United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
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Ventura, California 93003

IN REPLY REFER TO:
81440-2010-F-0145

February 4, 2011

Charlotte Ely
Project Officer, Region IX
United States Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105-3901

Subject: Biological Opinion on the Joshua Basin Water District, Water Recharge Basin and Pipeline, San Bernardino County, California (8-8-10-F-66)

Dear Ms. Ely:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the U.S. Environmental Protection Agency's proposed funding of the Joshua Basin Water District water recharge basin and pipeline project. This biological opinion analyzes the effects of installing an approximately 32.5-acre recharge basin and 24,000-linear-foot extension of the Morongo Basin Pipeline from its existing terminus on Yucca Mesa Road to the proposed basin on the federally threatened desert tortoise (*Gopherus agassizii*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act). We received your August 18, 2010, request for formal consultation (U.S. Environmental Protection Agency (EPA) 2010) on August 20, 2010.

This biological opinion is based on information in a biological assessment (Circle Mountain Biological Consultants, Inc. 2010), the final environmental impact report for the Recharge Basin Pipeline Project (Joshua Basin Water District 2009a), the mitigation monitoring and reporting program for the Recharge Basin and Pipeline Project report (Joshua Basin Water District 2009b), and our files. A complete record of this consultation can be made available at the Ventura Fish and Wildlife Office.

No desert tortoise critical habitat units exist within or near the project area. The proposed action will not affect critical habitat of the desert tortoise; therefore, we will not discuss critical habitat further in this biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

We summarized the following description of the proposed action from your request for consultation (EPA 2010) and the biological assessment (Circle Mountain Biological Consultants, Inc. 2010). The EPA proposes to provide $300,000 in financial assistance to the Joshua Basin Water District from its Special Appropriation Grant funds for the construction of one recharge basin facility (Recharge Basin Alternative 3) and an extension of the Morongo Basin Pipeline from its existing terminus on the Yucca Mesa Road to the new basin.

Construction of the proposed recharge basin would require 29 acres with 22 acres to be used for water recharge. The facility would involve multiple (up to 6) 6- to 7-foot-deep sub-basins within the recharge basin footprint. Earthen weirs would separate the sub-basins allowing water to flow from sub-basin to sub-basin, as needed. The basins would be gravity-fed with no pumping equipment required.

The proposed pipeline would include up to 24,000 linear-feet of up to 16- to 24-inch-diameter pipe connecting to the existing Morongo Pipeline at Yucca Mesa Road. The pipeline installation would occur within the road rights-of-way, following Yucca Mesa Road south to State Route 62 then eastward along State Route 62 to the recharge basin location. The pipeline will be buried approximately 3 to 4 feet below grade along the northern side of the highway.

The Joshua Basin Water District or its contractors would use standard construction practices and equipment to install the pipeline and recharge basin. The final environmental impact report (Joshua Basin Water District 2009a) contains a complete description of the proposed project.

To minimize adverse effects to the desert tortoise, the Joshua Basin Water District will implement the following protective measures during construction, operation, and maintenance of the pipeline and recharge basin, which we have summarized from the biological assessment (Circle Mountain Biological Consultants, Inc. 2010) and the letter requesting formal consultation (EPA 2010):

1. The Joshua Basin Water District will employ authorized biologists, approved by the Service, and desert tortoise monitors to ensure compliance with protective measures for the desert tortoise. Use of authorized biologists and desert tortoise monitors will be in accordance with the most up-to-date Service guidance and will be required for monitoring of any construction, operation, or maintenance activities that may result in adverse effects to the desert tortoise. The current guidance is entitled *Desert Tortoise – Authorized Biologist and Monitor Responsibilities and Qualifications* (Service 2008a).

2. The Joshua Basin Water District will provide the credentials of all individuals seeking approval as authorized biologists to the EPA. The EPA will review these and provide the

credentials of appropriate individuals to the Service for approval at least 30 days prior to the start of any fieldwork.

3. The Joshua Basin Water District will designate a field contact representative who will oversee compliance with protective measures during construction, operation, and maintenance that may result in adverse effects to desert tortoises. If the field contact representative identifies a violation of the desert tortoise protective measures, they will halt work until the violation is corrected.

4. Individuals approved to handle desert tortoises (i.e., authorized biologists and desert tortoise monitors) will do so in compliance with the most up-to-date guidance from the Service. The Service is currently using the *Desert Tortoise Field Manual* (Service 2009a).

5. The Joshua Basin Water District will develop and implement an environmental awareness program for all workers (construction, operation, and maintenance) that will address the following:

    a. types of work activities that may affect the desert tortoise;

    b. the required protective measures for the desert tortoise;

    c. life history of the desert tortoise relevant to protecting it during project work;

    d. legal protections and penalties; and

    e. reporting requirements.

6. The Joshua Basin Water District will install fencing to preclude entry of desert tortoises into the area of the recharge basin prior to the onset of ground disturbance and remove any desert tortoises from this area prior to construction. Any desert tortoises found within the approximately impact area of the recharge basin will be placed into contiguous areas to the north between the site and the wash, in lands also owned by the Joshua Basin Water District. Placing desert tortoises north of the site rather than south will keep the translocated animal on Joshua Basin Water District-owned lands and will enable the desert tortoise to move into contiguous areas (likely to the east) with which they are already familiar. Desert tortoises translocated out of the project area will be monitored until the authorized biologist determines the animal(s) has been safely removed from harm's way and is exhibiting normal behavior.

7. The Joshua Basin Water District will maintain fencing that meets Service standards around the recharge basin sufficient to exclude desert tortoises from this area until such time that development in the local area has eliminated the likelihood that desert tortoises

would be likely to enter the basin area. When the fence is no longer needed, the Joshua Basin Water District will seek the Service's concurrence prior to removing it.

8. Authorized biologists will remove desert tortoises from work areas for the pipeline immediately prior to the onset of construction or maintenance activities. The authorized biologist will move any desert tortoises encountered during pipeline installation and place them in the direction of their original heading. They will then monitor the desert tortoise until they are satisfied that normal activity is resumed.

9. The Joshua Basin Water District will employ an appropriate number of authorized biologists and desert tortoise monitors to monitor construction, operation, and maintenance that occur in any unfenced work areas. Authorized biologists or desert tortoise monitors will flag all desert tortoise burrows for avoidance in areas adjacent to work areas.

10. The Joshua Basin Water District will confine all construction activities, project vehicles, and equipment within the delineated boundaries of construction areas that authorized biologists or desert tortoise monitors have identified and cleared of desert tortoises. The Joshua Basin Water District will confine all work areas to the smallest practical area, considering topography, placement of facilities, location of burrows, public health and safety, and other limiting factors. The Joshua Basin Water District will use previously disturbed areas to the extent feasible.

11. Any non-emergency expansion of activities into areas outside of the areas considered in the Service's biological opinion will require EPA's approval and desert tortoise clearance surveys. These expanded activities may require re-initiation of consultation with the Service.

12. The Joshua Basin Water District will prohibit project personnel from driving off-road or performing ground-disturbing activities outside of designated areas during construction, operation, or maintenance, except to deal with emergencies.

13. During operation and maintenance activities, the Joshua Basin Water District will confine all vehicle parking, material stockpiles, and construction-related materials to areas previously cleared and fenced by the authorized biologists to ensure desert tortoises are absent.

14. With the exception of security personnel, the Joshua Basin Water District will prohibit firearms on the project site.

15. Project personnel working outside of the fenced area will check under vehicles or equipment before moving them. If a desert tortoise is present under the vehicle, the personnel will contact an authorized biologist or desert tortoise monitor. The desert tortoise will be allowed to move to a safe distance of its own accord prior to moving the

vehicle. Alternatively, an authorized biologist or desert tortoise monitor may move the desert tortoise to a safe location to allow for movement of the vehicle.

16. An authorized biologist or desert tortoise monitor will inspect all excavations that are not within desert tortoise exclusion fencing on a regular basis (several times per day) and immediately prior to filling of the excavation. If project personnel discover a desert tortoise in an open trench, an authorized biologist or desert tortoise monitor will move it to a safe location. The Joshua Basin Water District will cover or temporarily fence excavations that are outside of the permanently fenced project areas at the end of each day to prevent entrapment of desert tortoises during non-work hours.

17. When outside of fenced project areas, project personnel will not move pipes greater than 3 inches in diameter if they are stored less than 8 inches above the ground, until they have inspected the pipes to determine the presence of desert tortoises. As an alternative, the Joshua Basin Water District may cap all such pipes before storing them outside the fenced area.

18. The Joshua Basin Water District will contain all organic and inorganic trash associated with the project in secure, self-closing receptacles to prevent the introduction of subsidized food resources for common ravens (*Corvus corax*).

19. The Joshua Basin Water District will monitor the recharge basin facility to identify frequently used perching, roosting, or nesting locations for common ravens. If it identifies such locations, the Joshua Basin Water District will install bird barrier spikes or another functional equivalent following specific discussion with the Service. If biologists discover evidence of predation by common ravens on desert tortoises during construction or operation of the recharge facility, the Joshua Basin Water District will contact the Common Raven Management Working Group as soon as possible to determine the feasibility of removing these birds. Staff from Wildlife Services, which is an agency of the U.S. Department of Agriculture, would then visit the site, with the Joshua Basin Water District permission, to remove offending birds.

20. To mitigate the effects of the operation of the recharge basin with regard to providing subsidies to common ravens, the Joshua Basin Water District will contribute a one-time fee of $105 per acre for the area of desert tortoise habitat that would be disturbed by development of the recharge basin. At present, the Joshua Basin Water District estimates that approximately 32.5 acres of habitat would be disturbed. The Joshua Basin Water District will adjust the fee accordingly if the area of the basin changes.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that

reasonably would 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 the species (50 Code of Federal Regulations 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which describes the range-wide condition of desert tortoises, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes 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 evaluates the effects of future, non-Federal activities in the action area on the desert tortoise.

