally sensitive areas by the authorized biologist, if they are to be avoided and will be discussed and identified during the worker education program. To the extent possible, previously disturbed areas within the Caltrans ROW will be used for equipment storage, office trailer locations, and vehicle parking. The development of all temporary access and work roads associated with construction will be minimized and constructed without blading where feasible. Project-related vehicle traffic will be restricted to established roads, construction areas, staging/storage areas, and parking areas. The resident engineer, authorized biologist or approved desert tortoise monitor will ensure that blading is conducted only where necessary.

9. Caltrans will require all contractors to comply with the Act in the performance of work necessary for project completion. Evidence of compliance is required prior to Caltrans accepting or receiving materials or goods produced from outside of the right-of-way or through the use of facilities located outside of the right-of-way, including but not limited to, non-commercial batch plants, haul roads, quarries, and similar operations. Copies of the compliance documents will be maintained at the work-site by the resident engineer.

10. The resident engineer is responsible for ensuring that all protective measures are being fully implemented. If the resident engineer determines, or is notified by the authorized biologist, that one or more protective measures are not being fully implemented, he or she will halt all

activities that are out of compliance until all problems have been remedied. All workers, authorized biologists, and biological monitors will be required to notify the resident engineer of any such problem they notice. The resident engineer must always be able to contact an approved biological monitor or authorized biologist to resolve any unforeseen issues.

11. Caltrans will determine whether the presence of authorized biologists and approved desert tortoise monitors will be required during project activities as outline in the 'criteria for use in reaching appropriate determination' section of this programmatic biological opinion and the submitted Appendix I notification form to the Service. In general, where the risk to desert tortoises is low, the authorized biologist or an approved biological monitor will be present at the onset of the project to ensure protective measures are in place and will, if necessary (for example, for projects that will require a substantial length of time to complete), conduct periodic field checks to ensure compliance.

12. Permanent or temporary exclusion fencing may be used to prevent entry by desert tortoises into a work site, if Caltrans and the authorized biologist determine this measure is appropriate. Exclusion fencing will be installed following Service guidelines (2005) or more current protocol. The authorized biologist will ensure that desert tortoises cannot pass under, over, or around the fence. If such a fence is used, authorized biologists or desert tortoise monitors will not be required to be present at the site at all times. However, the authorized biologist must periodically check the fenced area to search for breaks in the fence and to ensure no desert tortoises have breached the fence. Preconstruction surveys for tortoise and tortoise sign will be performed within all proposed construction areas prior to the fence being installed. In addition, prior to ground disturbing activities beginning in a previously undisturbed or unfenced area, preconstruction surveys will be performed.

13. Upon locating a dead or injured tortoise within a project site, the resident engineer will immediately notify the authorized biologist whom then will notify the Service within 24 hours of the observation via telephone. Written notification must be made to the appropriate Fish and Wildlife field office within 5 days of the finding. The information provided must include the date and time of the finding or incident (if known), location of the carcass or injured animal, a photograph, cause of death or injury, if known, and other pertinent information (i.e., size, sex, recommendations to avoid future injury or mortality).

14. Injured desert tortoises will be transported to a veterinarian for treatment at the expense of the contractor or Caltrans. Only the authorized biologist or an approved desert tortoise biological monitor will be allowed to handle an injured tortoise. If an injured animal recovers, the appropriate Fish and Wildlife field office will be contacted for final disposition of the animal.

15. Caltrans will notify the authorized biologist or approved desert tortoise biological monitor to collect and place the remains of intact desert tortoise carcasses with educational or research institutions holding the appropriate State and Federal permits per their instructions. If such institutions are not available or the animal's remains are in poor condition, the information noted in this section will be obtained and the carcass left in place. If left in place and

sufficient pieces are available, the authorized biologist will attempt to mark the carcass to ensure that it is not reported again.

16. If working outside of a desert tortoise-proof fenced area, auger holes or other excavations will be covered following inspection at the end of each workday to prevent desert tortoises from becoming trapped.

17. When feasible or practicable, construction vehicles will be cleaned of all mud, dirt, and debris from other sites prior to entering the project area. The purpose of this measure is to minimize the spread of weedy plant species that may degrade desert tortoise habitat.

18. Except on maintained public roads designated for higher speeds or within a desert tortoise-proof fenced area, driving speed will not exceed 20 miles per hour through potential desert tortoise habitat on both paved and unpaved roads.

19. Any fuel or other hazardous materials spills will be promptly cleaned up; any leaks from equipment will be stopped and repaired immediately. Vehicle and equipment fluids that are no longer useful will be transported to an appropriate off-site disposal location. Fuel and lubricant storage and dispensing locations will be constructed to fully contain spilled materials until disposal can occur. Hazardous waste, including used motor oil waste and coolant, will be stored and transferred in a manner consistent with applicable regulations and guidelines.

20. Desert tortoise habitat, outside of the ROW, that is temporarily affected by grading during project construction (e.g., temporary access roads, detention basins) will be restored following construction, using salvaged topsoil. Habitat restoration will also incorporate desert bioregion revegetation/restoration guidance measures. These measures generally include alleviating soil compaction, returning the surface to its original contour, pitting or imprinting the surface to allow small areas where seeds and rain water can be captured, planting seedlings that have acquired the necessary root mass to survive without watering, planting seedlings in the spring with herbivory cages, broadcasting locally collected seed immediately prior to the rainy season, and covering the seeds with mulch. Temporary access roads and crossovers, outside of the ROW, will be re-graded, restored, and stabilized. Prior to the start of construction, potential temporary impact areas that have been identified by a botanist as having more than 75 percent cover of non-native grasses will not require restoration; areas that may be subject to temporary disturbance and would require revegetation following construction would be identified on Appendix I.

21. Plant species listed in Lists A and B of the California Exotic Pest Plant Council's list of exotic pest plants (latest edition) will not be used to restore or stabilize areas within or near desert tortoise habitat.

22. Upon completion of construction, all refuse, including, but not limited to equipment parts, wrapping material, cable, wire, strapping, twine, buckets, metal or plastic containers, and boxes will be removed from the site and disposed of properly.

23. If explosives need to be used, the authorized biologist will survey any area that may be affected by their use (via noise, vibration, or blown-up material) to determine if desert tortoises are present. If desert tortoises are present in this area, the resident engineer, with the cooperation of the authorized biologist or approved desert tortoise biological monitor, will implement necessary measures to protect these animals. Such measures may include, but are not limited to, installing temporary fencing and moving desert tortoises outside of it, holding desert tortoises in a secure location until after explosion, and other actions that protect the desert tortoises from injury or mortality during the blasting.

24. No firearms or pets, including dogs, will be allowed within the work area. Firearms carried by authorized security and law enforcement personnel and working dogs under the control of a handler will be exempt from this protective measure.

25. To preclude attracting predators, such as the common raven (*Corvus corax*) and coyotes (*Canis latrans*), food-related trash items will be removed daily from the work site and disposed of at an approved refuse disposal site. Workers are prohibited from feeding all wildlife.

26. Sandblasted material will either be vacuum-retrieved or contained by a tarp. All refuse material from sandblasting will be disposed of in compliance with Federal law.

27. During all off-road cross-country travel outside of any area surrounded by desert tortoise-proof fencing, the authorized biologist will select and flag the access route to avoid burrows, to minimize disturbance of vegetation, and to relocate any desert tortoises that are found in the access route, out of harm's way. The authorized biologist will walk in front of the lead vehicle to ensure that no desert tortoise or burrows are present. All vehicles will follow the lead vehicle's tracks and stay within the designated access route.

28. Boring locations will not be established within 35 feet of an active desert tortoise burrow. If an active burrow is found within 35 feet after the boring location is established, the boring location will be moved until it is at least 35 feet from the active burrow.

29. An authorized biologist will be onsite during all drilling or boring activities.

30. Desert tortoise exclusion fence construction will follow the guidelines in chapter 8 of the Desert Tortoise Field Manual (Service 2010) which is available at the VFWO website (www.fws.gov/ventura).

31. Cattle guards will be installed where appropriate, with technical assistance from the Service, if necessary. All cattle guards that serve as barriers to the movement of desert tortoises will be installed and maintained (e.g., removal of soil build-up) to ensure that any desert tortoise that falls underneath has a path of escape via a sloped escape ramp without crossing the intended barrier.

32. Desert tortoise-proof fencing will be tied to cattle guards in a manner that ensures juvenile desert tortoises cannot pass through (Service 2010)

33. When gates are installed within the fence line, desert tortoise-proof fencing will be installed along the gate bottom beginning at least 2 feet above the fence bottom and extending towards the ground leaving less than a 1-inch gap (Service 2010).

34. All desert tortoise fences, gates, and cattle guards will be regularly maintained at a frequency sufficient to ensure that they will continually provide an effective barrier to passage of desert tortoises.

35. Desert tortoise-proof fencing will not cross washes. When washes and culverts are encountered, the desert tortoise-proof fence will follow the wash to the roadway and either tie into the existing bridge or cross over the top of a culvert.

36. During fence inspections and repairs, if any desert tortoises are observed, workers are to notify the authorized biologist because only authorized biologists and approved biological monitors are permitted to handle tortoise. All desert tortoises encountered within the roadway side of the fence will be relocated across the fence to safety in accordance with Service protocol (Service 2010). Any such incident will be reported in the annual report.

37. On a case by case basis, individual active burrows may be fenced if the authorized biologist determines this protective measure is necessary to prohibit desert tortoises from repeatedly entering work areas. Fencing around individual burrows will be removed when adjacent construction is complete.

