Appendix C.7

Winter Golden Eagle Survey Report

WINTER GOLDEN EAGLE SURVEY REPORT FOR THE PROPOSED DESERT HARVEST SOLAR PROJECT LOCATED IN UNINCORPORATED RIVERSIDE COUNTY, CALIFORNIA

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1.0 INTRODUCTION

Bloom Biological, Incorporated (BBI) was retained by Aspen Environmental Group (Aspen) to conduct winter surveys for Golden Eagle (*Aquila chrysaetos*) for the proposed Desert Harvest Solar Project (project site) located in unincorporated Riverside County, California. The Golden Eagle is an uncommon permanent resident and migrant throughout most of California's foothills, mountains, sage-juniper flats and deserts (CDFG 2008), and is protected under the federal Bald and Golden Eagle Protection Act and by the California Department of Fish & Game as a Fully Protected Species. Golden Eagle status studies completed as recently as 1989 suggested a stable population for much of the western United States (Harlow and Bloom 1989); however, recent evidence suggests that eagle numbers in the western United States are now declining. As a result, the U.S. Fish and Wildlife Service (Service) is recommending focused surveys in nesting habitat within ten miles of proposed projects that might cause anthropogenic disturbances to eagles. Future recommendations regarding Golden Eagle wintering and migratory habitat use are being developed.

The winter survey described in this report will assist BBI and Aspen in further developing impact avoidance and management guidelines for this species in the project area. This report discusses BBI's survey methods, results and recommendations.

2.0 STUDY AREA DESCRIPTION

The project site is comprised of approximately 1,205 acres (488 hectares) of open desert in east-central Riverside County, California (see Figure 1). The site is located on all or portions of Public Land Survey Sections 26 and 27 of Township 4 South, Range 15 East of the US Geological Survey's (USGS) 7.5-minute *Victory Pass* quadrangle and Section 25 of Township 4 South, Range 15 East of the *East of Victory Pass* quadrangle. Terrain on the site is flat, with elevations ranging from 584 to 675 feet (178 to 206 meters) above mean sea level (amsl), with a mean elevation of 623 feet (190 meters) amsl.[1] The project site is accessed via County Route R2, which heads north from Desert Center – Rice Road just north of Interstate 10.

The study area for this survey includes the project site and all lands within a ten mile radius of the project site (Exhibits 1 and 2). For the purpose of this document, this region will be referred to as the "study area". The study area is comprised of approximately 247,160 acres (100,022 hectares) located on all or portions of the USGS 7.5-minute *Placer Canyon, Pinto Wells, Coxcomb Mountains, West of Palen Pass, Buzzard Spring, Victory Pass, East of Victory Pass, Palen Lake, Hayfield Spring, Desert Center, Corn Spring* and *Sidewinder Well* quadrangles. Terrain in the study area varies from flat to mountainous with elevations ranging from 423 to 3,983 feet (129 to 1,214 meters) amsl, with a mean elevation of 1,204 feet (367 meters) amsl[1]. Significant Holland (1986) land cover types in the study area are Agriculture, Alkali Playa, Blackbush Scrub, Desert Dry Wash Woodland, Mojave Creosote Bush Scrub, Mojave Mixed Woody Scrub, Mojavean Pinyon and Juniper Woodlands, Sonoran Creosote Bush Scrub and Sonoran Desert Mixed Scrub[2] (Exhibit 3). Potential locations for Golden Eagle nesting in the study area include the Eagle Mountains to the west, Coxcomb Mountains to the north, Palen Mountains to the east, and Chuckwalla Mountains to the south. Golden Eagles are also known to build nests on electrical towers, the majority of which run east-west in the southern end of the study area.

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[1] Elevation values derived from GRASS GIS version 6.4 using module *r.univar* on a US Geological Survey 1/3-minute digital elevation model.

[2] Land cover types and extents based on GAP Analysis Project data and determined via a PostGIS/PostgresSQL spatial query.

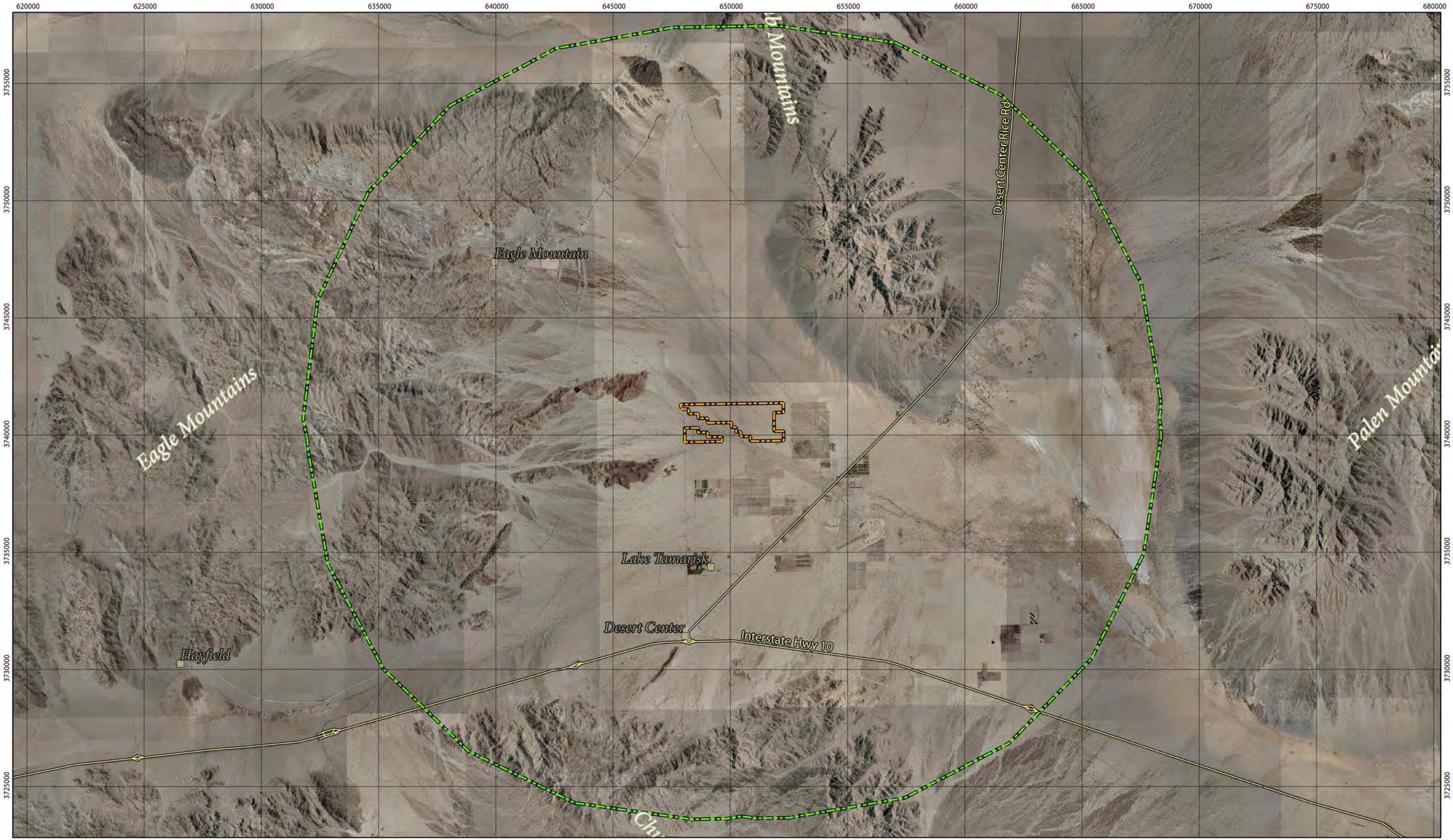

Exhibit 1: Study Area

Desert Harvest | Riverside County, California

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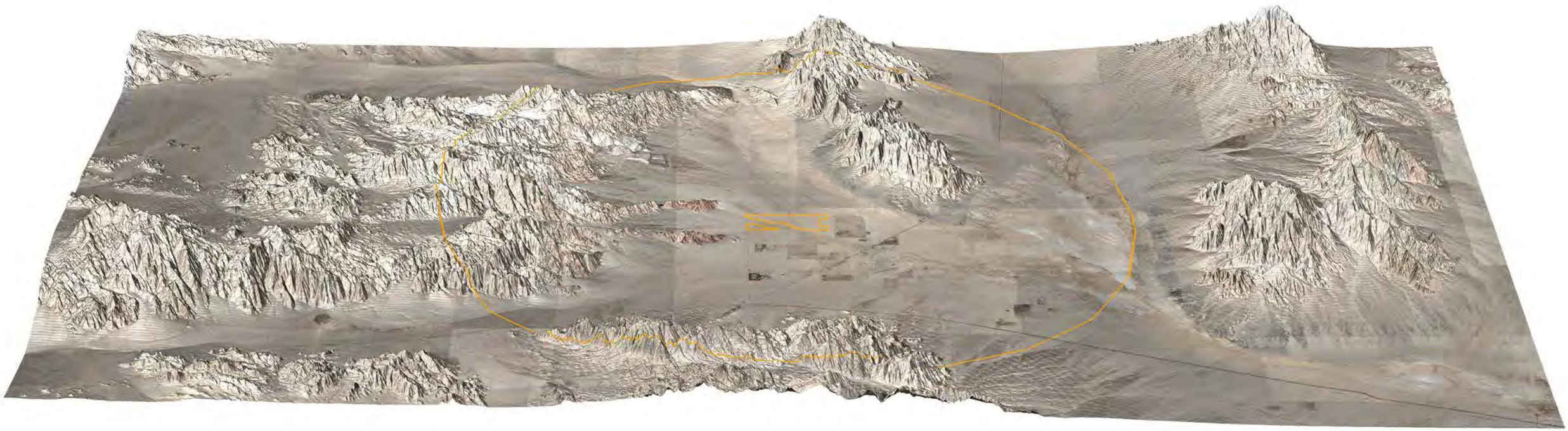

Exhibit 2: Terrain Features
Desert Harvest | Riverside County, California

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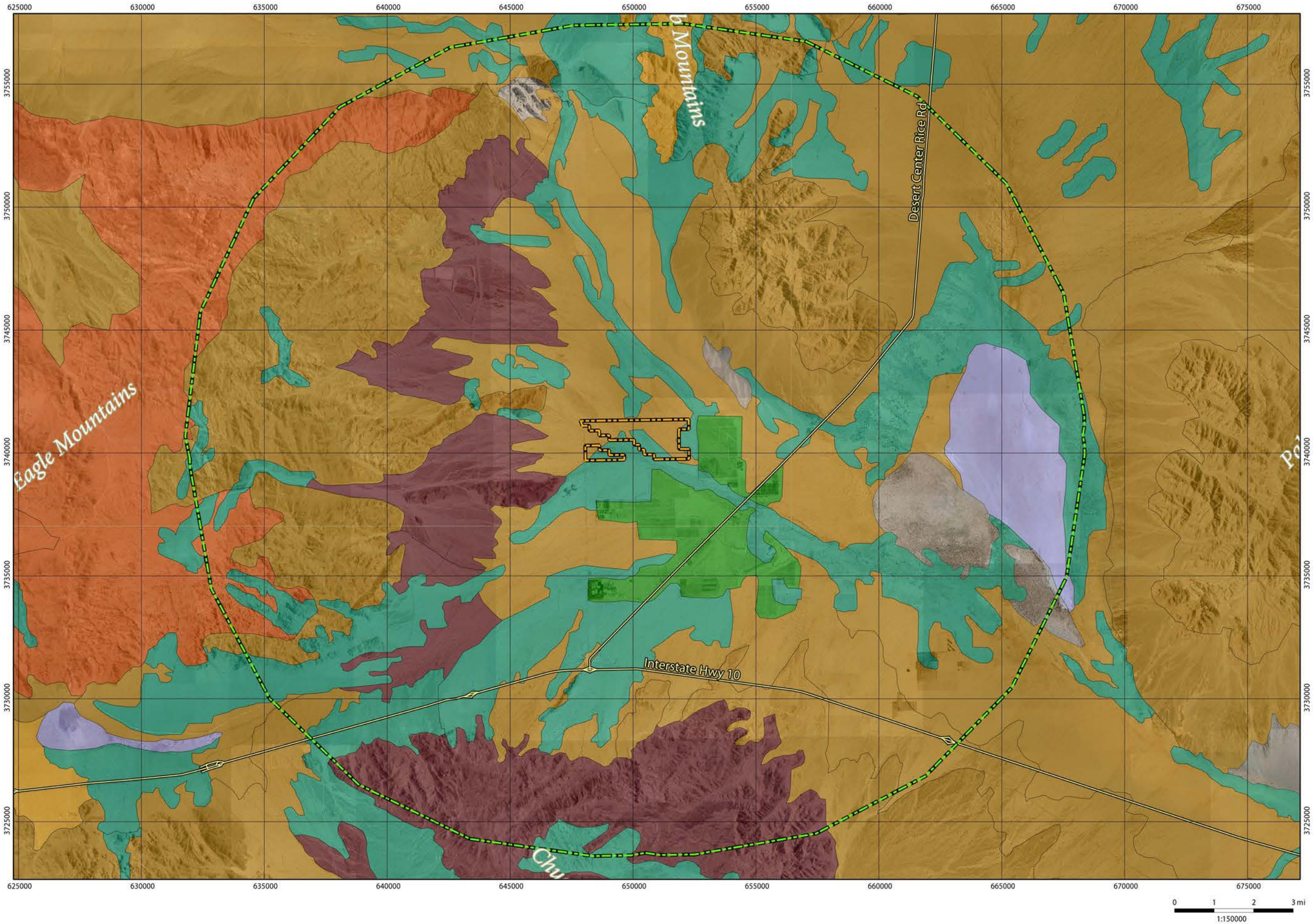

Vegetation Data Source: Davis, F. W., D. M. Stoms, A. D. Hollander, K. A. Thomas, P. A. Stine, D. Odion, M. I. Borchert, J. H. Thorne, M. V. Gray, R. E. Walker, K. Warner, and J. Graae. 1998. The California Gap Analysis Project--Final Report. University of California, Santa Barbara, CA.

UTM NAD 83 Zone 11 Coordinates
Author: Marcus C. England
Map Date: 21 March 2012
Aerial Photography: US Department of Agriculture

Exhibit 3: GAP Vegetation Communities
Desert Harvest | Riverside County, California

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Figure 1. Project Site Location

3.0 METHODS

BBI biologists conducted eight surveys from December 22, 2011 to February 7, 2012. The primary objective of the surveys was to document the locations, if any, of Golden Eagles and Golden Eagle nests observed in the study area. The secondary objective was to document the location of other raptor and corvid nests. BBI biologists documented all other biological resources of potential permitting significance. Surveys were generally completed from sunrise to mid-afternoon or near sunset. Weather conditions varied throughout but were generally seasonable with no rain or other significant weather events that could adversely affect observations. Much of the study area was covered via vehicle on both improved and unimproved roads. Foot travel was necessary for close inspection of nests and viewing of terrain when a vehicle approach did not allow an appropriate vantage point. All findings of biological significance (e.g., nests, sensitive species) were documented with a GPS waypoint and photograph where feasible.

Table 1. Field Survey Dates, Times and Weather Conditions

Date	Time	Weather	Biologists
12/22/11	0830-1610h	Start: 48° F, 0% cloud cover, Strong Wind out of the N End: 50° F, 0% cloud cover, Strong Wind out of the N No rain; No fog; No snow	Peter H. Bloom Marcus C. England
12/28/11	0700-1630h	Start: 55° F, 1-25% cloud cover, Calm out of the W End: 66° F, 1-25% cloud cover, Light Wind out of the W No rain; No fog; No snow	Peter H. Bloom Ryan Thomas
01/06/12	0715-1545h	Start: 46° F, 1-25% cloud cover, Calm out of the N End: 72° F, 0% cloud cover, Calm out of the N No rain; No fog; No snow	Peter H. Bloom Karly Moore
01/10/12	0715-1615h	Start: 37° F, 1-25% cloud cover, Breeze out of the SE End: 65° F, 26-50% cloud cover, Breeze out of the NE No rain; No fog; No snow	Peter H. Bloom Karly Moore
01/20/12	0730-1615h	Start: 49.9° F, 76-99% cloud cover, Breeze out of the NE End: 70° F, 26-50% cloud cover, Breeze out of the E No rain; No fog; No snow	Lee Aulman Karly Moore
01/27/12	0745-1615h	Start: 64.9° F, 76-99% cloud cover, Strong Wind out of the NW End: 70° F, 76-99% cloud cover, Strong Wind out of	Lee Aulman Karly Moore

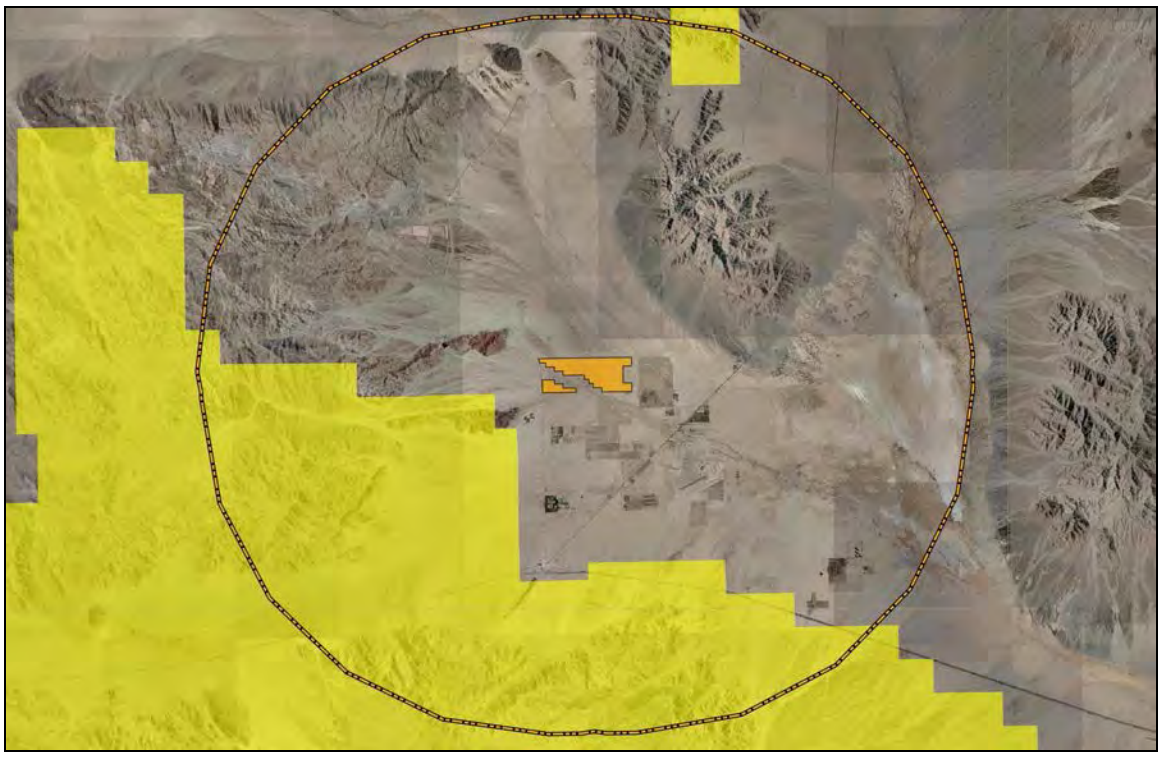
Date	Time	Weather	Biologists
		the NE No rain; No fog; No snow	
02/01/12	0715-1615h	Start: 53° F, 26-50% cloud cover, Breeze out of the W End: 69° F, 0% cloud cover, Light Wind out of the SW No rain; No fog; No snow	Peter H. Bloom Karly Moore
02/07/12	0730-1530h	Start: 54° F, 100% cloud cover, Breeze out of the E End: 67° F, 100% cloud cover, Breeze out of the W No rain; No fog; No snow	Peter H. Bloom Karly Moore

4.0 RESULTS

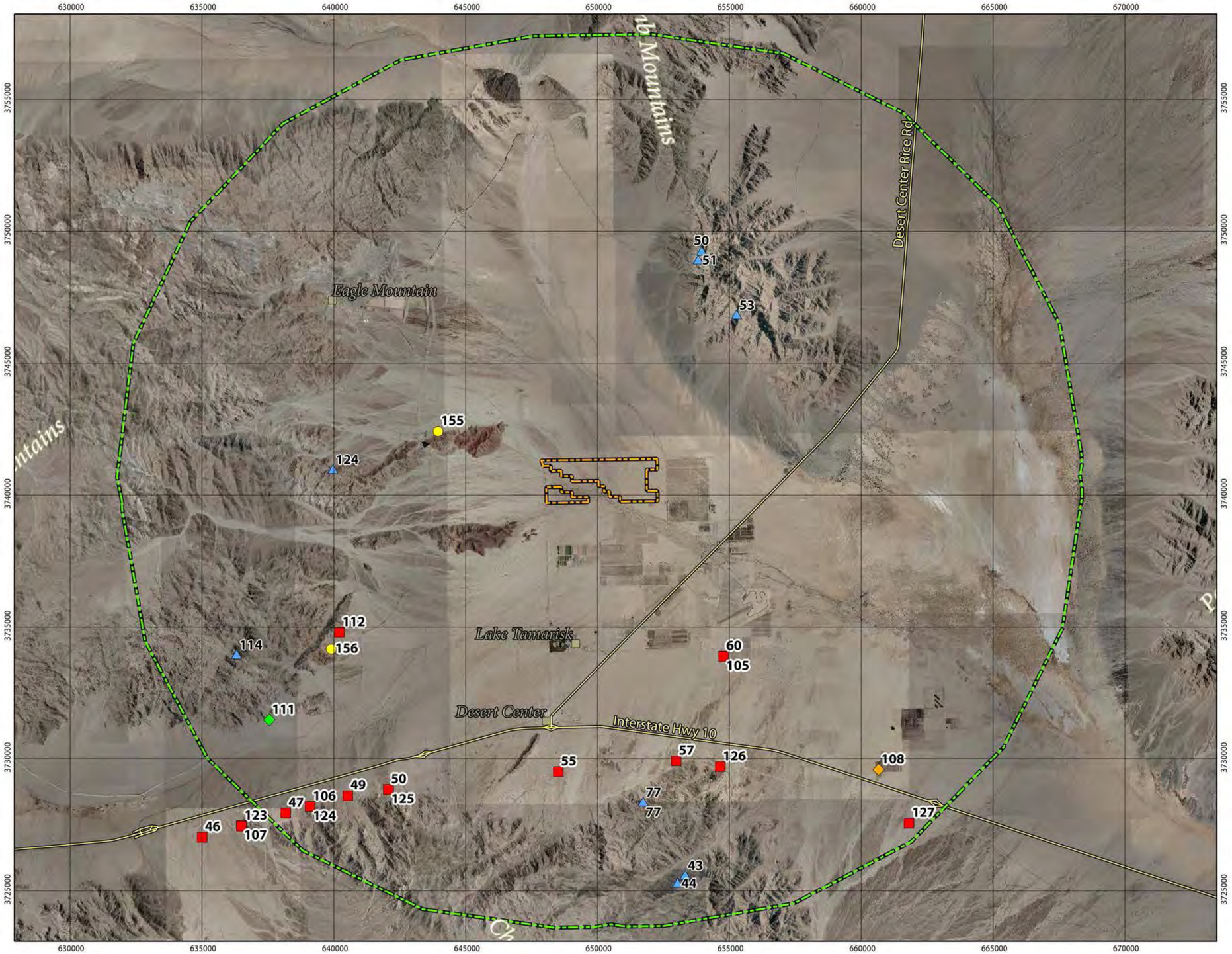
4.1 General Biological Conditions

A total of 41 bird, six mammal and two reptile species were observed during BBI's surveys. A comprehensive list of these species is provided in the Faunal Compendium which is attached as Appendix A. Other than Golden Eagle, the most significant resource observation during BBI's surveys was that of a shell fragment of a juvenile or immature Desert Tortoise (*Gopherus agassizii*) near the southwest edge of the study area on January 20, 2012 (point 111, Exhibit 4). The Desert Tortoise is listed as Threatened with Critical Habitat designated under the Federal Endangered Species Act. The project site is located approximately 1.25 miles northeast of the limits of the Chuckwalla Unit of Desert Tortoise Critical Habitat (Service 1994, Figure 2).

Figure 2. Desert Tortoise Critical Habitat Relative to the Project Site and Study area.