In accordance with policy and regulation, we evaluate 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 jeopardize the continued existence of the species by causing an appreciable reduction in the likelihood of both the survival and recovery of the desert tortoise in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the desert tortoise and the role of the action area in the survival and recovery of the desert tortoise as the context for evaluation of the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

STATUS OF THE DESERT TORTOISE

Basic Ecology

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote (*Larrea tridentata*), shadscale (*Atriplex confertifolia*), and Joshua tree (*Yucca brevifolia*) series of Mojave Desert scrub, and the Lower Colorado River Valley subdivision of Sonoran Desert scrub. Optimal habitat has been characterized as creosote bush scrub in areas where precipitation ranges from 2 to 8 inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally occur in windblown sand or in rocky terrain (Luckenbach 1982). Desert tortoises occur in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 feet to 3,000 feet (Luckenbach

1982, Schamberger and Turner 1986). Recent range-wide monitoring efforts have consistently documented desert tortoises above 3,000 feet (Service 2006).

Desert tortoises may spend more time in washes than in flat areas outside of washes. Jennings (1997) notes that, between 1 March and 30 April, desert tortoises "spent a disproportionately longer time within hill and washlet strata" and, from 1May through 31 May, hills, washlets, and washes "continued to be important." Jennings' paper does not differentiate between the time desert tortoises spent in hilly areas versus washes and washlets; however, he notes that, although washes and washlets comprised only 10.3 percent of the study area, more than 25 percent of the plant species on which desert tortoises fed were located in these areas. Luckenbach (1982) states that the "banks and berms of washes are preferred places for burrows." He also recounts an incident in which a flash flood killed 15 desert tortoises along 0.12 miles of wash.

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rainstorms. Desert tortoises spend most of their time during the remainder of the year in burrows, escaping the extreme conditions of the desert; however, recent work has demonstrated that they can be active at any time of the year. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and Service (1994).

Food resources for desert tortoises are dependent on the availability and nutritional quality of annual and perennial vegetation, that climatic factors, such as the timing and amount of rainfall, temperatures, and wind may influence (Beatley 1969 and 1974, Congdon 1989, Karasov 1989, Polis 1991 (all in Avery 1998)). In the Mojave Desert, these climatic factors are highly variable and this variability can limit the desert tortoise's food resources.

Desert tortoises will eat many species of plants. However, at any time, most of their diet consists of a few species (Nagy and Medica 1986, Jennings 1993 (all in Avery 1998)). Additionally, their preferences can change during the course of a season (Avery 1998) and over several seasons (Esque 1994 in Avery 1998). Possible reasons for desert tortoises to alter their preferences may include changes in nutrient concentrations in plant species, the availability of plants, and the nutrient requirements of individual animals (Avery 1998). In Avery's (1998) study in the Ivanpah Valley, desert tortoises consumed primarily green annual plants in spring and they ate cacti and herbaceous perennials once the winter annuals began to disappear. Medica et al. (1982 in Avery 1998) found that desert tortoises ate increased amounts of green perennial grass when winter annuals were sparse or unavailable. Avery (1998) also found that desert tortoises rarely ate perennial grasses.

Desert tortoises can produce from one to three clutches of eggs per year. On rare occasions, clutches can contain up to 15 eggs. Most clutches contain three to seven eggs. Multi-decade studies of the Blanding's turtle (*Emydoidea blandingii*), that, like the desert tortoise, is long lived and matures late, indicate that approximately 70 percent of the young animals must survive each

year until they reach adult size. After this time, annual survivorship exceeds 90 percent (Congdon et al. 1993). Research has indicated that 50 to 60 percent of young desert tortoises typically survive from year to year, even in the first and most vulnerable year of life. We do not have sufficient information on the demography of the desert tortoise to determine whether this rate is sufficient to maintain viable populations; however, it does indicate that maintaining favorable habitat conditions for small desert tortoises is crucial for the continued viability of the species.

Desert tortoises typically hatch from late August through early October. At the time of hatching, the desert tortoise has a substantial yolk sac. The yolk can sustain them through the fall and winter months until forage is available in the late winter or early spring; however, neonates will eat if food is available to them at the time of hatching. When food is available, they can reduce their reliance on the yolk sac to conserve this source of nutrition. Neonate desert tortoises use abandoned rodent burrows for daily and winter shelter. These burrows are often shallowly excavated and run parallel to the surface of the ground.

Neonate desert tortoises emerge from their winter burrows as early as late-January to take advantage of freshly germinating annual plants. If appropriate temperatures and rainfall are present, at least some plants will continue to germinate later in the spring. Freshly germinating plants and plant species that remain small throughout their phenological development are important to neonate desert tortoises because their size prohibits access to taller plants. As plants grow taller during the spring, some species become inaccessible to small desert tortoises.

Neonate and juvenile desert tortoises require approximately 12 to 16 percent protein content in their diet for proper growth. Both juvenile and adult desert tortoises seem to forage selectively for particular species of plants with favorable ratios of water, nitrogen (protein), and potassium. The potassium excretion potential model (Oftedal 2001) predicts that, at favorable ratios, the water and nitrogen allow desert tortoises to excrete high concentrations of potentially toxic potassium, which is abundant in many desert plants. Oftedal (2001) also reports that variation in rainfall and temperatures cause the potassium excretion potential index to change annually and during the course of a plant's growing season. Therefore, the changing nutritive quality of plants, combined with their increase in size, further limits the forage available to small desert tortoises to sustain their survival and growth.

In summary, the ecological requirements and behavior of neonate and juvenile desert tortoises are substantially different from those of subadults and adults. Smaller desert tortoises use abandoned rodent burrows, which are typically more fragile than the larger ones constructed by adults, they are active earlier in the season, and small desert tortoises rely on smaller annual plants with greater protein content. The smaller plant size allows them to gain access to food and the higher protein content promotes growth.

Status

The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California. On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 Federal Register 32326). In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 Federal Register 12178).

The Service listed the desert tortoise in response to loss and degradation of habitat caused by numerous human activities including urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The loss of individual desert tortoises to increased predation by common ravens, collection by humans for pets or consumption, collisions with vehicles on paved and unpaved roads, and mortality resulting from diseases also contributed to the Service's listing of this species.

Before entering into a discussion of the status and trends of the desert tortoise in the Western Mojave Recovery Unit where the proposed action is located, a brief discussion of the methods of estimating the numbers of desert tortoises would be useful. Three primary methods have been widely used: permanent study plots, triangular transects, and line-distance sampling. Generally, permanent study plots are areas visited at roughly four-year intervals to determine the numbers of desert tortoises present. Desert tortoises found on these plots during the initial spring surveys are registered. That is, individuals are marked for identification during subsequent surveys. Between 1971 and 1980, 27 plots were established in California to study the desert tortoise. Berry (1999) monitored desert tortoises on fifteen of these plots on a long-term basis. Range-wide, 49 plots were used at one time or another to attempt to monitor desert tortoises (Tracy et al. 2004).

Triangular transects are used to detect sign (i.e., scat, burrows, footprints, etc.) of desert tortoises. The number of sign is then correlated with standard reference sites, such as permanent study plots, to allow the determination of density estimates.

Finally, line-distance sampling involves walking transects while trying to detect live desert tortoises. An estimation of density can be made by measuring the distance of the desert tortoise from the transect centerline, measuring the distance the desert tortoise is observed along the transect length, and calculating the percentage of animals in the area that were likely to be above ground and visible to surveyors during the time the transect was walked. This density is only represents an estimation of the number of desert tortoises that are greater than 180 millimeters in size. Desert tortoises that are larger than this size are typically classified as subadult or adult desert tortoises.

Each of these methods has various strengths and weaknesses. In general, permanent study plots are used to estimate the status of desert tortoises across large areas over time. Triangular transects were used to assess the density of desert tortoises on specific sites at a point in time.

This method was commonly used to determine how many desert tortoises might be affected by a specific proposed action. In 2001, the Service initiated line-distance sampling to estimate the density of desert tortoises in desert wildlife management areas and critical habitat throughout their range.

Note that, when reviewing the information presented in the following sections, determining the number of desert tortoises over large areas is extremely difficult. The report prepared by the Desert Tortoise Recovery Plan Assessment Committee (Tracy et al. 2004) acknowledges this fact. Desert tortoises spend much of their lives underground or concealed under shrubs, are not very active in years of low rainfall, and are distributed over a wide area in several different types of habitat. Other factors, such as the inability to sample on private lands and rugged terrain, further complicate sampling efforts. Consequently, the topic of determining the best way to estimate the abundance of desert tortoises has generated many discussions over the years. Because of this difficulty, we cannot provide concise estimations of the density of desert tortoises in each recovery unit or desert wildlife management area in a consistent manner.

Given the difficulty in determining the density of desert tortoises over large areas, the reader needs to understand that the differences in density estimates in the recovery plan and those derived from subsequent sampling efforts may not accurately reflect on-the-ground conditions. Despite this statement, the reader should also be aware that the absence of live desert tortoises and the presence of carcasses over large areas of some desert wildlife management areas provide at least some evidence that desert tortoise populations seem to be in a downward trend in some regions.

The following paragraphs provide general information on the status and trends of the desert tortoise population in the Western Mojave Recovery Unit, where the proposed action is located. We have not included detailed information on the status of the desert tortoise in the other recovery units throughout the range of the species in this biological opinion. This omission will not compromise the analysis in the biological opinion because our determination regarding whether a proposed action is likely to jeopardize the continued existence of a species must be conducted at the level of the listed taxon. When the range of the listed taxon is divided into recovery units, our level of analysis begins with the recovery unit. If the effects of the proposed action have the potential to compromise the ability of the species to survive and recover within the recovery unit, the next level of analysis considers how the compromised recovery unit would affect the listed taxon throughout its range (Service 2005). Therefore, we conduct our analysis in a comprehensive manner through an iterative process. The Western Mojave Recovery Unit comprises one of six recovery units for the desert tortoise; consequently, our level of analysis in this biological opinion will begin at this level.