38. To further ensure that actions implemented under the auspices of this consultation do not substantially degrade the status of the desert tortoise or its critical habitat, Caltrans will reinitiate formal consultation in the event either of the following thresholds regarding injury or mortality to desert tortoises or loss or disturbance of their critical habitat is reached:

    a. two (2) desert tortoises injured or killed in any calendar year, within the action area, in each county considered in this biological opinion; or seven (7) desert tortoises injured or killed, within the action area (regardless of county) considered in this biological opinion, in any calendar year; and

    b. five (5) acres located outside of the ultimate rights-of-way containing the primary constituent elements of critical habitat of the desert tortoise are adversely affected on a long-term basis within each of the critical habitat units considered in this biological opinion, in any calendar year.

39. Each Caltrans district in the action area will record with a global positioning system (GPS) all new fence locations, culverts, and under crossings available to the desert tortoise within the range of roads covered by this programmatic biological opinion. All recorded data will be input into a geographical information system (GIS) database and submitted on an annual

basis to the Service to assist with future planning for fencing high priority roadways to reduce vehicle strikes to desert tortoises. The database will be updated as projects install new drainage structures, permanent desert tortoise proof fencing, and other structures such as cattle-guards and desert tortoise proof fencing.

## ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS

### Jeopardy Determination

The jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which describes the range-wide condition of the desert tortoise, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which describes the condition of the desert tortoise in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the desert tortoise; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the desert tortoise; and (4) the *Cumulative Effects*, which are the effects of future, non-Federal activities in the action area on the desert tortoise. In accordance with regulation and policy, the jeopardy determination is made by evaluating the effects of the proposed federal action in the context of the current status of the desert tortoise, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the desert tortoise in the wild.

### Adverse Modification Determination

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied on the statutory provisions of the ESA to complete the following analysis with respect to critical habitat. In accordance with regulation and policy, the adverse modification analysis in this biological opinion relies on four components: (1) *Status of Species*, which includes a description of the range-wide condition of designated critical habitat for the desert tortoise in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the critical habitat overall; (2) *Environmental Baseline*, which analyzes the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated and interdependent activities on the PCEs and how that will influence the recovery role of the affected critical habitat units; and (4) *Cumulative Effects*, which evaluates the effects of future non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units. The analysis in this biological opinion places an emphasis on using the intended range-wide recovery function of critical habitat for the desert tortoise and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

STATUS OF THE SPECIES

Section 4(c)(2) of the Act requires the Service to conduct a status review of each listed species at least once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review); these reviews, at the time of their completion, provide the most up-to-date information on the range-wide status of the species. For this reason, we are appending the 5-year review of the status of the desert tortoise (Appendix 1; Service 2010b) to this biological opinion and are incorporating it by reference to provide most of the information needed for this section of the biological opinion. The following paragraphs provide a summary of the relevant information in the 5-year review.

In the 5-year review, the Service discusses the status of the desert tortoise as a single distinct population segment and provides information on the Federal Register notices that resulted in its listing and the designation of critical habitat. The Service also describes the desert tortoise's ecology, life history, spatial distribution, abundance, habitats, and the threats that led to its listing (i.e., the 5-factor analysis required by section 4(a)(1) of the Act). In the 5-year review, the Service concluded by recommending that the status of the desert tortoise as a threatened species be maintained.

With regard to the status of the desert tortoise as a distinct population segment, the Service concluded in the 5-year review that the recovery units recognized in the original and revised recovery plans (Service 1994 and 2011e, respectively) do not qualify as distinct population segments under the Service's distinct population segment policy (61 Federal Register 4722; February 7, 1996). We reached this conclusion because individuals of the listed taxon occupy habitat that is relatively continuously distributed, exhibit genetic differentiation that is consistent with isolation-by-distance in a continuous-distribution model of gene flow, and likely vary in behavioral and physiological characteristics across the area they occupy as a result of the transitional nature of, or environmental gradations between, the described subdivisions of the Mojave and Colorado deserts.

In the 5-year review, the Service summarizes information with regard to the desert tortoise's ecology and life history. Of key importance to assessing threats to the species and to developing and implementing a strategy for recovery is that desert tortoises are long-lived, require up to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential. The number of eggs that a female desert tortoise can produce in a season is dependent on a variety of factors including environment, habitat, availability of forage and drinking water, and physiological condition. Predation seems to play an important role in clutch failure. Predation and environmental factors also affect the survival of hatchlings.

In the 5-year review, the Service also discusses various means by which researchers have attempted to determine the abundance of desert tortoises and the strengths and weaknesses of those methods. The Service provides a summary table of the results of range-wide monitoring, initiated in 2001, in the 5-year review. This ongoing sampling effort is the first comprehensive attempt to determine the densities of desert tortoises across their range. Table 1 of the 5-year review provides a summary of data collected from 2001 through 2007; we summarize data from the 2008 through

2010 sampling efforts in subsequent reports (Service 2010b, 2010c, 2010d). As the Service notes in the 5-year review notes, much of the difference in densities between years is due to variability in sampling; determining actual changes in densities will require many years of monitoring. Additionally, due to differences in area covered and especially to the non-representative nature of earlier sample sites, data gathered by the range-wide monitoring program cannot be reliably compared to information gathered through other means at this time.

In the 5-year review, the Service provides a brief summary of habitat use by desert tortoises; more detailed information is available in the revised recovery plan (Service 2011a). In the absence of specific and recent information on the location of habitable areas of the Mojave Desert, especially at the outer edges of this area, the 5-year review also describes and relies heavily on a quantitative, spatial habitat model for the desert tortoise north and west of the Colorado River that incorporates environmental variables such as precipitation, geology, vegetation, and slope and is based on occurrence data of desert tortoises from sources spanning more than 80 years, including data from the 2001 to 2005 range-wide monitoring surveys (Nussear et al. 2009). The model predicts the probability that desert tortoises will be present in any given location; calculations of the amount of desert tortoise habitat in the 5-year review and in this biological opinion use a threshold of 0.5 or greater predicted value for potential desert tortoise habitat. The model does not account for anthropogenic effects to habitat and represents the potential for occupancy by desert tortoises absent these effects.

To begin integrating anthropogenic activities and the variable risk levels they bring to different parts of the Mojave and Colorado deserts, the Service completed an extensive review of the threats known to affect desert tortoises at the time of their listing and updated that information with more current findings in the 5-year review. The review follows the format of the five-factor analysis required by section 4(a)(1) of the Act. The Service described these threats as part of the process of its listing (55 Federal Register12178; April 2, 1990), further discussed them in the original recovery plan (Service 1994), and reviewed them again in the revised recovery plan (Service 2011).

To understand better the relationship of threats to populations of desert tortoises and the most effective manner to implement recovery actions, the Desert Tortoise Recovery Office is developing a spatial decision support system that models the interrelationships of threats to desert tortoises and how those threats affect population change. The spatial decision support system describes the numerous threats that desert tortoises face, explains how these threats interact to affect individual animals and habitat, and how these effects in turn bring about changes in populations. For example, we have long known that the construction of a transmission line can result in the death of desert tortoises and loss of habitat. In addition, common ravens, known predators of desert tortoises, use transmission line pylons for nesting, roosting, and perching and that the access routes associated with transmission lines provide a vector for the introduction and spread of invasive weeds and facilitate increased human access into an area. Increased human access can accelerate illegal collection and release of desert tortoises and their deliberate maiming and killing, as well as facilitate the spread of other threats associated with human presence, such as vehicle use, garbage and dumping, and invasive plants (Service 2011a). Changes in the abundance of native plants because of invasive weeds can compromise the physiological health of desert

tortoises, making them more vulnerable to drought, disease, and predation. The spatial decision support system allows us to map threats across the range of the desert tortoise and model the intensity of stresses that these multiple and combined threats place on desert tortoise populations.

The threats described in the listing rule and both recovery plans continue to affect the species. Indirect impacts to desert tortoise populations and habitat occur in accessible areas that interface with human activity. Most threats to the desert tortoise or its habitat are associated with human land uses; research since 1994 has clarified many mechanisms by which these threats act on desert tortoises. As stated earlier, increases in human access can accelerate illegal collection and release of desert tortoises and deliberate maiming and killing, as well as facilitate the spread of other threats associated with human presence, such as vehicle use, garbage and dumping, and invasive weeds.

Some of the most apparent threats to the desert tortoise are those that result in mortality and permanent habitat loss across large areas, such as urbanization and large-scale renewable energy projects, and those that fragment and degrade habitats, such as proliferation of roads and highways, off-highway vehicle (OHV) activity, and habitat invasion by non-native invasive plant species. However, we remain unable to quantify how threats affect desert tortoise populations. The assessment of the original recovery plan emphasized the need for a better understanding of the implications of multiple, simultaneous threats facing desert tortoise populations and of the relative contribution of multiple threats on demographic factors (i.e., birth rate, survivorship, fecundity, and death rate; Tracy et al. 2004).

We have enclosed a map that depicts the 12 critical habitat units of the desert tortoise and the aggregate stress that multiple, synergistic threats place on desert tortoise populations (Appendix 2). The map also depicts linkages between conservation areas for the desert tortoise (which include designated critical habitat) recommended in the revised recovery plan (Service 2011a) that are based on an analysis of least-cost pathways (i.e., areas with the highest potential to support desert tortoises) between conservation areas for the desert tortoise. This map illustrates that areas under the highest level of conservation management for desert tortoises remain subjected to numerous threats and stresses, which suggests that current conservation actions for the desert tortoise are not substantially reducing mortality sources for the desert tortoise across its range.