Probable migratory corridors, at least for Turkey Vultures (*Cathartes aura*), were detected in the west end of the study area (points 155 and 156, Exhibit 4) by BBI on February 1, 2012. In BBI's project database, biologist Karly Moore noted:



Sensitive Birds

#	Date	Common Name	Scientific Name
108	2012-01-10	Golden Eagle	Aquila chrysaetos

Sensitive Reptiles

#	Date	Common Name	Scientific Name
111	2012-01-20	Desert Tortoise	Gopherus agassizii

Other

#	Date	Title
155	2012-02-01	Migrating corridor

Nests

#	Date	Common Name	Scientific Name	Substrate	Height
46	2011-12-22	Red-tailed Hawk	Buteo jamaicensis	Utility Pole	150
47	2011-12-22	Common Raven	Corvus corax	Utility Pole	150
49	2011-12-22	Common Raven	Corvus corax	Utility Pole	150
50	2011-12-22	Golden Eagle	Aquila chrysaetos	Utility Pole	150
105	2012-01-10	Red-tailed Hawk	Buteo jamaicensis	Utility Pole	30
106	2012-01-10	Golden Eagle	Aquila chrysaetos	Utility Pole	60
107	2012-01-10	Golden Eagle	Aquila chrysaetos	Utility Pole	60
112	2012-01-20	Golden Eagle	Aquila chrysaetos	Other	10 feet
123	2012-01-27	Golden Eagle	Aquila chrysaetos	Utility Pole	90 ft
55	2011-12-22	Common Raven	Corvus corax	Utility Pole	150
57	2011-12-22	Common Raven	Corvus corax	Utility Pole	150
60	2011-12-22	Red-tailed Hawk	Buteo jamaicensis	Utility Pole	100
124	2012-01-27	Golden Eagle	Aquila chrysaetos	Utility Pole	90 ft
125	2012-01-27	Golden Eagle	Aquila chrysaetos	Utility Pole	90 ft
126	2012-01-27	Golden Eagle	Aquila chrysaetos	Utility Pole	90 ft
127	2012-01-27	Golden Eagle	Aquila chrysaetos	Utility Pole	90 ft

Project Site Boundary

Ten Mile Golden Eagle Survey Buffer

Nests

Sensitive Birds

Sensitive Reptiles

Other

BLM-Provided Golden Eagle Nest Locations

0 1 2 3 mi

1:150000

UTM NAD 83 Zone 11 Coordinates
Author: Marcus C. England
Map Date: 29 March 2012
Aerial Photography: US Department of Agriculture

Exhibit 4: Biological Resource Observations

Desert Harvest | Riverside County, California

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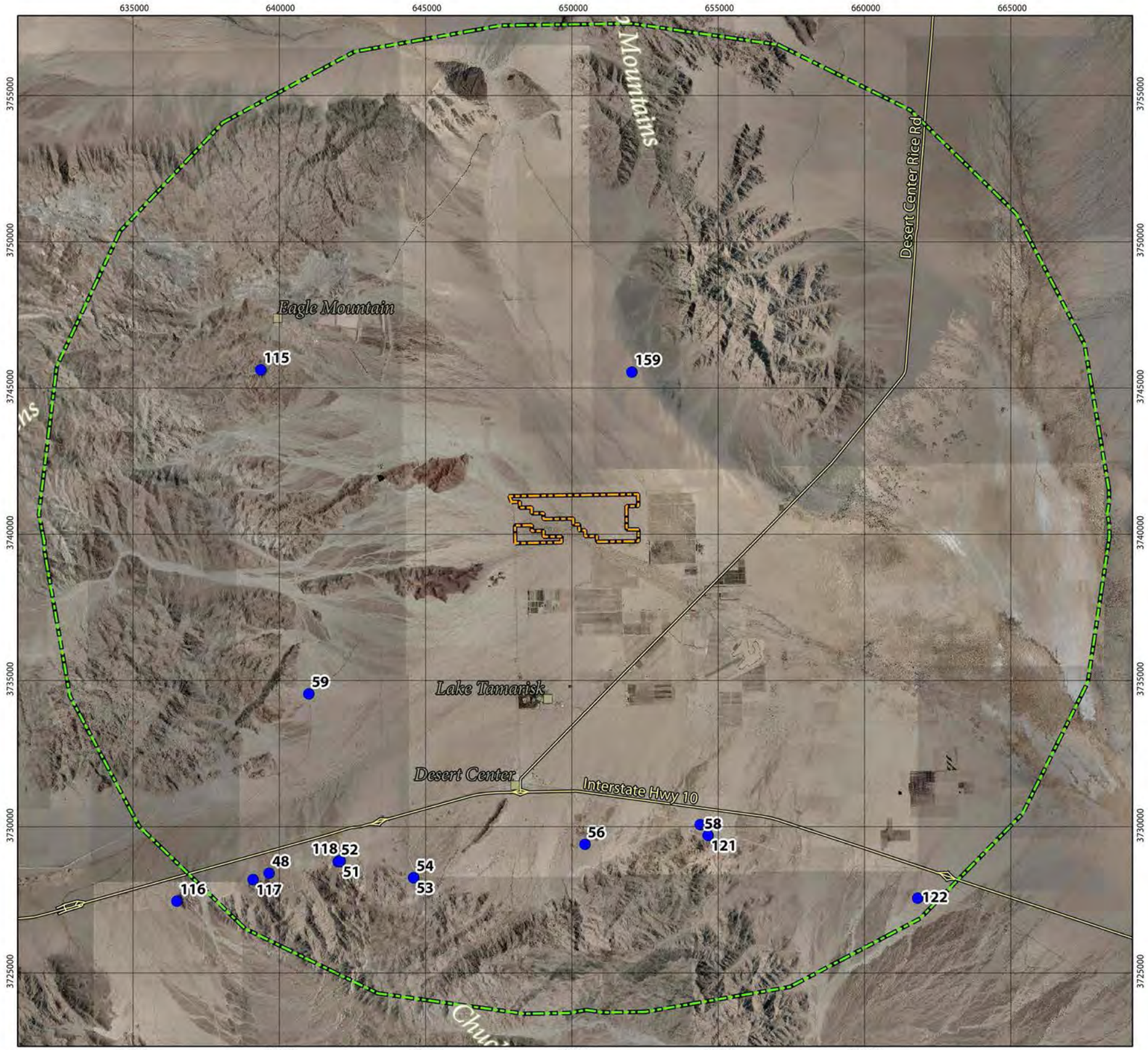

Waypoint: 159
UTM Easting: 652049
UTM Northing: 3745555
Biologist: Karly Moore
Direction: NW
Description: Photo across the sand dune, north of highway 10, east of current solar farm being constructed.

Waypoint: 118
UTM Easting:
UTM Northing:
Biologist: Karly Moore
Direction: N
Description: Golden eagle nest in a tower on the south side of Highway 10. Two unknown large birds of prey seen in the area.

Waypoint: 115
UTM Easting: 639364
UTM Northing: 3745631
Biologist: Karly Moore
Direction: NW
Description: Old, inactive probable Common Raven nest, stained with wood rat urine.

Waypoint: 48
UTM Easting: 639649
UTM Northing: 3728412
Biologist: Marcus C. England
Direction: W
Description: View of power line right of way.

Waypoint: 52
UTM Easting: 642005
UTM Northing: 3728813
Biologist: Marcus C. England
Direction: S
Description: Cliffs that could potentially provide nest locations for Golden Eagle.

Note: Additional photographs available upon request.

Exhibit 5: Photograph Locations

Desert Harvest | Riverside County, California

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Over the course of the day groups of turkey vultures were seen migrating WNW over Eagle Mountain. The first group of 80 turkey vultures were seen thermaling low below the ridgetop along the slope over by the aqueduct substation (643952, 3742418). This was the area the vultures were seen crossing a few weeks prior. Later in the day 136 turkey vultures were seen passing a little more to the west (639895, 3734170) traveling low and even into the draw/canyon by the old inactive golden eagle nest in the boulder.

One California Species of Special Concern, a Long-eared Owl (*Asio otus*) was flushed from a wash on the south side of the study area on January 10, 2012.

A variety of large bird nests were also documented. These will be described in the following section.

4.2 Golden Eagles & Other Raptors

Golden Eagles are present in the area, but it is uncertain whether they are currently regularly using the proposed project's study area. On January 10, 2012, one adult Golden Eagle was observed soaring near the southeastern edge of the study area just north of Interstate 10 (point 108, Exhibit 4). The eagle was thermaling with approximately 80 Common Ravens (*Corvus corax*) and three Turkey Vultures. No other Golden Eagles were detected during BBI's surveys.

Eight Golden Eagle nests or probable Golden Eagle nests were detected by BBI during the surveys. All were located on utility poles. None of the nests appeared to be recently active. All of the nest locations identified by BBI are shown on Exhibit 4 and in Table 2 below. Eight additional Golden Eagle nest locations from 2010 were provided by the Bureau of Land Management. At least one of these nests was active in 2010. The nests are shown on Exhibit 4 and in Table 3 below.

Uncommon raptor species detected during the surveys include Prairie Falcon (*Falco mexicanus*) with three observed on January 20, 2012 and two observed on February 7, 2012, and the aforementioned Long-eared Owl observed on January 10, 2012. Common raptor species detected during BBI's surveys were Sharp-shinned Hawk (*Accipiter striatus*), Cooper's Hawk (*Accipiter cooperii*), Red-tailed Hawk (*Buteo jamaicensis*), and American Kestrel (*Falco sparverius*). Red-tailed Hawk was the only raptor species, other than Golden Eagle, for which nest locations were detected during BBI surveys. Nests were observed at points 46, 60, and 105 (Exhibit 4 and Table 2).

Table 2. Nest Locations & Descriptions

The following table shows all large bird nests detected during BBI's surveys. These nests are also depicted with their coordinates on Exhibit 4.

#	Date	Common Name	Scientific Name	Substrate	Height	Notes
46	2011-12-22	Red-tailed Hawk	*Buteo jamaicensis*	Utility Pole	150	South cross arm of tower.
47	2011-12-22	Common Raven	*Corvus corax*	Utility Pole	150	North arm of tower. Possible Red-tailed Hawk nest.
49	2011-12-22	Common Raven	*Corvus corax*	Utility Pole	150	North cross arm. Possibly Red-tailed Hawk.
50	2011-12-22	Golden Eagle	*Aquila chrysaetos*	Utility Pole	150	South of arm of utility tower.
55	2011-12-22	Common Raven	*Corvus corax*	Utility Pole	150	South cross arm. Could be Red-tailed Hawk or Golden Eagle.
57	2011-12-22	Common Raven	*Corvus corax*	Utility Pole	150	North arm. Possible Red-tailed Hawk nest.
60	2011-12-22	Red-tailed Hawk	*Buteo jamaicensis*	Utility Pole	100	None
105	2012-01-10	Red-tailed Hawk	*Buteo jamaicensis*	Utility Pole	30	Found 6 January 2012, female

#	Date	Common Name	Scientific Name	Substrate	Height	Notes
						was nest building.
106	2012-01-10	Golden Eagle	*Aquila chrysaetos*	Utility Pole	60	inactive, south side of Hwy 10, near hillside
107	2012-01-10	Golden Eagle	*Aquila chrysaetos*	Utility Pole	60	inactive, near hillside, south side of Hwy 10.
112	2012-01-20	Common Raven	*Corvus corax*	Other	10	Inactive, old nest, sticks stained with wood rat urine. Nest waypoint is a projected waypoint.
123	2012-01-27	Golden Eagle	*Aquila chrysaetos*	Utility Pole	90	Golden eagle nest, south side of highway 10, west end of driving route (closest to red canyon rd).
124	2012-01-27	Golden Eagle	*Aquila chrysaetos*	Utility Pole	90	Golden eagle nest in a tower, south side of highway 10.
125	2012-01-27	Golden Eagle	*Aquila chrysaetos*	Utility Pole	90	Golden eagle nest in tower, on south side of highway 10. Two large unidentified birds of prey were seen nearby.
126	2012-01-27	Golden Eagle	*Aquila chrysaetos*	Utility Pole	90	Golden eagle nest on south side of highway 10. There are DPV2 signs indicating ESA (possibly the nest). Location is roughly 2.5 miles southwest of the golden eagle seen several weeks prior.
127	2012-01-27	Golden Eagle	*Aquila chrysaetos*	Utility Pole	90	Golden eagle nest on a tower on the south side of Highway 10, furthest to the east documented. This nest is 1.5 miles southeast of where the golden eagle was documented several weeks prior.

Table 3. BLM-Provided Golden Eagle Nest Locations

The following table shows Golden Eagle nest locations within the study area provided by the Bureau of Land Management. These nests are also depicted on Exhibit 4.

Waypoint	Active	Elevation	Notes	Easting	Northing	Year
43	N	2358 ft	very old and deteriorated	_	_	2010
44	N	2374 ft		_	_	2010
77	*	1730 ft	*Possibly active	_	_	2010
114	N	3816 ft		_	_	2010
124	*	2878 ft	*Possibly active, possibly new material	_	_	2010
50	Y	2709 ft		_	_	2010
51	N	2175 ft		_	_	2010
53	N	2346 ft		_	_	2010

5.0 CONCLUSIONS & DISCUSSION

While there is currently an effort to build a larger "sustainable" energy infrastructure in the United States and abroad with expected fewer overall environmental effects than the existing hydrocarbon-based infrastructure, conservation biologists are still in the process of establishing what effects alternative

energy plants might have on the environment at the local level. It is well-established that Golden Eagles and other raptors are vulnerable to mortality through collision with wind turbines (Orloff and Flannery 1992, PBRG 1997, Madders and Walker 2002). For solar facilities, potential effects on wildlife are in the early stages of investigation, but it is expected that raptors and other species could suffer adverse effects due to reduced foraging habitat, and potentially, a reduction in the prey base also caused by habitat loss for prey species. Specifically, BBI has identified the following potential adverse effects on Golden Eagles attributed to solar projects:

- **Direct Mortality -** Long-term surveys of Golden Eagle populations have shown declines in nesting populations throughout the western United States (Kochert and Steenhof 2002). Franson et al. (1995) found that humans cause >70% of recorded deaths, with the leading causes being accidental trauma (collisions with vehicles, power lines, or other structures, 27%), electrocution (25%), gunshot (15%), and poisoning (6%). Lead poisoning in California has also been identified as an important mortality factor with > 30% of a population having elevated levels (Bloom et al. 1989, Pattee et al. 1990).

  Electrocution is a particular risk potentially posed by infrastructure associated with many solar projects. Golden Eagles are vulnerable to electrocution when landing on power poles, with the risk increasing when inclement weather hampers flight or when wet feathers increase conductivity (Avian Power Line Interaction Committee 1996). Harness and Wilson (2001) reported that ≥272 Golden Eagle electrocution deaths occurred in western North America from 1986 to 1996. Poles with cross arms diagonal or parallel to prevailing winds are most lethal (Benson 1981, Harness and Wilson 2001).

  For this proposed project, the specifics of the proposed electrical infrastructure are unknown to BBI at this time. BBI recommends that electrocution risk be minimized through the use of bird-safe pole designs.

- **Nest Failures -** Golden Eagles may desert nests in early incubation if disturbed by humans (Thelander 1974), and potential desertion may not be noticed early through behavioral cues as Golden Eagles are not aggressive toward humans in the nest vicinity and will simply leave and not return to the area for hours (Camenzind 1969), if ever. While data collected in this survey suggest that the proposed project is unlikely to cause such an effect directly, project implementation could contribute to cumulative or growth-inducing impacts, ultimately causing additional anthropogenic disturbance in the area over time.

- **Indirect Mortality –** Management of healthy eagle populations requires maintaining prey habitat in foraging areas (Kochert et al. 2002), as the availability of food and nesting sites is the primary factor determining nesting density of Golden Eagles (Hunt et al. 1995), and reproductive rates of Golden Eagles often fluctuate with prey densities (Smith and Murphy 1979, Tjernberg 1983, Bates and Moretti 1994, Steenhof et al. 1997, McIntyre and Adams 1999). In southwestern Idaho, Marzluff et al. (1997) have found that behavior and demography of Golden Eagles are closely associated with the abundance of Black-tailed Jackrabbits (*Lepus californicus*), which are themselves dependent on stands of sagebrush/rabbitbrush interspersed with grassland (Knick and Dyer 1997). Bloom and Hawks (1982), working in the Great Basin Desert of northeast California and northwest Nevada, found that 91% of the biomass and 85% of the frequency of prey found in nests were attributed to lagomorphs. Patch sizes of this habitat were found to be an essential feature of Golden Eagle home ranges (Marzluff et al. 1997).

  In the study area for this proposed project, BBI biologists stated that there was "a notable absence of prey items on the site". Indeed, Black-tailed Jackrabbits were only observed in small numbers during the surveys, with one on January 6, two on January 10, one on January 20 and

three on February 1, 2012. While Golden Eagles are capable of killing large prey such as cranes, wild ungulates, and domestic livestock, smaller game such as rabbits, hares, ground squirrels, and prairie dogs are most important (Bloom and Hawks 1982, Olendorff 1976). As jackrabbit population levels are cyclical, it is unclear if the relatively low number of jackrabbits detected during the surveys were an indication of poor habitat quality or reflect numbers indicative of the low end of population fluctuation.

Golden Eagles typically reach sexual maturity, form territories and begin nesting at four years of age. Pairs generally stay within the limits of their territory, which can measure 20–30 square kilometers, and within that territory can have as many as 14 nests (Bloom pers. obs.) which a pair maintains and repairs as part of its courtship ritual. Over the course of a decade several of these nests will be used and will produce young, others may only be maintained with the periodic addition of fresh sticks. Most alternate nests are important in the successful reproduction of a pair of eagles. Pairs commonly refrain from laying eggs in some years, particularly when prey is scarce.

Given the presence of Golden Eagles and at least eight confirmed or probable Golden Eagle nests in the study area, but the lack of any indication of recent nest activity, it is the opinion of BBI that although Golden Eagles are present in the study area, they may not have recently nested within it because of low prey levels. BBI recommends that winter and springs surveys for Golden Eagle be conducted yearly until project construction is completed.

6.0 LITERATURE CITED

American Ornithologists' Union (AOU). 1998. Check-list of North American birds. Seventh edition. American Ornithologists' Union, Washington, DC. 829 pp.

Avian Power Line Interaction Committee. 1996. Suggested practices for raptor protection on power lines; the state of the art in 1996. Edison Electric Inst.; Raptor Res. Found. Washington, D.C.

Bates, J. W. and M. O. Moretti. 1994. Golden Eagle (*Aquila chrysaetos*) population ecology in eastern Utah. Great Basin Nat. 54:248-255.

Benson, P. C. 1981. Large raptor electrocution and powerpole utilization: a study in six western states. Phd Thesis. Brigham Young Univ. Provo, UT.

Bloom, P.H. 1974. Some precautions to be used in banding studies of nestling raptors. Western Bird Bander 49:4-5

Bloom, P. H. and S. J. Hawks. 1982. Food habits of nesting Golden Eagles in northeast California and northwest Nevada. Raptor Res. 16:110-115.

Bloom, P.H., J.M. Scott, O.H. Pattee, and M.R. Smith. 1989. Lead contamination of Golden Eagles within the range of the California Condor. Raptors in the Modern World - Proceedings of the International Conference on Birds of Prey, Eilat, Israel, 1987.

California Department of Fish and Game. 2008. CWHR version 8.2 personal computer program. California Interagency Wildlife Task Group. Sacramento, CA.

Camenzind, F. J. 1969. Nesting ecology and behavior of the Golden Eagle *Aquila chrysaetos* L. Brigham Young Univ. Sci. Bull., Biol. Ser. 10:4-15.

Dawson, W.L. 1923. The birds of California. South Moulton Company. Los Angeles.

Dixon, J.B. 1937. The Golden Eagle in San Diego County, California. Condor 39:49-56.

Franson, J. C., L. Sileo, and N. J. Thomas. 1995. Causes of eagle deaths. Pages 68 in Our living resources. (LaRoe, E. T., G. S. Farris, C. E. Puckett, P. D. Doran, and M. J. Mac, Eds.) U.S. Dep. Int., Natl. Biol. Serv. Washington, D.C.

Fyfe, R.W. and R.R. Olendorff. 1976. Minimizing the dangers of nesting studies to raptors and other sensitive species. Can Wild. Serv. Occas. Paper No. 23. Can. Wild. Serv., Ottawa, Ont. 7pp.

Garrett, K., and J. Dunn. 1981. Birds of southern California. Los Angeles Audubon Society. 408pp.

Grinnell, J., and A. H. Miller. 1944. The distribution of the birds of California. Pacific Coast Avifauna No. 27. 608pp.

Harlow, D. L. and P. H. Bloom. 1989. Buteos and the Golden Eagle. Pages 102-110 in Proceedings of western raptor management symposium and workshop. (Pendleton, B. G., Ed.) Natl. Wildl. Fed. Washington, D.C.

Harness, R. E. and K. R. Wilson. 2001. Electric-utility structures associated with raptor electrocutions in rural areas. Wildl. Soc. Bull. 29:612-623.

Hunt, W. G., R. E. Jackman, T. L. Brown, J. G. Gilardi, D. E. Driscoll, and L. Culp. 1995. A pilot Golden Eagle population study in the Altamont Pass Wind Resource Area, California. Predatory Bird Res. Group, Univ. of California, Santa Cruz.

Johnson, D.R. and J.M. Peek. 1984. The Black-tailed Jackrabbit in Idaho: Life history, population dynamics and control. University of Idaho College of Agriculture Cooperative Extension Service Bulletin No. 637, Moscow.

Kochert, M. N. and K. Steenhof. 2002. Golden Eagles in the U.S. and Canada; status, trends conservation challenges. J. Raptor Res. 36(supplement):33-41.

Kochert, M. N., K. Steenhof, C. L. Mcintyre and E. H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/684

Knick, S.T. and D.L. Dyer. 1997. Relationship of spatial distribution of habitats used by black-tailed jackrabbits in southwestern Idaho to wildfire and military training. Journal of Wildlife Management 61:75-8.

Madders, M. and D. Walker. 2002. Golden Eagles in a multiple land-use environment: a case study in conflict management. Journal of Raptor Research 36 (1 Supplement): 55-61.

Marzluff, J.M., S.T. Knick, M.S. Vekasy, L.S. Schueck and T.J. Zarriello. 1997. Spatial use and habitat selection of Golden Eagles in southwestern Idaho. The Auk 114(4): 673-687.

Mcintyre, C. L. and L. G. Adams. 1999. Reproductive characteristics of migratory Golden Eagles in Denali National Park, Alaska. Condor 101:115-123.

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: January 30, 2010).

Olendorff, R.R. 1976. The Food Habits of North American Golden Eagles. American Midland Naturalist 95 (1): 231-236.

Orloff S. and A. Flannery. 1992. Wind turbine effects on avian activity, habitat use and mortality in Altamont Pass and Solano County Wind Resource Areas. Biosystems Analysis, Inc. Tiburon, CA.

Pagel, J.E., D.M. Whittington and G.T. Allen. 2010. Interim Golden Eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Birds, U.S. Fish and Wildlife Service.

Predatory Bird Research Group (PBRG). 1997. A population study of Golden Eagles in the Altamont Pass Wind Resource Area. National Renewable Energy Laboratory, Golden, CO.

Smith, D. G. and J. R. Murphy. 1979. Breeding responses of raptors to jackrabbit density in the eastern Great Basin Desert of Utah. Raptor Res. 13:1-14.

Smith, D.G. and J.R. Murphy. 1973. Breeding ecology of raptors in the eastern Great Basin of Utah. Brigham Young Univ., Provo. Sci. Bull. Ser. 18, No. 3 76pp.

Steenhof, K. and M.N. Kochert. 1988. Dietary responses of three raptor species to changing prey densities in a natural environment. Journal of Animal Ecology 57:37-48.

Steenhof, K., M.N. Kochert and T.L. McDonald. 1997. Interactive effects of prey and weather on Golden Eagle reproduction. Journal of Animal Ecology 66:350-362.

Thelander, C.G. 1974. Nesting territory utilization by Golden Eagles (*Aquila chrysaetos*) in California during 1974. California Department of Fish and Game, Sacramento. Wildl. Manage. Branch Admin. Rep. 74-7.

Tjernberg, M. 1983. Prey abundance and reproductive success of the Golden Eagle Aquila chrysaetos in Sweden. Holarctic Ecol. 6:17-23.

US Fish and Wildlife Service (Service). 1994. Determination of Critical Habitat for the Mojave Population of the Desert Tortoise. Federal Register 59: 5820-5866.