The Western Mojave Recovery Unit is located entirely in California, situated west of the Eastern Mojave, Northern Colorado, and Eastern Colorado Recovery Units. Four critical habitat units and four desert wildlife management areas are located within this recovery unit. Tracy et al. (2004) and Service (1994) note that densities on permanent study plots in various locations (Fremont Valley, Johnson Valley, Stoddard Valley, Fremont Peak, Kramer Hills, Lucerne

Valley, and the Desert Tortoise Natural Area) across the Western Mojave Recovery Unit have shown a significant negative trend in adult densities over time.

In the Western Mojave Recovery Unit, desert tortoises generally occur from Olancha and the northern Panamint Valley in the north, to Joshua Tree National Park in the south, and from the lower foothills of the southern Sierra Nevada and Tehachapi Mountains in the west, and east to Death Valley and the eastern side of Joshua Tree National Park. Although desert tortoises were historically widespread in the western Mojave Desert, their distribution within this region was not uniform. For example, desert tortoises likely occurred at low densities in the juniper woodlands of the western Antelope Valley and in the sandier habitats in the Mojave River valley. Likely, they were also largely absent from the higher elevations of the area's mountains and from playas and the areas immediately surrounding these dry lakes.

The following paragraphs describe the status of the desert tortoise outside of desert wildlife management areas in the Western Mojave Recovery Unit. At the Fort Irwin Military Base, the Army conducts realistic, large-scale exercises with large numbers of wheeled and tracked vehicles. In areas where training has occurred for many decades, desert tortoises persist in relatively low numbers primarily on the steep, rugged slopes of the mountain ranges and in incised washes that occur throughout Fort Irwin. Desert tortoises persist here because vehicles generally do not use these areas. We do not have specific information on the numbers of desert tortoises in these areas. We expect that they will persist long into the future as small aggregations of animals that are likely isolated from desert tortoises in the remainder of the Western Mojave Recovery Unit. Some exchange may occur with desert tortoises in the South Range portion for the Naval Air Weapons Station to the west of Fort Irwin, and a narrow strip of Bureau lands and Death Valley National Park to the north.

The Naval Air Weapons Station, China Lake, is divided into two large units. The southern unit lies to the west of Fort Irwin and north of the western expansion area, and the northern portion of the Naval Air Weapons Station lies to the northwest of the southern unit. The Department of the Navy (Navy) has designated approximately 200,000 acres of the South Range at the Naval Air Weapons Station, China Lake as a management area for the desert tortoise (Service 1995). Through a consultation with the Service (1992a), the Navy agreed to try to direct most ground-disturbing activities outside of this area, to use previously disturbed areas for these activities when possible, and to implement measures to reduce the effects of any action on desert tortoises. This area also encompasses the Superior Valley Tactical Bombing Range located in the southernmost portion of the Mojave B South land management unit of the Naval Air Weapons Station. It is as an active bombing range for military test and training operations by the Navy and Department of Defense. In the three years for which we had annual reports available, activities conducted by the Navy did not kill or injure any desert tortoises (Navy 1995, 2001, 2002). In general, desert tortoises occur in low densities on the North Range of the Naval Air Weapons Station. Kiva Biological Consulting, and McClenahan and Hopkins Associates (in Service 1992a) reported that approximately 136 square miles of the North Range supported densities of 20 or fewer desert tortoises per square mile. The South Range supported densities of 20 or fewer desert tortoises per square mile over an area of approximately 189 square miles and

densities of greater than 20 per square mile in approximately 30 square miles. The higher elevations and latitude in this area may be responsible for these generally low densities (Weinstein 1989 in Bureau et al. 2005).

The Indian Wells Valley, which is located to the southwest of the northern portion of the Naval Air Weapons Station, most likely supported desert tortoises at higher densities in the past. Current low densities in this area are probably due to urban, suburban, and agricultural developments. The city of Ridgecrest and town of Inyokern are located in this valley. Rose Valley, which lies generally to the north of the Indian Wells Valley and west of the northern portion of the Naval Air Weapons Station seems to support few desert tortoises and is likely the northern extent of the species' range in this portion of the Western Mojave Recovery Unit.

To the south of the Indian Wells Valley and extending west to the eastern slopes of the Sierra Nevada and Tehachapi Mountains, desert tortoises occur in generally low numbers on a mix of Bureau and private lands. They may have been more common in the past in the area west of Highway 14 between the town of Mojave and Walker Pass. High levels of off-road vehicle use and extensive livestock grazing are potential causes for the current scarcity of desert tortoises in this area. On public lands, the Bureau manages grazing by domestic sheep according to the standards and guidelines established in the California Desert Conservation Area Plan amendments for the western Mojave Desert (Bureau et al. 2005). We are unaware of any standards and guidelines associated with sheep grazing on private lands. Off-road vehicle use is also commonplace in this portion of the desert.

The western end of Antelope Valley lies south of the Tehachapi Mountains and north of the western end of the San Gabriel Mountains. This far western portion of the Mojave Desert supported juniper and Joshua tree woodlands. Desert tortoises may not have been common here, even prior to the arrival of the agricultural development that covers much of the valley. Desert tortoises persist in low numbers in creosote scrub habitat in portions of the valley. Sheep grazing, off-road vehicle use, and rural development occur in this area also. Some areas support wind energy operations. Most of the land is under private ownership.

The Department of Defense uses Edwards Air Force Base, which lies in the eastern portion of the Antelope Valley, primarily to test aircraft and weapons systems. Desert tortoises occur over approximately 220,800 acres of the installation. Approximately 80,640 acres of the base are naturally unsuitable for use by desert tortoise or are used for military operations, such as Rogers and Rosamond dry lakes. Based on surveys conducted between 1991 and 1994, approximately 160,640 acres of the base supported 20 or fewer desert tortoises per square mile. Approximately 55,040 acres supported densities between 21 and 50 desert tortoises per square mile. From 51 to 69 desert tortoises per square mile occurred on several smaller areas that totaled 5,120 acres (Air Force 2004). We expect that current densities are somewhat lower, given the regional declines in desert tortoise numbers elsewhere in the Western Mojave Recovery Unit.

Four townships of private land east of California City, north of Edwards Air Force Base, and south of the Rand Mountains supported large numbers of desert tortoises as late as the 1970s.

High levels of off-road vehicle use, extensive grazing of sheep, scattered development, and possibly poaching have greatly reduced the density of desert tortoises in this area.

South of Edwards Air Force Base, the direct and indirect effects of urban and suburban development have largely eliminated desert tortoises from this area of primarily private lands that extends from Lancaster in the west to Lucerne Valley in the east. A few desert tortoises remain on the northern slopes of the San Bernardino Mountains, south of Lucerne Valley; however, they seem to be largely absent from the portion of this area in Los Angeles County (Bureau et al. 2005). The Bureau manages the 24,000-acre El Mirage Off-highway Vehicle Management Area, which lies south of the eastern portion of Edwards Air Force Base. The Bureau has designated this and three other off-highway vehicle management areas in the western Mojave Desert for use by off-road vehicles. Low numbers of desert tortoises persist in the area that generally lies between the off-highway vehicle management area and Edwards Air Force Base.

Continuing to the east, the northern portion of Joshua Tree National Park is within the Western Mojave Recovery Unit. Given the general patterns of visitor use at Joshua Tree National Park (i.e., most visitors remain close to established roads and trails), we expect that most of these areas receive little use. Private lands between the northern boundary of Joshua Tree National Park and the southern boundary of the Marine Corps Air Ground Combat Center continue to support desert tortoises. The primary threat to desert tortoises in this area is urbanization. The cities of Twentynine Palms, Yucca Valley, Joshua Tree, and Morongo Valley are located in this area.

Desert tortoises occur within the Marine Corps Air Ground Combat Center in densities of greater than 50 per square mile in limited areas. Most of the installation, however, supports from zero to five animals per square mile (Jones and Stokes Associates 1998 in Natural Resources and Environmental Affairs Division 2001). The Marine Corps' integrated natural resource management plan also notes that the number of desert tortoises may have declined in the more heavily disturbed areas of the Marine Corps Air Ground Combat Center and that vehicle strikes, common ravens, and dogs are responsible for mortalities. In general, the Marine Corps Air Ground Combat Center supports a wide variety of training exercises that include the use of tracked and wheeled vehicles, and live fire.

The 189,000-acre Johnson Valley Off-highway Vehicle Management Area lies to the west of the Marine Corps Air Ground Combat Center. The Stoddard Valley Off-highway Vehicle Management Area lies to the west of the Johnson Valley Off-highway Vehicle Management Area. Desert tortoises remain in suitable habitat primarily in areas with less recreation use.

The Mojave River valley lies to the northwest of the Marine Corps Air Ground Combat Center. It is generally a low-lying area dominated by private lands with current and fallow agricultural use. We are aware of a few records of desert tortoises in this area, primarily in creosote scrub habitat near the Marine Corps Logistics Base, Nebo, and around Elephant Mountain, which lies at the western end of the valley.

The city of Barstow lies at the western end of the Mojave River valley. A large expanse of primarily private land lies between Barstow and the city of Victorville. Now heavily used by off-road vehicles, this area likely supported high densities of desert tortoises prior to the development of surrounding areas. The cities of Adelanto, Apple Valley, and Hesperia, and the Southern California Logistics Airport generally surround Victorville.