Since the completion of the 5-year review, the Service has issued several biological opinions that affect large areas of desert tortoise habitat because of numerous proposals to develop renewable energy within its range. These biological opinions concluded that proposed solar plants were not likely to jeopardize the continued existence of the desert tortoise primarily because they were located outside of critical habitat and Desert Wildlife Management Areas (DWMAs) that contain most of the land base required for the recovery of the species. The proposed actions also included numerous measures intended to protect desert tortoises during the construction of the projects, such as translocation of affected individuals. Additionally, the Bureau of Land Management (Bureau) and California Energy Commission, the agencies permitting these facilities, have required the project proponents to fund numerous measures, such as land acquisition and the implementation of recovery actions intended to offset the adverse effects of the proposed actions. In aggregate, these projects resulted in an overall loss of approximately 30,180 acres of desert

tortoise habitat; three of the projects (i.e., BrightSource Ivanpah, Stateline Nevada, and Desert Sunlight) constricted linkages between conservation areas that are important for the recovery of the desert tortoise. We also predicted that these projects would translocate, injure, or kill up to 1,621 desert tortoises (see table below); we concluded that most of the individuals in these totals would be juveniles. The mitigation required by the Bureau and California Energy Commission will result in the acquisition of private land within critical habitat and DWMAs and funding for the implementation of various actions that are intended to promote the recovery of the desert tortoise; at this time, we cannot assess how successful these measures will be.

The following table summarizes information regarding the proposed solar projects that have undergone formal consultation with regard to the desert tortoise. Data are from Service (2010d [Chevron Lucerne Valley], f [Calico], g [Genesis], h [Blythe]; 2011f [BrightSource Ivanpah], g [Desert Sunlight], h [Abengoa Harper Lake], i [Palen]; and Burroughs (2012; Nevada projects). Projects are in California, unless noted.

| Project | Acres of Desert Tortoise Habitat | Estimated Number of Desert Tortoises Onsite | Recovery Unit |
|---|---|---|---|
| BrightSource Ivanpah | 3,582 | 1,136 | Eastern Mojave |
| Stateline Nevada - NV | 2,966 | 123 | Eastern Mojave |
| Amargosa Farm Road - NV | 4,350 | 4 | Eastern Mojave |
| Calico* | | | Western Mojave |
| Abengoa Harper Lake | Primarily in abandoned agricultural fields | 4 | Western Mojave |
| Chevron Lucerne Valley | 516 | 10 | Western Mojave |
| Nevada Solar One - NV | 400 | ** | Northeastern Mojave |
| Copper Mountain North - NV | 1,400 | 30 ** | Northeastern Mojave |
| Copper Mountain - NV | 380 | ** | Northeastern Mojave |
| Moapa K Road Solar - NV | 2,152 | 202 | Northeastern Mojave |
| Genesis | 1,774 | 8 | Colorado |
| Blythe | 6,958 | 30 | Colorado |
| Palen | 1,698 | 18 | Colorado |
| Desert Sunlight | 4,004 | 56 | Colorado |
| Total | 30,180 | 1,621 | |

* The applicant has proposed changes to the proposed action; the Bureau has re-initiated formal consultation with the Service, pursuant to section 7(a)(2) of the Endangered Species Act, as part of its re-evaluation of the project (Service 2012a)

** These projects occurred under the Clark County Multi-species habitat conservation plan; we estimate that all three projects combined will affect fewer than 30 desert tortoises.

In addition to the biological opinions issued for solar development within the range of the desert tortoise, the Service (2012a) also issued a biological opinion to the Department of the Army for the use of additional training lands at Fort Irwin. As part of this proposed action, the Army removed approximately 650 desert tortoises from 18,197 acres of the southern area of Fort Irwin, which had been off-limits to training. The Army would also use an additional 48,629 acres that lie east of the former boundaries of Fort Irwin; much of this parcel is either too mountainous or too rocky and low in elevation to support numerous desert tortoises.

As the Service notes in the 5-year review (Service 2010b), "(t)he threats identified in the original listing rule continue to affect the (desert tortoise) today, with invasive species, wildfire, and renewable energy development coming to the forefront as important factors in habitat loss and conversion. The vast majority of threats to the desert tortoise or its habitat are associated with human land uses." Oftedal's work (2002 in Service 2010b) suggests that invasive weeds may adversely affect the physiological health of desert tortoises. Modeling with the spatial decision support system indicates that invasive species likely affect a large portion of the desert tortoise's range; see Appendix 3. Furthermore, high densities of weedy species increase the likelihood of wildfires; wildfires, in turn, destroy native species and further the spread of invasive weeds.

Global climate change is likely to affect the prospects for the long-term conservation of the desert tortoise. For example, predictions for climate change within the range of the desert tortoise suggest more frequent and/or prolonged droughts with an increase of the annual mean temperature by 3.5 to 4.0 degrees Celsius. The greatest increases will likely occur in summer (June-July-August mean increase of as much as 5 degrees Celsius [Christensen et al. 2007 in Service 2010b]). Precipitation will likely decrease by 5 to 15 percent annually in the region, with winter precipitation decreasing by up to 20 percent and summer precipitation increasing by 5 percent. Because germination of the desert tortoise's food plants is highly dependent on cool-season rains, the forage base could be reduced due to increasing temperatures and decreasing precipitation in winter. Although drought occurs routinely in the Mojave Desert, extended periods of drought have the potential to affect desert tortoises and their habitats through physiological effects to individuals (i.e., stress) and limited forage availability. To place the consequences of long-term drought in perspective, Longshore et al. (2003) demonstrated that even short-term drought could result in elevated levels of mortality of desert tortoises. Therefore, long-term drought is likely to have even greater effects, particularly given that the current fragmented nature of desert tortoise habitat (e.g., urban and agricultural development, highways, freeways, military training areas) will make recolonization of extirpated areas difficult, if not impossible.

The Service notes in the 5-year review that the combination of the desert tortoise's late breeding age and a low reproductive rate challenges our ability to achieve recovery. When determining whether a proposed action is likely to jeopardize the continued existence of a species, we are required to consider whether the action would "reasonably be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). Although the Service does not explicitly address these metrics in the 5-year review, we have used the information in that document to summarize the status of the desert tortoise with respect to its reproduction, numbers, and distribution.

In the 5-year review, the Service notes that desert tortoises increase their reproduction in high rainfall years; more rain provides desert tortoises with more high quality food (i.e., plants that are higher in water and protein), which, in turn, allows them to lay more eggs. Conversely, the physiological stress associated with foraging on food plants with insufficient water and nitrogen may leave desert tortoises vulnerable to disease (Oftedal 2002 in Service 2010b), and the reproductive rate of diseased desert tortoises is likely lower than that of healthy animals. Young desert tortoises also rely upon high-quality, low-fiber plants (e.g., native forbs) with nutrient levels

not found in the invasive weeds that have increased in abundance across its range (Tracy et al. 2004). Compromised nutrition of young desert tortoises likely represents an effective reduction in reproduction by reducing the number that reaches adulthood. Consequently, although we do not have quantitative data that show a direct relationship, the abundance of weedy species within the range of the desert tortoise has the potential to negatively affect the reproduction of desert tortoises and recruitment into the adult population.

Data from long-term study plots, which were first established in 1976, cannot be extrapolated to provide an estimate of the number of desert tortoises on a range-wide basis; however, these data indicate, "appreciable declines at the local level in many areas, which coupled with other survey results, suggest that declines may have occurred more broadly" (Service 2010b). Other sources indicate that local declines are continuing to occur. For example, surveyors found "lots of dead [desert tortoises]" in the western expansion area of Fort Irwin (Western Mojave Recovery Unit) in 2008 (Fort Irwin Research Coordination Meeting 2008). After the onset of translocation, coyotes killed 105 desert tortoises in Fort Irwin's southern translocation area (Western Mojave Recovery Unit); other canids may have been responsible for some of these deaths. Other incidences of predation were recorded throughout the range of the desert tortoise during this time (Esque et al. 2010). Esque et al. (2010) hypothesized that this high rate of predation on desert tortoises was influenced by low population levels of typical prey for coyotes due to drought conditions in previous years. Recent surveys in the Ivanpah Valley (Northeastern Mojave Recovery Unit) for a proposed solar facility detected 31 live desert tortoises and the carcasses of 25 individuals that had been dead less than 4 years (Ironwood 2011); this ratio of carcasses to live individuals over such a short period of time may indicate an abnormally high rate of mortality for a long-lived animal. In summary, the number of desert tortoises range-wide likely decreased substantially from 1976 through 1990 (i.e., when long-term study plots were initiated through the time the desert tortoise was listed as threatened), although we cannot quantify the amount of this decrease. Additionally, more recent data collected from various sources throughout the range of the desert tortoise suggest that local declines continue to occur (e.g., Bureau et al. 2005, Esque et al. 2010).

The distribution of the desert tortoise has not changed substantially since the publication of the original recovery plan in 1994 (Service 2010b) in terms of the overall extent of its range. Prior to 1994, desert tortoises were extirpated from large areas within their distributional limits by urban and agricultural development (e.g., cities of Barstow, Lancaster, Las Vegas, St. George; agricultural areas south of Edwards Air Force Base and east of Barstow), military training (e.g., Fort Irwin, Leach Lake Gunnery Range), and off-road vehicle use (e.g., portions of off-road management areas managed by the Bureau and unauthorized use in areas such as east of California City). Since 1994, urban development around Las Vegas has likely been the largest contributor to habitat loss throughout the range. Desert tortoises have been essentially removed from the 18,197-acre southern expansion area at Fort Irwin (Service 2012b).