APPENDIX A. FAUNAL COMPENDIUM

Birds

Anseriformes - Screamers, Swans, Geese, and Ducks | Anatidae - Ducks, Geese, and Swans
- Canada Goose *Branta canadensis*

Galliformes - Gallinaceous Birds | Odontophoridae - New World Quail
- Mountain Quail *Oreortyx pictus*
- Gambel's Quail *Callipepla gambelii*

Pelecaniformes - Pelicans, Herons, Ibises, and Allies | Ardeidae - Herons, Bitterns, and Allies
- Great Egret *Ardea alba*

Accipitriformes - Hawks, Kites, Eagles, and Allies | Cathartidae - New World Vultures
- Turkey Vulture *Cathartes aura*

Accipitriformes - Hawks, Kites, Eagles, and Allies | Accipitridae - Hawks, Kites, Eagles, and Allies
- Sharp-shinned Hawk *Accipiter striatus*
- Cooper's Hawk *Accipiter cooperii*
- Red-tailed Hawk *Buteo jamaicensis*
- Golden Eagle *Aquila chrysaetos*

Falconiformes - Caracaras and Falcons | Falconidae - Caracaras and Falcons
- American Kestrel *Falco sparverius*
- Prairie Falcon *Falco mexicanus*

Gruiformes - Rails, Cranes, and Allies | Rallidae - Rails, Gallinules, and Coots
- American Coot *Fulica americana*

Columbiformes - Pigeons, and Doves | Columbidae - Pigeons and Doves
- Eurasian Collared-Dove *Streptopelia decaocto*
- Mourning Dove *Zenaida macroura*

Cuculiformes - Cuckoos and Allies | Cuculidae - Cuckoos, Roadrunners, and Anis
- Greater Roadrunner *Geococcyx californianus*

Strigiformes - Owls | Strigidae - Typical Owls
- Long-eared Owl *Asio otus*

Apodiformes - Swifts, and Hummingbirds | Apodidae - Swifts
- White-throated Swift *Aeronautes saxatalis*

Piciformes - Puffbirds, Jacamars, Toucans, Woodpeckers, and Allies | Picidae - Woodpeckers and Allies
- Ladder-backed Woodpecker *Picoides scalaris*

Passeriformes - Passerine Birds | Tyrannidae - Tyrant Flycatchers
- Black Phoebe *Sayornis nigricans*
- Say's Phoebe *Sayornis saya*

Passeriformes - Passerine Birds | Laniidae - Shrikes
- Loggerhead Shrike *Lanius ludovicianus*

Passeriformes - Passerine Birds | Corvidae - Crows and Jays
Common Raven *Corvus corax*

Passeriformes - Passerine Birds | Alaudidae - Larks
Horned Lark *Eremophila alpestris*

Passeriformes - Passerine Birds | Remizidae - Penduline Tits and Verdins
Verdin *Auriparus flaviceps*

Passeriformes - Passerine Birds | Troglodytidae - Wrens
Cactus Wren *Campylorhynchus brunneicapillus*
Rock Wren *Salpinctes obsoletus*

Passeriformes - Passerine Birds | Polioptilidae - Gnatcatchers and Gnatwrens
Blue-gray Gnatcatcher *Polioptila caerulea*
Black-tailed Gnatcatcher *Polioptila melanura*

Passeriformes - Passerine Birds | Turdidae - Thrushes
Western Bluebird *Sialia mexicana*
Mountain Bluebird *Sialia currucoides*

Passeriformes - Passerine Birds | Mimidae - Mockingbirds and Thrashers
Sage Thrasher *Oreoscoptes montanus*
California Thrasher *Toxostoma redivivum*

Passeriformes - Passerine Birds | Sturnidae - Starlings
European Starling *Sturnus vulgaris*

Passeriformes - Passerine Birds | Ptilogonatidae - Silky-flycatchers
Phainopepla *Phainopepla nitens*

Passeriformes - Passerine Birds | Parulidae - Wood-Warblers
Yellow-rumped Warbler *Setophaga coronata*

Passeriformes - Passerine Birds | Emberizidae – Emberizids
Black-throated Sparrow *Amphispiza bilineata*
White-crowned Sparrow *Zonotrichia leucophrys*

Passeriformes - Passerine Birds | Fringillidae - Fringilline and Cardueline Finches and Allies
House Finch *Carpodacus mexicanus*
Lesser Goldfinch *Spinus psaltria*

Passeriformes - Passerine Birds | Passeridae - Old World Sparrows
House Sparrow *Passer domesticus*

Mammals

Lagomorpha | Leporidae
Black-tailed Jackrabbit *Lepus californicus*

Rodentia | Sciuridae
White-tailed Antelope Squirrel *Ammospermophilus leucurus*

Rodentia | Heteromyidae
Desert Kangaroo Rat *Dipodomys deserti*
Merriam's Kangaroo Rat *Dipodomys merriami*

Artiodactyla | Cervidae
Mule Deer *Odocoileus hemionus*

Reptiles

Testudines | Testudinidae
Desert Tortoise *Gopherus agassizii*

Squamata | Phrynosomatidae
Side-blotched Lizard *Uta stansburiana*

Appendix C.8

Draft Desert Tortoise Translocation Plan

DRAFT Desert Tortoise Translocation Plan
Desert Harvest Solar Project

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Draft Report: April 2012

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ACRONYMS AND ABBREVIATIONS

Area of Critical Environmental Concern	ACEC
AMEC Earth & Environmental, Inc.	AMEC
Applicant	enXco Development Corporation
Biological Assessment	BA
Bureau of Land Management	BLM
Biological Opinion	BO
California Department of Fish and Game	CDFG
California Endangered Species Act	CESA
Critical Habitat Unit	CHU
Draft Environmental Impact Statement	DEIS
Desert Harvest Solar Project	DHSP
Desert Sunlight Solar Farm Project	DSSF
Desert Tortoise Conservation Center	DTCC
Desert Wildlife Management Area	DWMA
Environmental Impact Statement	EIS
enXco Development Corporation	enXco
Eagle Mountain Pumped Storage Project	EMPSP
Federal Endangered Species Act	ESA
Final Environmental Impact Statement	FEIS
Generator intertie transmission line	gen-tie
Incidental Take Permit	ITP
Kilometer (0.62 mi)	km
Joshua Tree National Park	JTNP
Megawatt	MW
Memorandum of Understanding	MOU
National Environmental Policy Act	NEPA
Desert Harvest Solar Project and associated generation intertie transmission line	Proposed action
Right-of-way	ROW
Upper respiratory tract disease	URTD
U.S. Fish and Wildlife Service	USFWS
Worker Environmental Awareness Program	WEAP

1. INTRODUCTION

enXco Development Corporation (enXco or Applicant) has applied to the Bureau of Land Management (BLM) for an issuance of a right-of-way (ROW) grant that would authorize construction, operation, maintenance, and decommission of the proposed Desert Harvest Solar Project (DHSP) and generator intertie (gen-tie) transmission line (together referred to as the proposed action). The proposed action is a commercial solar power-generating facility on over 1,200 acres of BLM-managed lands, and the gen-tie line would traverse 12.1 miles of both BLM-managed lands and private lands under the jurisdiction of Riverside County. enXco's objective for the DHSP is to construct and operate a 150 megawatt (MW) renewable energy resource. The DHSP has a minimum expected lifetime of 30 years, with an opportunity of 50 years or more with equipment replacement and repowering. The DHSP and several alternatives to the proposed action are currently under BLM review, pursuant to the National Environmental Policy Act (NEPA).

The proposed action area is located in Riverside County, in the upper Chuckwalla Valley approximately 5 miles north of the rural community of Desert Center (Figure 1, *Regional Location*; all figures are located at the end of this document). Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the proposed solar field site. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the site. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the DHSP boundary at Kaiser Road.

Complete details of project locations and description are found in the *Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment* (BLM 2011a), the *Biological Resources Technical Report, Desert Harvest Solar Project* (Aspen 2011), and in the *Biological Assessment*, *Desert Harvest Solar Project* (BLM 2011b).

The federally and state listed threatened desert tortoise (Gopherus agassizii) occurs in the project vicinity. No live desert tortoises or recent sign were observed on the DHSP site or adjacent areas during the 2010 and 2011 protocol-level field surveys (AMEC 2011a; 2011b). However, several desert tortoise burrows, designated as class 2 (good condition) and class 3 (deteriorated condition), and several disarticulated bone fragments, possibly originating from a desert tortoise, were located on the site. Active desert tortoises and sign were located on the adjacent Desert Sunlight Solar Farm (DSSF) site and on the gen-tie alignment proposed for DSSF and DHSP (Ironwood and Woodard 2011). The occurrence of tortoise sign, even where no living tortoises are found during surveys, indicates desert tortoise presence (US Fish and Wildlife Service; USFWS 2010a). Desert tortoises are found throughout the region and are mobile during their active seasons. Based on the presence of desert tortoises and active burrows on the adjacent project site and gen-tie alignments, the entire DHSP site and gen-tie alignment may be occupied by desert tortoises at any time, albeit only in low numbers. Take of desert tortoises requires authorization from the USFWS and California Department of Fish and Game (CDFG) under the federal and California Endangered Species Acts (ESA and CESA, respectively). This Translocation Plan describes enXco's proposed translocation methods and locations for any desert tortoises that may be found within the DHSP site prior to construction. This Plan has been prepared to support the BLM's consultation with USFWS under Section 7 of the federal ESA and state permitting under CESA.

The purposes of this Desert Tortoise Translocation Plan are to provide:

1. Estimates of the number of desert tortoises that may be present on the DHSP site;
2. Detailed descriptions of the methods to be used to translocate any tortoises present on the DHSP site at the time of project construction in order to avoid and minimize potential "take" of

desert tortoises during the construction, O&M, and decommissioning phases of the proposed action;

3. The details of the long-term monitoring and reporting program to track the effectiveness of the translocation effort.

This Translocation Plan builds on concepts and general translocation ideals with nearby solar projects, reviewed and approved by USFWS, CDFG, and BLM.

1.1 Draft Environmental Impact Statement and Biological Assessment

The Final DHSP Translocation Plan will conform to the following Applicant-Proposed Measure (**AM-BIO-6**) and to the requirements of (i) relevant provisions of the DHSP Project's Environmental Impact Statement, (ii) any USFWS Biological Opinion (BO) or CDFG Incidental Take Permit (ITP) issued for the DHSP Project, and (iii) any revisions to relevant mitigation measures that may be adopted in the BLM Record of Decision for the project.

AM-BIO-6 A **Draft Desert Tortoise Translocation Plan** will be prepared for the project and will be implemented by the Applicant to ensure that construction monitoring will be conducted by BLM-, USFWS-, and CDFG-approved biologists during all construction activities, and that any desert tortoise found with the construction zone will be translocated to a suitable location outside of the project footprint. The Final Plan will conform to the 2010 USFWS desert tortoise relocation guidelines entitled *Translocation of Desert Tortoise (Mojave Population) From Project Sites: Plan Development Guidance* (unpublished report dated August 2010).

1.2 Biological Opinion

To be completed upon issuance of the BO.

2. Estimated Number of Desert Tortoises

The DHSP site is within the Colorado Desert Recovery Unit as identified in the *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (USFWS 2011b). The Revised Recovery Plan is the most current document describing USFWS's strategy for desert tortoise recovery and reflects the most current understanding of desert tortoise biology. The Colorado Desert Recovery Unit as recognized in the Revised Recovery Plan comprises two recovery units recognized in the prior Recovery Plan (USFWS 1994) as the Eastern Colorado Desert and Northern Colorado Desert Recovery Units.

Reliable estimates of desert tortoise densities for the region surrounding the proposed action area are not available. Tortoise densities were estimated at approximately 6.9 animals per square kilometer, based on range-wide sampling data collected between 2001 and 2007 for the formerly recognized Eastern Colorado Recovery Unit (USFWS 2011b). However, these densities vary widely throughout the recovery unit. The USFWS has concluded that too few data are available to support a confident estimate of tortoise densities in the region, but that the ratio of carcasses to live animals found in recent range-wide sampling was low, which may indicate a relatively stable population. The current density estimate for the Colorado Desert Recovery Unit is 5.3 tortoises per square kilometer (USFWS 2011c).

Desert tortoise surveys were conducted on the DHSP site in 2010 and 2011 by AMEC Earth and Environmental (AMEC 2011a; 2011b) in accordance with the USFWS survey protocol *Preparing for any Action that may Occur within the Range of the Mojave Desert Tortoise* (USFWS 2010a). No live desert

tortoises or recent sign were observed within the DHSP survey area. However, several desert tortoise burrows, designated as class 2 (good condition) and class 3 (deteriorated condition), and several disarticulated bone fragments possibly originating from a desert tortoise, were located in the larger northeastern parcel of the solar generator site, and eight possible desert tortoise burrows, designated as class 5 (possibly tortoise, good condition), were observed in the smaller southwestern parcel. One additional class 5, possible desert tortoise burrow, was also observed offsite, within the perimeter transects for the southwestern parcel. Figure 2, *Desert Tortoise Survey Results*, identifies the locations of desert tortoise sign encountered during desert tortoise surveys for the DHSP. None of the burrows or other sign observed in 2010 and 2011 exhibited any evidence of recent use or corroborating sign.

The nearest documented desert tortoise locations are on the DSSF site, north of the DHSP site (BLM 2011c). Tortoises and recent sign were found on the DSSF site, about 0.3 mile north of the DHSP site, and along the proposed gen-tie alignment for the proposed action (BLM 2011c and Figures 3 and 4). In addition, a road-killed desert tortoise was observed at the Eagle Mountain off ramp on east-bound Interstate 10, approximately 6.5 miles southwest of the DHSP site, by biologists en route to the DHSP site in 2010 (AMEC 2011a).

Desert tortoises are found throughout the region and are mobile during their active seasons. Based on the presence of desert tortoise sign on the DHSP site and on active desert tortoises on the adjacent DSSF site and associated gen-tie alignments, the entire DHSP site and all gen-tie alternative alignments may be occupied by desert tortoises at any time, albeit in low numbers.

The USFWS (2010a) provides a mathematical formula for estimating actual numbers of adult and sub-adult desert tortoises from field survey data. However, this formula is not applicable for the available field data for the proposed action because no living tortoises were observed within the project site. The actual number of desert tortoises on the project site as of the commencement of construction cannot be determined from field survey data alone, due to the possibility that tortoises may have been overlooked during surveys (i.e., underground in burrows, eggs in an underground nest, juveniles in various types of refugia, etc.) or may have moved onto the site since surveys were completed. This Translocation Plan anticipates that 5 or fewer tortoises occur on the DHSP site, and would necessitate translocation prior to construction. However, this Plan also includes provisions for expanded monitoring to be implemented if more than 5 tortoises must be translocated, consistent with USFWS guidance (2011c). This is a conservative approach and it is likely that fewer tortoises, or none at all, may be found on the DHSP site during preconstruction surveys and would necessitate translocation.

Active desert tortoise sign was documented along the DSSF gen-tie line during surveys for that project. The DHSP would share the same gen-tie alignment. The northern portion of the gen-tie line along Kaiser Road lacked evidence of recent tortoise activity. Active sign was found along the gen-tie line east of Highway 177 and north of I-10, including one live tortoise observed within 30 meters of the center of the gen-tie line (Ironwood and Woodard 2011). Abundance and distribution of desert tortoises and sign are not described in further detail because off-site translocation of desert tortoises is not proposed for the gen-tie component of the DHSP. Instead, any tortoises observed in the vicinity of gen-tie work areas would be monitored and work activities would be scheduled or modified to avoid any potential take. If necessary, tortoises may be translocated no more than 500 meters, out of harm's way.

3. Recipient and Control Sites

This section describes the proposed recipient and control sites in terms of the most recent USFWS guidance document and protocols for the preparation of desert tortoise translocation plans (USFWS 2011c; J. Fraser, USFWS, personal communication 2011). The 3 recipient sites and the control site proposed in this Translocation Plan are the same sites that were reviewed for the adjacent DSSF Project (now under construction). For that project's Desert Tortoise Translocation Plan, Ironwood and Woodard (2011) used Geographic Information System (GIS) software to assess lands located within 40 kilometers (22 miles) of the DSSF site boundaries to identify potential recipient sites. They identified 3 suitable recipient sites and 1 control site for that project, based on a series of recipient site selection criteria developed from then-current USFWS (2009; 2010b) guidelines and consultation with BLM, CDFG, and USFWS. The same sites are proposed as recipient and control sites for the DHSP Translocation Plan because of their suitability for the DSSF project, and because any tortoises that would be translocated from the DHSP site would be from the same population as those translocated for the DSSF Project.

To date, 4 desert tortoises have been located in the portions of the DSSF project currently under construction. These tortoises have been or will be translocated to the Sunlight Recipient Site, (below). Based on discussions with USFWS, BLM, and CDFG biologists, this translocation plan ranks the three potential recipient sites in order of preference as follows:

1. Sunlight Recipient Site. The Sunlight Recipient Site is the preferred translocation site due to its proximity to the DHSP site and relative distance from hazards, such as busy roads; however, depending on the final number of tortoises translocated from the DSSF site into the Sunlight Recipient Site, it may be unsuitable for additional translocated animals due to potential for overcrowding.
2. Chuckwalla Recipient Site. The Chuckwalla Recipient Site is ranked second, due to its proximity to the DHSP site and its location within the Chuckwalla Desert Wildlife Management Area (DWMA). However, the proposed Eagle Mountain Pumped Storage Project (EMPSP) Draft EIS (FERC 2010) indicates that the gen-tie line for that project may be built along Eagle Mountain Road, at the eastern boundary of the Chuckwalla Recipient Site, which could contribute to habitat degradation and the potential for injury or mortality to translocated tortoises from construction, O&M, or decommissioning activities associated with that line.
3. DuPont Recipient Site. The DuPont Recipient Site is ranked third, due to its distance from the DHSP site.

Since finalization of the DSSF Translocation Plan, the USFWS has revised its Translocation Plan Guidance (2011c). The most recent guidance document lists seven criteria for consideration in selecting prospective recipient sites, noting that sites failing to meet criteria 1-3 (noted with asterisks) will be disqualified from consideration. In addition, the revised guidance defines recipient sites to encompass the area within a 6.5-km radius of the set of release points, to account for expected dispersal following release.

1. *The site supports desert tortoise habitat suitable for all life stages. [Note that reviews of desert tortoise habitat and ecology, e.g., USFWS 2011b, do not distinguish among life stages in descriptions of suitable habitat].
2. *Disease prevalence within the resident desert tortoise population is less than 20 percent.
3. *The site is at least 10 km from major unfenced roads or highways. Distance from roads may be

reduced if the proposed action includes provisions to install and maintain desert tortoise exclusion fencing as a minimization measure.

4. The site is within 40 km of the project site, with no natural barriers to movement between them, to ensure that the desert tortoises at the two sites were likely part of a larger mixing population and similar genetically (note that there are several significant anthropogenic barriers to movement in the areas surrounding the DHSP site, including I-10, Hwy 177, and the above-ground portions of the Colorado River Aqueduct; see Figure 5).

5. The site occurs on lands where desert tortoise populations have been depleted or extirpated yet still support suitable habitat. Depleted areas may include lands adjacent to highways.

6. The site has no detrimental rights-of-way (ROWs) or other encumbrances.

7. The site will be managed for conservation so that potential threats from future impacts are precluded. In the project region, DWMAs, designated critical habitat units (CHUs), areas of critical environmental concern (ACECs), National Park Service lands, and BLM Wilderness Areas are managed for conservation.

Sections 3.1 through 3.3, below, assess the three potential recipient sites in terms of the USFWS selection criteria listed above. As shown on Figure 6, the three potential recipient sites are also modeled as having habitat potential equal to or greater than that modeled on the DSSF and DHSP sites (Nussear et al. 2009). If the identified sites cannot be used for translocation purposes due to density thresholds or disease prevalence, alternate recipient site(s) will be identified in consultation with CDFG, USFWS, and BLM.

3.1 Sunlight Recipient Site

The proposed Sunlight Recipient Site is shown on Figure 7 and described below. The Sunlight Control Site is 1,613 ha (3,986 ac), located north of the DSSP boundary.

USFWS Selection Criteria (2011c; * indicates required criterion)

1. *Desert tortoise habitat suitability. The Sunlight Recipient Site supports Creosote Bush-White Bursage vegetation and several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland), similar to habitats found on the DHSP site. These habitats support all life stages of the desert tortoise (USFWS 2011b).

2. *Disease prevalence. Data on disease prevalence in the resident population are not available. During field surveys for the DSSF project, 32 desert tortoises were observed and no clinical signs of URTD were noted. These data would be collected upon issuance of a Biological Opinion from the USFWS and Consistency Determination or Incidental Take Permit (ITP) from CDFG.

3. *Minimum 10 km distance from major unfenced roads or highways. The closest point of the Sunlight Recipient Site is approximately 15 km (9 miles) north of I-10. Kaiser Road is located at the western boundary of the mapped recipient site. It is unfenced, but is not a major road or highway.

4. Within 40 km of the project site, with no natural barriers to movement between them. The mapped site described in the DSSF Translocation Plan is 4 to 11 km from the DHSP site. There are no natural barriers to dispersal between the two sites.

5. Resident desert tortoise population depletion. The site does not show evidence of desert tortoise population depletion (e.g., numerous carcasses). Tortoise population densities in the site were estimated at 3.4 tortoises per km2 (Ironwood and Woodard 2011). The estimated average density is 5.3 tortoises per km2 for the Colorado Desert Recovery Unit, and USFWS guidance considers areas 'depleted" only if tortoise densities are less than 2.79 animals per km2 (USFWS 2011c).
6. Detrimental ROWs or other encumbrances. There are designated road and utility ROWs located within the Sunlight Recipient Site that surround unpaved roads, but they are narrow and infrequently traveled.
7. Conservation management. The Sunlight Recipient Site is located on BLM-managed lands within the Colorado Desert Recovery Unit for the desert tortoise that BLM has committed to managing as a solar exclusion area. However, the site is not within a designated DWMA, CHU, ACEC, Wilderness Area, or on National Park Service lands.

Desert tortoise field surveys at the Sunlight Recipient Site located 32 live tortoises. The USFWS (2011a) estimated that 45 subadult or adult desert tortoises may be within this site, based on density data for JTNP.

All tortoises were observed for signs of URTD, and none of them exhibited obvious clinical signs (Ironwood and Woodard 2011). All sign of desert tortoise activity, including live animals, intact burrows with or without sign of recent activity, scat (feces), tracks, and mating rings are depicted on Figure 7.

The Sunlight Recipient Site is far enough from the DHSP site (3.7 km or 2.3 miles) that it likely is not within the former home range of any tortoise that may be translocated from the DHSP site. The DSSF project, now under construction, presents a substantial anthropogenic barrier between the two sites. However, there are no natural barriers, and desert tortoises at the two sites were likely part of a local genetically related subpopulation. There are no significant anthropogenic "predator subsidies" within the Sunlight Recipient Site, such as food or water sources, that would contribute to increased numbers of ravens, coyotes, or feral dogs and consequent increased predation on desert tortoises.

Kaiser Road provides paved access for desert tortoise translocation and follow-up monitoring in the Sunlight Recipient Site. Tortoise exclusion fencing is often installed along paved roads to prevent mortality by vehicle strikes. However, fencing also fragments habitat, reducing opportunity for genetic exchange and demographic population shifts. This portion of Kaiser Road serves the community of Eagle Mountain, but it is north of most other traffic destinations, including traffic related to the DSSF or DHSP projects. Kaiser Road would, however, be the primary access route to the proposed EMPSP (FERC 2010), if that project is implemented. The Draft EIS for that project includes mitigation measure AQ-6, requiring the applicant to develop a transportation management plan including ride sharing, shuttle transit, and other measures for employees to reduce vehicle trips. That project's Draft EIS also indicates that a buried water supply line would be built along this portion of Kaiser Road. Due to the low existing traffic volume on Kaiser Road, and regional importance of desert tortoise habitat connectivity (USFWS 2011a), enXco would not propose to fence Kaiser Road if desert tortoises are translocated to the Sunlight Recipient Site. However, further measures may be necessary to minimize hazards to tortoises on Kaiser Road if the EMPSP is approved and constructed.

3.2 Chuckwalla Recipient Site

The proposed Chuckwalla Recipient Site is shown on Figure 8 and described below. The site is located on 1,747 ha (4,317 ac) within the Chuckwalla CHU and DWMA west of Kaiser Road and north of I-10. The northeastern corner of this translocation site is within 1 km (0.6 mi) of the DHSP site.

USFWS Selection Criteria (2011c; * indicates required criterion)

1. *Desert tortoise habitat suitability. The Chuckwalla Recipient Site supports Creosote Bush-White Bursage vegetation and several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland), similar to habitats found on the DHSP site. These habitats support all life stages of the desert tortoise (USFWS 2011b).
2. *Disease prevalence. Data on disease prevalence in the resident population are not available. During field surveys for the DSSF project, 28 desert tortoises were observed and no clinical signs of URTD were noted. These data would be collected upon issuance of a Biological Opinion from the USFWS and Consistency Determination or ITP from CDFG.
3. *Minimum 10-km distance from major unfenced roads or highways. The Chuckwalla Recipient Site is within 10 km of I-10. In order for the site to meet this selection criterion, desert tortoise exclusion fencing would be necessary along I-10 south of the site.
4. Within 40 km of the project site, with no natural barriers to movement between them. The Chuckwalla Recipient Site is between 1 and 7 km from the DHSP site. There are no natural barriers to dispersal between the two sites. Kaiser Road, a lightly used paved road, is located between the Chuckwalla Recipient Site and the DHSP site.
5. Resident desert tortoise population depletion. Tortoise densities within the Chuckwalla Recipient Site are lower than the average for the Colorado Desert Recovery Unit. Population densities in the site were estimated at 3.2 tortoises per km2 (Ironwood and Woodard 2011), and carcasses were not found in large numbers. The estimated average density is 5.3 tortoises per km2 for the Colorado Desert Recovery Unit, and USFWS guidance considers areas “depleted” only if tortoise densities are less than 2.79 animals per km2 (USFWS 2011c).
6. Detrimental ROWs or other encumbrances. The Chuckwalla Recipient Site is between Kaiser Road and Eagle Mountain Road, and south of an emergency spillway at the Metropolitan Water District Eagle Mountain Pump Station. There are no designated or proposed detrimental ROWs or other encumbrances within the site. The Land and Mineral Legacy Rehost 2000 data base (LR2000; BLM 2011d) does not show any over-filings or pending applications for use of the Chuckwalla Recipient Site (Ironwood and Woodard 2011).
7. Conservation management. The Chuckwalla Recipient Site is located on BLM-managed lands within the Colorado Desert Recovery Unit and within the Chuckwalla DWMA and CHU.

Desert tortoise field surveys at the Chuckwalla Recipient Site located 28 live tortoises (Ironwood and Woodard 2011). All were observed for signs of URTD, and none of them exhibited obvious clinical signs (Ironwood and Woodard 2011). Based on these data, the USFWS (2011a) estimated that there are 49 subadult and adult desert tortoises; between 9 and 40 juveniles; and that reproductive females may produce approximately 211 eggs per year within the Chuckwalla Recipient Site. All sign of desert tortoise activity, including live animals, intact burrows with or without sign of recent activity, scat (feces), tracks, and mating rings are depicted on Figure 8. The Chuckwalla Recipient Site is close enough to the DHSP site (less than 1.5 km) to be within the home range of tortoises that may be in the western

portion of the DHSP site. There are no significant natural barriers to movement on or adjacent to the Chuckwalla Recipient Site. The Chuckwalla Recipient Site is within a potential connectivity corridor extending from the Pinto Basin and JTNP, southward through upper Chuckwalla Valley and south beyond I-10.

The use of the Chuckwalla Recipient Site would be contingent upon several conditions relating to its proximity to roads and a potential future gen-tie ROW. The site is less than 10 km from Interstate 10. In order to meet the USFWS required criterion 3 (above), the north side of I-10 would need to be fenced to exclude tortoises along approximately 20 km of its length. Fencing on Kaiser Road may also be necessary, depending on traffic volume during construction and operation of the DHSP, DSSF, and possibly EMPSP. In addition, the EMPSP gen-tie alignment along Eagle Mountain Road may degrade habitat suitability or increase raven activity (due to perch or nest site "subsidies" on the gen-tie towers within the Chuckwalla DWMA, including the recipient site. (Note that FERC staff's recommended alignment would not be within the Chuckwalla DWMA). The Chuckwalla Recipient Site is also near the proposed DHSP/DSSF gen-tie alignment along Kaiser Road; and the project gen-tie also may serve as raven perch or nest subsidies.

If desert tortoises are translocated into the Chuckwalla Recipient Site, the preferred release point would be in the northern part of the recipient site, north of the unnamed hills approximately 1 km west of Kaiser Road, because it is furthest from I-10 and Desert Center. The intervening hills may minimize tortoise movement toward I-10.

Ironwood and Woodard (2011) noted that coyote and kit fox sign were highest in the southwest part of the Chuckwalla Recipient Site. The community of Desert Center may be a source of predator subsidies (food and water) to both species, as well as feral dogs. Utilization of the northern release point described above may reduce vulnerability to predation for translocated desert tortoises. In addition, the DHSP and DSSF gen-tie line will be subject to Raven Management Plans to be implemented for both projects, which would reduce vulnerability to predation by ravens.

Kaiser Road and Eagle Mountain Road provide paved access for desert tortoise translocation and follow-up monitoring in the Chuckwalla Recipient Site. Tortoise exclusion fencing is often installed along paved roads to prevent mortality by vehicle strikes. However, fencing also fragments habitat, reducing opportunity for genetic exchange and demographic population shifts. This portion of Kaiser Road serves the communities of Lake Tamarisk to the south of the site and Eagle Mountain to the north, as well as construction and O&M traffic for the DSSF project and future traffic for the DHSP and possibly the EMPSP. Due to the relatively high traffic volume on Kaiser Road expected from these projects, and limited habitat availability east of Kaiser Road, enXco may propose to fence Kaiser Road south of the DHSP site if desert tortoises are translocated to the Chuckwalla Recipient Site.