Death Valley National Park lies to the north of Fort Irwin. Desert tortoises are uncommon in the national park, primarily because much of the habitat lies either lower or higher than optimal elevations for the species. Greenwater Valley, to the east of Death Valley, seems to support a moderate number of desert tortoises. Panamint Valley lies to the west of Death Valley, and east of the northern section of the Naval Air Weapons Station. It supports low densities of desert tortoises, likely because of unsuitable habitat over large areas of the valley.

The Spangler Hills Off-highway Vehicle Management Area lies to the southwest of the Panamint Valley and southeast of Ridgecrest. We do not have recent information on the number of desert tortoises in this area. We expect that these areas support low densities of desert tortoises because of extensive recreational use.

Major roads include Interstates 15 and 40, and State Routes 14, 18, 58, 62, 127, 138, 178, 247, and U.S Highway 395. These roads fragment habitat. Vehicles using these roads strike and kill numerous desert tortoises every year. Portions of Interstate 15 and State Route 58 are fenced to prevent entry by desert tortoises. Smaller paved roads and unpaved roads probably do not fragment habitat to a substantial degree but are responsible for additional mortalities of desert tortoises.

The Service uses line-distance sampling to estimate the density of desert tortoises in monitored areas within the Western Mojave Recovery Unit; based on the latest information, we estimate the density to be approximately 10.1 subadult and adult desert tortoises per square mile (Service 2009b, 2010b, 2010c); we averaged the densities from sampling years 2007 through 2010). However, we do not have extensive data on the density of desert tortoises in the areas of the recovery unit that lie outside desert wildlife management areas. With the exception of two areas in 2007 (see Service 2009b), existing data were collected using methods other than line-distance sampling and are not comparable to the numbers obtained through line-distance sampling. Examples include a Bureau study of desert tortoise density west of State Route 14 between Red Rock Canyon State Park and State Route 178 (Keith et al. 2005) and various surveys of the eastern Antelope Valley, Victor Valley, and near the town of Rosamond. Consequently, we do not have comparable information regarding densities for most areas outside of critical habitat and desert wildlife management areas.

The following paragraphs describe the status of the desert tortoise within desert wildlife management areas in the Western Mojave Recovery Unit. The Ord-Rodman Desert Wildlife Management Area is located southeast of Barstow. It lies south of Interstate 40, east of State Route 247, west of Argus Mountain, and north of the central portion of the Fry Mountains. The recovery plan states that densities of desert tortoises in this recovery unit vary from 5 to 150

animals per square mile (Service 1994). In 2010, the Service (2010c) estimated a density for the Ord-Rodman Desert Wildlife Management Area of approximately 19.5 subadult and adult desert tortoises per square mile based on line-distance sampling transects.
The Superior-Cronese Desert Wildlife Management Area is bordered on the west by the Fremont-Kramer Desert Wildlife Management Area and Cuddleback Dry Lake; on the north by the northern end of Superior Valley and NASA Road on the National Training Center; on the east by West Cronese Dry Lake; on the southeast by Interstate 15; and on the south and southwest by Rainbow Basin National Natural Landmark and the southern end of the Gravel Hills. The recovery plan states that densities of desert tortoises in this recovery unit vary from 20 to 250 animals per square mile (Service 1994). In 2010, the Service (2010c) estimated a density for the Superior-Cronese Desert Wildlife Management Area of approximately 6.8 subadult and adult desert tortoises per square mile based on line-distance sampling transects.

The Fremont-Kramer Desert Wildlife Management Area is located west of the Superior-Cronese Desert Wildlife Management Area on both sides of U.S. Highway 395. Density estimates for the Fremont-Kramer Desert Wildlife Management Area, as determined on permanent study plots and strip-transects between 1990 and 1991, varied from 5 to 100 animals per square mile with average densities of approximately 15 individuals per square mile (Service 1994). In 2010, the Service (2010c) estimated a density for the Fremont-Kramer Desert Wildlife Management Area of approximately 6.5 subadult and adult desert tortoises per square mile based on line-distance sampling transects.

The Pinto Mountain Desert Wildlife Management Area is located north of the northeastern corner of Joshua Tree National Park. The recovery plan does not specifically address the density of desert tortoises in this area (Service 1994). In 2010, the Service (2010c) estimated a density for this desert wildlife management area to be approximately 8.8 subadults and adults per square mile based on line-distance sampling transects.

In the previous consultations, we estimated the numbers of desert tortoises in various recovery units based primarily on the acreages of desert wildlife management areas and units of critical habitat without adjustment for the potential suitability of habitat and the densities provided by line-distance sampling. We did not attempt to eliminate areas of non-habitat because of the difficulty in determining such areas on the scale of the recovery units. Since that time, Nussear et al. (2009; see the next section of this biological opinion [Habitat of the Desert Tortoise within the Western Mojave Recovery Unit] for a description of their methodology) developed a model of desert tortoise habitat that allows us to estimate the area of desert tortoise habitat. We used this model to estimate the amount of potential desert tortoise habitat in an area, then removed areas of such habitat that have been subjected to human disturbance by using data from The Nature Conservancy (2010).

Data on the density of desert tortoises are largely lacking from outside of critical habitat and desert wildlife management areas. To estimate the number of desert tortoises in these areas, we have provided a potential range of densities by multiplying the acreage of these areas by the average density as determined by line-distance sampling within desert wildlife management

areas and critical habitat as an upper limit; for the lower limit, we multiplied this acreage by one-tenth of the average density.

Using this method, we can likely provide a more accurate estimate of the number of desert tortoises over large areas of the desert. The accuracy of the estimates derived from this method remain subject to numerous variables that likely affect its overall accuracy (e.g., the digitizing of the recovery unit boundaries, the scale at which the Nussear et al. model was developed, the accuracy of the information from The Nature Conservancy, etc.). Despite the unknowns involved in deriving this estimate, it provides us with some quantification of the number of subadult and adult desert tortoises in a recovery unit. The estimates of subadult and adult desert tortoises in the Western Mojave Recovery Unit used in this biological opinion follow:

Western Mojave Recovery Unit [1]	**Area (square miles)**	**Density of Desert Tortoises per Square Mile**	**Number of Desert Tortoises**
Total Area of Modeled Desert Tortoise Habitat [2]	13,385		
Disturbed Modeled Desert Tortoise Habitat [3]	910		
Net Modeled Desert Tortoise Habitat [4]	12,475		
Net Modeled Desert Tortoise Habitat within Desert Wildlife Management Areas and Critical Habitat	4,997	10.1[5]	50,470
Net Remaining Modeled Desert Tortoise Habitat outside Desert Wildlife Management Areas and Critical Habitat	7,478	10.1[6]	75,528
		1.0[7]	7,478
Total Number of Desert Tortoises			57,948 – 125,998

Key

[1] Unless otherwise noted, all acreages are from Waln 2011.

[2] Modeled desert tortoise habitat is from Nussear et al. (2009).

[3] From USC or TNC

[4] The area of Modeled Desert Tortoise Habitat minus the area of disturbed modeled desert tortoise habitat.

[5] From Service (2009b, 2010b, 2010c); we averaged the densities from sampling years 2007 through 2010.

[6] We do not have substantial information on the number of desert tortoises outside of desert wildlife management areas and critical habitat. Consequently, in this section, we use the same density we derived for the desert wildlife management areas and critical habitat.

[7] See footnote 6. In this section, we used a density of one-tenth of that in desert wildlife management areas and critical habitat.

Based on the estimate of the number of subadult and adult desert tortoises in the Western Mojave Recovery Unit, we estimated the number of juvenile desert tortoises and eggs that the area also supports as described in the Environmental Baseline - Status of the Desert Tortoise in the Action Area section of this biological opinion. (Eggs would be present only for a portion of any given year.) The following tables depict these estimates:

	Number of Subadult and Adult Desert Tortoises [1]	**Number of Juvenile Desert Tortoises [2]**
Within Desert Wildlife Management Areas and Critical Habitat	50,470	52,530
Outside Desert Wildlife Management Areas and Critical Habitat	75,528 [3]	78,611
	7,478 [4]	7,783
Total Number of Juvenile Desert Tortoises		60,313 – 131,141 [5]

Key:
[1] From preceding table.
[2] Derived by assuming that juveniles comprise 51 percent of the overall population. (See the Environmental Baseline – Status of the desert tortoise in the Action Area section of this biological opinion for all references.)
[3] Upper limit estimate of the number of subadult and adult desert tortoises outside of desert wildlife management areas and critical habitat.
[4] Lower limit estimate of the number of subadult and adult desert tortoises outside of desert wildlife management areas and critical habitat.
[5] These estimates are the „within' number added to the „low range' or „high range' numbers.

	Number of Subadult and Adult Female Desert Tortoises [1]	**Number of Juvenile Desert Tortoise Eggs [2]**
Within Desert Wildlife Management Areas and Critical Habitat	25,235	234,181
Outside Desert Wildlife Management Areas and	37,764 [3]	350,450

Critical Habitat	3,739 [4]	34,698
Total Number of Juvenile Desert Tortoises		268,879 - 584,631 [5]

Key:
[1] We assumed a ratio of males to females of 1:1. These estimates were derived by dividing the number of subadult and adult desert tortoises from the previous tables by 2.
[2] Derived by assuming that each female produces 1.6 clutches with 5.8 eggs per clutch.
[3] High range estimate of the number of subadult and adult female desert tortoises outside of desert wildlife management areas and critical habitat.
[4] Low range estimate of the number of subadult and adult female desert tortoises outside of desert wildlife management areas and critical habitat.
[5] These estimates are the „within' number added to the „upper limit' or „lower limit' numbers.