The following table depicts acreages of habitat (as modeled by Nussear et al. 2009) within various regions of the desert tortoise's range and of impervious surfaces as of 2006 (Xian et al. 2009). Impervious surfaces include paved and developed areas and other disturbed areas that have zero probability of supporting desert tortoises.

| Regions[1] | Modeled Habitat (acres) | Impervious Surfaces within Modeled Habitat | Percent of Modeled Habitat that is now Impervious |
|---|---|---|---|
| Western Mojave | 7,582,092 | 1,864,214 | 25 |
| Colorado Desert | 4,948,900 | 494,981 | 10 |
| Northeast Mojave | 7,776,934 | 1,173,025 | 15 |
| Upper Virgin River | 232,320 | 80,853 | 35 |
| Total | 20,540,246 | 3,613,052 | 18 |

[1]The regions do not correspond to recovery unit boundaries; we used a more general separation of the range for this illustration.

On an annual basis, the Service produces a report that provides an up-to-date summary of the factors that were responsible for the listing of the species, describes other threats of which we are aware, describes the current population trend of the species, and includes comments of the year's findings. The Service's (2011d) recovery data call report describes the desert tortoise's status as 'declining,' and notes that "(a)nnual range-wide monitoring continues, but the life history of the desert tortoise makes it impossible to detect annual population increases (continued monitoring will provide estimates of moderate- to long-term population trends). Data from the monitoring program do not indicate that numbers of desert tortoises have increased since 2001. The fact that most threats appear to be continuing at generally the same levels suggests that populations are still in decline. Information remains unavailable on whether mitigation of particular threats has been successful."

In conclusion, we have used the 5-year review (Service 2010b), revised recovery plan (Service 2011), and additional information that has become available since these publications to review the reproduction, numbers, and distribution of the desert tortoise. The reproductive capacity of the desert tortoise may be compromised to some degree by the abundance and distribution of invasive weeds across its range; the continued increase in human access across the desert likely continues to facilitate the spread of weeds and further affect the reproductive capacity of the species. Prior to its listing, the number of desert tortoises likely declined range-wide, although we cannot quantify the extent of the decline; since the time of listing, data suggest that declines have occurred in local areas throughout the range. The continued increase in human access across the desert continues to expose more desert tortoises to the potential of being killed by human activities. The distributional limits of the desert tortoise's range have not changed substantially since the issuance of the original recovery plan in 1994; however, desert tortoises have been extirpated from large areas within their range (e.g., Las Vegas, other desert cities). The species' low reproductive rate, the extended time required for young animals to reach breeding age, and the multitude of threats that continue to confront desert tortoises combine to render its recovery a substantial challenge.

Critical Habitat

The Service designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule, published February 8, 1994 (59 Federal Register 5820). Critical habitat is designated by the Service to identify the key biological and physical needs of the species and key areas for recovery and to focus conservation actions on those areas. Critical habitat is

composed of specific geographic areas that contain the biological and physical features essential to the species' conservation and that may require special management considerations or protection. These features, which include space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats, are called the primary constituent elements of critical habitat. The specific primary constituent elements of desert tortoise critical habitat are: 1) sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; 2) sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; 3) suitable substrates for burrowing, nesting, and overwintering; 4) burrows, caliche caves, and other shelter sites; 5) sufficient vegetation for shelter from temperature extremes and predators; and 6) habitat protected from disturbance and human-caused mortality.

Critical habitat of the desert tortoise would not be able to fulfill its conservation role without each of the primary constituent elements being functional. As examples, having a sufficient amount of forage species is not sufficient if human-caused mortality is excessive; an area with sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow would not support desert tortoises without adequate forage species.

The final rule for designation of critical habitat did not explicitly ascribe specific conservation roles or functions to the various critical habitat units. Rather, it refers to the strategy of establishing recovery units and desert wildlife management areas recommended by the recovery plan for the desert tortoise, which had been published as a draft at the time of the designation of critical habitat, to capture the "biotic and abiotic variability found in desert tortoise habitat" (59 Federal Register 5820, see page 5823). Specifically, we designated the critical habitat units to follow the direction provided by the draft recovery plan (Service 1994) for the establishment of desert wildlife management areas. The critical habitat units in aggregate are intended to protect the variability that occurs across the large range of the desert tortoise; the loss of any specific unit would compromise the ability of critical habitat as a whole to serve its intended function and conservation role.

Despite the fact that desert tortoises are not required to move between critical habitat units to complete their life histories, both the original and revised recovery plans highlight the importance of these critical habitat units and connectivity between them for the recovery of the species. Specifically, the revised recovery plan states that "aggressive management as generally recommended in the 1994 Recovery Plan needs to be applied within existing (desert) tortoise conservation areas (defined as critical habitat, among other areas being managed for the conservation of desert tortoises) or other important areas ... to ensure that populations remain distributed throughout the species' range .... (Desert tortoise) conservation areas capture the diversity of the Mojave population of the desert tortoise within each recovery unit, conserving the genetic breadth of the species, providing a margin of safety for the species to withstand catastrophic events, and providing potential opportunities for continued evolution and adaptive change .... Especially given uncertainties related to the effects of climate change on desert tortoise populations and distribution, we consider (desert) tortoise conservation areas to be the minimum baseline within which to focus our recovery efforts (pages 34 and 35, Service 2011a)."

We did not designate the Desert Tortoise Natural Area and Joshua Tree National Park in California and the Desert National Wildlife Refuge in Nevada as critical habitat because they are "primarily managed as natural ecosystems" (59 Federal Register 5820, see page 5825) and provide adequate protection to desert tortoises. Since the designation of critical habitat, Congress increased the size of Joshua Tree National Park and created the Mojave National Preserve. A portion of the expanded boundary of Joshua Tree National Park lies within critical habitat of the desert tortoise; portions of other critical habitat units lie within the boundaries of the Mojave National Preserve.

Within each critical habitat unit, both natural and anthropogenic factors affect the function of the primary constituent elements of critical habitat. As an example of a natural factor, in some specific areas within the boundaries of critical habitat, such as within and adjacent to dry lakes, some of the primary constituent elements are naturally absent because the substrate is extremely silty; desert tortoises do not normally reside in such areas. Comparing the model of desert tortoise habitat developed by Nussear et al. (2009) to the gross acreages of the critical habitat units demonstrates quantitatively that the entire area within the boundaries of critical habitat likely does not support the primary constituent elements. As an example, the following table demonstrates this information; the acreage for modeled habitat is for the area in which the probability that desert tortoises are present is greater than 0.5. The acreages of modeled habitat are from Service (2010a); they do not include loss of habitat due to human-caused impacts.

| **Critical Habitat Unit** | **Gross Acreage** | **Modeled Habitat** |
|---|---|---|
| Superior-Cronese | 766,900 | 724,967 |
| Fremont-Kramer | 518,000 | 501,095 |
| Ord-Rodman | 253,200 | 184,155 |
| Pinto Mountain | 171,700 | 144,056 |
| Piute-Eldorado | 970,600 | 930,008 |
| Ivanpah Valley | 632,400 | 510,711 |
| Chuckwalla | 1,020,600 | 809,319 |
| Chemehuevi | 937,400 | 914,505 |
| Gold Butte-Pakoon | 488,300 | 418,189 |
| Mormon Mesa | 427,900 | 407,041 |
| Beaver Dam Slope | 204,600 | 202,499 |
| Upper Virgin River | 54,600 | 46,441 |
| **Totals** | 6,446,200 | 5,792,986 |

*Condition of the Primary Constituent Elements of Critical Habitat*

Human activities can have obvious or more subtle effects on the primary constituent elements. The grading of an area and subsequent construction of a building removes the primary constituent elements of critical habitat; this action has an obvious effect on critical habitat. The revised recovery plan identifies human activities such as urbanization and the proliferation of roads and highways as threats to the desert tortoise and its habitat; these threats are examples of activities that have a clear impact on the primary constituent elements of critical habitat.

We have included the following paragraphs from the revised recovery plan for the desert tortoise (Service 2011) to demonstrate that other anthropogenic factors affect the primary constituent

elements of critical habitat in more subtle ways. All references are in the revised recovery plan (i.e., in Service 2011); we have omitted some information from the revised recovery plan where the level of detail was unnecessary for the current discussion.

> Surface disturbance from OHV activity can cause erosion and large amounts of dust to be discharged into the air. Recent studies on surface dust impacts on gas exchanges in Mojave Desert shrubs showed that plants encrusted by dust have reduced photosynthesis and decreased water-use efficiency, which may decrease primary production during seasons when photosynthesis occurs (Sharifi et al. 1997). Sharifi et al. (1997) also showed reduction in maximum leaf conductance, transpiration, and water-use efficiency due to dust. Leaf and stem temperatures were also shown to be higher in plants with leaf-surface dust. These effects may also impact desert annuals, an important food source for [desert] tortoises.
>
> OHV activity can also disturb fragile cyanobacterial-lichen soil crusts, a dominant source of nitrogen in desert ecosystems (Belnap 1996). Belnap (1996) showed that anthropogenic surface disturbances may have serious implications for nitrogen budgets in cold desert ecosystems, and this may also hold true for the hot deserts that [desert] tortoises occupy. Soil crusts also appear to be an important source of water for plants, as crusts were shown to have 53 percent greater volumetric water content than bare soils during the late fall when winter annuals are becoming established (DeFalco et al. 2001). DeFalco et al. (2001) found that non-native plant species comprised greater shoot biomass on crusted soils than native species, which demonstrates their ability to exploit available nutrient and water resources. Once the soil crusts are disturbed, non-native plants may colonize, become established, and out-compete native perennial and annual plant species (DeFalco et al. 2001, D'Antonio and Vitousek 1992). Invasion of non-native plants can affect the quality and quantity of plant foods available to desert tortoises. Increased presence of invasive plants can also contribute to increased fire frequency.
>
> Proliferation of invasive plants is increasing in the Mojave and Sonoran deserts and is recognized as a significant threat to desert tortoise habitat. Many species of non-native plants from Europe and Asia have become common to abundant in some areas, particularly where disturbance has occurred and is ongoing. As non-native plant species become established, native perennial and annual plant species may decrease, diminish, or die out (D'Antonio and Vitousek 1992). Land managers and field scientists identified 116 species of non-native plants in the Mojave and Colorado deserts (Brooks and Esque 2002).
>
> Increased levels of atmospheric pollution and nitrogen deposition related to increased human presence and combustion of fossil fuels can cause increased levels of soil nitrogen, which in turn may result in significant changes in plant communities (Aber et al. 1989). Many of the non-native annual plant taxa in the Mojave region evolved in more fertile Mediterranean regions and benefit from increased levels of soil nitrogen, which gives them a competitive edge over native annuals. Studies at three sites within the central, southern, and western Mojave Desert indicated that increased levels of soil nitrogen can increase the dominance of non-native annual plants and promote the invasion of new species in desert regions. Furthermore, increased dominance by non-native annuals may decrease the diversity of native annual plants,

> and increased biomass of non-native annual grasses may increase fire frequency (Brooks 2003).