3.3 DuPont Recipient Site

The proposed DuPont Recipient Site covers approximately 7,460 acres of contiguous public lands within the Chuckwalla CHU and DWMA immediately east of the Chuckwalla Wilderness Area. It is shown on Figure 9 and described below.

USFWS Selection Criteria (2011c; * indicates required criterion)

1. *Desert tortoise habitat suitability. The DuPont Recipient Site supports sandy substrates with small gravel and a sparse Creosote Bush-White Bursage vegetation community with several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland).

The vegetation is similar to those found on the DHSP site. Habitats on the DuPont Recipient Site support all life stages of the desert tortoise (USFWS 2011b).

2. *Disease prevalence. Data on disease prevalence in the resident population are not available. These data would be collected upon issuance of a Biological Opinion from the USFWS and Consistency Determination or ITP from CDFG.
3. *Minimum 10-km distance from major unfenced roads or highways. The closest major unfenced road or highway to the DuPont Recipient Site is I-10, approximately 5.0 km (3.1 miles) north. In order for the site to meet this selection criterion, desert tortoise exclusion fencing would be necessary along I-10 north of the site.
4. Within 40 km of the project site, with no natural barriers to movement between them. The DuPont Recipient Site is approximately 32 km (20 miles) southeast of the DHSP site. There are no natural barriers that would have limited gene flow between the sites. I-10 is now a significant anthropogenic barrier between the sites.
5. Resident desert tortoise population depletion. Desert tortoise densities at the DuPont Recipient Site are unknown.
6. Detrimental ROWs or other encumbrances. There are no existing designated ROWs or other encumbrances that would conflict with desert tortoise habitat suitability within the DuPont Recipient Site.
7. Conservation management. The DuPont Recipient Site is located primarily on BLM-managed lands within the Colorado Desert Recovery Unit and the Chuckwalla DWMA and CHU for desert tortoise. One 259 ha (640 acre) inholding within the DuPont Recipient Site is owned and managed by the State of California. No tortoises would be translocated to this parcel, although they would be likely to use habitat resources there following the translocation.

The DuPont Recipient Site is 32 km from the DHSP site, and on the south side of I-10, well outside potential home ranges of any tortoises that may be on the DHSP site. Desert tortoises have been observed in the DuPont Recipient Site, but field survey data are not available and desert tortoise densities are unknown. US Geological Survey (USGS) modeling (Figure 6) suggests moderate to high habitat potential. Range-wide sampling between 2001 and 2005 within the region indicated the historical presence of tortoise (i.e., carcasses) and recorded one live tortoise in 2003 (USFWS 2006, as cited in Ironwood and Woodard 2011). In September 2010, random transects were walked throughout the site to assess general habitat characteristics and habitat suitability for desert tortoise. These surveys covered approximately 20 linear miles and recorded no sign of active desert tortoise or any older sign (e.g., inactive burrows, old scat, or carcasses) (Ironwood and Woodard 2011). There are no known significant subsidies for canid or avian predators (e.g., human activity, trash dumping) and no anticipated new sources of subsidies related to new land use proposals.

Access to the area is available via unpaved roads, with travel time between the DHSP site and recipient site more than 60 minutes.

The USFWS (2011a) estimated that approximately 111 subadult and adult resident desert tortoises may be present at the DuPont Recipient Site, based on the density estimate of 3.7 tortoises/km^2 in the Chuckwalla CHU and DWMA.

3.4 Control Site

If more than 5 desert tortoises are translocated from the DHSP site, then an equivalent number of tortoises will be monitored at a control site to allow comparison of desert tortoise movement and behavior among the translocated animals, recipient population, and control population. The USFWS (2011c) states that potential control sites should:

- be similar in habitat type/quality, desert tortoise population size/structure, and disease status to the recipient sites;
- not have been previously used as a recipient site for other projects; and
- be a minimum distance of 10 km (6 miles) from an unfenced recipient site that has no substantial anthropogenic or natural barriers to prevent the interaction of control, resident, and translocated desert tortoises.

The proposed Red Cloud Control Site is located approximately 7 miles southwest of Desert Center, south of I-10 (Figure 6). Desert tortoise surveys of this site have not been conducted, but available data suggests that this site has the potential to support moderate to high densities of desert tortoise (Nussear 2009; USFWS 2006; Ironwood and Woodard 2011).

- Similar habitat to the recipient site. The proposed Red Cloud Control Site is located southwest of the Sunlight and Chuckwalla Recipient Sites and northwest of the DuPont Recipient Site. The proposed control site is comprised of intact creosote bush scrub with active alluvial fans with friable soils and prominent washes supporting desert dry wash woodland, similar to the habitats found on the project and recipient sites.
- Not previously used as a recipient site. The Red Cloud Control Site has not been previously used as a recipient site for other projects.
- Minimum distance of 10 km (6 miles) from the recipient site or have fencing or other movement barrier between sites. No portion of the Red Cloud Control Site is within 10 km (6 miles) of proposed recipient sites. In addition, there are several existing barriers to movement between the sites, including I-10 and the Chuckwalla Mountains.

4. Methods for Desert Tortoise Translocation

4.1 Overview

For projects necessitating translocation of more than 5 desert tortoises to recipient sites, the USFWS generally requires long-term monitoring of the translocated tortoises, as well as similar monitoring of resident tortoises at the recipient site and a control site. enXco anticipates that fewer than 5 desert tortoises, and possibly none at all, will be translocated for the project, and that long-term monitoring will not be necessary. However, this Translocation Plan identifies a control site and describes a monitoring plan for translocated tortoises and resident tortoises within the recipient and control sites for implementation if more than 5 tortoises are translocated. Any tortoises translocated from the DHSP site would be translocated more than 500 meters. The translocation process described in this section will apply only to tortoises found on the DHSP site or immediately adjacent to it (i.e., on the fence line). Any tortoise encountered in a work area along the gen-tie line would be allowed to leave the site on its own, or if necessary, would be relocated out of harm's way, no more than 500 meters from its original

location. The translocation activities described below will be revised as needed to comply with the terms and conditions contained in the BO and the ITP or Consistency Determination upon issuance by the USFWS and CDFG.

Any desert tortoises that are found on the DHSP site during pre-construction clearance surveys will be either translocated to a recipient site or removed from the wild, depending upon disease status and resource agency direction. The survey, testing, and translocation procedures are briefly summarized here as an overview. First, the DHSP site will be fenced to prevent desert tortoises from entering it throughout the life of the project. Second, all desert tortoises within the fenced boundaries will be located by field biologists and their health conditions will be assessed visually. For tortoises that appear healthy, blood will be drawn to determine URTD status, and they will be allowed to move about all or part of the fenced project site, pending results of the disease test. Depending on their activities, they may be fitted with radio transmitters, or they may be monitored visually, by regularly confirming their locations, until they are removed from the site. Tortoises showing visual signs of illness or injury will be held in quarantine facilities on the site to prevent them from interacting with other tortoises, until they are removed from the site for transport to a suitable care facility.

Vegetation clearing, grading, and construction of the DHSP may proceed in phases. These activities will not take place in any given portion of the project site until all tortoises throughout the project site have been either translocated off the site or held in fenced areas or quarantine enclosures elsewhere on the project site pending translocation or transport to a care facility. Holding areas will be away from work areas, and protected by exclusion fencing so that tortoises cannot access the work areas.

Blood samples will be sent to a laboratory for disease assay. No tortoises will be translocated from the site until the test results are returned. Depending upon the results of the visual health assessment and laboratory disease test, tortoises may be translocated to the selected recipient site or may be removed from the wild. After all pre-construction clearance surveys and visual health evaluations are complete, the Designated Biologist and Resource Agencies (USFWS and CDFG) will tentatively determine the number of tortoises to be removed from the site, and will prepare a Disposition Plan for each tortoise. Depending on the numbers of healthy and diseased or injured tortoises, translocation activities will proceed as follows:

- If the total number of tortoises to be removed from the site (including healthy animals and any sick or injured ones) is 5 or fewer, then a mitigation fee may be assessed in lieu of translocating and monitoring these tortoises (USFWS 2011c). This option is consistent with Mitigation Measure MM-WIL-2 of the DHSP DEIS (see Section 7, below).
- If the total number of tortoises to be removed from the site (including healthy animals and any sick or injured ones) is 5 or fewer, then a mitigation fee may be assessed in lieu of translocating and monitoring these tortoises (USFWS 2011c). This option would be consistent with the terms of the DHSP EIS (see Section 7, below).
- If more than 5 tortoises will be translocated to a recipient site (excluding diseased or injured tortoises to be removed from the wild), then field work at the recipient and control sites will be initiated to locate an equivalent number of tortoises at each site to be fitted with transmitters for monitoring, and to evaluate disease status of the recipient site population (USFWS 2011c). The monitoring plan (Section 5) will be implemented.
- Any injured or diseased tortoises that are removed from the wild will be transferred to the Desert Tortoise Conservation Center in Las Vegas, Nevada or an alternate facility to be determined in consultation with Resource Agencies.

4.2 Designated Biologist and Biological Monitors

Prior to initiation of any ground-disturbing activity, including installation of tortoise exclusion fencing, enXco will appoint a Designated Biologist and one or more Biological Monitors, as described in Mitigation Measure VEG-1 of the DHSP DEIS and Section 8 of this Translocation Plan. The Designated Biologist will hold appropriate USFWS and CDFG authorizations to handle desert tortoises, perform visual health assessments, draw blood for disease testing or other clinical purposes, and carry out any other activities related to desert tortoise handling as may be required by the USFWS or CDFG. The Designated Biologist also will be responsible for training and supervising Biological Monitors who conduct desert tortoise surveys, monitor tortoises, or implement any other aspect of this Translocation Plan. The Designated Biologist will be enXco's primary point of contact for BLM, USFWS, and CDFG regarding implementation of this Translocation Plan.

4.3 Tortoise Exclusion Fence

Tortoise exclusion fencing will be constructed around the perimeter of the DHSP site prior to desert tortoise clearance surveys, pre-construction site preparation, or any construction-related activities. enXco will coordinate with DSSF to determine whether DHSP may share the existing exclusion fence on the shared boundary between the two project sites, or if a separate fence must be constructed. If a separate fence is built on the shared boundary, enXco will build tortoise exclusion fencing across any opening at the east and west ends of the shared boundary to prevent desert tortoises or other wildlife from entering any narrow passageway between the two fences, where they would likely become entrapped. Upon completion of desert tortoise exclusion fencing around both project sites and pre-construction clearance surveys within each site, the shared boundary fence will no longer serve to exclude desert tortoises from either project area, and need not meet design requirements for tortoise exclusion fencing. With this exception, fences will be constructed and maintained according to USFWS (2005) specifications. enXco may also construct one or more temporary tortoise exclusion fences within the interior of the project site to allow for phased project construction in part of the ROW while tortoises are held in situ on the remainder of the site.

Fence construction may take place during any season. Construction disturbance for fence installation will be limited to 15 feet on either side of the fence centerline. The limits of disturbance for fence construction will be staked on the ground and enXco shall provide a figure for USFWS, CDFG, and BLM review clearly depicting the limits of construction disturbance for the proposed fence installation at least 30 days prior to any ground disturbance. No more than 10 days prior to fence construction, the fence line and an adjacent buffer 30 feet wide on either side of the centerline will be surveyed for desert tortoises and sign. Survey transects for fence construction will be no wider than 15 feet and will conform to pre-construction clearance survey methods described by the USFWS (2009). If the disturbance area for all or part of the fence construction activities must be wider than 15 feet on either side of the centerline, then pre-construction surveys will extend at least 15 feet beyond the limits of disturbance. Pre-construction surveys will be carried out by the Designated Biologist and one or more Biological Monitors, under the Designated Biologist's supervision.

Any active tortoises found above ground on the fence alignment or adjacent buffer area (including the surveyed area described above and any incidental tortoise observations up to 50 m beyond the fence line) during the preconstruction clearance survey or during construction will be placed inside the DHSP site and handled as described in Section 4.5, below. Their locations will be monitored during fence construction to ensure that they do not leave the project area.

During fence construction, the Designated Biologist or Biological Monitor will be on site during all construction activities. They will be responsible for surveying work areas for tortoises or sign, and ensuring compliance with the project Worker Environmental Awareness Program (WEAP).

It is possible that the exclusion fence may cross the home range of a desert tortoise, preventing it from accessing part of its normal range. The exclusion fence will be monitored twice daily during fence construction and for 7 days following completion of its construction to locate any tortoise that may be pacing the fence. Thereafter, the exclusion fence will be inspected daily throughout desert tortoise spring and fall activity seasons (approximately April 1 to May 31 and September 1 to October 15) for one year after fence completion. Outside of tortoise activity seasons, and for the remainder of the life of the project, the fence will be inspected monthly and maintained as needed. Any damage to the fence that could allow a tortoise to enter the site will be repaired promptly. The fence will also be inspected during and within 24 hours following any significant rainfall event (defined as any rain storm causing measurable flow in channels or washes crossing the fence line) to ensure that storms have not damaged the fence, potentially allowing access by desert tortoises. Any damage to the fence shall be temporarily repaired immediately and permanently repaired within 48 hours. If a tortoise is found walking the fence line outside the project area, its location and activity will be monitored and the Designated Biologist will contact BLM, CDFG and USFWS to develop a Disposition Plan for the tortoise (Section 4.5).

4.4 Pre-Construction Clearance Surveys

Pre-construction desert tortoise clearance surveys will be completed throughout the fenced project area, during the spring or fall desert tortoise activity season (approximately April 1 through May 31 or September 1 through October 15). Survey transects will be no wider than 15 feet and will conform to pre-construction clearance survey methods described by the USFWS (2009). If the project area is subdivided into fenced subsections for construction phasing, then pre-construction clearance surveys will be completed and all tortoises removed from any subsection prior to initiation of pre-construction site preparation, or any construction-related activities. Clearance survey transects will be spaced at maximum widths of 15 feet. The transects will be paced slowly enough so that biologists may thoroughly view any areas partially hidden by rocks or shrubs, to ensure that all tortoises on the site are found. Any tortoises found during pre-construction surveys will be handled as described below (Section 4.5).

The entire fenced ROW area (or each fenced subsection) will be surveyed repeatedly to ensure that any tortoise within the area is located and removed prior to construction or site preparation. If one or more tortoises are located during a 100 percent coverage pass, then the entire area will be covered at least twice more. Surveys will be repeated until two consecutive 100 percent coverage passes of the site are completed without finding a tortoise or any sign of recent tortoise activity (e.g., scat or burrow) other than sign located during previous transects. Each successive full coverage pass will follow transect lines perpendicular to the previous pass (e.g., full coverage on north-south transects, than on east-west transects).

During clearance surveys all desert tortoise burrows, and all burrows constructed by other species that might be used by desert tortoises, will be examined by the Authorized Biologist and Biological Monitor(s) to assess occupancy of each burrow by desert tortoises. All potential desert tortoise burrows located during clearance surveys during the active season will be excavated carefully by hand; if desert tortoise occupancy is confirmed, excavation of the burrow and handling of tortoises will be conducted in accordance with this Translocation Plan and the most recent version of the USFWS's Desert Tortoise Field Manual (USFWS 2009). To prevent reentry by a desert tortoise or other wildlife, all burrows will be collapsed once absence has been verified.

4.5 Desert Tortoise Handling and Disposition

Desert tortoises will only be handled by biologists who are authorized by the USFWS and CDFG to do so (i.e., the project's Designated Biologist and any Biological Monitor with appropriate qualifications), and any handling of desert tortoises will follow specific terms of agency permits or MOUs, including daily, seasonal, and air or ground temperature limitations on handling (USFWS 2009). All adult or subadult tortoises located during preconstruction surveys for the exclusion fence or project construction, or located during follow-up monitoring, will be visually assessed for sign or injury or illness; blood will be drawn for URTD testing (from individuals that do not show clinical signs of disease); and held on the project site pending test results and a Disposition Plan.

Temperature Considerations. Desert tortoises will only be captured, moved, transported, released, or evicted from their burrows when the ambient air temperature ranges from 18-30°C (65-85°F) and is not forecast to exceed 32°C (90°F) within 3 hours of release or 35° (95°F) within 1 week of release. Ambient air temperature will be measured in the shade created by the observer, protected from wind, at a height of 2 inches (5 cm) above the ground surface. Deviation from these temperature thresholds may be considered in coordination with the Resource Agencies.

Inactive Desert Tortoises. Pre-construction clearance surveys will be conducted during the spring or fall desert tortoise activity seasons (approximately April 1 to May 31 and September 1 to October 15), and any tortoises found during these surveys would likely be active. However, it is possible that one or more tortoises may be located outside or near the end of the activity season (i.e., during pre-construction fence alignment surveys). Additionally, a tortoise may display minimal activity by remaining near a burrow entrance, even during the general activity season. In these cases, the tortoise may be left in place until the next activity season or, if needed to avoid injury, may be "blocked" into an artificial burrow on the project site during winter inactivity season, but not during summer (USFWS 2009; 2011c). Inactive tortoises found within the fence alignment or within 50 m of it will be moved out of harm's way into an artificial or empty natural burrow, inside of the perimeter fence (i.e., onto the DHSP site), and monitored. Depending on season and temperature considerations, the tortoise may be blocked into the burrow, or a temporary desert tortoise exclusion fence may be built at a 100 m radius surrounding the burrow (enclosing the inactive tortoise within an 8 acre area). If a tortoise within a burrow must be moved, every effort will be made to cause it to leave the burrow on its own (e.g., pounding the ground, "tapping," or repeated visits to the burrow at warmer or cooler times of day) prior to using the less-preferred method of carefully excavating the burrow by hand (USFWS 2009).

Tortoises confined in burrows or within 100 m radius enclosures, will be monitored for activity and safety daily for at least 1 week; then weekly for at least 3 weeks; then twice monthly until either translocation or transfer to a quarantine enclosure.

Eggs, Hatchlings, or Juvenile Tortoises. If a clutch of eggs is located during pre-construction clearance surveys, the location will be recorded and the nest will be monitored daily from a distance, using binoculars, to prevent the possibility of identifying the nest to avian or canid predators. The Designated Biologist will contact the USFWS, CDFG, and BLM to determine the best course of action, depending on date, vulnerability to predation, and construction schedule. The eggs may be left in place to hatch, or may be collected and translocated. If the eggs do not hatch in place, they will be inspected to determine if they are viable. If so, the Designated Biologist or another USFWS Authorized Biologist will translocate them to a replacement nest in a comparable micro-area (e.g., cover, project species, soil type, substrate, and aspect) at the recipient site, in accordance to the USFWS Desert Tortoise Field Manual (USFWS 2009). Translocated nests will be fenced with sturdy open-mesh fencing (e.g. 2-inch wide chain link

mesh) that will permit hatchlings to escape but prevent depredation by canids that might be attracted to the new nests by human scent. Open-mesh fencing or avian netting also will be installed on the roof to prevent predator entry. The replacement nest location(s) will be added to the long-term monitoring program.

If hatchling or juvenile desert tortoises measuring less than 120 mm midline carapace length or weighing less than 100 grams (i.e., too small for marking, radio transmitters, or blood collection) are located during clearance surveys, they will be carefully collected from the field and maintained in disinfected, separate containers either indoors or in on-site quarantine enclosures, depending on season, temperatures, and anticipated holding time. The Designated Biologist will contact the USFWS, CDFG, and BLM to determine the best course of action.

Visual Health Assessment. Visual health assessments will be conducted by biologists approved and permitted by the BLM, USFWS, and CDFG to conduct such assessments, following USFWS guidance (2011c). Visual health assessments will be performed upon locating tortoises during pre-construction field surveys; prior to translocation; and if more than 5 tortoises are translocated, repeated periodically during long-term monitoring (Section 5.2). At a minimum, for all desert tortoises handled, the Authorized Biologist will mark the animals with unique identification numbers as assigned by the USFWS and record data as recommended by the USFWS (2011c; 2011d), including:

- Locations (narrative and maps) and dates of observation;
- General condition and health, including injuries, state of healing and whether desert tortoise voided its bladder during handling;
- Locations the tortoise is moved from and moved to (GPS coordinates);
- Gender, midline carapace (shell) length, weight, and diagnostic markings (i.e., identification numbers or marked lateral scutes [shell segments]);
- Ambient temperature when handled and released; and
- Digital photograph of each desert tortoise handled.

Tortoises showing evidence of injury or illness will be held in quarantine enclosures (below) on the project site, pending preparation and approval of a Disposition Plan and relocation to the Desert Tortoise Conservation Center in Nevada or other offsite location. Tortoises appearing healthy will be held on the site for disease testing and disposition.

Holding *in situ.* Healthy appearing tortoises will be held on the project site until blood is drawn, test results are received and Disposition Plans (below) are prepared by the Authorized Biologist and approved by USFWS and CDFG. The tortoises will either be (1) fitted with a radio transmitter (below) and allowed to move throughout all or part of the project area (i.e., within the tortoise exclusion fence and away from any project construction area); or (2) held within a fenced 100 m radius (8 acre) area surrounding the active or occupied burrow to enable subsequent relocation. No tortoise will be held on the site for longer than 18 months.

Disease Testing. All tortoises larger than 120 mm median carapace length or weighing more than 100 grams (3.5 ounces) and showing no apparent illness or injury will be tested for URTD using an enzyme-linked immunoabsorbent assay (ELISA) test and held on the site pending test results. Because physiological activity of the tortoise immune system is related to behavioral activity, blood samples will be drawn no earlier than May 15 or, upon specific approval from USFWS and CDFG, four weeks after the date that the tortoise left its hibernaculum or was first found active and above ground away from a

shelter site. The last date for blood sampling will be October 31. In order to minimize handling on any given day, blood drawing and transmitter attachment (below) will only be done on the same day if these activities combined will not exceed restrictions of time of day, temperature, and total time handled (USFWS guidance provided at recent health and disease workshops and *Desert Tortoise Field Manual,* USFWS 2009). If these restrictions could be exceeded, then the two activities will be done on separate days.

Tortoises with positive URTD test results will be held in quarantine enclosures (below) on the project site, pending preparation and approval of a Disposition Plan and relocation to the Desert Tortoise Conservation Center in Nevada or other offsite location. If test results are inconclusive, the animal will be held in a quarantine enclosure until results of a second test are available.

Quarantine Enclosure: Tortoises showing visual evidence of illness or injury, or testing positive or inconclusive for URTD will be held in quarantine enclosures on the site, pending transport to the Desert Tortoise Conservation Center (DTCC) in Nevada, or (for inconclusive disease tests) results of repeated tests. The specific locations of the enclosures will be determined by the Designated Biologist prior to initiation of preconstruction clearance surveys, in consultation with BLM, USFWS, and CDFG. The Designated Biologist may recommend holding them at an alternate offsite facility, pending approval of the BLM, USFWS, and CDFG. The enclosure design and the care of tortoises held in them will follow protocols described by San Diego Zoo Global (*Temporary Captive Care of Wild Mojave Desert Tortoises: Examples of Protocols Used at the Desert Tortoise Conservation Center*, Appendix 1 to USFWS 2011c) or the most recent USFWS translocation guidance. The enclosures will be at least 20 m × 20 m (65.6 ft × 65.6 ft). Husbandry of the quarantined animals, including aseptic techniques and site security from predators and humans; and provision of burrows, food, and water will conform to recommendations of San Diego Zoo Global (cited above). Quarantined tortoises will be monitored in accordance with surveillance recommendations of San Diego Zoo Global. The quarantine period will not exceed 18 months. Every attempt will be made to translocate or transport to the DTCC each animal within 18 months of the date it was initially discovered.

Disposition Plan. The Designated Biologist will recommend a Disposition Plan for each tortoise and submit the plans to the USFWS, BLM, and CDFG for concurrence prior to moving any desert tortoises. Each Disposition Plan will include the visual health assessment and URTD test results. Desert tortoises will not be taken off the project site prior to concurrence by the BLM, USFWS, and CDFG with the Disposition Plan.

If a desert tortoise is determined to be sick or injured, BLM, USFWS, and CDFG will be notified within 24 hours of such discovery. The Designated Biologist will generally recommend transport to the Desert Tortoise Conservation Center. In some cases (e.g., minor injuries) the Designated Biologist may recommend observation for possible future translocation in the wild. If a tortoise is transported outside the State of California it will only be with CDFG's prior written consent. The Applicant shall submit to CDFG a written request indicating the number of desert tortoises to be relocated out of state, the reason for relocating them (i.e., the nature of the disease or injury), the proposed facility to which the desert tortoise(s) will be relocated, and the date on which they are proposed to be relocated. CDFG will provide a written response to each such request indicating, on a case-by-case basis, whether the relocation is authorized.

Tortoises that are suitable for translocation (i.e., tortoises without visual evidence of illness or injury and testing negative for URTD) will be held on the site pending authorization from BLM, USFWS, and CDFG, and until the appropriate date for translocation. The Disposition Plan will specify a recipient site, release

point, and release time, date, and temperature restrictions for each tortoise. Where appropriate, the Disposition Plan will also describe any recipient site pre-release preparation (e.g., construction of artificial burrow) and pre-release animal husbandry activity (e.g., hydration).

Transmitter Attachment. If more than 5 adult and subadult tortoises will be translocated, then each one will be fitted with a radio transmitter for long-term monitoring. Transmitters will not be attached to juvenile tortoises (weighing less than 100 g or measuring less than 120 midline carapace length) unless the transmitters weigh less than 10% of the tortoise's body weight. If 5 or fewer adult and subadult tortoises will be translocated, then enXco will not be responsible for further monitoring. If radio transmitters are already in place, the transmitters may be removed, or (at the direction of BLM, USFWS, and CDFG) left in place to allow follow-up monitoring by the agencies.

Each tortoise larger than 120 mm carapace length will be assigned a unique identifier and fitted with a transmitter following methods, including handling and temperature restrictions, provided in *Review of Radio Transmitter Attachment Techniques for Chelonian Research and Recommendations for Improvement* (Boarman et al. 1998) and the most recent USFWS translocation guidance. Transmitter attachment will conform to restrictions of time of day, temperature, and total time handled (USFWS guidance provided at recent health and disease workshops and *Desert Tortoise Field Manual,* USFWS 2009). Transmitters will be replaced as necessary throughout the monitoring period (Section 5.2).