Habitat of the Desert Tortoise within the Western Mojave Recovery Unit

Nussear et al. (2009) modeled desert tortoise habitat across the range of the desert tortoise. This model, based on 3,753 desert tortoise locations, uses 16 environmental variables, such as precipitation, geology, vegetation, and slope. In addition, Nussear et al. (2009) used 938 additional occurrence locations to test the model's accuracy. Although this analysis likely omits some marginal desert tortoise habitat, it explains the occurrence of 95 percent of the 938 test points used in the Nussear et al. (2009) model. The modeling and mapping analysis do not consider habitat loss, fragmentation, or degradation associated with human-caused impacts.

Because the modeling and mapping analysis do not consider habitat loss, fragmentation, or degradation associated with human-caused impacts, we estimated how much modeled desert tortoise has likely been degraded or lost by subtracting the acreage of urbanized and agricultural areas as shown by The Nature Conservancy (2010) from the total. Based on this calculation, approximately 12,475 square miles of potential desert tortoise habitat remain within the Western Mojave Recovery Unit (Waln 2010). (We subtracted only The Nature Conservancy's "highly disturbed" category from the total amount of potential desert tortoise habitat. The Nature Conservancy's „moderately disturbed' category contains some areas that, based on our knowledge, are highly disturbed and support few, if any desert tortoises (e.g., maneuver areas at Fort Irwin) and other areas that are somewhat less disturbed and continue to support some desert tortoises (e.g., some private lands). At this time, we do not have the ability to separate out and quantify these areas.

The acreages depicted here of desert tortoise habitat and the amount development are not precise, given the difficulty of mapping at this scale. They do, however, provide a reference point relative to the amount of desert tortoise habitat within the Western Mojave Recovery Unit. This information also demonstrates that, although large amounts of desert tortoise habitat remain in the Western Mojave Recovery Unit, human activities have removed a substantial amount of modeled habitat and fragmented the remaining habitat to some degree. As our ability to quantify

disturbance and estimate the density of desert tortoises improves, we expect to refine these estimates further.

Recovery Plan

The recovery plan for the desert tortoise is the basis and key strategy for recovery and delisting of the desert tortoise. The recovery plan divides the range of the desert tortoise into 6 distinct population segments, or recovery units, and recommends the establishment of 14 desert wildlife management areas throughout the recovery units. Within each desert wildlife management area, the recovery plan recommends implementation of reserve level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The recovery plan also recommends that desert wildlife management areas be designed to follow the accepted concepts of reserve design and be managed to restrict human activities that negatively affect desert tortoises (Service 1994). The delisting criteria established by the recovery plan are:

1. The population within a recovery unit must exhibit a statistically significant upward trend or remain stationary for at least 25 years;

2. Enough habitat must be protected within a recovery unit or the habitat and desert tortoises must be managed intensively enough to ensure long-term viability;

3. Populations of desert tortoises within each recovery unit must be managed so discrete population growth rates (lambdas) are maintained at or above 1.0;

4. Regulatory mechanisms or land management commitments that provide for long-term protection of desert tortoises and their habitat must be implemented; and

5. The population of the recovery unit is unlikely to need protection under the Endangered Species Act in the near future.

The recovery plan based its descriptions of the six recovery units on differences in genetics, morphology, behavior, ecology, and habitat use over the range of the Mojave population of the desert tortoise. The recovery plan contains generalized descriptions of the variations in habitat parameters of the recovery units and the behavior and ecology of the desert tortoises that reside in these areas (pages 20 to 22 in Service 1994). The recovery plan (pages 24 to 26 from Service 1994) describes the characteristics of desert tortoises and variances in their habitat, foods, burrow-sites, and phenotypes across the range of the listed taxon. Consequently, to capture the full range of phenotypes, use of habitat, and range of behavior of the desert tortoise as a species, conservation of the species across its entire range is essential.

The Service (2008b) has released a revised recovery plan for public review. The revised recovery plan includes a discussion of reducing the number of recovery units to four, based on information generated since the release of the original document.

Relationship of Recovery Units, Distinct Population Segments, Desert Wildlife Management Areas, and Critical Habitat Units

The recovery plan (Service 1994) recognized six recovery units or evolutionarily significant units across the range of the listed taxon, based on differences in genetics, morphology, behavior, ecology, and habitat use of the desert tortoises found in these areas. The boundaries between these areas are vague. In some cases, such as where the Western Mojave Recovery Unit borders the Eastern Mojave Recovery Unit, a long, low-lying, arid valley provides a substantial separation of recovery units. In other areas, such as where the Eastern Mojave Recovery Unit borders the Northern Colorado Recovery Unit, little natural separation exists. Over the years, workers have commonly referred to the areas as "recovery units;" the term "distinct population segment" has not been in common use.

The recovery plan recommended that land management agencies establish one or more desert wildlife management areas within each recovery unit. As mentioned previously in the Recovery Plan for the Desert Tortoise section of this biological opinion, the recovery plan recommended that these areas receive reserve-level management to remove or mitigate the effects of the human activities responsible for declines in the number of desert tortoises. As was the case for the recovery units, the recovery plan did not determine precise boundaries for the desert wildlife management areas. The recovery team intended for land management agencies to establish these boundaries, based on the site-specific needs of the desert tortoise. At this time, desert wildlife management areas have been established throughout the range of the desert tortoise.

Based on the recommendations contained in the draft of the original recovery plan for the desert tortoise, the Service designated critical habitat units throughout the range of the desert tortoise (59 Federal Register 5820). The 14 critical habitat units have defined boundaries and cover specific areas throughout the 6 recovery units.

The Bureau used the boundaries of the critical habitat units and other considerations, such as conflicts in management objectives and more current information, to propose and designate desert wildlife management areas through its land use planning processes. In California, the Bureau also classified these desert wildlife management areas as areas of critical environmental concern, which allows the Bureau to establish management goals for specific resources in defined areas. Through the land use planning process, the Bureau established firm boundaries for the desert wildlife management areas.

Finally, we note that the Department of Defense installations and National Park Service units in the California desert did not establish desert wildlife management areas on their lands. Where the military mission is compatible with management of desert tortoises and their habitat, the Department of Defense has worked with the Service to conserve desert tortoises and their habitat. Examples of such overlap include the bombing ranges on the Navy's Mojave B and the Chocolate Mountains Aerial Gunnery Ranges. Although the target areas are heavily disturbed, most of the surrounding land remains undisturbed. Additionally, the Army has established several areas along the boundaries of Fort Irwin where it prohibits training with vehicles. Desert

tortoises persist in these areas, which are contiguous with lands off base. The National Park Service did not establish desert wildlife management areas within the Mojave National Preserve, because the entire preserve is managed at a level that is generally consistent with the spirit and intent of the recovery plan for the desert tortoise.

The following table depicts the relationship among recovery units, desert wildlife management areas, and critical habitat units through the range of the desert tortoise.

Critical Habitat Unit	**Desert Wildlife Management Area**	**Recovery Unit**	**State**	**Size of Critical Habitat Unit (acres)**
Chemehuevi	Chemehuevi	Northern Colorado	CA	937,400
Chuckwalla	Chuckwalla	Eastern Colorado	CA	1,020,600
Fremont-Kramer	Fremont-Kramer	Western Mojave	CA	518,000
Ivanpah Valley	Ivanpah Valley	Eastern Mojave/Northeastern Mojave	CA	632,400
Pinto Mountain	Joshua Tree	Western Mojave/ Eastern Colorado	CA	171,700
Ord-Rodman	Ord-Rodman	Western Mojave	CA	253,200
Piute-Eldorado-CA Piute-Eldorado-NV	Fenner Piute-Eldorado	Eastern Mojave Northeastern Mojave/ Eastern Mojave	CA NV	453,800 516,800
Superior-Cronese	Superior-Cronese Lakes	Western Mojave	CA	766,900
Beaver Dam: NV UT AZ	 Beaver Dam Beaver Dam Beaver Dam	Northeastern Mojave (all)	 NV UT AZ	 87,400 74,500 42,700
Gold Butte-Pakoon NV AZ	 Gold Butte-Pakoon Gold Butte-Pakoon	Northeastern Mojave (all)	 NV AZ	 192,300 296,000
Mormon Mesa	Mormon Mesa Coyote Spring	Northeastern Mojave	NV	427,900
Upper Virgin River	Upper Virgin River	Upper Virgin River	UT	54,600

Fires

Since December 2004, numerous wildfires have occurred in desert tortoise habitat across its range. Although we know that some desert tortoises were killed by wildfires, mortality estimates are not available. We estimate that approximately 300,000 acres of potential desert tortoise habitat burned in the Northeastern Mojave Recovery unit in 2005 (Burroughs 2005). This acreage includes approximately 109,000 acres of critical habitat (Clayton 2005). In total, approximately 136,447 acres of critical habitat burned in the 2005 fires (Clayton 2005).

Recovery Unit	Critical Habitat Unit	Acres Burned
Upper Virgin River	Upper Virgin River	10,446
Northeastern Mojave	Beaver Dam Slope	46,757
Northeastern Mojave	Gold Butte-Pakoon	62,466
Northeastern Mojave	Mormon Mesa	15,559
Eastern Mojave	Piute-Eldorado	154
Eastern Mojave	Ivanpah	1,065
Total		136,447

The 136,447 acres of critical habitat that burned represent approximately 2.1 percent of the total amount of critical habitat that designated for the desert tortoise. Given the patchy distribution of the primary constituent elements of critical habitat 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.

ENVIRONMENTAL BASELINE

Action Area

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 CFR 402.02). For the purposes of this biological opinion, we consider the action area to include the area directly affected by ground disturbance associated with the various portions of the project and any desert tortoise habitat within a 1,000-foot area around areas of ground disturbance. This 1,000-foot-wide area accounts for effects associated with short-distance translocation of desert tortoises out of work areas; consequently, it does not include any areas where the land adjacent to the project supports development. The action area defined for this biological opinion is the approximately 37.5 acres associated with direct ground disturbance resulting from the project (32.5 acres with the recharge basin and approximately 5 acres associated with the pipeline) and approximately 23 acres associated with the 1,000-foot translocation area, for a total of approximately 60.7 acres (Circle Mountain Biological Consultants, Inc. 2010).