This summary from the revised recovery plan (Service 2011) demonstrates how the effects of human activities on habitat of the desert tortoise are interconnected. In general, surface disturbance causes increased rates of erosion and generation of dust. Increased erosion alters additional habitat outside of the area directly affected by altering the nature of the substrate, removing shrubs, and possibly destroying burrows and other shelter sites. Increased dust affects photosynthesis in the plants that provide cover and forage to desert tortoises. Disturbed substrates and increased atmospheric nitrogen enhance the likelihood that invasive species will become established and outcompete native species; the proliferation of weedy species increases the risk of large-scale fires, which further move habitat conditions away from those that are favorable to desert tortoises. The following paragraphs generally describe how the primary constituent elements are affected by the threats described in the revised recovery plan.

Sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow. Urban and agricultural development, concentrated use by off-road vehicles, and other activities of this nature completely remove habitat. Although we are aware of local areas within the boundaries of critical habitat that have been heavily disturbed by the unauthorized use of such activities, we do not know of any areas that have been disturbed to the intensity and extent that this primary constituent element has been compromised. To date, the largest losses of critical habitat are likely the result of the widening of existing freeways. Despite these losses of critical habitat, which occur in a linear manner, the critical habitat units continue to support sufficient space to support viable populations within each of the six recovery units.

In some cases, major roads likely disrupt the movement, dispersal, and gene flow of desert tortoises. State Route (SR) 58 and SR 395 in the Fremont-Kramer Critical Habitat Unit and Fort Irwin Road in the Superior-Cronese Critical Habitat Unit are examples of large and heavily travelled roads that likely disrupt movement, dispersal, and gene flow. Roads that have been fenced and provided with underpasses may alleviate this fragmentation to some degree; however, such facilities have not been in place for sufficient time to determine whether they would eliminate this effect.

The threats of invasive plant species described in the revised recovery plan generally do not result in the removal of this primary constituent element because they do not convert habitat into impervious surfaces, such as urban development would.

Sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species. This primary constituent element addresses the ability of critical habitat to provide adequate nutrition to desert tortoises. As described in the revised recovery plan and 5-year review, grazing, historical fire, invasive plants, altered hydrology, drought, wildfire potential, fugitive dust, and climate change/temperature extremes contribute to the stress of "nutritional compromise." Paved and unpaved roads through critical habitat of the desert tortoise provide avenues by which invasive native species disperse; these legal routes also provide the means by which unauthorized use occurs over large areas of critical habitat. Nitrogen deposition

from atmospheric pollution likely occurs throughout all the critical habitat units and exacerbates the effects of the disturbance of substrates. Because paved and unpaved roads are so widespread through critical habitat, we expect that this threat has, to some degree, compromised the conservation value and function of critical habitat throughout the range of the desert tortoise. Appendix 2 depicts the routes by which invasive weeds have access to critical habitat; we expect that the routes shown on this map are a subset of the actual number of routes that actually cross critical habitat of the desert tortoise.

Suitable substrates for burrowing, nesting, and overwintering. Surface disturbance, motor vehicles traveling off route, use of OHV management areas, OHV events, unpaved roads, grazing, historical fire, wildfire potential, altered hydrology, and climate change leading to shifts in habitat composition and location, storms, and flooding can alter substrates to the extent that they are no longer suitable for burrowing, nesting, and overwintering; erosion caused by these activities can alter washes to the extent that desert tortoise burrows placed along the edge of a wash, which is a preferred location for burrows, could be destroyed. We expect that the area within critical habitat that is affected by off-road vehicle use to the extent that substrates are no longer suitable is relatively small in relation to the area that desert tortoises have available for burrowing, nesting, and overwintering; consequently, we expect that off-road vehicle use does not have a substantial effect on this primary constituent element.

Most livestock allotments have been eliminated from within the boundaries of critical habitat. Additionally, we expect that livestock would compact substrates to the extent that they would become unsuitable for burrowing, nesting, and overwintering only in areas of concentrated use, such as around watering areas and corrals. Because livestock grazing occurs over a relatively small portion of critical habitat and the substrates in most areas within livestock allotments would not be substantially affected, we expect that suitable substrates for burrowing, nesting, and overwintering remain throughout most of the critical habitat units.

Burrows, caliche caves, and other shelter sites. We expect that human-caused effects to burrows, caliche caves, and other shelter sites likely occur at a similar rate as effects to substrates for burrowing, nesting, and overwintering for the same general reasons. Consequently, we expect that sufficient burrows, caliche caves, and other shelter sites remain throughout most of the critical habitat units.

Sufficient vegetation for shelter from temperature extremes and predators. In general, sufficient vegetation for shelter from temperature extremes and predators remains throughout critical habitat. In areas where large fires have occurred in critical habitat, many of the shrubs that provide shelter from temperature extremes and predators have been destroyed; in such areas, cover sites may be a limiting factor. The proliferation of invasive plants poses a threat to shrub cover throughout critical habitat as the potential for larger wildfires increases.

In 2005, wildfires in Nevada, Utah, and Arizona burned extensive areas of critical habitat (Service 2010a). Although different agencies report slightly different acreages, the following table provides an indication of the scale of the fires.

| Critical Habitat Unit | Total Area Burned (acres) | Percent of the Critical Habitat Unit Burned |
|---|---|---|
| Beaver Dam Slope | 53,528 | 26 |
| Gold-Butte Pakoon | 65,339 | 13 |
| Mormon Mesa | 12,952 | 3 |
| Upper Virgin River | 10,557 | 19 |

The revised recovery plan notes that the fires caused statistically significant losses of perennial plant cover, although patches of unburned shrubs remained. Given the patchiness with which the primary constituent elements of critical habitat are distributed across the critical habitat units and the varying intensity of the wildfires, we cannot quantify precisely the extent to which these fires disrupted the function and value of the critical habitat.

Habitat protected from disturbance and human-caused mortality. In general, the Federal agencies that manage lands within the boundaries of critical habitat have adopted land management plans that include implementation of some or all of the recommendations contained in the original recovery plan for the desert tortoise. (See pages 70 to 72 of Service 2010a.) To at least some degree, the adoption of these plans has resulted in the implementation of management actions that are likely to reduce the disturbance and human-caused mortality of desert tortoises. For example, these plans resulted in the designation of open routes of travel and the legal closure (and, in some cases, physical closure) of unauthorized routes. Numerous livestock allotments have been relinquished by the permittees and retired by the Bureau and National Park Service. As a result of planning efforts, the Bureau's record of decision included direction to withdraw areas of critical habitat from mineral entry. As a result of actions on the part of various agencies, many miles of highways and other paved roads have been fenced to prevent desert tortoises from wandering into traffic and being killed. The Service and other agencies of the Desert Managers Group in California are implementing a plan to remove common ravens that prey on desert tortoises and to undertake other actions that would reduce subsidies (i.e., food, water, sites for nesting, roosting, and perching) that facilitate their abundance in the California desert (Service 2008).

Despite the implementation of these actions, disturbance and human-caused mortality continue to occur in many areas of critical habitat (which overlap the desert wildlife management areas to a large degree and are the management units for which most data are collected) to the extent that the conservation value and function of critical habitat is, to some degree, compromised. For example, many highways and other paved roads in California remain unfenced. Twelve desert tortoises have been reported to be killed on paved roads from within Mojave National Preserve in 2011; we fully expect that desert tortoises are being killed at similar rates on many other roads, although these occurrences are not discovered and reported as diligently as by the National Park Service. Employees of the Southern California Gas Company reported two desert tortoises in 2011 that were crushed by vehicles on unpaved roads.

Unauthorized off-road vehicle use continues to disturb habitat and result in cleared areas within the boundaries of critical habitat (e.g., Coolgardie Mesa in the Western Mojave Recovery Unit); although we have not documented the death of desert tortoises as a result of this activity, it likely occurs. Additionally, the habitat disturbance caused by this illegal activity exacerbates the spread

of invasive plants, which displace native plants that are important forage for the desert tortoise, thereby increasing the physiological stress faced by desert tortoises.

Although the Bureau has approved through its land use planning processes the withdrawal of areas of critical habitat from mineral entry, the Bureau has not undertaken the administrative procedures to complete withdrawals in all areas. Absent this withdrawal, new mining claims can be filed and further disturbance of critical habitat would likely occur.

Finally, the Bureau has not allowed the development of solar power plants within the boundaries of its desert wildlife management areas, which largely correspond to the boundaries of critical habitat. Conversely, the Bureau is considering the approval of at least one wind energy facility within critical habitat, while the County of San Bernardino is also circulating planning documents for the construction and operation of at least two such facilities within the boundaries of the Superior-Cronese Critical Habitat Unit.