Translocation. Desert tortoises will be translocated during their spring activity periods (April 1 through May 31), well enough in advance of the summer inactive period to enable each tortoise to acclimate to the recipient site and to locate or build a suitable burrow. Release dates will be proposed in each Disposition Plan, to be reviewed and approved by the USFWS, CDFG, and BLM.

Each desert tortoise to be translocated will be visually evaluated for health and condition immediately prior to translocation. Tortoises previously considered suitable for translocation but subsequently showing clinical signs of URTD or other illness or injury will be held pending further evaluation. Healthy-appearing tortoises will be hydrated according to the most current agency guidance or protocols. They will be transported to release sites as specified in the Disposition Plans in clean, ventilated protective containers. The containers will be disinfected prior to any re-use. Tortoises will be released at unoccupied shelter sites such as burrows, spaces within rock outcrops, caliche caves, or the shade of shrubs or trees.

All translocations will take place between 0700 and 1600 hours (7:00 AM and 4:00 PM), and while air temperature is between 18° and 30°C (65-85°F). Temperatures will be taken at approximately 2 inches above ground in a shaded area. Tortoises will only be released if temperatures are not forecast to exceed 32°C (90°F) within 3 hours of release and if daily low temperatures are not forecast to be cooler than 10°C (50°F) for one week following the release date. Release locations will be identified and spatial patterns among tortoises will be maintained as consistently as possible to those found on the DHSP site. Tortoises found in close proximity to each other on the DHSP site will be released in the same area in the same proximity.

4.6 Surveys and Disease Testing at Recipient and Control Sites

If 1 or more tortoises will be translocated from the DHSP site, enXco will coordinate with USFWS, CDFG, and BLM to determine the most appropriate recipient site and need for additional density estimates, health assessments, and disease testing at the selected recipient site or control site.

If 5 or fewer tortoises will be translocated, then density estimates, health assessments, and disease testing at the selected recipient site will be arranged in coordination with USFWS, CDFG, and BLM. No health assessments, disease tests, surveys, or monitoring at the Red Cloud Control Site would be required. Portions of this section addressing the control site will not be applicable.

If more than 5 tortoises will be translocated, enXco and the Designated Biologist will commence field surveys to locate desert tortoises for disease testing (if data are not already available) and radio transmitter attachment for long-term monitoring at the selected recipient site and the Red Cloud Control Site.

During the spring or fall desert tortoise activity seasons, following or concurrent with health assessment and disease testing of tortoises at the DHSP site, surveys will be conducted at the selected recipient and control sites to: (1) confirm desert tortoise densities, (2) conduct visual health assessments and collect blood for URTD ELISA tests for all tortoises found at both sites, and (3) attach transmitters to a number of tortoises at both sites equal to the number of tortoises to be translocated. If density and disease status of the resident population at the recipient site are already known, then these new data will not be collected. For each animal handled during these surveys, data collection and identification marking will be as described in Section 4.5.

Disease prevalence at the recipient sites should not exceed 20 percent within the resident population (USFWS 2011a). No animals will be translocated to the selected recipient site until URTD test results for the resident population are available, based on a sample size of resident animals to be determined in coordination with USFWS, CDFG, and BLM.

If more than 10 percent of the resident population at the proposed recipient site test positive for URTD, then the Designated Biologist will contact BLM, USFWS, and CDFG for further guidance or to select an alternative recipient site. Because translocated desert tortoises will disperse from initial release sites, to further reduce the potential for disease transmission, translocated desert tortoises will be placed a minimum distance of 1.5 km (0.9 mi) from any resident desert tortoises that have tested positive for URTD.

Table 1. Translocation of Desert Tortoises and Eggs

Size/Age of Tortoise	Translocation Strategy
Juveniles (<100 g or 120 mm MCL[1])	Visual health assessment, unique identifier, no transmitter or URTD ELISA test, translocation.
Sub-adults (120-180 mm MCL) and Adults (>180 mm MCL)	Visual health assessment, negative URTD disease test result, unique identifier, transmitter, and translocation.
Nests with potentially viable eggs	If a nest is suspected or found, the eggs will be monitored in place or carefully moved together and placed in a replacement nest created by the Designated Biologist at the recipient site. The replacement nest location(s) will be added to the long-term monitoring program.

1 – midline carapace length

4.7 Linear Project Components

Pre-construction clearance surveys and construction of the gen-tie line may occur at any time of the year (USFWS 2010b). Any desert tortoises found during clearance of linear facilities shall be allowed to leave on their own or moved out of harm's way following clearance and handling procedures outlined in the current *Desert Tortoise Field Manual* (USFWS 2009). Tortoises shall not be moved more than 500

meters from their original location. Pre-construction surveys, construction monitoring, and any handling of a tortoise (if needed) will be as follows.

1. Within 30 days prior to construction, a clearance survey will be conducted along each portion of the gen-tie line and all active desert tortoise sign mapped and communicated to the Designated Biologist and site-specific Biological Monitor(s).
2. Biological Monitors shall be on the work site during all construction activities to ensure that active burrows along the gen-tie line will be avoided by project construction activities and facilities.
3. If a desert tortoise is found along the gen-tie line or in any work area associated with the gen-tie line, adverse effects will be avoided by allowing the tortoise to passively traverse the site while construction in the immediate area is halted. If the tortoise does not move out of harm's way after approximately 20 minutes, the Designated Biologist or any other biologist approved by the USFWS, CDFG, and BLM to handle tortoises for the proposed action can actively move the animal out of harm's way within 500 meters of its original location. The Designated Biologist will be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes which could be harmful to the animal. The Designated Biologist or Biological Monitor(s) will remain at the work site from which the tortoise was relocated for the duration of active construction at that site to ensure the animal does not return.
4. All vehicles parked in desert tortoise habitat will be inspected immediately prior to being moved. If a tortoise is found beneath a vehicle, the Designated Biologist will be contacted to move the animal from harm's way, or the vehicle will not be moved until the desert tortoise leaves of its own accord.

5. Monitoring and Reporting

All activities related to monitoring will be conducted by Designated Biologists identified in the project BO and associated authorizations. Standardized data sheets and/or digital data recorders will be used to record individual tortoise locations, behavior, obvious health indications (not full health assessment but limited assessment of obvious clinical signs), behavior, interactions with other animals, burrow locations, etc. during all monitoring activities.

5.1 Project Component Monitoring for Desert Tortoises: Construction, O&M, and Decommissioning

Mitigation Measure MM-WIL 1 of the Desert Harvest DEIS recommends ongoing monitoring for wildlife, including desert tortoises, during vegetation- or ground-disturbing activities throughout the construction, O&M, and decommissioning phases of the project. If a live tortoise is located during the construction phase (i.e., after the clearance surveys are completed, but before the facility is in operation), the tortoise will be handled as described in this Translocation Plan. All construction activities will temporarily stop until two consecutive full coverage clearance surveys have been repeated throughout the site, without a desert tortoise or new active sign being found.

Monitoring of vegetation- or ground-disturbing activities during O&M or decommissioning phases would also be implemented in areas not enclosed with desert tortoise exclusion fencing, including O&M or

decommissioning activities for access roads, gen-tie alignment, drainage channels off the project site, and perimeter security fences or desert tortoise exclusion fences. Clearance surveys and handling of desert tortoises will be in accordance with this Translocation Plan and other project documents, as well as the most recent version of the USFWS's Desert Tortoise Field Manual (USFWS 2009).

Monitoring of the desert tortoise exclusion fence during its construction and the subsequent desert tortoise activity seasons are described above (Section 4.3). Following that period, the exclusion fence will be checked monthly and repaired, as necessary, throughout the construction, O&M, and decommissioning phases, for the life of the project. In addition, it will be checked and repaired during and within 24 hours of any significant rainfall causing visible runoff within channels on the site. Any damage to the fencing will be temporarily repaired immediately to keep desert tortoises out of the project area, and permanently repaired within 48 hours of observing damage. Any time during the life of the project that a tortoise is found walking the fence line, its location and activity will be monitored and the Designated Biologist will contact BLM, CDFG and USFWS to develop a Disposition Plan for the tortoise (Section 4.5).

Project component monitoring results throughout the construction, O&M, and decommissioning phases will be reported according to the requirements adopted in the final EIS, Record of Decision, BO, ITP, and other applicable documents.

5.2 Translocated Desert Tortoises, Recipient Site, and Control Site Monitoring

If 5 or fewer tortoises are translocated from the DHSP site, long-term monitoring of the recipient or control sites will not be required. The remainder of this section will not be applicable.

If more than 5 desert tortoises are translocated from the DHSP site to a designated recipient site, then long-term monitoring at the recipient and control sites will be implemented, as described below. All translocated desert tortoises and an equal number of resident tortoises at the Recipient Site and Control Site will be monitored on a long-term basis for a period of at least 30 years after the initial translocation date, as recommended by USFWS (2011c). The resident and control site tortoises will consist of equal or approximately equal numbers of males and females, regardless of the sex ratio of translocated tortoises (USFWS 2011c).

Monitoring will consist of locating the tortoise and attempting to view it and record its activity, without disturbing it. In some cases, the monitored animal will be handled for visual health assessments or to maintain or replace a transmitter.

The monitoring schedule for translocated tortoises will be:

- Once within 24 hours of release;
- A minimum of twice weekly for the first 2 weeks after release;
- A minimum of once a week from March through early November for the duration of the 30-year monitoring period; and
- Once every 2 weeks from November through February for the duration of the 30-year monitoring period.

The monitoring schedule for resident and control tortoises will be:

- A minimum of once a week from March through early November throughout the 30-year monitoring period; and
- Once every 2 weeks from November through February throughout the 30-year monitoring period.

Transmitters will be changed throughout the monitoring period as necessary to maintain battery life. At the end of the 30-year monitoring period, the Designated Biologist will coordinate with BLM, USFWS, and CDFG to determine whether transmitters should be removed and decommissioned.

5.2.1 Health Monitoring

Visual health assessments (Section 4.5) will be conducted twice annually for all monitored tortoises, including translocated, resident, and control site tortoises: once prior to overwintering (i.e., between October 15 and November 15) and once subsequent to overwintering (i.e., between March 1 and April 1). Any health problems (e.g., decline in physical condition, or evidence of disease) or mortalities observed will be reported to BLM, USFWS, and CDFG verbally within 48 hours of discovery and via email within 5 business days thereafter and will include the animal's unique identifier, location, and suspected health issue(s) and/or cause of death (if known). Fresh carcasses will be brought for necropsy as directed by BLM, USFWS, and CDFG.

5.2.2 Vegetation Monitoring

Vegetation will be qualitatively monitored each spring and fall at the recipient and control sites. The Designated Biologist will select a 0.5 km linear transect at each site and record the GPS coordinates at its start and end points. During each spring and fall tortoise activity season, a qualified biologist will walk the transect length and record all plant species observed within an estimated 5 m belt along each side of the transect. These data are intended to provide general, qualitative estimates of vegetation condition, desert tortoise forage availability, and relative abundance of native and non-native species. They are not intended as precise, replicate samples. Minor variations in the transect path or endpoints will be acceptable.

For each shrub species, the biologist will record qualitative indicators of condition as:

- Most plants flowering or fruiting and with new seasonal growth;
- Most plants flowering or fruiting but without new seasonal growth;
- Most plants with new seasonal growth but not flowering or fruiting;
- Most plants in apparently good condition but without flowers, fruits, or new seasonal growth (for drought-deciduous species, most plants with few or no live leaves but without dead branches); or
- Most or many plants evidently stressed, with dead branches (for evergreen species, plants with large numbers of dead leaves or branches).

For herbaceous plants, the biologists will record estimates of total percentage of the ground surface covered by native species and non-native species. For each annual species or perennial herb species, the biologist will qualitatively assign an abundance category, as follows:

- Dominant (throughout): numerous plants, visually dominant, and covering enough of the ground surface so that the biologist is likely to walk on them along most of the transect

length;

- Dominant (patchy): numerous plants, visually dominant, and covering enough of the ground surface so that the biologist is likely to walk on them along less than half of the transect length;
- Common-abundant (throughout): Found along most of the transect length, but generally spaced widely enough to be easily avoided while walking.
- Common-abundant (patchy): Mostly found in patches, comprising less than half of the transect length, and generally spaced widely enough to be easily avoided while walking.
- Occasional: Scattered along all or part of the transect length, but not difficult to find.
- Scarce: Only one or a few plants seen.

5.3 Reporting

5.3.1 Reporting During Translocation

Within 30 days after completion of desert tortoise clearance surveys and translocation, the Designated Biologist shall submit a Desert Tortoise Clearance Survey, Exclusion Fencing, and Translocation Report to the BLM, Riverside County, USFWS, CDFG, and JTNP describing methods and results of the fencing, clearance surveys, and translocation (if any). The report will also document any other animals relocated during the clearance surveys.

5.3.2 Reporting During Long-Term Monitoring

During the period of long-term monitoring, all information related to translocation and monitoring for the previous calendar year will be compiled by the Designated Biologist and submitted along with all annual report information to the USFWS, CDFG, BLM, and JTNP on or before January 15 for the preceding calendar year. Annual reports will summarize all long-term monitoring activities conducted during the previous calendar year including health assessments, vegetation monitoring, and any adaptive management employed. Each report will include data summary tables and short narrative descriptions of monitoring activities, observations, and (if applicable) notation of any concerns or recommendations.

5.3.3 Final Report

Following the completion of the 30-year monitoring program, a final report will be completed that will assess the overall success of the translocation and monitoring program. The final report will summarize all long-term monitoring activities and will discuss any observed differences in individual or group behaviors in the translocated, recipient, and/or control populations; overall tracking of health assessments for each monitored tortoise; an overview of the 30 years of vegetation monitoring; and any adaptive management employed throughout the long-term monitoring period and an assessment of the success of each adaptive management strategy (see Section 6 below). Copies of the final report shall be submitted to the BLM, CDFG, USFWS, and JTNP.

6. Adaptive Management

enXco will be prepared to modify or amend this Translocation Plan, including methods and locations for translocating desert tortoises, follow-up monitoring, or other components, if necessary and appropriate. Any adaptive management actions will be proposed by the Designated Biologist in response to specific management issues that arise that pose a threat to monitored tortoises, including translocated, recipient, and control site tortoises. Adaptive management strategies will be discussed with BLM, USFWS, and CDFG.

If there are concerns regarding immediate threat to a tortoise, adaptive management decisions (e.g., to relocate a tortoise away from a road) will be made in the field with phone calls or emails to agency personnel made within 72 hours to describe the actions taken to avoid or minimize the threat, as well as any actions recommended to avoid similar threats in the future. If the situation does not pose an immediate threat to one or more tortoises, agencies will be notified of proposed adaptive management decisions for concurrence or additional direction and response from agency personnel before actions are taken.

7. Alternative to Translocation

As an alternative to translocation, the Final DHSP Translocation Plan will identify a strategy to remove desert tortoises on the project site from the wild and place them permanently in facilities approved by USFWS and CDFG, to be fully funded by the project Owner. Current USFWS guidelines (2011c) include a provision that if 5 or fewer tortoises are located on a site, they may be removed from the wild and placed with a USFWS and State-approved program. The only potential program currently known is the Desert Tortoise Conservation Center in Las Vegas Nevada, operated by San Diego Zoo Global. This program is generally considered appropriate only for tortoises deemed inappropriate for translocation (i.e., sick or injured tortoises). Removing healthy tortoises from the wild would avoid risks and adverse impacts of translocation (described in the DHSP DEIS) but also would prevent those animals from contributing to the recovery of wild desert tortoise populations.

8. Roles and Responsibilities and Project Contacts

8.1 Roles and Responsibilities

enXco will appoint a Designated Biologist and one or more Biological Monitors who will be responsible for the implementation of all desert tortoise translocation and monitoring activities. The resumes of the proposed Designated Biologist and Biological Monitors shall be submitted to the BLM, USFWS, and CDFG for approval prior to their appointment on the project. If at any time a personnel change is proposed for these positions, enXco will obtain approval for the new personnel from BLM, USFWS, and CDFG.

8.1.1 Designated Biologist

The Designated Biologist will hold appropriate USFWS and CDFG authorizations to handle desert tortoises, perform visual health assessments, draw blood for disease testing or other clinical purposes, and carry out any other activities related to desert tortoise handling as may be required by this Translocation Plan or by the USFWS or CDFG. The Designated Biologist also will be responsible for

training and supervising Biological Monitors who conduct desert tortoise surveys, monitor tortoises, or implement any other aspect of this Translocation Plan. The Designated Biologist will be enXco's primary point of contact for BLM, USFWS, and CDFG regarding implementation of this Translocation Plan. The Designated Biologist duties will vary during the construction, O&M, and decommissioning phases. In general, the duties shall include, but shall not be limited to:

- Notify the BLM's Authorized Officer, Riverside County, and the Resource Agencies (USFWS and CDFG) at least 14 calendar days before initiation of ground-disturbing activities.
- Immediately notify the project Owner, BLM's Authorized Officer, Riverside County, and the Resource Agencies (as applicable) in writing of any non-compliance with any of the biological mitigation measures or permit conditions.
- Conduct continuous compliance inspections throughout the initial site preparation activities, including the construction of tortoise-exclusion fencing; pre-construction clearance surveys; and initial clearing, grubbing, and grading. Provide weekly verbal or written updates to BLM, Riverside County, and, for any information pertinent to state or federal permits, to the Wildlife Agencies.
- After the initial clearance and construction activities are complete, conduct monthly compliance inspections throughout the construction and decommissioning phases of the project, and provide weekly verbal or written updates to BLM, Riverside County, and, for any information pertinent to state or federal permits, to the Resource Agencies. Prepare and submit monthly compliance reports as required in **MM VEG-2**, and other reports as required under all applicable mitigation measures. A copy of the monthly compliance reports shall also be provided to the National Park Service (NPS).
- During the operations phase of the project, conduct quarterly compliance inspections; conduct weed monitoring and control (as required in **MM VEG-9**); prepare and submit quarterly compliance reports and other reports as required under all adopted mitigation measures.
- Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance requirements, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat; and to appoint a Biological Monitor as temporary contact at any time the Designated Biologist will be unavailable.
- Respond directly to inquiries of the BLM, Riverside County, the Resource Agencies, NPS, or any other agencies regarding biological resource issues.
- Train and supervise the Biological Monitors as appropriate, and ensure their familiarity with the Worker Environmental Awareness Program (WEAP) training, mitigation measures, conditions required by biological permits and agreements, and current USFWS guidelines on desert tortoise surveys and handling procedures.
- Maintain the ability to be in regular, direct communication with representatives of the BLM, Riverside County, the Wildlife Agencies, and NPS, including notifying these agencies of dead or injured special-status species.

Designated Biologist

TBD

8.1.2 Biological Monitors

The Applicant and the Designated Biologist shall appoint Biological Monitors as needed for the construction, O&M, and decommissioning phases of the project. During the operations phase, a Biological Monitor may assume most of the on-site duties, so long as a qualified Designated Biologist is available as needed. The Designated Biologist shall submit the resume, at least three (3) references, and contact information of each of the proposed Biological Monitors to the BLM's Authorized Officer, Riverside County, and the Resource Agencies. The resume shall demonstrate, to the satisfaction of the BLM's Authorized Officer and Riverside County, the appropriate education and experience to accomplish the assigned biological resources tasks. The responsibilities, qualifications, and authority of each Biological Monitor will be the equivalent of the USFWS designated Desert Tortoise Monitor (http://www.fws.gov//_information/protocols_guidelines/index.html).

Biological Monitors

TBD

8.2 Project Applicant

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8.3 Bureau of Land Management

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8.4 U.S. Fish and Wildlife Service

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8.5 California Department of Fish and Game

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LITERATURE CITED

AMEC Earth and Environmental (AMEC). 2011a. Desert Harvest: 2010 focused survey for desert tortoise (*Gopherus agassizii*). Unpublished report prepared for Aspen Environmental Group, San Francisco, California.

AMEC Earth and Environmental (AMEC). 2011b. Desert Harvest: 2011 focused survey for desert tortoise (Gopherus agassizii) on southwestern portion of ROW application. Unpublished report prepared for Aspen Environmental Group, San Francisco, California.

Aspen Environmental Group (Aspen). 2011. Biological Resources Technical Report: Desert Harvest Solar Project. Prepared for enXco, San Ramon, California and submitted to BLM Renewable Energy Coordination Office, Moreno Valley, California. 44p.

Boarman, W. I., Goodlett, T., & G. C. Goodlett. 1998. Review of radio transmitter attachment techniques for chelonian research and recommendations for improvement. Herpetological Review 29:26-33.

BLM (Bureau of Land Management). 2011a. Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment, Riverside County, California (CACA 48649).

_____. 2011b. Draft Biological Assessment for the Desert Harvest Solar Project, Riverside County, California (CACA 48649). December.

_____. 2011c. Desert Sunlight Solar Farm Project California Desert Conservation Area Plan Amendment and Final Environmental Impact Statement. Palm Springs–South Coast Field Office. April.

_____. 2011d. Land & Mineral Legacy Rehost 2000 System (LR2000). Online: http://www.blm.gov/lr2000/.

FERC (Federal Energy Regulatory Commission). 2010. Draft Environmental Impact Statement for Hydropower License: Eagle Mountain Pumped Storage Hydroelectric Project. Project No. 13123-002, FERC Division of Hydropower Licensing, Washington, DC. 284 p.

Ironwood and Woodard (Ironwood Consulting, Inc. and R. Woodard). 2011. Desert Tortoise Translocation Plan, Desert Sunlight Solar Farm Project and Red Bluff Substation, Case File Number CACA-48649, Riverside County, California. September.

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

USFWS (U.S. Fish and Wildlife Service). 1994. Desert Tortoise (Mojave Population) Recovery Plan. USFWS, Portland, Oregon.

_____. 2005. Desert tortoise exclusion fence. Ventura Fish and Wildlife Office, Ventura, California. http://www.fws.gov/ventura/species_information/protocols_guidelines/

_____. 2006. Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2001-2005 Summary Report. Desert Tortoise Recovery Office, Reno, Nevada.

_____. 2009. Desert Tortoise Field Manual. Ventura Fish and Wildlife Office, Ventura, California. http://www.fws.gov/ventura/species_information/protocols_guidelines/

_____. 2010a. Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii); 2010 Field Season. Ventura Fish and Wildlife Office, Ventura, California. 18p.

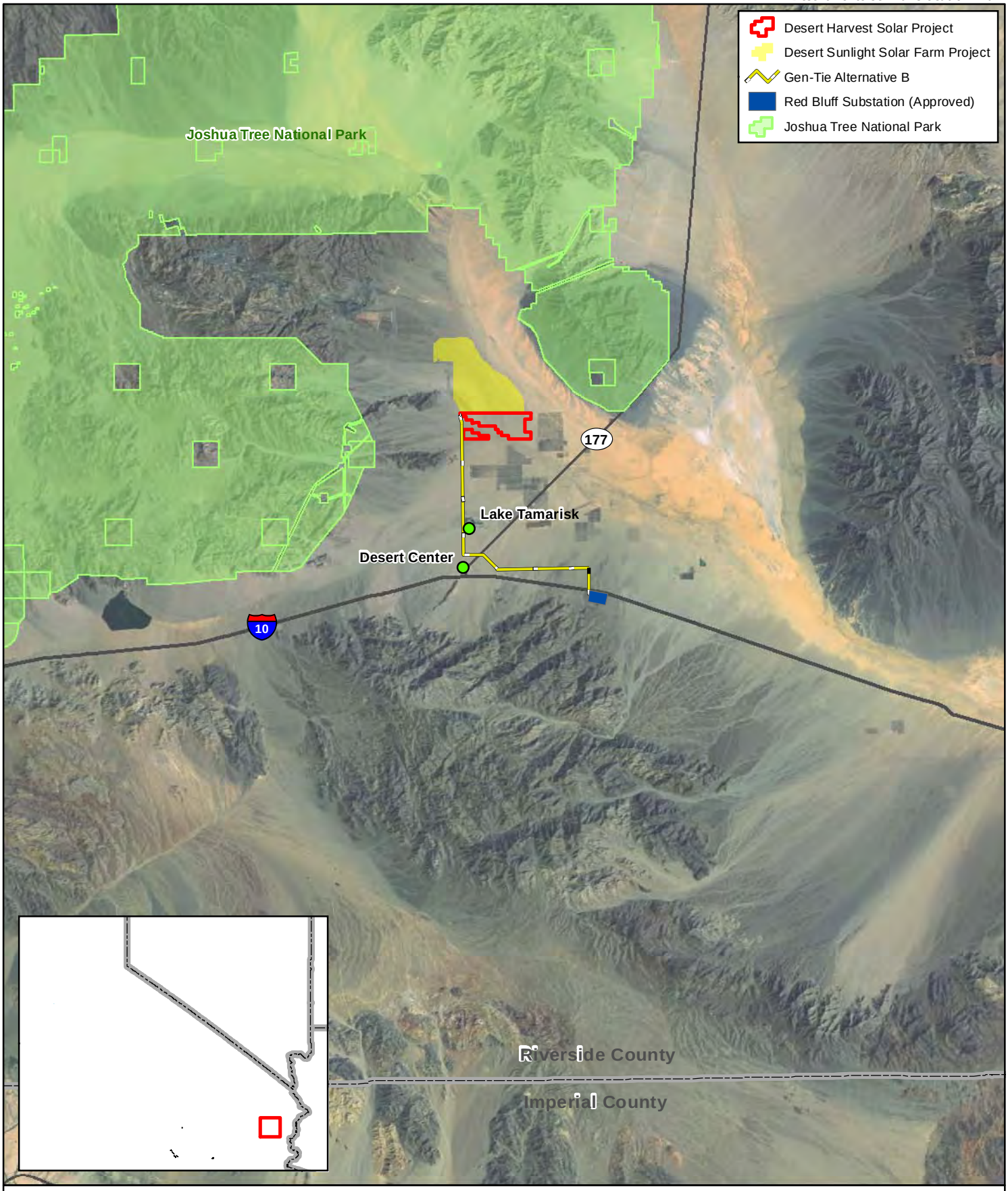
_____. 2010b. Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance. Ventura Fish and Wildlife Office, Ventura, California. 11p. August.

_____. 2011a. Biological Opinion on the Desert Sunlight Solar Farm Project, Riverside County, California (CACA 48649). Carlsbad Fish and Wildlife Office, Carlsbad, California. July.