During informal consultation, we discussed with the EPA and Joshua Basin Water District whether the importation of additional water would promote growth in the service area of the

water district. If the proposed project facilitated such growth, our action area for this consultation would include the entire Service area. After review of the final environmental impact report (Joshua Basin Water District 2009a) and information provided by the Joshua Basin Water District (Circle Mountain Biological Consultants, Inc. 2010, Joshua Basin Water District 2009b, Joshua Basin Water District 2009c), we determined that facilitated growth was not an indirect effect of the proposed action. We reached this conclusion because developers could choose to obtain water from sources other than the water district (e.g., by installing wells or having it delivered); the Joshua Basin Water District merely provides service when requested but does not determine whether water should be provided. Consequently, because we determined that the proposed project would not be the sole factor that promoted additional development in the water district's service area, we have limited the action area as described previously in this section and have not included growth in the service area as an adverse effect of the proposed action in our analysis.

Habitat Characteristics of the Action Area

Elevations along the pipeline right-of-way range from approximately 3,135 feet at the junction of Yucca Mesa Road and State Route 62, to 2,660 feet at the northeast corner of the recharge basin. Terrain is mostly flat, with a slight eastern aspect along the pipeline and less so at the recharge basin. Soils are mostly sandy throughout (Circle Mountain Biological Consultants, Inc. 2010). The recharge basin and pipeline right-of-way occur in habitats that vary from highly urbanized in "downtown" Joshua Tree to relatively undeveloped habitats to the west.

Recharge Basin

The proposed recharge basin site covers 32.5 acres and located approximately 1,500 feet north of State Route 62 between Boarder Avenue and Memory Lane. The topography of the site is relatively level although the overall area generally slopes to the east. A large wash lies to the north of the property that drains to Coyote Lake approximately 6 miles to the east.

The plant community on this site is characterized as Mojave creosote bush scrub. The dominant plant species are creosote bush (*Larrea tridentata*), burro-weed (*Ambrosia dumosa*), and silver cholla (*Opuntia echinocarpa*). Other species observed included pencil cholla (*O. remosissima*), desert senna (*Senna armata*), desert tea (*Ephedra californica*), hedgehog cactus (*Echinocereus englemannii*), beavertail cactus (*O. basilaris*), and bladderpod (*Cleome isomeris*). The wash adjacent to the north side of the recharge basin supports individuals of several riparian-associated species not present on the site proper, including cat claw (*Acacia greggii*), and desert willow (*Chilopsis linearis*). Numerous off-road vehicle trails crisscross the site and refuse including construction debris and trash litters the area (Circle Mountain Biological Consultants, Inc. 2010).

Pipeline

Because the pipeline would be located adjacent to a heavily traveled road (State Route 62), it would pass primarily through disturbed habitats. The plant communities present along the

pipeline route are similar to those found on the recharge basin site though much more disturbed. In addition, several patches of landscaped, ornamental vegetation are scattered along the roadway (Circle Mountain Biological Consultants, Inc. 2010).

Status of the Desert Tortoise in the Action Area

Circle Mountain Biological Consultants, Inc. (2010) generally followed the desert tortoise survey protocol first identified by the Service in 1992 (Service 1992b) and the recently revised survey protocols from 2010 (Service 2010a) for its surveys on the recharge basin and along the pipeline right-of-way.

Pipeline Right-of-Way

No desert tortoise sign was found within the pipeline right-of-way during the focused desert tortoise surveys conducted by Ed LaRue on April 5, 2010 (Circle Mountain Biological Consultants, Inc. 2010). On April 7, 2010, LaRue surveyed 4 transects, spaced at 200- and 400-meter intervals north and south of the pipeline right-of-way, in accordance with the current survey protocol (Service 2010).

LaRue found scat, 2 burrows, and an adult desert tortoise on a transect 200 meters to the north of the right-of-way. All desert tortoise sign found in April 2010 occurred north of the west half of the pipeline right-of-way. Desert tortoise sign was not observed south of the right-of-way and State Route 62.

Recharge Basin

Initially, LaRue did not observe any sign of desert tortoises within the area of the recharge basin. A single desert tortoise, burrows, and scat were detected east of the recharge basin adjacent to the large flood control channel. During geotechnical testing in April 2010, this desert tortoise traveled across a portion of the recharge basin site from the southeast to the northwest and then moved to the east, north of the basin (Circle Mountain Biological Consultants, Inc. 2010).

Because the pipeline right-of-way would be located immediately adjacent to a busy highway, we anticipate that few, if any, desert tortoises of any size reside (i.e., maintain burrows to which they return repeatedly) in this area. We have reached this conclusion based on the survey results and Hoff and Marlowe's (2002) finding that the density of desert tortoises is frequently suppressed adjacent to heavily used roads; Hoff and Marlow (2002) based their finding on the amount of sign found in relation to the distance from the edge of the road. Individuals are likely to traverse the area of the proposed pipeline occasionally; we base this assertion on the fact that a desert tortoise and a small amount of sign were found along transects conducted north of the pipeline route. We expect most, if not all, desert tortoises to be located along the western portion of the pipeline, based on the results of the surveys. Any desert tortoise that resides adjacent to the action area may move into or out of it repeatedly over a short period of time; conversely, because

of the proximity of State Route 62 and human development, we do not expect numerous desert tortoises to migrate into the action area during construction and operation of the pipeline.

Based on surveys conducted to date, desert tortoises do not seem to reside within the area that the recharge basin would occupy. At least one desert tortoise seemed to reside within the action area, to the east of the proposed site of the recharge basin.

In summary, two adult desert tortoises were detected within the action area. The surveys did not cover the entire action area and represent a brief window in time; consequently, the number of individuals on the site may change by the onset of construction and over the course of operation. For example, desert tortoises that were found in the action area may leave or die; others may move into the area, undetected desert tortoises may be found, or eggs may hatch. For the purposes of this biological opinion, we will estimate that the action area supports four subadult and adult desert tortoises (i.e., any combination of four individuals that are greater than 180 millimeters in length).

Juvenile desert tortoises are extremely difficult to detect because of their small size and their cryptic nature. Based on 4-year study of their population ecology, Turner et al. (1987) determined that juveniles accounted for 31.1 to 51.1 percent of the overall population. Using this range and a maximum of 4 subadult and adult desert tortoises on the proposed site, we estimate that the action area may support up to 4 juveniles (i.e., those animals less than 180 millimeters in size account for approximately one-half of the number of animals on site).

To estimate the number of eggs that could be present on the project site, we used the average number of clutches per reproductive female in a given year, (i.e., 1.6, see Turner et al. 1984), multiplied by the average number of eggs found in a clutch (i.e., 5.8, see Service 1994). Based on work performed in Ivanpah Valley and at the Goffs study site where the ration of males to females was 1:1 (Turner et al. 1984, Turner et al. 1987), we assumed that 2 of the 4 subadult and adult desert tortoises are reproductive females. These individuals could produce approximately 19 eggs in a given year (i.e., 2 females times 1.6 clutches per female per year (turner et al. 1984) times 5.8 eggs per clutch (Turner et al. 1986 in Service 1994)). Fewer eggs are likely to be onsite at any given time because the territories of the female desert tortoises likely extend, at least in part, off the project site and individuals may establish nests in these areas.

EFFECTS OF THE ACTION

Capture and Relocation of Desert Tortoises within the Action Area

Desert tortoise barrier fencing will be installed around all permanent and temporary disturbance areas, including the existing access road. Desert tortoises immediately adjacent to the boundaries of the project area that have been or are to be fenced would be moved to the side of the fence where project activities would not occur. Animals moved in this manner may attempt to return to the portions of their territory on the far side of the fence. In past studies, at least a small percentage of translocated desert tortoises that had been radio-tagged tried to return to their

capture sites (Corn 2004, Nussear 2004). We expect that these animals would eventually become acclimated to the new boundaries of their territories and cease attempts to return. In fact, Walde et al. (2008) found that desert tortoises moved from one side of the fence to the other did not move as far as animals that were moved a long distance.

Releasing a desert tortoise outside of its home range, far from known burrows, or away from shade may be detrimental to its health (Stewart 1993 in Boarman 2002); such a release could be particularly hazardous during hot, dry weather or late in the afternoon when the body temperatures of stressed desert tortoises could reach fatal levels. However, these desert tortoises will be moved short distances and, therefore, are likely to be familiar with the release areas

An elevated level of transmission of disease is also unlikely to occur because the translocated animals would likely have previous contact with other individuals in the area. In addition, we expect relatively few desert tortoises to be moved in this manner, because few desert tortoises occur within the project area. For this reason, these short-distance translocations are unlikely to affect desert tortoises in the action area in a substantial manner.

Based on the results of the desert tortoise surveys and general knowledge of the area, we estimate the translocation of approximately four subadult and adult and four juvenile desert tortoises to the area outside of the barrier fencing. Subadult and adult desert tortoises are generally large enough to be observed during clearance surveys. Juvenile desert tortoises are less likely to be found during surveys and as a result are more likely to be injured or killed during project activities.

Handling desert tortoise may cause several effects to desert tortoises. Handling desert tortoises sometimes causes them to void the contents of their bladder, which may represent loss of important fluids and this loss could be fatal (Averill-Murray 1999 in Boarman 2002). Averill-Murray 1999 (in Boarman 2002) provided some evidence that handling-induced voiding may adversely affect survivability, although the amount of fluid discharged is usually small. In addition, disease transmission could occur if people handle more than one desert tortoise without sterilizing their hands or using different clean or sterilized gloves for each handling (Rosskopf 1991 and Berry and Christopher 2001 in Boarman 2002).