*Summary of the Status of Critical Habitat of the Desert Tortoise*

As noted in the revised recovery plan for the desert tortoise and 5-year review (Service 2011a, 2010a), critical habitat of the desert tortoise is subject to landscape level impacts in addition to the site-specific effects of individual human activities. On the landscape level, atmospheric pollution is increasing the level of nitrogen in desert substrates; the increased nitrogen exacerbates the spread of invasive plants, which out compete the native plants necessary for desert tortoises to survive. As invasive plants increase in abundance, the threat of large wildfires increases; wildfires have the potential to convert the shrubland-native annual plant communities upon which desert tortoises depend to a community with fewer shrubs and more invasive plants. In such a community, shelter and forage would be more difficult for desert tortoises to find.

Invasive plants likely have already compromised the conservation value and function of critical habitat to some degree with regard to the second primary constituent element (i.e., sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species). These effects likely extend to the entirety of critical habitat, given the numerous routes by which invasive plants can access critical habitat and the large spatial extent that is subject to nitrogen from atmospheric pollution. Appendix 2 demonstrates the extent of the threat of invasive plants; Appendix 3 illustrates the 12 critical habitat units of the desert tortoise and the aggregate stress that multiple threats, including invasive plants, place on critical habitat.

We also expect that critical habitat has also been compromised to some degree with regard to the last primary constituent element (i.e., habitat protected from disturbance and human-caused mortality) as a result of the wide variety of human activities that continues to occur within its boundaries. These effects result from the implementation of discrete human activities and are thus more site-specific in nature.

Although the remaining primary constituent elements have been affected to some degree by human activities, we expect that these impacts have not, to date, substantially compromised the conservation value and function of the critical habitat units. We have reached this conclusion

primarily because we expect the impacts to be more localized and thus not affect the conservation value and function over large areas of critical habitat.

Land managers have undertaken actions to improve the status of critical habitat. For example, as part of its efforts to offset the effects of the use of additional training maneuver lands at Fort Irwin (Service 2004), the Army acquired the private interests in the Harper Lake and Cronese Lakes allotments, which are located within critical habitat in the Western Mojave Recovery Unit; as a result, cattle have been removed from these allotments. (On April 20, 1994, the Service issued a biological opinion that evaluated the effects of cattle grazing on critical habitat of the desert tortoise, which had recently been designated; the Service concluded that the Bureau's rangewide cattle grazing program was not likely to adversely modify critical habitat of the desert tortoise (Service 1994). Numerous other allotments have been retired through various means throughout the range of the desert tortoise. The retirement of allotments assisted in the recovery of the species by eliminating disturbance to the primary constituent elements of critical habitat by cattle and range improvements.

## ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) of the Act define the "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 C.F.R. 402.02). For the purposes of this biological opinion, we consider the action area to include the areas within Caltrans' ROW along the State highway system, within the range of the desert tortoise in California under the jurisdictions of the VFWO and PSFWO that are not included in approved habitat conservation plans. The action area also includes a minimal amount of desert tortoise habitat that would be disturbed during seismic testing conducted outside Caltrans ROW and during minor improvements (e.g., fence maintenance) to existing State points of entry.

The action area includes the acres in the counties indicated in Table 1 below, along with the specific acreage in each county in the action area. The acres that are included in Table 1 comprise the action area except for the small amount of habitat that would be disturbed by seismic testing.

The total acres in each county are divided between those acres that are within critical habitat for the desert tortoise, and those acres that are not within designated critical habitat, but are still within the range of the desert tortoise.

| County | Acres in Critical Habitat | Acres outside Critical Habitat | Caltrans District |
|---|---|---|---|
| Kern | 145 | 1,030 | 6 |
| Los Angeles | 0 | 242 | 7 |
| San Bernardino | 1,485 | 1,062 | 8 |
| Riverside | 242 | 150 | 8 |
| Inyo | 0 | 678 | 9 |
| Imperial | 747 | 96 | 11 |
| Total acres | 2,619 | 3,258 | |

**Status of the Desert Tortoise in the Action Area**

Caltrans did not conduct surveys for desert tortoises within the action area because the specific projects they may conduct under the auspices of this biological opinion have not been identified. However, research has shown that the density of desert tortoises is lower adjacent to existing roads than in more isolated areas (Nicholson 1978, Boarman and Sazakai 1996, von Seckendorff Hoff and Marlow 2002). Although we know that desert tortoises are frequently struck by vehicles and killed when they attempt to cross roads, we do not know if this mortality is solely responsible for the lowered density; poaching, habitat degradation, and noise from vehicle traffic may also be factors. Also, the quality of desert tortoise habitat adjacent to existing roads is often degraded as a result of non-native plant species and frequent disturbance of substrates resulting from the use of the roads. Therefore, because the action area includes previously disturbed areas near existing structures and the ROW along the State Highway system, we expect the action area to support lower densities of desert tortoises than adjacent areas outside of the ultimate ROW.

**Status of Critical Habitat in the Action Area**

Because of the nature of this consultation, Caltrans did not conduct surveys to assess the condition of the primary constituent elements of critical habitat within the action area. We assume that roadways (and the appurtenant ROW) that existed prior to the critical habitat designation have been degraded to some degree, and that existing ROW are not in pristine condition. Therefore, based upon our general knowledge of critical habitat in the vicinity of roads, we provide the following assessment of the likely condition of each primary constituent element adjacent to roadways within the action area:

Sufficient Space to Support Viable Populations Within Each of the Six Recovery Units and to Provide for Movement, Dispersal, and Gene Flow. All of the actions that would occur under the auspices of this consultation are likely to be located in the immediate vicinity of roadways; the vast majority would be within Caltrans' ROW. This area comprises a small portion of the critical habitat units in the action area. They are also linear segments of the critical habitat units, with a large edge-to-area ratio; such configuration is the least desirable from the perspective of establishing reserve areas. For these reasons, the areas where projects will occur currently do not support sufficient space to support viable populations; they are also not configured appropriately for the purposes of conservation.
Many of the roadways within the action area support volumes of traffic that likely prevent most desert tortoises from crossing them. In these cases, the existing road likely precludes movement, dispersal, and gene flow of desert tortoises. Portions of a few roads, such as SR 58 and Interstate 15, have been fenced to preclude entry by desert tortoises; desert tortoises can use culverts and undercrossings to move from one side of the road to the other.

Sufficient Quality and Quantity of Forage Species and the Proper Soil Conditions to Provide for the Growth of these Species. In the immediate vicinity of highly traveled roads, we expect that the quality and quantity of forage species have been substantially diminished due to routine use by vehicles and maintenance activities; we also expect that soil conditions have been highly altered by the frequent use. The condition of the habitat generally improves as distance from the road

increases; we expect this factor to hold for this and the remaining primary constituent elements of critical habitat.

Suitable Substrates for Burrowing, Nesting, and Overwintering. In general, roads will affect the ability of substrates to support burrowing, nesting, and overwintering in the same manner discussed in the previous paragraph. Shelter sites may be more abundant closer to roads in areas where rugged terrain precludes use and maintenance of roadside areas.

Burrows, Caliche Caves, and Other Shelter Sites. Again, roads will affect the ability of the area to support burrows, caliche caves, and other shelter sites; high levels of disturbance will generally eliminate these sites in most substrates. Burrows, caliche caves, and other shelter sites may be more abundant closer to roads in areas where rugged terrain precludes use and maintenance of roadside areas.

Sufficient Vegetation for Shelter from Temperature Extremes and Predators. The use and maintenance of roads generally results in the degradation of shrubs adjacent to heavily used roads. In some cases, such as where large scale road construction projects have occurred, shrubby vegetation has been completely removed and is highly unlikely to return.

Habitat Protected from Disturbance and Human-Caused Mortality. Roads can be a constant source of disturbance and human-caused mortality of desert tortoises in an area. Disturbance occurs as a result of general use, maintenance, and vehicle-related fires. Desert tortoises are crushed by vehicles that are using the roads; roads also serve as access to others who collect desert tortoises illegally. In general, habitat is not well protected from disturbance and human-caused mortality along roads. Fencing seems to reduce the incidence of mortality associated with road-killed desert tortoises.

In general, the condition of the primary constituent elements of critical habitat improves as the distance from a road increases because the amount of disturbance associated with the road decreases. Primary constituent elements adjacent to roads that do not receive heavy traffic and extensive maintenance generally are more capable of supporting the conservation functions because of the decreased amount of disturbance.

## EFFECTS OF THE ACTION

Effects to the desert tortoise from the construction and maintenance activities being considered in this biological opinion include injury or mortality during construction, movement of desert tortoises out of harm's way, and predation by common ravens and other predators attracted to the construction sites. We did not analyze the effects of the existing roads themselves on the desert tortoise.

### Injury or Mortality During Construction

Desert tortoises may be injured or killed by vehicles that strike individuals, bury occupied burrows, or trap desert tortoises in steep-sided excavations left as a result of work activities.

However, Caltrans will install desert tortoise exclusion fencing around each construction site and conduct a clearance survey to collect and move all desert tortoises found to suitable nearby habitat. Caltrans will employ only qualified biologists to conduct these surveys. For this reason, we anticipate that construction is unlikely to kill larger desert tortoises. Some potential always exists that surveyors may miss an individual during initial surveys or a desert tortoise may enter a work site through a temporary breach in the fence; in such instances, work activities could kill or injure it. Juvenile desert tortoises and eggs are difficult to detect during surveys; therefore, the potential exists that surveyors may miss them and they may remain in the work areas during construction. Because desert tortoise densities are generally lower adjacent to roads (Nicholson 1978, Boarman and Sazakai 1996, von Seckendorff Hoff and Marlow 2002), we assume few desert tortoises will occur in the action area (generally within ROW) and that even fewer are likely to avoid detection during surveys.