_____. 2011b. Revised Recovery Plan for the Mojave Population of the Desert Tortoise (Gopherus agassizii). USFWS Pacific Southwest Region, Sacramento, California. May 6.

_____. 2011c. Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance. Ventura Fish and Wildlife Office, Ventura, California. 16p. November.

_____. 2011d. Health Assessment Procedures for the Desert Tortoise (Gopherus agassizii): A Handbook Pertinent to Translocation. USFWS Desert Tortoise Recovery Office, Reno, Nevada. 82p.



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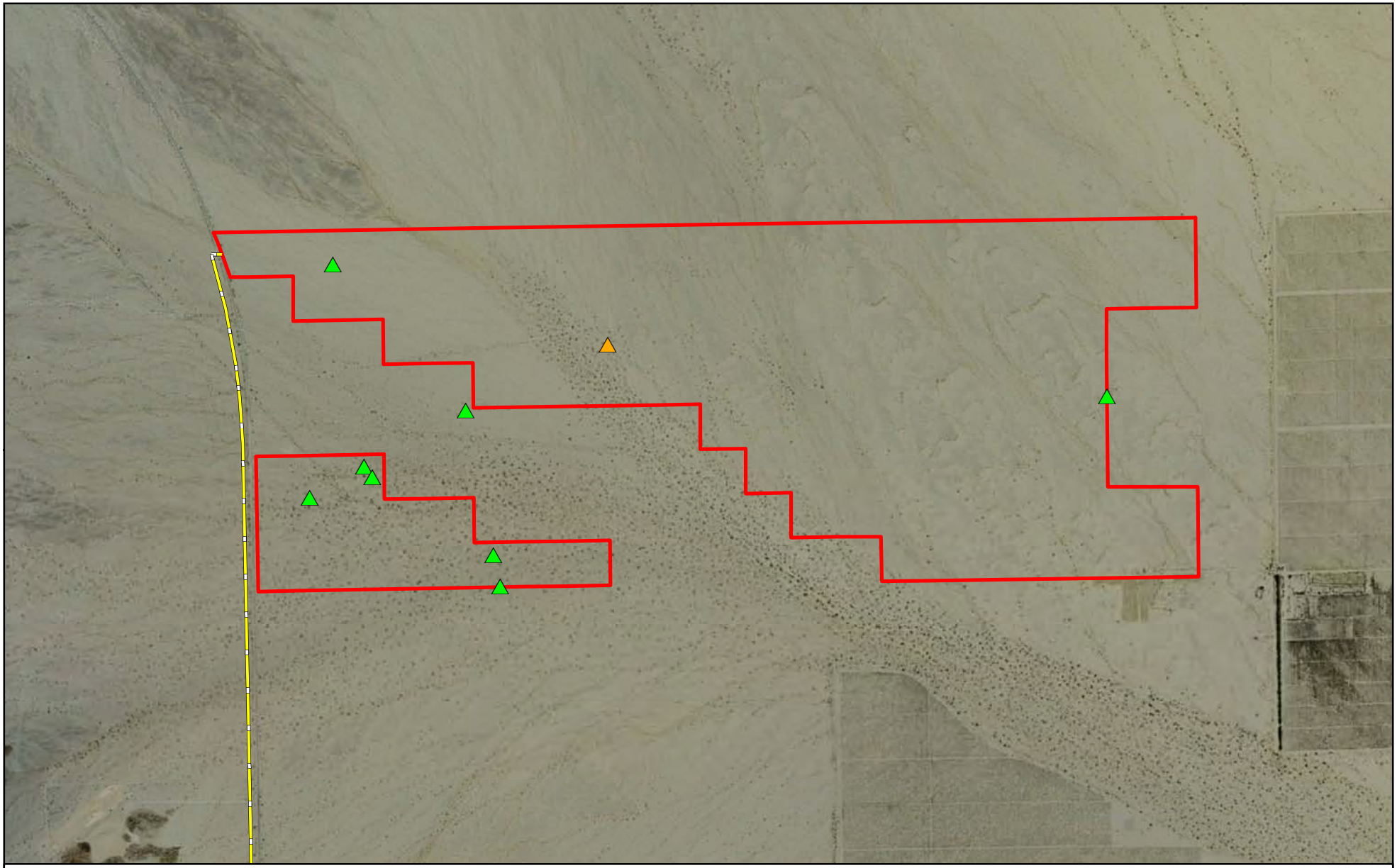
0 5 10 Miles

Figure 1

Regional Location



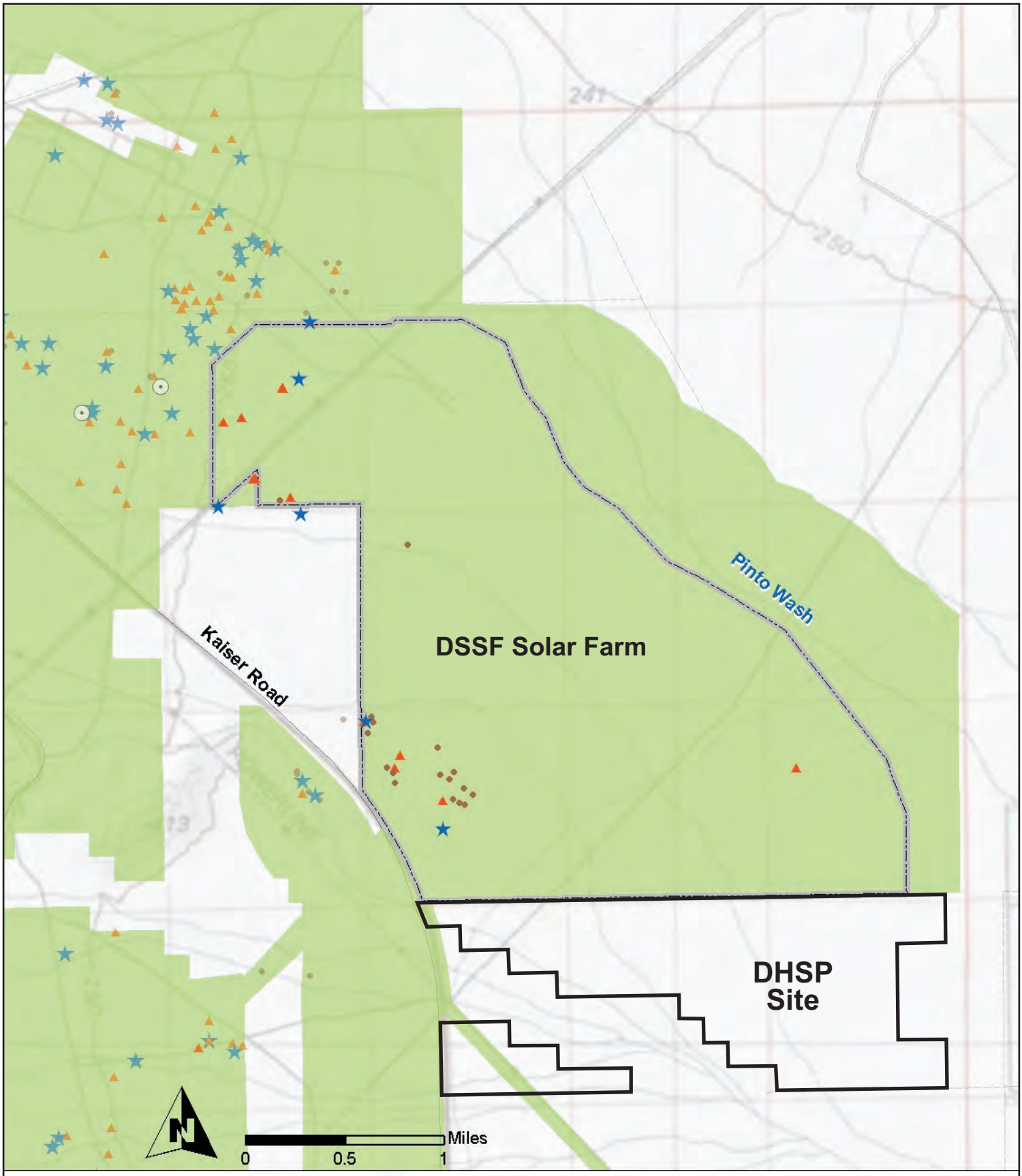
Aspen Environmental Group

0 1,000 2,000 4,000 Feet

Bone Fragments
Inactive Burrows
Desert Harvest Solar Project
Gen-Tie Alternative B

Figure 2

Desert Tortoise Survey Results



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Project Site

Full Coverage Survey Area

Live Tortoise

Active Burrow/Pallet

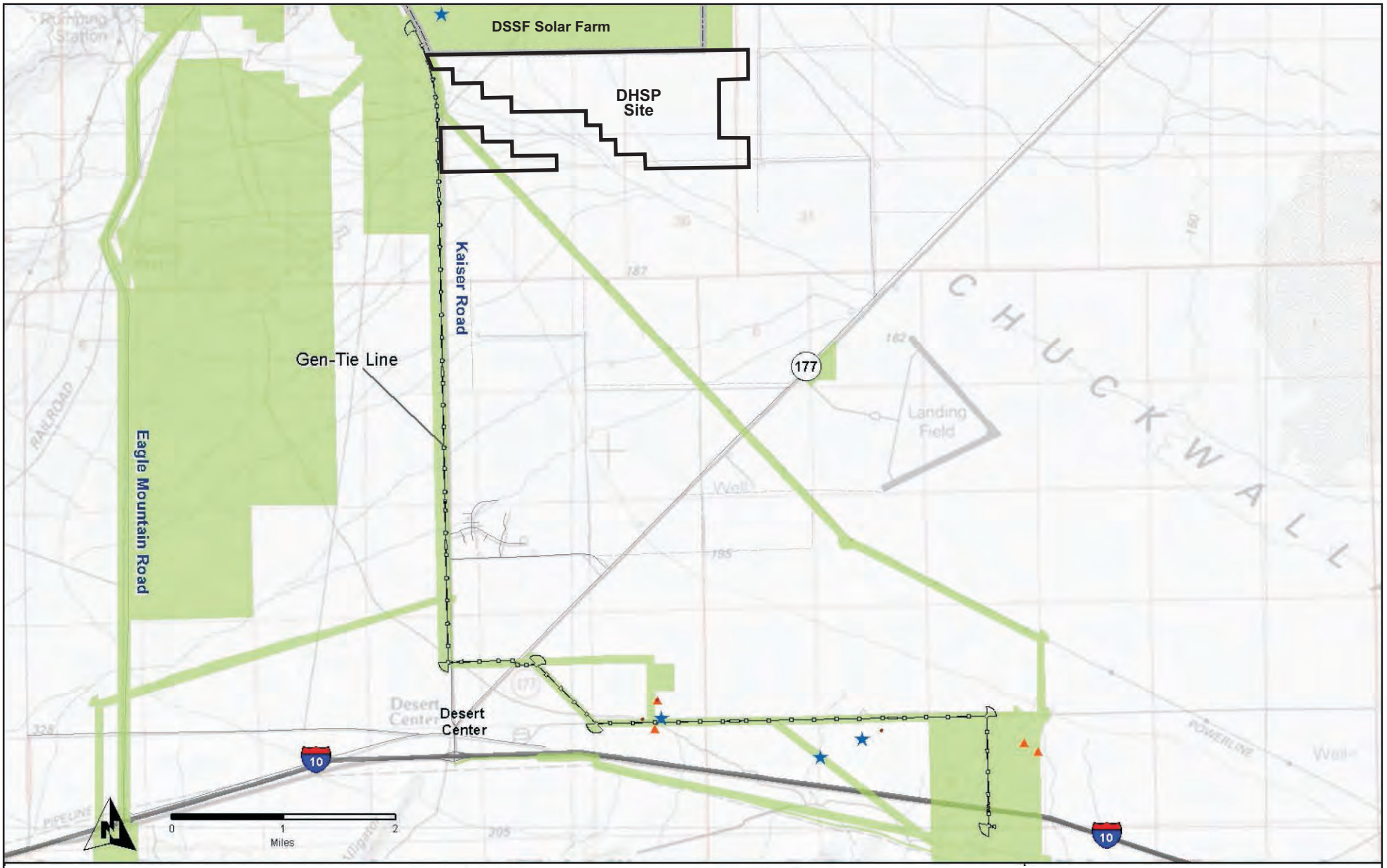
Scat

Mating Ring

Source: Ironwood and Woodard, 2011.

Figure 3

**Active Desert Tortoise Sign-
Desert Sunlight Solar Farm Project**



Aspen Environmental Group

Source: Ironwood and Woodard, 2011.

Project Site

Full Coverage Survey Area

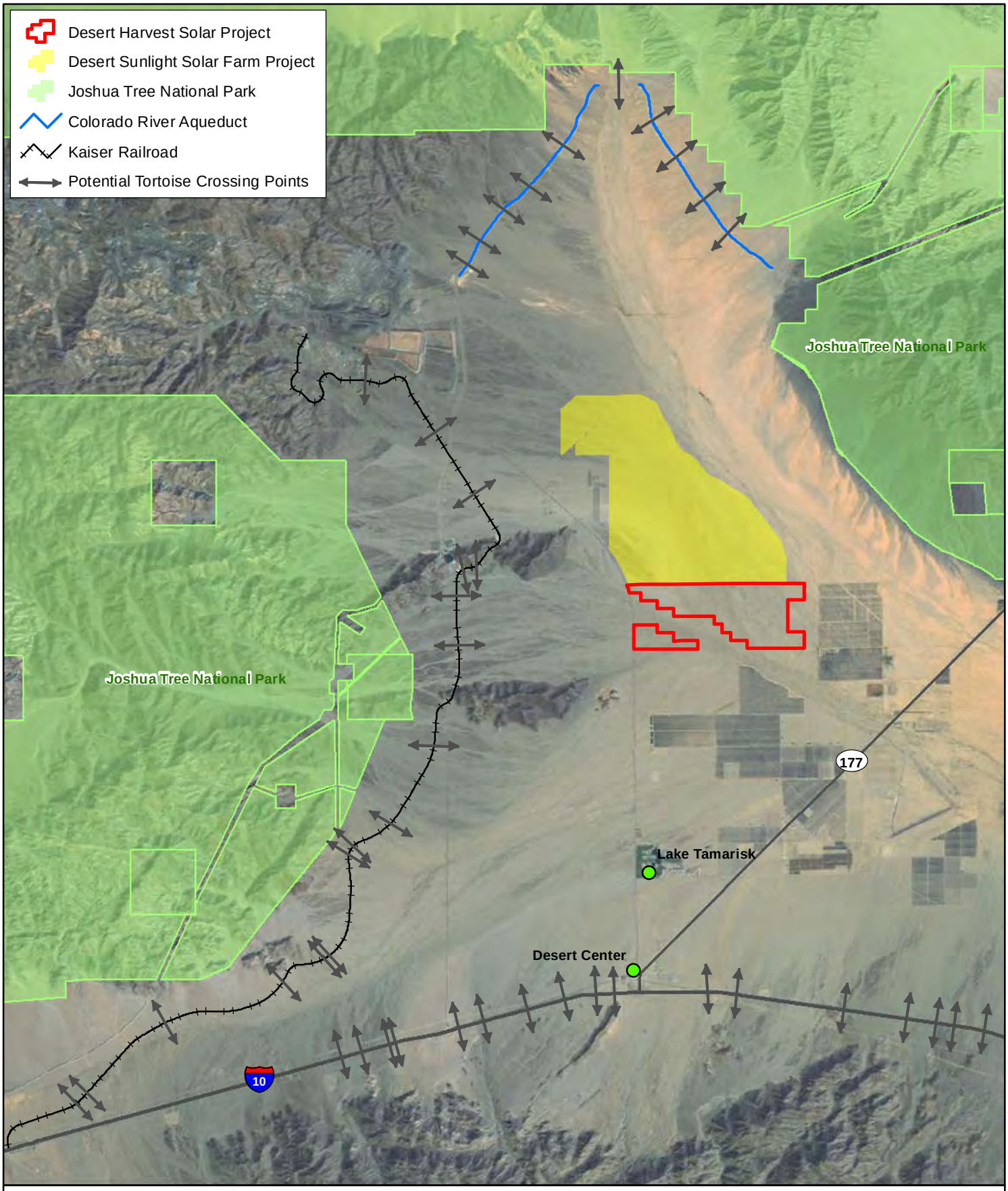
Tortoise

Active Burrow/Pallet

Scat - Fresh

Figure 4

Active Desert Tortoise Sign-Gen-Tie Line

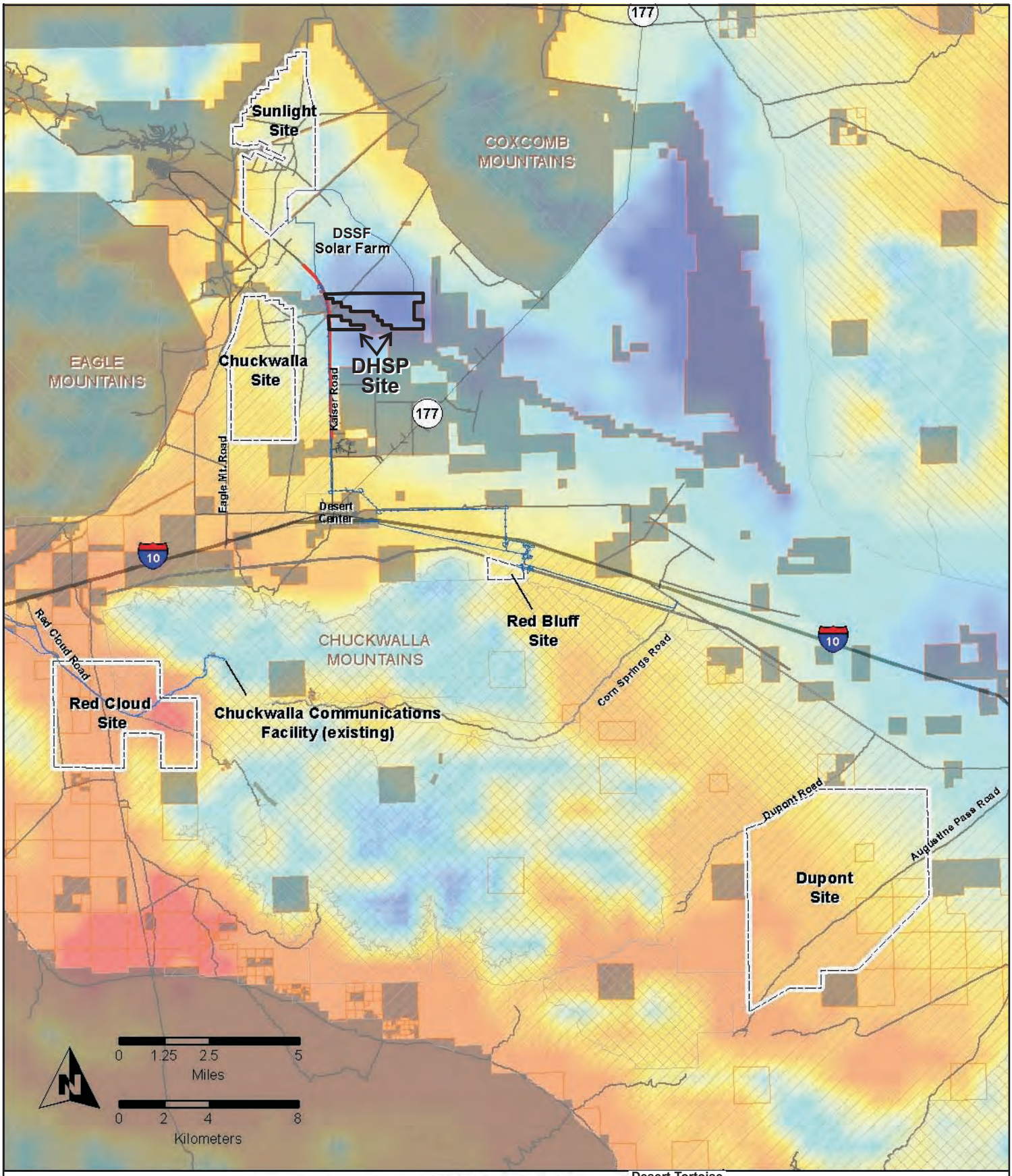


Aspen Environmental Group

0 2 4 Miles

Figure 5

Regional Barriers to Movement



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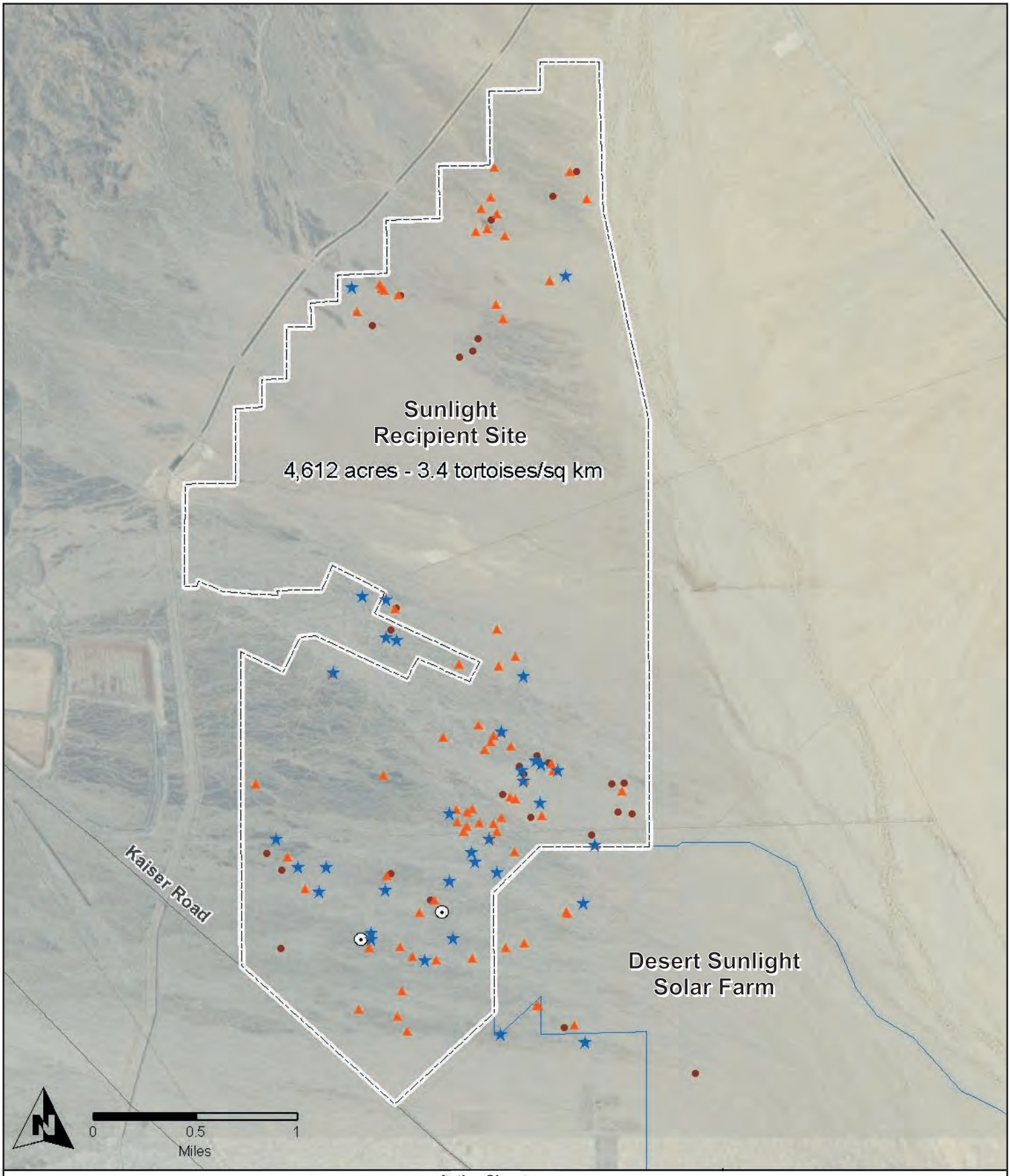
Translocation Site
Project Site
Exclusion Fence

Chuckwalla DWMA
Wilderness Area
BLM Lands
Private, State and Other Federal Lands

Desert Tortoise Habitat Value
High
Low

Source: Ironwood and Woodard, 2011.

Figure 6
Translocation Sites



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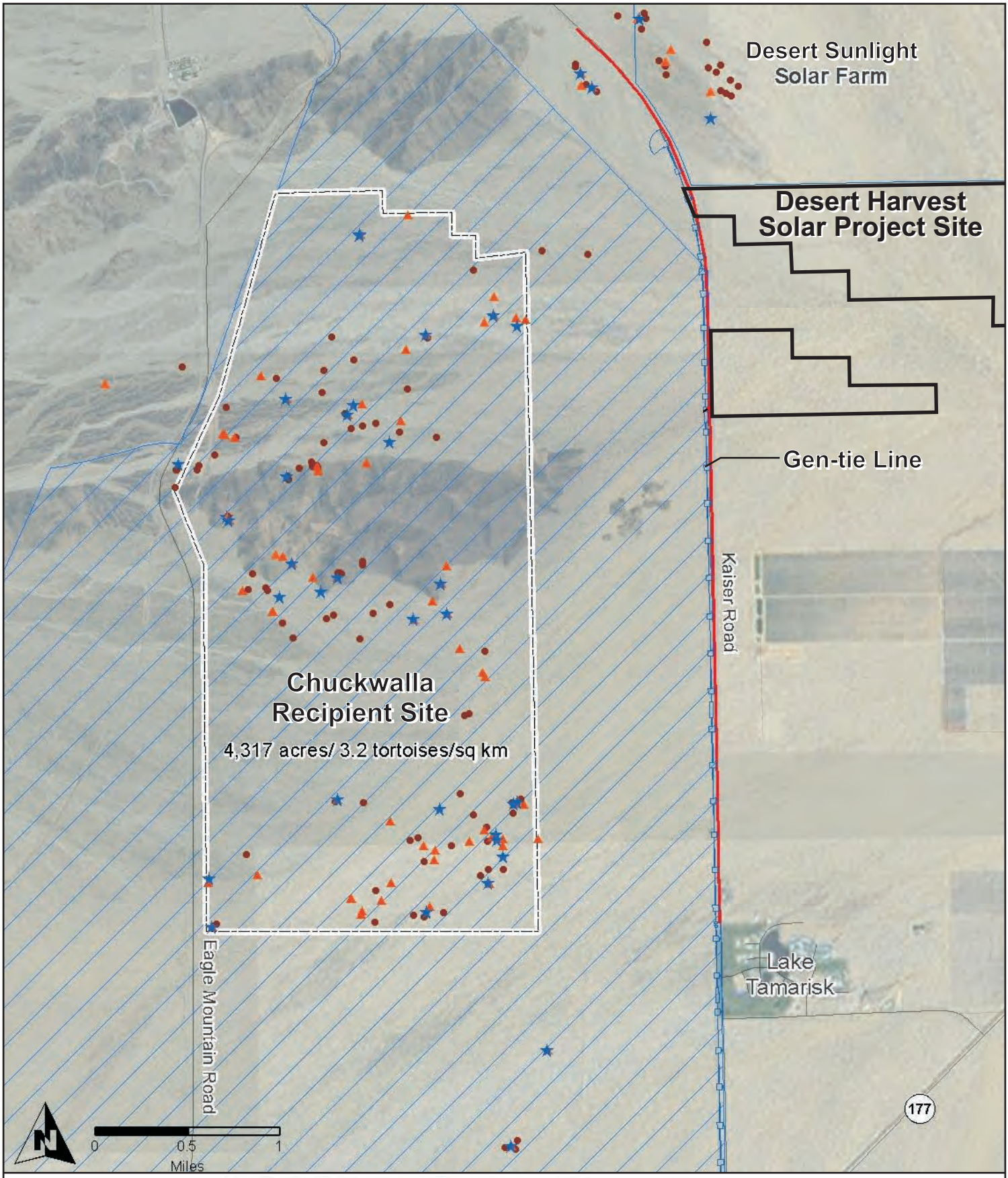
Source: Ironwood and Woodard, 2011.