The movement of desert tortoises into areas adjacent to the project area could potentially affect the home ranges of desert tortoises already outside of the project area, but within the release area. This movement could slightly increase the density within the release area. However, we do not expect that released animals would be so concentrated that it would substantially alter the density of desert tortoises in the translocation area. Given that Saethre et al. 2003 (in Esque et al. 2005) did not observe possible effects until densities reached 1,295 desert tortoises per square mile and the densities within the project area are already far below this number, we expect that the translocation is unlikely to affect resident animals in a substantial manner as a result of increased densities.

Injury and Mortality Associated with Construction Activities

The Joshua Basin Water District will employ authorized biologists to survey work sites and access road for desert tortoise prior to the commencement of ground-disturbing activities and will use fencing to exclude desert tortoises from work areas for the duration of the project. Any desert tortoises found within the proposed construction areas or roads will be moved to the outside of the fencing, away from project activities. During construction of the other ground-disturbing activities that are outside of the fenced areas (i.e., along the existing access road), the Joshua Basin Water District will perform pre-activity clearance surveys and employ monitors to move desert tortoises out of harm's way if they re-enter work areas. For these reasons, we anticipate that construction, including construction access, is unlikely to kill larger desert tortoises. Some potential always exists that surveyors may miss an individual during clearance surveys and construction monitoring. We cannot predict how many subadult and adult desert tortoises that clearance surveys and construction monitoring would miss.

Juvenile desert tortoises and eggs are difficult to detect during surveys and construction monitoring; therefore, the potential exists that surveyors may miss them and they may remain in the work areas during construction activities. We cannot predict how many juvenile desert tortoises or eggs surveyors may miss because we cannot predict how many would be in the action area at the time of project implementation; eggs are particularly vulnerable because they are buried. Ground-disturbing activities, such as grading and trenching, may crush desert tortoises and eggs missed during pre-clearance surveys or bury eggs so deep that they may not hatch. Because the Joshua Basin Water District will use qualified biologists, authorized by the Service, for clearance surveys and because few desert tortoises likely reside within the project area, we anticipate that the few, if any, individuals will remain after the clearance surveys. As noted in the Environmental Baseline section of this biological opinion, we estimate that the action area supports up to 8 desert tortoises and 19 eggs. As a caveat to this discussion, desert tortoise eggs are not present throughout the entire year; consequently, if construction occurs after eggs have hatched and before desert tortoises have laid the next year's clutches, eggs would not be destroyed by the project's activities.

Operations and Maintenance Activities

Operation and maintenance activities within the permanently fenced recharge basin are unlikely to injure or kill any desert tortoises, primarily because the fencing will exclude desert tortoises from the site. However, we are aware of a few circumstances where desert tortoises have breached fences intended to exclude them. In such cases, activities within the fenced area could kill or injure these individuals. We expect that desert tortoises would breach the fencing very infrequently, because the Joshua Basin Water District has proposed to maintain the fence in good condition until such time that desert tortoises likely no longer occur near the recharge basins.

Over the life of this project, the Joshua Basin Water District would perform some maintenance activities outside of fenced areas, such as repairing the pipeline. These activities could injure or kill desert tortoises, if any desert tortoises are present when the repair occurs, in the same manner

we described for construction of the pipeline. Because the Joshua Basin Water District would implement protective measures to reduce the potential that desert tortoises to be killed or injured during maintenance of the pipeline, these activities would kill few, if any, desert tortoises.

Because we do not know how frequently repair of the pipeline would be required or whether desert tortoises would be present when such work is needed, we cannot predict how many individuals are likely to be affected over the life of the pipeline. However, given the location of the pipeline adjacent to a heavily used road and the likelihood that the number of desert tortoises near the pipeline will continue to decrease over time as the amount of development increases, we expect that the Joshua Basin Water District will encounter few individuals during repair work. If any desert tortoises are found during maintenance work, we expect that moving them to adjacent habitat would have minimal adverse effects on them, as we discussed previously in this biological opinion.

Injury and Mortality of Desert Tortoises

In the previous sections, we discussed how various aspects of the proposed action might kill or injure desert tortoises and concluded that up to 8 desert tortoises and 19 eggs may occur in the action area and be affected by the proposed construction of the pipeline and recharge basin. We expect that most of the desert tortoises would be translocated to adjacent habitat and persist in the area after construction. We anticipate that some subset of the desert tortoises in the action area may be killed if they are not detected during surveys; we anticipate that eggs would not be detected and would likely be destroyed. We cannot estimate the number of desert tortoises that may be killed or injured during operation and maintenance of the pipeline and recharge basin because of the many variables we described previously in this consultation. Over the life of the project, however, we expect that few individuals would be killed or injured because of the low density of animals that remain in the area, the small amount of disturbance that would likely occur during operations and maintenance, and the protective measures that the Joshua Basin Water District would employ.

In the Status of the Desert Tortoise - Status section of this biological opinion, we estimated that approximately 57,948 subadult and adult desert tortoises, 60,313 juvenile desert tortoises, and 268,879 eggs may reside within the Western Mojave Recovery Unit. (Here, we have used the lower range of the estimates we derived previously in this biological opinion.) Assuming the worst case scenario (i.e., that all the desert tortoises and eggs in the action area are destroyed during construction), this loss would constitute 0.007 percent of the subadults and adults, 0.007 percent of the juveniles, and 0.007 percent of the eggs we estimate to be present in the Western Mojave Recovery Unit. Consequently, we conclude that the number of subadults, adults, juveniles, and eggs that are likely to be lost as a result of construction of the proposed project comprises a small portion of the overall population in the Western Mojave Recovery Unit and that this loss would not appreciably affect the number of desert tortoises in the recovery unit. Because we estimate that even fewer desert tortoises would be killed or injured over the life of the project as a result of operations and maintenance, we conclude these losses would not affect the species to a measurable degree.

Loss of Habitat

Construction of the project would result in approximately 32.5 acres of permanent disturbance at the recharge basin and 5 acres of temporary disturbance along the pipeline route (Circle Mountain Biological Consultants 2010 and Joshua Basin Water District 2009). This loss comprises approximately 0.0004 percent of the habitat remaining in the Western Mojave Recovery Unit (i.e., 37.5 acres = approximately 0.6 square mile; 0.6 square mile divided by 12,475 [the amount of remaining potential desert tortoise habitat] = 0.000004; 0.000004 times 100 = 0.0004 percent). This loss of habitat comprises a small percentage of the remaining habitat in the Western Mojave Recovery Unit. It is also located outside of any area that the Service considers important for the long-term conservation of the desert tortoise (i.e., critical habitat unit or desert wildlife management area) and likely linkage between such areas. The loss of habitat is located within an area that has experienced substantial disturbance as a result of development. Consequently, the loss of approximately 38 acres of desert tortoise habitat in this area of the Western Mojave Recovery Unit is unlikely to affect substantially the distribution of the species.

Miscellaneous Effects

The construction, operation, and maintenance of the Joshua Basin Water District's water recharge basin and pipeline is likely to cause at least some increased use of the area by common ravens because they will be attracted to the human activity associated with these activities and, to some degree, water that is temporarily available in the recharge basin. Increased use of the area by common ravens is likely to lead to increased predation of desert tortoises. The Joshua Basin Water District has proposed numerous measures to address predation by common ravens associated with the project site. These measures include subsidy control, a monitoring program, and contingencies for removal of problem common ravens. Despite these measures, common ravens are likely to use the recharge basin to some degree. To offset this use, the Joshua Basin Water District will provide funds for implementation of regional management actions for common ravens through the National Fish and Wildlife Foundation.

We cannot reasonably predict the amount of predation by common ravens that construction, operation, and maintenance of this project is likely to add to baseline levels within the action area, but we anticipate that the program proposed by the Joshua Basin Water District is likely to be effective in controlling common raven use of the action area. Depending on the location of specific control actions, funding of regional management of common ravens may also aid in reducing the amount of common raven predation on desert tortoises within the Western Mojave Recovery Unit.

Non-native plant species currently occur on the proposed project site and are likely to occur in other portions of the action area at varying densities. Construction, maintenance, and operation of the recharge basin and pipeline have the potential to increase the distribution and abundance of non-native species within the action area due to ground-disturbing activities that favor the establishment of non-native species. In addition, access to the project site and other project

features by construction and operations personnel is likely to increase the volume and distribution of non-native seed carried into the action area. The increased abundance in non-native species associated with this project may result in an increased fire risk, which may result in future habitat loss.

We cannot reasonably predict the increase in non-native species abundance that this project will create within the action area. The Joshua Basin Water District has not proposed any measures to control species, such as red brome (*Bromus rubens*), that are very common in the area. In general, a mitigating factor with regard to the spread of non-native species in this area and the increased potential for fire is that, because the action area is located adjacent to residential areas, local fire companies would respond quickly to any fire in this area to keep it from spreading. Consequently, we do not anticipate that the spread of non-native weeds and the potential concomitant increased risk of fire as a result of the proposed action are likely to pose a substantial threat to desert tortoises and their habitat beyond the action area.

Summary

To conclude, the area disturbed by the proposed water recharge basin would no longer support reproduction of desert tortoises because the Joshua Basin Water District would fence this area to exclude their entry. The area that would be disturbed by the construction, operation, and maintenance of the pipeline would continue to be available. Because the pipeline right-of-way lies immediately adjacent to Highway 62, we expect that desert tortoises would generally not use this area for nesting; we expect that they do not use it at the present time. Most of the desert tortoises that currently reside within the action area (outside of the area of the recharge basin) will likely continue to reproduce after translocation. Consequently, we anticipate that the proposed action will not appreciably diminish the reproductive capacity of the species in the Western Mojave Recovery Unit.