Construction noise has the potential to adversely affect the desert tortoise. The recovery plan notes that loud noises (and associated vibrations) may damage the hearing apparatus of desert tortoises (Service 1994). Such an injury could result in their being unable to communicate with other desert tortoises or unable to hear predators. The loss of the ability to communicate could affect reproductive efforts. The loss in the ability to hear predators could result in direct mortality. To avoid and minimize noise impacts, desert tortoises will be moved from project action areas, particularly areas where blasting will occur. In addition, desert tortoises within proximity of the blasting area will be relocated and burrows within the blast zone may be covered to reduce impacts from flying debris.

Capture and Removal of Desert Tortoises from the Project Sites

Caltrans will collect all desert tortoises observed within each project site during pre-project clearance surveys and move them into adjacent suitable habitat. We cannot predict how many desert tortoises would be removed during clearance surveys. However, as we discussed in the previous section, we anticipate few desert tortoises will occur in the action area due to its proximity to existing roadways, therefore, we expect that few would need to be captured and relocated.

Some potential exists that capturing desert tortoises may cause elevated levels of stress that may render these animals more susceptible to disease. Because Caltrans will use experienced biologists approved by the Service and approved handling techniques, collected desert tortoises are unlikely to suffer substantially elevated stress levels.

The translocation of any desert tortoises from the project area into surrounding habitat may disrupt the behavior and social structure of resident animals. However, because the action area considered in this biological opinion consists of the ROW along existing roadways and small isolated areas outside of the ROW where seismic testing or improvements to State Ports of Entry may be located, the action area will be linear and generally less than 100 feet wide at any given location. Those areas that may be affected by seismic work or improvements to State Points of Entry, outside the ROW, will be relatively small and inconsequential, and in close proximity to existing roadways, or other developed areas, where habitat is degraded. For this reason, projects are unlikely to affect

the entire home range of any desert tortoise. Therefore, desert tortoises are likely to be moved within their own home ranges where little threat exists that relocation will disrupt the behavior and social structure of other resident animals.

Relocated desert tortoises may attempt to travel back to the area from which they were collected. This effort could result in the desert tortoise moving into an active construction area where the likelihood of being injured or killed is greater. The relocated desert tortoise could also move around an exclusion fence and ultimately onto a roadway where it could be struck by motor vehicles or collected by passersby. Relocated adult desert tortoises may continue to disperse and never establish a territory resulting in no reproductive effort and the loss of offspring to maintain population viability. Because we anticipate most, if not all, desert tortoises would be moved a short distance within their home ranges, we do not expect them to try and return to the collection site or continue to disperse.

Predation

Human activities often attract predators of the desert tortoise such as the common raven and coyote. To avoid and minimize adverse effects from predators, employees at construction sites will remove all food related trash from the work site on a daily basis. This measure should greatly reduce the likelihood the predators will be attracted to work sites. Compliance with this measure will be monitored by the resident engineer and biologist(s) authorized to work on the project.

**Effects on Critical Habitat**

The roadways and State Ports of Entry that would be improved now exist. Improvements would occur within the ROW and in some other small areas outside of the ROW. Caltrans has proposed to reinitiate consultation if more than 5 acres located outside of the ultimate ROW containing the primary constituent elements of critical habitat of the desert tortoise are adversely affected on a long-term basis within each critical habitat unit considered in this biological opinion, in any calendar year. Five acres is an inconsequential amount of critical habitat that may be lost as a result of the proposed action in comparison with the amount of critical habitat that would still be available for desert tortoises within the affected critical habitat units. Additionally, because of the nature of the actions that would be implemented under the provisions of this consultation, the five acres will be scattered throughout the action area; under this scenario, the effects of the loss of these relatively small areas of critical habitat on any given critical habitat unit would be insignificant.

Furthermore, as we discussed in the Environmental Baseline - Status of Critical Habitat in the Action Area section of this biological opinion, the action area will generally occur in highly degraded areas of low habitat value to the desert tortoise because of disturbance associated with use and maintenance of the road. For example, with regard to "sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow" (the first primary constituent element), the areas adjacent to roads where work would occur would generally be linear in shape and small in size relative to the amount of habitat needed to conserve desert tortoises; additionally, the existing road may already prevent movement, dispersal,

and gene flow to a large degree. Thus, any effects to this primary constituent element would not be measurable when considered in light of the existing conditions and in comparison with the general sizes of the critical habitat units. (For example, the Pinto Mountain Critical Habitat Unit, at approximately 171,700 acres, is the smallest critical habitat unit in the action area. Even if the entire Caltrans right-of-way along SR 62 that intersected the Pinto Mountain Critical Habitat Unit was disturbed [i.e., approximately 200 feet wide by 50 miles], only approximately 0.7 percent of the critical habitat unit would be affected.)

The second through fifth primary constituent elements (sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators) relate to very specific biological and physical attributes of critical habitat. Again, as we discussed in the Environmental Baseline - Status of Critical Habitat in the Action Area section of this biological opinion, routine use and maintenance of roads generally degrade the quality of these primary constituent elements in the area adjacent to the roadway. Generally, the amount of degradation decreases with distance from the road and is less intense along less heavily used roads. As we discussed in the previous paragraph, the amount of the primary constituent elements that may be disturbed in the action area would constitute, at most, a very small fraction of the critical habitat within the action area.

The final primary constituent element, habitat protected from disturbance and human-caused mortality, is generally absent from areas adjacent to roads. As in the other primary constituent elements, the quality of the critical habitat in this regard increases as the distance from the roadway increases.

In summary, the conservation function of the critical habitat units will not be impaired in any measurable manner by the proposed action, primarily because the amount of disturbance would be relatively minor, compared to the sizes of the critical habitat units in the action area. Furthermore, large, intact blocks of critical habitat would not be affected by the proposed highway improvements and small projects because the vast majority of this work will occur in areas that are already substantially degraded due to the presence of existing highways and roads.

## CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this programmatic biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of any non-federal actions that are reasonably certain to occur in the action area. The vast majority of activities that may occur in the ROW would likely be linked to work on the highways and roads, so we expect that most actions in these areas will have some Federal nexus. Outside of the Caltrans ROW but still in the action area, much of the desert tortoise habitat is under the control of the Bureau or other federal agency, so actions in those areas would be subject to section 7 consultation and not part of the cumulative effects.

CONCLUSION

**Desert Tortoise**

After reviewing the current status of the desert tortoise, the environmental baseline for the action area, the effects of the proposed highway small projects and operational improvements, and the cumulative effects, it is the Service's biological opinion that the small projects and operational improvements, as proposed by Caltrans, are not likely to jeopardize the continued existence of the desert tortoise. We have reached this conclusion because:

1. Caltrans has proposed numerous measures to avoid or minimize mortality and injury of desert tortoises during construction;

2. The area to be directly affected constitutes a small portion of the range of the desert tortoise;

3. The habitat that would be adversely affected by the proposed action does not support high densities of desert tortoise due to the presence of existing roadways; and

4. We expect few desert tortoises to be injured or killed.

**Critical Habitat**

After reviewing the current status of the critical habitat of the desert tortoise, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the small projects and operational improvements, as proposed by Caltrans, are not likely to destroy or adversely modify critical habitat of the desert tortoise. We have reached this conclusion because:

1. The proposed actions would occur in areas where the primary constituent elements have been degraded, or are absent, due to the proximity of existing roadways;

2. The amount of critical habitat that would be affected within, and adjacent to the ROWs, is relatively small in comparison with the amount and quality of suitable habitat that would be available for desert tortoises within the remainder of the affected critical habitat units; and

3. Given the condition of the primary constituent elements in the ROW and the quantity of critical habitat that would be affected, the conservation functions of the critical habitat would not be impaired by the proposed actions.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to

harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service as an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The protective measures described in this biological opinion are non-discretionary and must be undertaken by the FHWA and Caltrans or made binding conditions of any grant or permit issued to contractors, as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA and Caltrans have a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA or Caltrans fails to assume and implement the protective measures and terms and conditions or fails to require contractors to adhere to the protective measures and terms and conditions of the incidental take statement through enforceable terms that are added to construction contracts, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the FHWA and Caltrans must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

Because of the limited size of the operational improvements and small projects, the location of most projects in previously disturbed areas, and the measures proposed by the FHWA and Caltrans to avoid or minimize the amount of incidental take, the Service anticipates that the proposed actions are likely to result in few injuries to or mortalities of desert tortoises; however, desert tortoises are mobile, not entirely predictable in their activity patterns, can dig new burrows in previously inspected areas over time, and desert tortoise hatchlings and their burrows are particularly difficult to detect because of their small size. Therefore, we anticipate that some incidental take may occur. We are unable to anticipate precisely the number of desert tortoises that may be killed or injured during small projects and operation improvement activities. Caltrans has proposed to reinitiate consultation if two (2) desert tortoises are injured or killed in any county within the action area in any calendar year or if seven (7) desert tortoises are injured or killed in the action area (regardless of county) in any calendar year. Consequently, we anticipate that the amount of take, in the form of injury or mortality, will not exceed these numbers each year.

Caltrans has also proposed to capture and relocate any desert tortoises found in the action area and in harm's way. All desert tortoises found within the areas proposed for highway improvement or maintenance may be captured and relocated. Based on the disturbed nature of the habitat within the action area and the low density of desert tortoises likely to be found adjacent to roadways (Nicholson 1978, Boarman and Sazakai 1996, von Seckendorff Hoff and Marlow 2002), we assume that few desert tortoises will be relocated. We consider the relocation of desert tortoises

out of harm's way to be an effective way to minimize adverse effect to this species, and any desert tortoises that are relocated will be done so to reduce the potential for injury or mortality. Animals that are relocated will not be counted toward the re-initiation threshold proposed by the Federal Highway Administration and Caltrans.

## REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

Because the protective measures included in the "Description of the Proposed Action" section of this biological opinion were developed in full cooperation by the Service and Caltrans, we have not included any additional reasonable and prudent measures and terms and conditions.

## REPORTING REQUIREMENTS

Pursuant to 50 CFR 402.14(i)(3), Caltrans must report the progress of the action and its impact on the desert tortoise to the Service as specified in this incidental take statement.

By March 1 of every year this biological opinion is in effect, each Caltrans District must submit an annual report to the Fish and Wildlife Service describing the projects conducted under the auspices of this biological opinion during the previous year. The annual report must include information on: the number of desert tortoises injured or killed during work conducted under the auspices of this biological opinion, the location and date those injuries or mortalities occurred, the number of desert tortoise moved out of harm's way, the locations and dates of the relocations, the amount of critical habitat lost or disturbed, and any other relevant information regarding the desert tortoise or its critical habitat. We request that Caltrans provide any recommendations that may increase the level of protection of desert tortoises while not interfering with their ability to implement their proposed actions. Reports may be sent by e-mail to the appropriate contact at the VFWO.

## DISPOSITION OF DEAD OR INJURED DESERT TORTOISES

Caltrans must report dead or injured desert tortoises as described in protective measures 13 through 15.

## CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend Caltrans inspect the site of each activity performed pursuant to this biological opinion for any infestations of the Sahara mustard (*Brassica tournefortii*), and that you notify us if Sahara mustard is found and whether eradication efforts were implemented.

2. We recommend Caltrans continue to construct fences and install underpasses within desert wildlife management areas to keep desert tortoises off of roads while allowing dispersal across roads.

The Service requests notification of the implementation of any conservation recommendations, so we may be kept informed of actions that minimize or avoid adverse effects to or benefit the desert tortoise and its habitat.

REINITIATION NOTICE

This concludes formal consultation on Caltrans' highway maintenance activities and small projects in Imperial, Inyo, Kern, Los Angeles, Riverside, and San Bernardino counties. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this consultation, please contact Carl Benz of the VFWO at (805) 644-1766, ext. 311, or John Taylor of the PSFWO at (760) 322-2070, ext. 218.

Sincerely,

Stephen P. Henry
Acting Field Supervisor
Ventura Fish and Wildlife Office

Jim A. Bartel
Field Supervisor
Carlsbad Fish and Wildlife Office

LITERATURE CITED

Aber, J.d., K.J. Nadelhoffer, P. Steudler, and J.M. Melillio. 1989. Nitrogen saturation in northern forest ecosystems. Bioscience 39:378-386.

Belnap, J. 1996. Soil surface disturbance in cold deserts: effects on nitrogenase activity in cyanonbacterial-lichen soil crusts. Biology and Fertility of Soils 23:362-367.

Boarman, W.I., and M. Sazaki. 1996. Highway mortality in desert tortoises and small vertebrates: success of barrier fences and culverts. Pages 169-173 In Proceedings of the 1978 Symposium: The Desert Tortoise Council.

Brooks, M.L. and T.C. Esque. 2002. Alien plants and fire in desert tortoise (Gopherus agassizii) habitat of the Mojave and Colorado deserts. Chelonian Conservation and Biology 4(2): 330-340.

Brooks, M.L. 2003. Effects of increased soil nitrogen on the dominance of alien annual plants in the Mojave Desert. Journal of Applied Ecology 40:344-353.

Pages 51-74 In Proceedings of the 1976 Symposium, The Desert Tortoise Council.

D'Antonio, C.M. and P.M. Vitousek. 1992. Biological invasion by exotic grasses, the grass/fire cycle, and global change. Annual Review of Ecology and Systematics 23: 63-87.

DeFalco, L.A., J.K. Detling, C.R. Tracy, and S.D. Warren. 2001. Physiological variation among native and exotic winter annual plants associated with microbiotic crusts in the Mojave Desert. Plant and Soil 234:10-14.

Esque, T.C., K.E. Nussear, K.K. Drake, A.D. Walde, K.H. Berry, R.C. Averill-Murray, A.P. Woodman, W.I. Boarman, P.A. Medica, J. Mack, J.S. Heaton. 2010. Effects of subsidized predators, resource variability, and human population density on desert tortoise populations in the Mojave Desert, USA. Endangered Species Research (12) 167-177.

Fort Irwin Research Coordination Meeting. 2008. Meeting notes. Dated October 29.

Ironwood Consulting. 2011. Biological resources technical report – Stateline Solar Farm project, San Bernardino, County, California.

Longshore, K.M., J.R. Jaeger, and J.M. Sappington. 2003. Desert tortoise (*Gopherus agassizii*) survival at two eastern Mojave Desert sites: death by short-term drought? Journal of Herpetology 37(1):169–177.

Nicholson, L. 1978. The effects of roads on desert tortoise populations. Pages 127-129 In Proceedings of the 1978 Symposium, The Desert Tortoise Council.

Nussear, K.E., T.C. Esque, R.D. Inman, L. Gass, K.A. Thomas, C.S.A. Wallace, J.B. Blainey, D.M. Miller, and R.H.Webb. 2009. Modeling habitat of the desert tortoise (*Gopherus agassizii*) in the Mojave and parts of the Sonoran Deserts of California, Nevada, Utah, and Arizona. U.S. Geological Survey Open-File Report 2009-1102.

Oftedal, O.T., S. Hillard, and D.J. Morafka. 2002. Selective spring foraging by juvenile desert tortoises (*Gopherus agassizii*) in the Mojave Desert: Evidence of an adaptive nutritional strategy. Chelonian Conservation and Biology 4:341-352.

Sharifi, M., A.C. Gibson, and P.W. Rundel. 1997. Surface dust impacts on gas exchange in Mojave Desert shrubs. Journal of Applied Ecology 34: 837-846.

Tracy, C.R., R. Averill-Murray, W.I. Boarman, D. Delehanty, J. Heaton, E. McCoy, D. Morafka, K. Nussear, B. Hagerty, and P. Medica. 2004. Desert Tortoise Recovery Plan Assessment. Prepared for the U.S. Fish and Wildlife Service. Reno, Nevada.

U.S. Bureau of Land Management, County of San Bernardino, City of Barstow. 2005. Final environmental impact report and statement for the West Mojave Plan; a habitat conservation plan and California Desert Conservation Area Plan amendment. California Desert District, Moreno Valley, California.

_____. 1994. Desert tortoise (Mojave population) recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon.

_____. 2006. Programmatic Endangered Species Consultation for California Department of Transportation's Small Projects and Highway Operational Improvement Activities in Imperial, Los Angeles, Riverside, Kern, Inyo, and San Bernardino Counties, California (1-6-05-P-3595).

_____. 2008. Environmental assessment to implement a desert tortoise recovery plan task: reduce common raven predation on the desert tortoise. Ventura Fish and Wildlife Office, Ventura, California.

_____. 2010. Desert Tortoise Field Manual. Published on the web at the Ventura Fish and Wildlife Office website : http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/.

_____. 2010a. Mojave population of the desert tortoise (*Gopherus agassizii*) 5-year review: summary and evaluation. Desert Tortoise Recovery Office, Reno, Nevada.

_____. 2010b. Range-wide monitoring of the Mojave population of the desert tortoise: 2010 annual report. Desert Tortoise Recovery Office. Reno, Nevada.

_____. 2010c. Range-wide monitoring of the Mojave population of the desert tortoise: 2008 and 2009 annual report. Desert Tortoise Recovery Office. Reno, Nevada.

_____. 2010d. Biological opinion for the Lucerne Valley Chevron Solar Project, San Bernardino County, California (8-8-10-F-6). Memorandum to Field Manager, Barstow Field Office, Bureau of Land Management, Barstow, California. Dated June 10. From Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California.

_____. 2011a. Revised recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222pp.

_____. 2012a. Re-initiation of consultation for the Calico Solar Project, San Bernardino, California (FWS File #8-8-10-F-34) (CACA-049537, (3031) P, CA-680.33). Dated June 12. Memorandum to Deputy State Director, Bureau of Land Management, Sacramento, California. From Field Supervisor, Ventura Fish and Wildlife Office. Ventura, California.

_____. 2012b. Biological opinion for the proposed addition of maneuver training lands at Fort Irwin, California (8-8-11-F-38R). Letter to Chief of Staff, Headquarters, National Training Center and Fort Irwin, Fort Irwin, California. Dated April 27. From Field Supervisor, Ventura Fish and Wildlife Office. Ventura, California.

von Seckendorff Hoff, K. and R. W. Marlow. 2002. Impacts of vehicle road traffic on desert tortoise populations with consideration of conservation of tortoise habitat in southern Nevada. Chelonian Conservation and Biology 4(2): 449-456.

Xian, G, C, Homer, and J. Fry. 2009. Updating the 2001 National Land Cover Database land cover classification to 2006 by using Landsat imagery change detection methods. Remote Sensing of Environment 113(6):1133-1147.

# APPENDIX 1

Report on Proposed Action to be Covered by the
Programmatic Biological Opinion (8-8-13-F-0279) on
California Department of Transportation's Small Projects and
Operational Improvement Activities in Desert Tortoise Habitat in
Imperial, Riverside, Inyo, Eastern Kern, Los Angeles,
and San Bernardino Counties, California

Name of Project:

Type of Activity:

Location of Activity: Roadway: Begin Milepost: End Milepost:
General Locality:

Map Attached: Yes/No

Timing of project: Start Date: End Date:

Brief description of project:

Conservation measures to be implemented:

Determination (provide rationale for your determination):

No Effect:

May Affect, Not Likely to Adversely Affect:

May Affect, Likely to Adversely Affect