Recipient Site

Project Component

Active Sign
- Tortoise
- Burrow/Pallet
- Mating Ring
- Scat

Figure 7
Sunlight Recipient Site



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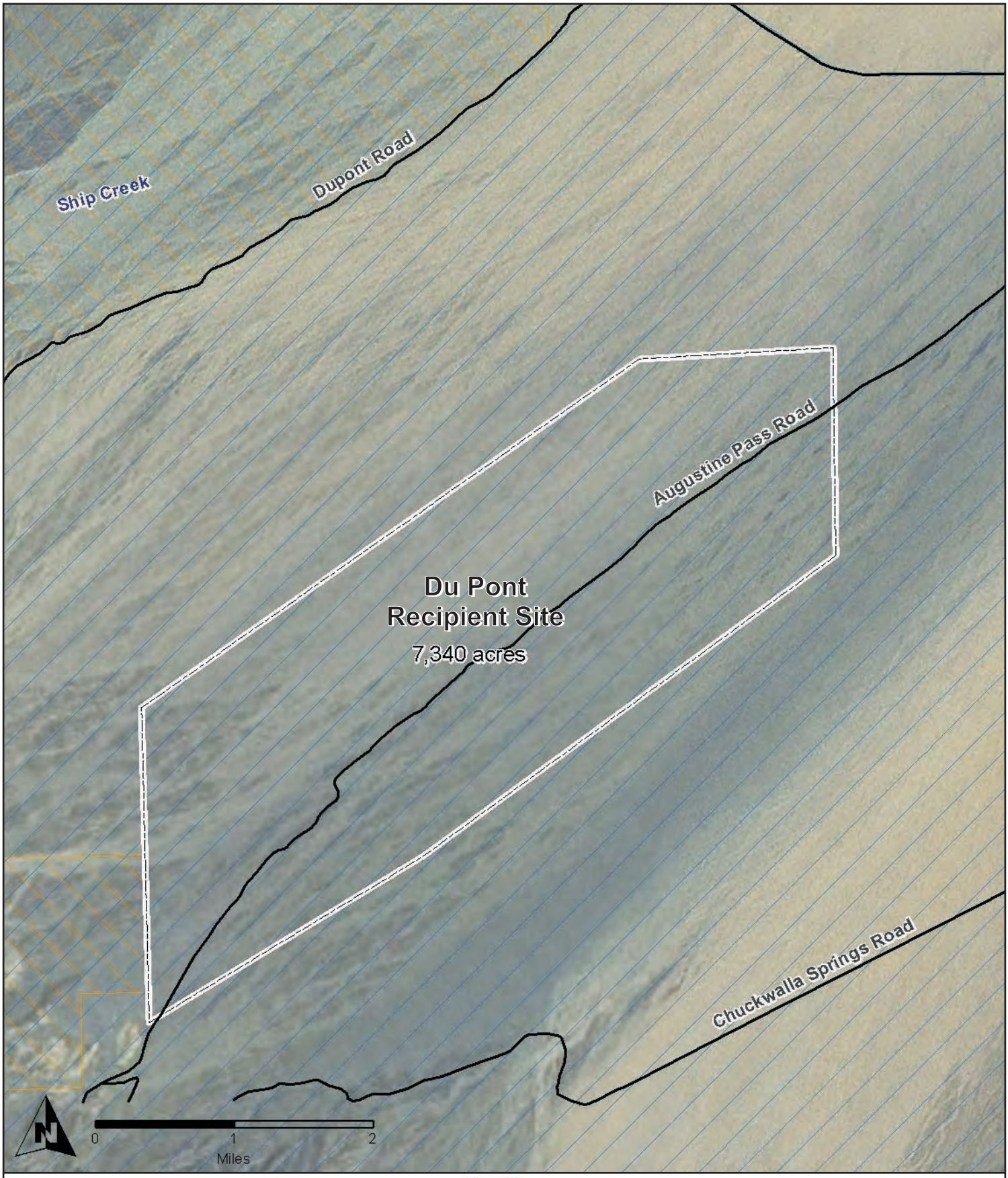
Recipient Site
Project Site
Chuckwalla DWMA
Exclusion Fencing
Active Sign
Tortoise
Burrow/Pallet
Scat

Source: Ironwood and Woodard, 2011.

Figure 8
Chuckwalla Recipient Site



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Source: Ironwood and Woodard, 2011.

Recipient Site

Unpaved Road

Chuckwalla DWMA

Wilderness Area

Figure 9
DuPont Recipient Site

Appendix C.9

Draft Bird and Bat Conservation Strategy

Draft Bird and Bat Conservation Strategy
Desert Harvest Solar Project

Prepared for:

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January 2012

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ABBREVIATIONS AND ACRONYMS

Alternating current	AC
Bald and Golden Eagle Protection Act	BGEPA
Bird and Bat Conservation Strategy	BBCS
Bureau of Land Management	BLM
California Burrowing Owl Consortium	CBOC
California Environmental Quality Act	CEQA
Desert Harvest Solar Project	DHSP
Desert Wildlife Management Area	DWMA
Direct current	DC
Draft Environmental Impact Statement	DEIS
Engineering, procurement and construction	EPC
Federal Endangered Species Act	ESA
Gallons per day	GPD
Generator tie line	gen-tie line
Kilowatt	kW
Megawatt	MW
Migratory Bird Treaty Act	MBTA
National Environmental Policy Act	NEPA
Natural Community Conservation Planning Act	NCCP
Operation and maintenance	O&M
Photovoltaic	PV
Record of Decision	ROD
Right-of-way	ROW
Total dissolved solids	TDS
US Fish and Wildlife Service	USFWS
Wildlife Management Habitat Area	WHMA

1.0 INTRODUCTION

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 6 miles north of Desert Center, California. The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2011a). enXco is voluntarily proposing this Bird and Bat Conservation Strategy to set forth the measures it will implement to avoid, minimize, or mitigate for potential adverse effects of the Project to birds or bats. Accordingly, enXco will collect and evaluate data during the construction, operation and maintenance (O&M), and decommissioning phases of the Project and will implement adaptive management measures as necessary and appropriate to minimize or mitigate impacts to birds or bats. enXco does not anticipate that construction, operations, or decommissioning of the project will cause unauthorized take or prohibited disturbance of bird or bat species.

This Bird and Bat Conservation Strategy (BBCS) was prepared according to guidelines recommended by the US Fish and Wildlife Service (USFWS 2010a; 2010b). It describes the proposed DHSP Project components, summarizes baseline data regarding birds and bats in the Project vicinity; assesses potential risks to those species that could result from Project construction, operation, and decommissioning; and describes conservation measures to be implemented, to minimize those risks.

1.1 PROJECT DESCRIPTION

The DHSP would be located on BLM-administered land north of Desert Center in Riverside County (Figures 1 and 2). Several designated wildlife management areas are in the vicinity of the applicant's right-of-way (ROW; Figure 3). Portions of the proposed and alternative generator transmission lines (gen-tie lines) are within a designated Desert Wildlife Management Area (DWMA) and critical habitat (both designated for desert tortoise). The project's Draft Environmental Impact Statement (DEIS) analyzes 3 solar project alternatives and 4 gen-tie line alternatives. This section of the BBCS summarizes the applicant's proposed project and the alternatives. More complete descriptions of the Project and alternatives may be found in Chapter 2 of the DEIS.

1.1.1 Structures and Facilities

Solar field. The DHSP would be a 150 MW nominal capacity, alternating current (AC) solar photovoltaic (PV) energy-generating project. The proposed project site is comprised of two separate parcels separated by a desert wash. The northern parcel consists of 1,053 acres and the southern parcel consists of 155 acres. The proposed solar facility would consist of several main components. Table 1 presents a breakdown of site acreage for each solar facility component.

- Main generation area—PV arrays, switchyard, inverters, overhead lines, and access corridors;
- Operations and maintenance (O&M) Facility – either on or off site;
- On-site electrical substation; and
- Site security, fencing, and lighting.

Table 1. Estimated Overall Project Acreage

Project Component	Acreage
Current BLM right-of-way case record (Northern Parcel / Southern Parcel; respectively)	1,208 (1,053 / 155)
Solar panel field	1,200
Area cleared of vegetation (10% of Project area)	107
Parking and admin areas	3.0
Access corridors	200
Construction laydown area	2
Gravel access roads	10
On-site substation	3
Area disturbed by trenching	11
Area permanently covered by at-grade items (footprint of piles, power conversion station, transformer, PV combining switchgear, on-site substation, on-site overhead line poles, Visitors Center, M&M Facility)	10
Water storage ponds	2
Approximate maximum area shaded by PV modules	910

The specific PV technology to be installed has not been determined. The project may use any of a variety of PV technologies, including, but not limited to:

- Crystalline silicon panels
- Copper indium gallium cyanide selenide panels
- Fixed-tilt racking system
- Single-axis tracking system

The PV modules would be organized into arrays that would be spread out over approximately 1,200 acres of the site. Each megawatt requires approximately 8 acres. Each array would consist of PV modules, a power conversion station, and a transformer. Tracking systems, which may be installed, have motors that rotate the PV modules from east to west during the day to track the sun across the sky.

enXco proposes to use site preparation techniques that would minimize the required volume of earth movement, including a “disc and roll” technique that uses farm tractors to till the soil over much of the solar facility site and then roll it level, as well as “micrograding” or “isolated cut and fill and roll” of other areas of the site to trim off high spots and use the material to fill in low spots. The entire solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Panel foundations would permanently disturb 10 acres of on-site soils. Internal access roads would permanently disturb 210 acres. Installed panels would shade up to approximately 910 acres of the solar facility acreage.

The field of panels would consist of repeating blocks of 1.44 MW (AC). The approximate dimensions of each array block would consist of 12,480 panels, separated into four quadrants (northwest, southwest,

northeast, southeast). Within each quadrant, there would be 6 rows of 10 or 11 48-panel strings, arranged in a 6 by 8 table layout. Each block would employ two 720 kW inverters, set along the access roads, in the middle of the panel array area.

The panel field would be laid out by installing vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver or, if soil conclude that further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts.

The rows of panels would be spaced to prevent shading of adjacent panel rows and to allow access between the rows for panel maintenance. Between each 720 kW power block would be 14- to 20 foot-wide roads running east-to-west, and 14 foot-wide roads running north-south to allow fire and vehicular access for the maintenance of the electrical facilities.

Meteorological station. One or more meteorological stations would be installed at the solar facility site prior to construction in order to track weather patterns. The meteorological station(s) would be attached to a data acquisition system to collect data for analysis and system monitoring. Each meteorological station would be 6 feet in height and would be set on a stainless-steel tripod base approximately 10 feet by 10 feet.

Electrical collection system. Most of the electrical collection system conductors would be underground. Power from several rows of PV modules would be conveyed to power conversion stations via underground direct current (DC) cables. DC trenches would be approximately 3 feet deep and from 1.5 to 2.5 feet wide; the DC cables would be surrounded by clean fill, and the remainder of the trench would be back-filled with native soil and compacted to 90 percent (95 percent when crossing under roadways). Power screeners may be used on site to extract the required clean fill from native soils excavated during trenching for use as bedding material in the trenches. A power screener is a motorized piece of equipment that uses moving screens to filter soils to a particular granularity.

A power conversion station and transformer would be located within each PV array. Each power conversion station comprises an inverter located within an enclosure and (approximately 11.5 feet tall) connected to a transformer. The transformers would be approximately 6.3 feet tall. Each transformer would be placed on a pre-cast concrete pad. Each pad would be delivered by flatbed truck during construction, in combination with a power conversion station vault, and installed by crane from the truck.

The PV inverters would convert the DC electric input into grid-quality alternating current (AC) electric output. The transformer would step up the voltage of the AC electrical input and then would transmit the power via underground lines to the PV combining switchgear. AC trenches would be approximately 3 feet deep and from 8 inches to 6.5 feet wide, depending on the number of cables, and would also be used to house fiber optic cables. The AC cables would be surrounded by sand, and the remainder of the trench would be back-filled with native soil and compacted.

The PV combining switchgear would transmit the power to overhead lines within the solar facility site; the overhead lines would transmit the electrical output to the on-site substation. At the on-site substation, the voltage would be stepped up to 220 kV and routed via a new gen-tie tine to the approved Southern California Edison (SCE) Red Bluff Substation (the alternative gen-tie lines are described below).

Each PV combining switchgear would collect power from a number of arrays. The PV combining switchgear cabinets would be approximately 7.5 feet tall and would be dispersed among the arrays.

Each PV combining switchgear would be placed on pre-cast 32 foot by 14.5 foot concrete pads, delivered and installed in the same manner as transformer pads and power conversion station vaults.

Because the project site is comprised of two separate parcels, electrical connection between the southern parcel and on-site substation would be required. The Applicant would seek to under-ground the electrical power conversion station connections from the southern parcel to the northern parcel along an easement on the eastern side of Kaiser Road. The route would parallel the natural gas line adjacent to Kaiser Road.

Overhead collection lines. High-capacity 34.5 kV collection system lines would connect the power output from the PV combining switchgear to the on-site substation via overhead lines. These overhead lines would be supported by wooden poles approximately 52 feet above finished grade. The overhead lines would span a distance of approximately 150 feet from pole to pole.

On-site substation. The project substation would be located in the northwest corner of the site and would cover approximately 5 acres. It would step up voltage of the solar-generated electricity to 220 kV. The project's primary 20 foot-wide access road would serve the on-site substation.

Switchyard. An electrical switchyard serves to interconnect an electrical generator to the grid. The switchyard would be constructed and operated by enXco. It would occupy an area approximately 400 feet long and 400 feet wide in the west corner of the northern parcel immediately adjacent to the substation. Transformer(s) in the switchyard would be set on concrete pads within containment areas designed to hold any accidental releases of transformer oil. All transformers would be free of polychlorinated biphenyls. The high-voltage side of the trans-former(s) would be connected to the plant’s switchyard.

A small control building would be located within the switchyard and would be accessible to authorized personnel only. The building would house electrical control equipment, battery/DC systems for device operation, safety relays, and other similar electrical equipment. This building would interconnect with the main control room in the operations building for monitoring of the substation.

Security fencing. Beginning at the onset of construction, site access would be controlled for personnel and vehicles. A security fence would be installed around the plant site perimeter. An access gate would be located in the west corner. An emergency gate would be located in the southeast corner, with access to Beekley Road (north of Rice Road, west of Carr Road). The security fence would have an overall height of no more than 10 feet, including chain link fabric and three strands of barbed wire mounted on 45 degree extension arms. All required laydown areas are expected to be within the defined solar facility boundaries, and thus no additional temporary fencing would be required.

Controlled swing or rolling access gates, requiring an electronic swipe card, would be located at the facility entrance. Visitors would be allowed entry only with approval from staff, issued passes to be worn during their visit, and would be logged in and out of the facility.

Lighting and Electrical Supply. Additional security features would include motion detectors, lighting, and cameras in key locations. Exterior lighting would comply with current Title 24 regulations from the State of California. Security would be maintained as required by the engineering, procurement, and construction (EPC) contractor or a suitable subcontractor to maintain public safety and the security of the facilities.

Except as provided below, lighting during construction would be limited to the staging area for the construction trailers, parking area, and site security facilities. Lighting would be located on temporary

service poles approximately 18 feet in height. Power would come from a connection to the local distribution system or from an on-site generator. If required, construction lighting would be limited to that needed to ensure safety. It would be focused downward, shielded, and directed toward the interior of the site to minimize light exposure to areas outside the construction area.

During operations, lighting would be limited to shielded, area-specific lighting for security purposes. Power would come from the local distribution system. The level and intensity of lighting during operations would be the minimum needed for security and safety purposes. Security lights would use motion sensors that would be triggered by movement. There would be no lights around the project perimeter, in order to minimize the project's visual impact on surrounding receptors and roads. Lights would be shielded and focused downward and toward the interior of the site to minimize lighting impacts on the night sky and to neighboring areas. Portable lighting may be used occasionally for maintenance activities during operations.

Access roads. Access would be via the existing Kaiser Mine Road, at the western boundary of the project area. Kaiser Mine Road is reached from Rice Road, just north of the on-ramp/off-ramp to Interstate 10 at Desert Center. The primary point of access to the project site would be a 20 foot-wide access road connecting the northwest corner of the solar facility to Kaiser Mine Road. Access within the project area would be provided by a grid of 14 to 20-foot wide unpaved roads to allow fire and maintenance access. The total length of on-site roads would be 109 miles.

Water requirements and sources. During the construction period, an estimated total of between 400 and 500 acre-feet of water would be needed for such uses as soil compaction, dust control, and sanitary needs. The majority of the construction water use would occur during site grading operations. The daily water demand during construction is estimated to range from a low of 125,000 gallons per day (gpd) to a peak of approximately 600,000 gpd. enXco proposes to draw water from two new and/or existing local wells to meet construction water demands. One well would continue to be used for project operations. Both wells would be available for use during construction to provide flexibility in the water supply and in the event of a well malfunction. The project's maximum well extraction rate over any 24 hour period is not expected to exceed 880 gallons per minute. Drinking water would be provided from an off-site commercial source during construction. A permanent, above-ground 5,000 gallon water storage tank would be built for O&M and as an emergency fire-fighting supply. The water tank would be about 12 feet in diameter and 13 feet tall and would be located on a round concrete slab.

The potential locations for the construction of two new on-site wells are at the northeastern and northwestern areas of the site. As an alternative to new wells, DHSP may use nearby (within 10 miles) off-site active wells. If off-site wells are used, water would be trucked to the on-site water treatment facility described below. No new roads or ground disturbance would be required for use of off-site wells.

Temporary ponds would be used for water storage during construction. A total of 3 temporary ponds are planned around the project construction site. It is anticipated that each pond would occupy approximately three-quarters of an acre and would hold approximately 21.5 million gallons. Ground water pumped from the supply wells would be piped the ponds via 6 inch HDPE pipe runs along on-site access roads or the site perimeter. No more than two or three ponds would be operating at any one time. The temporary ponds would be approximately 6 to 8 feet deep and would be fenced and lined for safety. The temporary ponds would be covered with netting to deter ravens and other wildlife. To minimize earth work, most of the ponds would be co-located with planned retention basins that would

be used during project operation to contain storm water runoff. Storm water pollution prevention BMP controls would be incorporated with the retention basins.

The ponds would be filled by pumps running 24 hours per day at up to 600 gallons per minute. A float valve in each pond would control overflow. Water would be pumped from the pond into large temporary storage tanks (stand tanks) using hurricane pumps. Water would be transferred directly to trucks from the stand tanks, as needed for dust control and compaction during construction.

Reverse osmosis system. A water treatment facility and demineralization evaporation pond may be required to treat well water, depending upon total dissolved solids (TDS) content. Panel washing requires water with very low TDS. A water treatment system consisting of a double-pass reverse osmosis (RO) system may be installed near the main O&M well, most likely adjacent to the on-site project substation. It would be enclosed in a small structure approximately 6 feet wide by 12 feet deep and approximately 6 feet high. This system would produce up to approximately 20 gallons per minute (gpm) of low-TDS water and approximately 9 gpm of reject water. This reject water would be piped to a lined evaporation pond with four sections comprising approximately 1 acre total. Residue would be periodically removed from the ponds and disposed of at an approved facility. enXco would re-purpose one of the construction holding ponds as a settling pond for RO reject water.

Gravel, aggregate, and concrete requirements and sources. Gravel would be required for the north-south access roads (not for the less often used east-west routes) and would be sifted from on-site soil, or obtained from a BLM-approved commercial mine approximately 6 miles from the project site. Road aggregate required for the on-site access roads would amount to 17,500 cubic yards.

Concrete would be required for the inverter pads and the switchyard. Concrete for the inverter pads and vertical H-pile supports, if needed, would be pre-poured and transported to the site by truck. Concrete for the switchyard and asphalt for the parking area would be trucked to the site. If commercial ready-mix concrete supply is not sufficient, a temporary, two-acre concrete batch plant would be installed in the construction laydown area.

1.1.2 Construction Activities

Construction schedule and phasing Site preparation would begin shortly after final permitting is complete. Construction is anticipated to commence during the 3rd quarter of 2012, and continue through the 4th quarter of 2014, in two phases. Commercial operation would also be phased and the first phase of operation would commence during the 3rd quarter of 2013, with commercial operation of the final phase commencing during the 4th quarter of 2014. The construction schedule would be as follows:

Construction would generally occur between 7 a.m. and 7 p.m., Monday through Friday. Additional hours may be necessary at times, due to weather or specific construction activities.

Construction workforce. The on-site workforce would consist of laborers, craftsmen, supervisory personnel, supply personnel, and construction management personnel. The maximum number of on-site personnel would be 250 individuals at any one time during construction. An average workforce of 100 is anticipated during construction.

Construction waste management. Portable bathrooms would be provided on-site during construction and would be emptied in an approved off-site facility; domestic wastewater generated during construction would not be disposed of on-site.

Construction vehicles and equipment. During construction, the number of truck loads and the tonnage delivered would be on the order of about 15,000 tons of equipment and materials. Construction equipment would include front end loaders (3), backhoes (8), scrapers (5), bulldozers (2), graders (5), hydraulic rams (10), cranes (2), power screeners (3), and pile drivers (10).

Vegetation removal and treatment. Once fencing is erected, site preparation would consist of removal of vegetation within the project area by scarification where necessary; for example, along the access roads. Approximately 10 percent of the entire project area would be scarified to remove vegetation on all the access roads between the 1.44 MW rows of solar panels. In addition, any vegetation over 18 inches tall would be removed to avoid interference with the solar panels. Preparation would likely proceed by section, so that only the portion of the project area where panels would be laid out over a period of 6 months would be scarified at any one time.

Key considerations for vegetation treatment of the site would include:

- Soil disturbance in support of construction would increase the possibility of introduction of invasive species. Regular monitoring and weed management would be required during construction. Ongoing maintenance in the solar field may include treatment of noxious weeds by targeted spraying with Roundup® (a common formulation of the herbicide glyphosate). Pursuant to BLM requirements, an Integrated Weed Management Plan will be prepared and implemented for the project.
- Where temporary access is needed to install facilities, such as along the perimeter fencing, no removal of existing vegetation or grading would occur. Instead, equipment would drive over or around existing desert scrub vegetation without direct removal. Crushed vegetation is much more likely to show a rapid recovery than where vegetation is removed and reseeded, or where soils are disturbed. The Applicant is not expecting that final plans would require any disturbance outside the final perimeter fencing.
- Revegetation with native species would be implemented where feasible in areas of temporary disturbance. Pursuant to BLM requirements, a Revegetation Plan will be prepared and implemented for areas temporarily disturbed during project construction.

Solar array assembly and construction. After site preparation, the panel field would be laid out by installing the vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver. If further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts. Once the foundations are secure, trenching would be dug along the perimeter of the 1.44 MW units, to tie the inverter blocks together, and the electrical conduit and wires would be laid down. Next, the framing would be bolted to the vertical support beams. Once framing is complete, panels would be installed on the frames. Finally, the pre-poured concrete inverter pads would be laid down and the inverters would be secured to the pads, and the electrical wiring would be completed.

During construction, electric power for construction activities would be derived from the distribution lines along the southern side of the project site, or by mobile generators. Up to five mobile generators would be located at the laydown area (at the northwest corner of the site). Each generator would produce 60 dB(A) of noise at 23 feet.

1.1.3 Operations and Maintenance Activities

Staff and equipment. The project would employ 8 full-time staff during operations. Maintenance staff would access the facility using 4 diesel engine pickup trucks. The trucks would travel to the site daily from an off-site O&M building (located within 10 miles of the site) or an optional on-site building.

Roads and vegetation. Operations and maintenance (O&M) of the facility would require periodic access to the project components via the on-site road network. Roads would be maintained to minimize fugitive dust and prevent erosion. Additional gravel or surface treatments may be required. Vegetation would be allowed to re-grow within the solar panel field, but would be maintained below a height of 18 inches to prevent interference with solar panels. The access roads in the solar panel field would be maintained free from significant vegetation through the use of targeted spraying, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays.

Operational water requirements and sources. During operation, water would be required for solar panel washing two to three times per year. If off-site wells are used, water would be trucked to the project site from up to 10 miles away in up to 1,200 water trucks annually. Panel wash water would be purified using the on-site reverse osmosis system (above). The total water used would be between 18 and 27 acre-feet per year. Domestic wastewater would be treated and disposed at the site using a septic disposal system consisting of septic tanks and leach field.

Aviation Lighting. enXco anticipates no aviation restrictions for the project. No structures would be taller than the height requiring aviation lighting.