As described in the Environmental Baseline section of this biological opinion, we estimate that the action area supports 4 subadult and adult desert tortoises, 4 juvenile desert tortoises, and 19 eggs. Because of the protective measures proposed by the Joshua Basin Water District, we expect that the subadult and adult desert tortoises are likely to be translocated from the work areas and will likely survive in the areas to which they are moved. We acknowledge that some potential exists that desert tortoises may not be detected during removal surveys and could be killed or injured by project activities; this fact is particularly true for juvenile desert tortoises and eggs. A limited potential exists that desert tortoises may be killed, injured, or captured (and moved from harm's way) during operation and maintenance of the recharge basin and pipeline; we cannot predict how many desert tortoises operation and maintenance may affect for the reasons described in the Effects of the Action - Operations and Maintenance Activities section of this biological opinion. Even if the proposed action caused the death of 8 desert tortoises and 19 eggs, the number of desert tortoises in the Western Mojave Recovery Unit would not be appreciably reduced, given the total predicted number of desert tortoises in the recovery unit.

The proposed action would reduce the distribution of the desert tortoise by approximately 32.5 acres, based on the amount of permanent disturbance. This loss comprises approximately 0.0004 percent of the modeled habitat in the Western Mojave Recovery Unit. This loss of habitat and disturbance comprise an inconsequential reduction in the distribution of the desert tortoise because of its small area, but, more importantly, because it would be located in an already urbanizing area that we do not consider important for the long-term recovery of the desert tortoise.

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 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. To the best of our knowledge, no additional activities are proposed in the action area at this time.

CONCLUSION

After reviewing its status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the desert tortoise. We have reached this conclusion because:

1. Project activities are likely to kill or injure few desert tortoises because the Joshua Basin Water District will implement numerous measures to protect desert tortoises during construction, operations, and maintenance (e.g., clearance surveys, translocation, exclusion fencing, translocation, qualified biologists, desert tortoise monitors).

2. The Joshua Basin Water District will implement numerous measures to reduce the potential for increased predation by common ravens.

3. This project would not result in loss of desert tortoise habitat in areas designated for intensive management to achieve conservation of desert tortoises.

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 to 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. 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 measures described in this incidental take statement are non-discretionary. The EPA must make them binding conditions of funding provided to the Joshua Basin Water District. If the EPA fails to make the terms and conditions of the incidental take statement binding conditions of the funding provided to the Joshua Basin Water District, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the EPA or Joshua Basin Water District must report the progress of its action and its impact on the species to the Service as specified in the incidental take statement (50 Code of Federal Regulations 402.14(i)(3)). We also note that, because the Service considered the effects of the protective measures proposed by the EPA and the Joshua Basin Water District in its analysis of the proposed action, these measures are also non-discretionary.

We anticipate that all desert tortoises within the action area will be killed, injured, or captured during construction, operation, and maintenance of the pipeline and recharge basin. We anticipate that most of these individuals will be captured and translocated to nearby suitable habitat. Based on the number of desert tortoises and eggs we predicted may occur in the action area (see the Environmental Baseline section of the biological opinion), we expect that the proposed action is likely to take up to 4 subadult and adult desert tortoises, 4 juveniles, and 19 eggs during construction. Because of all the variables involved, we cannot estimate the number of desert tortoises that may be taken during operation and maintenance of the pipeline and recharge basin (see the Effects of the Action - Operation and Maintenance section of the biological opinion); for this reason, we will establish a threshold to re-initiate formal consultation with the reasonable and prudent measures and terms and conditions of this biological opinion.

The exemption provided by this incidental take statement to the prohibitions against take contained in section 9 of the Act extends only to the action area as described in the Environmental Baseline section of this biological opinion.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of desert tortoises during the implementation (i.e., construction, operation, and maintenance) of the Joshua Basin Water District's water recharge basin and pipeline project:

1. The EPA or Joshua Basin Water District must ensure that only experienced biologists conduct surveys for and translocate desert tortoises during the implementation of the proposed project.

2. The EPA or Joshua Basin Water District must ensure that the level of incidental take anticipated in this biological opinion is commensurate with the analysis contained herein.

Our evaluation of the proposed action includes consideration of the protective measures proposed by the Joshua Basin Water District and the EPA in the biological assessment and re-iterated in the Description of the Proposed Action section of this biological opinion. Consequently, any changes in these protective measures may constitute a modification of the proposed action that causes an effect to the desert tortoise that was not considered in the biological opinion and require re-initiation of consultation, pursuant to the implementing regulations of the section 7(a)(2) of the Act (50 Code of Federal Regulations 402.16). The reasonable and prudent measures and terms and conditions are intended to complement and clarify the protective measures proposed by the EPA and the Joshua Basin Water District.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the EPA or Joshua Basin Water District must comply with the following terms and conditions, which implement the reasonable and prudent measures described in the previous section, and the reporting and monitoring requirements. These conditions are non-discretionary.

1. The following term and condition implements reasonable and prudent measure 1:

   The EPA or Joshua Basin Water District must ensure that only biologists authorized by the Service under the auspices of this biological opinion conduct clearance surveys for and translocate desert tortoises. We request that you provide us with the credentials of authorized biologists who you wish to conduct these duties at least 30 days prior to the time they must be in the field. The authorized biologist we approve will be responsible for selecting additional monitors to ensure that the protective measures proposed by the consulting agency and terms and conditions required by the Service are fully implemented. The authorized biologist will assign appropriate tasks to any additional monitors, based on their experience.

2. The following terms and conditions implement reasonable and prudent measure 2:

   a. To ensure that the measures proposed by the EPA and the Joshua Basin Water District are effective and are being properly implemented, the EPA or Joshua Basin Water District must contact the Service immediately if it becomes aware that a desert tortoise has been killed or injured by project activities. At that time, the EPA or Joshua Basin Water District must review the circumstances surrounding the incident with the Service to determine whether additional protective measures are required. Project activities may continue pending the outcome of the review, if the proposed protective measures and any appropriate terms and conditions of this biological opinion have been and continue to be fully implemented.

b. If four desert tortoises are killed or injured during operation and maintenance of the proposed action, the EPA must re-initiate consultation, pursuant to the implementing regulations for section 7(a)(2) of the Act at 50 Code of Federal Regulations 402.16, on the proposed action. Because we do not expect that the capture and handling of desert tortoises (e.g., to remove them from the pipeline right-of-way and recharge basin during operation and maintenance) is likely to result in injury or mortality, we are not establishing a criterion for re-initiation of formal consultation for this activity.

REPORTING REQUIREMENTS

Within 60 days of the completion of the proposed action, the EPA or Joshua Basin Water District must provide a report to the Service that provides details on the effects of the action on the desert tortoise. Specifically, the report must include information on any instances when desert tortoises were killed, injured, or handled, the circumstances of such incidents, and any actions undertaken to prevent similar instances from re-occurring. We recommend that the EPA or Joshua Basin Water District provide us with any recommendations that would facilitate the implementation of the protective measures while maintaining protection of the desert tortoise. We also request that the EPA or Joshua Basin Water District provide us with the names of any monitors who assisted the authorized biologist and an evaluation of the experience they gained on the project. The qualifications form on our website (http://www.fws.gov/ventura/sppinfo/protocols/deserttortoise_monitor-qualifications-statement.pdf), filled out for this project, along with any appropriate narrative would provide an appropriate level of information. This information would provide us with additional reference material in the event these individuals are submitted as potential authorized biologists for future projects.

DISPOSITION OF DEAD OR INJURED DESERT TORTOISES

Within 3 days of locating any dead or injured desert tortoises, you must notify the Ventura Fish and Wildlife Office by telephone (805 644-1766) and by facsimile (805 644-3958) or electronic mail. The report must include the date, time, and location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Injured desert tortoises must be taken to a qualified veterinarian for treatment. If any injured desert tortoises survive, the EPA or Joshua Basin Water District must contact the Service regarding their final disposition.

The EPA or Joshua Basin Water District must take care in handling dead specimens to preserve biological material in the best possible state for later analysis. The remains of desert tortoises must be placed with the U.S. Geological Survey (Contact: Kristin Berry, U.S. Geological Survey, 22835 Calle San Juan De Los Lagos, Moreno Valley, California 92553, (951-697-5361). If the U.S. Geological Survey does not want the carcass because the damage is too extensive, the carcass must be disposed of in an appropriate manner. Prior to the onset of ground-disturbing activities, the EPA or Joshua Basin Water District must contact the U.S. Geological Survey to

determine whether it wants carcasses and to determine the proper handling of carcasses that it desires.

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. We encourage the Joshua Basin Water District to investigate opportunities to work with the Service, the National Park Service at Joshua Tree National Park, the Bureau of Land Management, and other appropriate groups to implement programs that would further the conservation of the desert tortoise and the ecosystem upon which it depends. Such opportunities could include education programs regarding the use of native plants and avoidance of invasive non-native plants in landscaping, measures to avoid attracting and subsidizing predators, and appropriate recreation in desert areas.

RE-INITIATION NOTICE

This concludes formal consultation on the EPA's proposed funding of the Joshua Basin Water District's water recharge basin and pipeline in Joshua Tree, San Bernardino County, California. Re-initiation of formal consultation is required where discretionary federal involvement or control over the action has been retained or is authorized by law and:

(a) if the amount or extent of taking specified in the incidental take statement is exceeded;

(b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

(c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or

(d) if a new species is listed or critical habitat designated that may be affected by the identified action (50 Code of Federal Regulations 402.16).

If you have any questions regarding this biological opinion, please contact Amy Torres of my staff at (909) 382-2654.

Sincerely,

/s/: Diane K. Noda

Diane K. Noda
Field Supervisor

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