1.1.4 Decommissioning Activities

The expected operational lifetime of the project is 30 years; however, the actual life of the project could be longer or shorter. When permanent closure is appropriate, a decommissioning plan will be prepared and submitted to the BLM for review and approval. Closure strategies may include temporary "mothballing"; removing old facilities and upgrading to newer solar technology; or complete removal of equipment and restoration of the land to BLM-approved specifications. Fully decommissioning the site would involve removal and demolition of above-ground and below-ground structures; dismantling and removing concrete structures to a depth of 3 feet; removal of underground utilities within 3 feet of final grade; and excavation and removal of contaminated soils, if applicable.

1.1.5 Project Alternatives

In addition to enXco's proposed project, the DEIS addresses two smaller solar field designs. Both alternatives would be located at the same ROW. These action alternatives are summarized below.

Alternative 5 – Solar Project Excluding WHMA: Alternative 5 would have the same project boundaries as the proposed project, except that it would exclude the portion of the site which is within the Palen-Ford Wildlife Habitat Management Area (WHMA), as shown on Figure 4a, Alternatives to the Proposed Action. Alternative 5 would encompass approximately 1,161 acres. It would not incorporate any substantial changes to construction, O&M, or decommissioning from those described above. Direct and indirect impacts would be similar in type as those presented above for the proposed action, but would be incrementally reduced in magnitude due to the 47-acre reduction in the size of the Alternative 4 site.

Alternative 6 – Reduced Footprint Solar Project: Alternative 6 would have the same project boundaries as the proposed project, except that it would exclude the smaller southern parcel of the project, as shown on Figure 4b, Alternatives to the Proposed Action. Alternative 6 would encompass approximately 1,044 acres. Because Alternative 6 would not include the disjunct ROW parcel, it would not require an underground electrical connection between southwestern and northeastern parcels described for the proposed project. Alternative 6 would not incorporate any substantial changes to construction, O&M, or decommissioning from those described above. Direct and indirect impacts would be similar in type as those presented above for the proposed action, but would be incrementally reduced in magnitude due to the 164-acre reduction in the size.

1.1.6 Gen-tie line

The proposed gen-tie, Alternative B, is the same gen-tie line as proposed by the approved adjacent Desert Sunlight project and described in the Desert Sunlight EIS (BLM 2011b) as Alternative A-1. Because the Desert Sunlight gen-tie has not yet been constructed (as of December 2011), the effects of constructing, operating, and decommissioning gen-tie Alternative B are analyzed in the EIS and described here without the presumption that the approved Desert Sunlight gen-tie would be built. However, if the Desert Sunlight gen-tie line were to commence construction prior to or at the same time as the construction schedule for the proposed action, then the proposed gen-tie line would instead consist of an additional line strung on the gen-tie line towers of the Desert Sunlight project. Under such a scenario, stringing of enXco's gen-tie line would occur concurrently with construction of Desert Sunlight's gen-tie line, and would require no additional equipment, personnel, or time beyond that already required and approved for Desert Sunlight's gen-tie line. The same access roads would be used for maintenance of both companies' conductors, and the conductors would be maintained concurrently using the same maintenance service provider. The proposed alignment is shown on Figures 1 and 2. The gen-tie line would be on steel monopoles, which would be approximately 135 feet tall. Typical spans between poles would be approximately 900 to 1,100 feet.

Construction scheduling and mobilization. Construction would begin 3rd or 4th quarter, 2012 (depending on Record of Decision [ROD] issuance) and would last for 12 months. Gen-tie construction would occur concurrently with Desert Sunlight, if feasible. Over a 12 month construction period, the gen-tie workforce will average 30 employees, with no more than 65 employees at any one point. A total of approximately 240 material deliveries are expected during the 12 month construction period for the gen-tie line.

Work site and access road clearing. Access roads and work areas at each structure location would be cleared and graded. Clearing and grading would also be needed for conductor pulling and tensioning sites and temporary guard structure sites at road or utility crossings. Laydown yards would all be within the project footprint and would not require any additional ground disturbance. The total area of permanent and temporary disturbance is estimated as 92 acres.

Tower construction. Structures would be picked up from the material storage yard, hauled to tower locations or marshalling yards. The pole base and top sections of each structure would be assembled in sections on the ground, using hydraulic cranes. After assembly, each structure would be erected onto a foundation (either shaft anchor-bolted foundations, drilled shaft embedded foundations, or vibrated steel casings), using a crane.

Operations and maintenance. DHSP operations and maintenance personnel would perform periodic maintenance of the gen-tie line, and no additional personnel would be required. Operation and

maintenance would involve periodic inspection via helicopter or truck. The transmission lines would be maintained on an as-needed basis and would include maintenance of access roads and erosion/drainage control structures.

Decommissioning. A final Decommissioning Plan would be developed prior to facility closure, based on conditions at that time. The Decommissioning Plan would be developed in coordination with the BLM and submitted to the BLM for review and approval prior to final closure.

1.1.7 Gen-tie Alternatives

In addition to the proposed gen-tie alignment, three other alignments are under review (alternatives C, D, and E in the DHSP EIS; see Figure 2). Alternative C would be constructed on separate towers immediately adjacent to the approved Desert Sunlight gen-tie line; gen-tie alignment Alternative D, or the cross-valley alignment, was described in the Desert Sunlight EIS as Alternative A-2; and gen-tie alignment Alternative E is a new alternative that was not reviewed in the Desert Sunlight EIS. The transmission support structures, construction activities, and other aspects of construction for gen-tie Alternatives C, D, and E would be as summarized above for the proposed gen-tie.

1.2 REGULATORY SETTING

This BBCS was prepared to ensure Project compliance with state and federal statutes protecting native birds, as well as NEPA and CEQA requirements to disclose environmental effects of the project, and provide public opportunity for comment. These applicable statutes are summarized below:

1.2.1 Federal Regulations

Endangered Species Act of 1973. The Endangered Species Act (ESA) (16 USC 1531 et seq.) and subsequent amendments establish legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend. Section 9 prohibits the take of any fish or wildlife species listed as endangered and most species listed as threatened, and defines *take* to mean "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 to mean "any act that kills or injures the species, including significant habitat modification." *Harass* is further defined as actions that create the likelihood of injury to listed species to an extent as to significantly disrupt normal behavior patterns which include breeding, feeding, and shelter.

The ESA also includes mechanisms for allowing exceptions to the Section 9 take prohibitions. Section 7 requires federal agencies, in consultation with the US Fish and Wildlife Service (USFWS) to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered terrestrial wildlife species or result in the destruction or adverse modification of critical habitat for these species. Under Section 7, USFWS may authorize limited, incidental take (i.e, incidental to carrying out otherwise lawful activities) of listed species in a Biological Opinion.

The project is not expected to affect federally listed threatened or endangered bird or bat species, though it is possible that such federally listed migratory species may be found in the project vicinity during seasonal migrations.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (16 U.S.C. §§ 703, et seq.; MBTA) prohibits the taking, killing, possession, transportation and importation of migratory birds, their eggs, parts, and nests, except where specifically authorized by the USFWS (e.g., hunting waterfowl and upland game

species). Under the MBTA, *migratory bird* is broadly defined as "any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle" and thus applies to most native bird species. Except where specifically permitted, most actions that cause bird mortality or result in the permanent or temporary possession of migratory birds or any associated body parts, feathers, eggs or nests, constitute violations of the MBTA.

The USFWS recommends that electric utilities and utility-scale renewable energy project developers prepare and implement Bird and Bat Conservation Strategies to minimize the incidental take of migratory birds.

Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d; BGEPA) prohibits take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*). The BGEPA defines '*take'* to include "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing." The USFWS (2007) further defines '*disturb'* as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.'' Therefore, the requirements for guarding against impacts to eagles generally are more stringent than those required by the MBTA alone.

The USFWS can authorize take of bald and golden eagles when the take is associated with, but not the purpose of, an otherwise lawful activity, and cannot practicably be avoided (50 CFR § 22.26). In order to authorize take, the USFWS must determine that the proposed action is consistent with the goal of maintaining stable or increasing breeding populations. That is, any authorized take must be offset or mitigated by the proposed action.

1.2.2 State Regulations

California Endangered Species Act. The California Endangered Species Act (CESA) prohibits take of wildlife listed as threatened or endangered and defines '*take'* as any action or attempt to "hunt, pursue, catch, capture, or kill." CESA also allows exceptions for take that occur incidental to otherwise lawful activities. Approval requires minimization and full mitigation of projected impacts. For projects that affect a species listed under both CESA and the federal ESA, compliance with the federal ESA will satisfy CESA if CDFG determines that the federal incidental take authorization is consistent with CESA under Fish and Game Code § 2080.1. For projects that will result in take of a species listed under CESA but not under the federal ESA, the applicants must apply for a take permit under § 2081(b).

Native Birds (California Fish and Game Code, Sections 3503 and 3513). California Fish and Game Code § 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; § 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and § 3513 provides for the adoption of the MBTA's provisions (above). With the exception of a few non-native birds such as European starling, the take of any bird or loss of active bird nests or young is regulated by these statutes. As with the MBTA, these statutes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game migratory birds.

California Fully Protected Species. Prior to enactment of CESA and the federal ESA, California enacted laws to "fully protect" designated wildlife species from take, including hunting, harvesting, and

other activities (Fish and Game Code § 3511). Unlike the subsequent CESA and ESA, there was no provision for authorized take of designated fully protected species. Currently, 36 fish and wildlife species are designated as fully protected, including golden eagle and several other desert species.

California Senate Bill 618 (signed by Governor Brown in October 2011) authorizes take of fully protected species, where pursuant to a Natural Communities Conservation Plan approved by CDFG. The legislation gives fully protected species the same level of protection that is provided under the Natural Community Conservation Planning Act for endangered and threatened species (below).

Natural Community Conservation Planning Act (Fish and Game Code Sections 2800-2835). The Natural Community Conservation Planning (NCCP) Act of 1991 (amended in 2002) was established to provide a regional approach to conservation for multiple species, in contrast to the single-species approach implemented under CESA and ESA. The NCCP Program is implemented by CDFG as a cooperative effort by the State of California and private and public partners, designed to protect species and their habitats through an ecosystem approach. The program helps identify and provide for large area-wide protection of plants, animals, and their habitats while allowing for compatible and appropriate economic activity.

The NCCP Act promotes conservation of unfragmented habitat areas, promotes multispecies and multihabitat management and conservation, and promotes the conservation of broad-based natural communities and species diversity. It provides an option for identifying mitigation that is proportional to a project's impacts to biological resources. Participation in the NCCP program is a voluntary mechanism that can provide an early planning framework for proposed development projects.

The Desert Renewable Energy Conservation Plan (DRECP) is being developed by BLM, USFWS, CDFG, and the California Energy Commission (CEC). It is intended to protect California desert ecosystems (including the project area), while allowing for appropriate development of renewable energy projects. The DRECP is scheduled to be completed in 2012. The DRECP, upon completion, will be an NCCP. The DHSP site is within the geographic area to be covered by the DRECP.

2.0 AGENCY COORDINATION

enXco has initiated a series of meetings with state and federal resource agencies (BLM, USFWS, and CDFG) to discuss environmental review of the DHSP, including review of potential impacts to native birds, and minimization or mitigation of those impacts. Meetings and other communications relative to this Bird and Bat Conservation Strategy took place on:

- November 5, 2010 – Meeting at BLM Palm Springs Field Office, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office (by phone), and Aspen;
- April 20, 2011 - Meeting at BLM Palm Springs Field Office, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office, Marine Corps Air Station 29 Palms, Joshua Tree National Park, and Aspen;
- June 22, 2011 – Presentation by enXco to REAT member agencies at California Energy Commission, Sacramento, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office, CDFG Inland Deserts Region and Aspen;
- Weekly agency coordination conference calls, beginning August 29 2011, participants vary.

Other communications relating to bird and bat conservation include:

- A checklist provided by BLM Renewable Energy Coordination Office in January 2011, listing biological survey needs for the project; the checklist included golden eagle surveys and general avian breeding and winter season point counts;
- enXco, USFWS Carlsbad Fish & Wildlife Office, and Aspen staff discussed baseline golden eagle data recommendations during a conference call on 28 April 2011;
- A letter provided by USFWS, commenting on the project Notice of Intent (NOI) reading, in part:

  "Migratory birds are federally protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 et seq.) and under Executive ruder 13186 - Responsibility of Federal Agencies to Protect Migratory Birds. Based on the Service's management authority for migratory birds under the MBTA, we also recommend that the EIS include an evaluation of potential impacts to migratory and resident birds, particularly the western burrowing owl. Western burrowing owls have been documented in the project area and we recommend protocol surveys for the species be conducted in support of the EIS analysis. In addition to MBTA, eagles are protected under the Bald and Golden Eagle Protection Act. Active and inactive golden eagle nests were documented in 2010 within close proximity to the proposed project. Since nesting patterns change annually, we recommend providing up-to-date biological information about golden eagles within a 10 mile radius of the project area for the EIS analysis. Please refer to the Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al. 2010) for appropriate survey methods.

  "Finally, to minimize impacts from linear project features, we recommend co-locating these components to the extent practicable with First Solar's Desert Sunlight project. Co-location opportunities include utilizing a common generation tie line alignment, right-of-way, and access roads, and sharing the northernmost boundary security fencing."

- An on-site field meeting, including USFWS staff from the Carlsbad and Palm Springs Fish & Wildlife Offices, and Aspen, on November 17, 2011.

3.0 SITING

3.1 SITE OVERVIEW

The DHSP site is located in the upper Chuckwalla Valley, on public lands administered by the BLM in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Township 4 South, Range 15 East, Sections 25, 26, 27, USGS 7.5' Victory Pass and East of Victory Pass quadrangles). The Right-of-Way Application consists of two non-contiguous parcels (Figures 1 and 2). The large, northeastern parcel is 1,070 acres and the smaller, southwestern parcel is 270 acres. Portions of each parcel extend to the west of Kaiser Road (County Route R2); enXco does not propose to construct solar facilities within the Kaiser Road right of way, or west of Kaiser Road. With these areas excluded from the analysis, the total solar facility project area is approximately 1,208 acres, consisting of 1051 acres in the larger parcel, and 157 acres in the smaller one.

The site is now undeveloped, natural open space. The surrounding area consists primarily of public lands managed by the BLM, with scattered smaller private land parcels to the south and east. The Desert Sunlight Solar Project, now under construction, is located to the immediate north of the DHSP site

(Figure 2). The Desert Sunlight project was recently approved (BLM 2011b; 2011c) and will occupy 3,761 acres when fully built out. Public lands to the west of Kaiser Road, adjacent to the Desert Harvest site, are within a BLM Desert Wildlife Management Area (DWMA), designated in the Northern & Eastern Colorado Desert Coordinated Management Plan (NECO; BLM and CDFG 2002). The Palen-Ford WHMA, also designated in the NECO, is generally east of the site, but approximately 46 acres of the WHMA are within the project site (see Figure 3). Some of the private lands to the south and west have been developed as residential and agricultural lands. These include active and inactive jojoba fields, rural residential lands, and the community of Lake Tamarisk.

Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the Desert Harvest ROW, and about 4.5 miles north of the approved Desert Sunlight project boundary. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the Desert Harvest ROW. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the Desert Harvest site, at Kaiser Road.

3.2 HABITAT

Two vegetation types cover the proposed solar generator site and generator tie-line Alternatives B, C, and D (Figures 5 and 6): Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance) and Blue Palo Verde-Ironwood Woodland (*Parkinsonia florida-Olneya tesota* Woodland Alliance) (Sawyer et al. 2009). The Creosote Bush Scrub vegetation is a subset of the Sonoran Creosote Bush Scrub as described by Holland (1986), and Blue Palo-Verde-Ironwood Woodland is a subset of his description of Desert Dry Wash Woodland. Small, closely-spaced, braided ephemeral channels are abundant throughout the project site (Figure 7). There also are small areas within the proposed solar generator site where natural vegetation has been removed or disturbed for roads and other land uses. In most cases (e.g., narrow roads), these areas are too small for mapping at this scale; however, the proposed solar generator site overlaps a narrow area disturbed for date palm agriculture (on an adjacent parcel) in the southeastern corner of the site. This area is mapped as “Disturbed / Disused Agriculture” on Figures 5 and 6.

In addition, disturbed areas are located along the generator tie-line alignments, particularly alignment Alternative D, which crosses disused agricultural lands over part of its length. Generator tie-line alignment Alternative E, located farther to the east, crosses two additional vegetation or habitat types: active sand dunes and creosote bush scrub on partially stabilized sand fields (Figure 6).

Creosote Bush Scrub (bajada/alluvial landforms). Creosote Bush Scrub on the site is characterized by low shrub species diversity and relatively wide spacing of shrubs, usually with bare ground between. The dominant species in this vegetation is creosote bush (*Larrea tridentata*). Associated species include white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), and big galleta (*Pleuraphis rigida*). This vegetation also supports a diverse assemblage of seasonal annuals, including desert sunflower (*Geraea canescens*), desert dandelion (*Malacothrix glabrata*), several pincushion species (*Chaenactis* spp.) and several species of cryptantha (*Cryptantha* spp.). The areas mapped as Creosote Bush Scrub also include areas of desert pavement with relatively sparse cover of low-statured creosote bush and seasonal annuals such as devil’s spineflower (*Chorizanthe rigida*), kidneyleaf buckwheat (*Eriogonum reniforme*), and Emory’s rock daisy (*Perityle emoryi*). There are 1,026 acres of creosote bush scrub mapped on the proposed solar project site. Creosote Bush Scrub has no California Department of Fish and Game special-status designation (CDFG 2010a). Each of the generator tie-line alternatives would affect a limited additional acreage of creosote bush scrub, depending on the specific locations of access roads, transmission line structures, and work sites.

Creosote Bush Scrub on the site matches the Desert Scrub wildlife habitat described by Laudenslayer and Boggs (1988). Within the project area it provides habitat for wildlife species typical of the California deserts, including burrowing species such as kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp., *Chaetodipus* spp.), and desert cottontail (*Sylvilagus audubonii*); and mesopredators such as desert kit fox (*Vulpes macrotis arsipus*) and coyote (*Canis latrans*). This community also serves as habitat for numerous species of reptiles including desert iguana (*Dipsosaurus dorsalis*), sidewinder (*Crotalus cerastes*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin whiptail (*Aspidocelis tigris tigris*) and zebra-tailed lizard (*Callisaurus draconoides*). Common birds observed within this vegetation included black-throated sparrow (*Amphispiza bilineata*), Gambel's quail (*Callipepla gambelii*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*).

Blue Palo Verde-Ironwood Woodland. Blue Palo Verde-Ironwood Woodland occurs throughout the project area primarily in dry washes and is characterized by the presence of desert ironwood (*Olneya tesota*) and blue palo verde (*Parkinsonia florida*). Additional tree species such as smoketree (*Psorothamnus spinosus*) and cat claw acacia (*Acacia greggii*) also occur but are uncommon. It is one of several communities included within broader vegetation types called desert wash woodland or microphyll woodland (Holland 1986; Schoenherr and Burk 2007). Vegetation in desert washes is generally taller, up to approximately 9m (30 ft) in height, and denser than surrounding desert habitats, with the height of the wash vegetation proportional to the size of the arroyo (Laudenslayer 1988). Understory vegetation within these woodlands is composed of big galleta, cheesebush (*Hymenoclea salsola*), desert lavender (*Hyptis emoryi*) and other shrubs and subshrubs. Blue Palo Verde-Ironwood Woodlands on the site match the desert wash wildlife habitat described by Laudenslayer (1988). This habitat provides greater food, nesting, and cover resources than the surrounding creosote bush scrub, and wildlife diversity is generally greater than in the surrounding desert. Examples of species that depend in part on desert microphyll woodlands include vermillion flycatcher and black-tailed gnatcatcher. In addition, many of the species occupying the surrounding creosote bush scrub are found in greater numbers in microphyll woodlands. This community is ranked by CDFG (2010a) as a special-status vegetation type, with state rarity ranking of S3. There are 180 acres of Blue Palo Verde –Ironwood Woodland on the proposed solar project site. Each of the generator tie-line alternatives would affect a limited additional acreage of this woodland vegetation, depending on the specific locations of access roads, transmission line structures, and work sites.

Creosote Bush Scrub on Partially Stabilized Sand Fields. Creosote Bush Scrub occurs on partially stabilized sand fields in the eastern portion of gen-tie Alternative E. This area is located at the western margin of a much larger dune system associated with Pinto Wash, at the base of the Coxcomb Mountains. This vegetation matches the description of "Creosote Bush Scrub," above, but the cover is much sparser and the substrate consists of partially stabilized sand fields with accumulations of sands mounded at the bases of the shrubs. This habitat is suitable for a series of special status plants and animals, including Mojave fringe-toed lizard, which were reported in the area in the Desert Sunlight EIS and observed there by Aspen field staff. None of this habitat would be affected by solar generator construction, and only generator tie-line Alternative E would affect it. Acreage impacted by Alternative E would be dependent on the specific locations of access roads, transmission line structures, and work sites.

Active Sand Dunes. Active sand dunes are found on gen-tie Alternative E. These dunes are at the western margin of the larger Pinto Wash / Coxcomb Mountains dune system, above. This habitat is characterized by fine aeolian (i.e., wind-blown) sands that support very little vegetation. Vegetation on the dunes is sparse, but dominated by scattered creosote bush and Russian thistle (*Salsola* sp.). None of

this habitat would be affected by solar generator construction, and only generator tie-line Alternative E would affect it. Impacts acreage would be dependent on the specific locations of access roads, transmission line structures, and work sites.

4.0 BIRD AND BAT SPECIES OF THE PROJECT VICINITY

4.1 INFORMATION COMPILED TO DATE (PRE-CONSTRUCTION SURVEYS)

The following discussion of bird and bat occurrence in the area is based on field surveys conducted by Aspen and AMEC field staff the Desert Harvest project, and a review of field surveys for previous projects in the vicinity (Aspen 2012). Aspen and AMEC biologists reviewed the California Natural Diversity Data Base (CNDDB; California Dept. of Fish and Game, CDFG 2011a) to identify special status species known from the area. We also reviewed applicable documents pertaining to the Desert Sunlight project, including the vegetation and wildlife sections of the Environmental Impact Statement (BLM 2011a) and the Biological Resources Technical Report (Ironwood Consulting 2011). During all field surveys conducted for the Desert Harvest project, all incidental bird species observations were recorded in field notes.

AMEC biologists conducted avian point count surveys during winter and spring of 2011 to comply with BLM requirements (2009). Winter season point counts were conducted during January 2011, and breeding season point counts were between March 30 and April 28, 2011. A total of 45 bird species was detected during the study, including the winter season, and nesting season point count data and incidental observations made during both seasons. The methods and results are described in the attached report (AMEC 2011), and pertinent data are incorporated into this BBCS.

Most of the birds occurring in the project vicinity have no special conservation status (Aspen 2012), but all native birds are protected under the federal MBTA and California Fish and Game Code, as described in Section 1.2 above. In addition to the common birds of the area, a list of special-status bird and bat species with potential to occur in the vicinity of the proposed project was compiled. Species were considered to be special-status species if they were classified as one or more of the following:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the federal ESA;
- Listed as threatened or endangered, or candidates for listing under CESA;
- Designated by BLM as Sensitive Animals (BLM 2010);
- Meet the definition of rare or endangered under CEQA §15380(b) and (d).
- Considered special-status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

All special-status species identified by this literature review, and others known from the general region, are included in Table 1, which summarizes the natural history, agency status, and occurrence probability on the site for each species.

Table 2. Special Status Bird and Bat Species of the Chuckwalla Valley Area.

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
BIRDS				
Circus cyaneus Northern harrier	Breeds colonially in grasslands and wetlands; forages over open terrain; N America and Eurasia	Winter; rare in summer	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Foraging: Expected rarely, mainly winter
Aquila chrysaetos Golden eagle	Nests in remote trees and cliffs; forages over shrublands and grasslands; breeds throughout W N America, winters to E coast	Year-around	Fed: Eagle Protection act (see text) Calif: SSC S3 fully protected	Nesting: Minimal on-site (no suitable nest sites); occurs in surrounding mtns Foraging: High (year-around)
Pandion haliaetus Osprey	Nests in northern N America and Mexican coastlines near large water bodies, preys primarily on fish; winters in central Calif to S America;	Spring and fall migr. seasons	Fed: none Calif: S3, watch list (nesting)	Nesting: Minimal (outside range; no suitable sites) Migration: Present, occasional flyover
Buteo swainsonii Swainson's hawk	Breeds in trees in open habitats (e.g., grassland), Central Valley (Calif.) and east to cent. US, S. Canada, N. Mexico; winters in S America. A few nesting records in W Mojave Des (e.g., Lancaster area)	Spring and fall migr. seasons	Fed: none Calif: S2, **THR**	Nesting: Minimal (outside range; no suitable sites) Migration: Present, occasional flyover
Buteo regalis Ferruginous hawk	Forages over grassland and shrubland; winters in W and SW N Amer. (breeds in Great Basin and N plains)	Winter	Fed: none Calif: SSC S3S4 (wintering)	Nesting: Minimal (outside range) Winter: Expected during winter
Accipiter striatus Sharp-shinned hawk	Nests and hunts in forest & woodland mainly to N (may breed in S Calif. Mtn woodlands); also forages in open areas; regularly winters in S Calif.	Winter	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat, outside range) Winter/Migration present (Jan 2011)
Accipiter cooperii Cooper's hawk	Nests and hunts in forest &woodland, also forages in open areas; most of US, Central and S America	Year-around	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Winter/Migration expected
Falco columbaris Merlin	Uncommon in winter in S Calif. desert and valleys (breeds in northern N America and Eurasia)	Winter	Fed: none Calif: SSC S3 (wintering)	Nesting: Minimal (outside range) Winter: Expected during winter
Falco mexicanus Prairie falcon	Nests on high cliffs, forages primarily over open lands; occurs throughout arid western US and Mexico	Year-around	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal on-site, occurs in surrounding mtns Foraging: High (year-around)
Athene cunicularia (*Speotyto cunicularia*) Burrowing owl	Nests mainly in rodent burrows, usually in open grassland or shrubland; forages in open habitat; increasingly uncommon in S Calif.; occurs through W US and Mexico	Year-around	Fed: none Calif: SSC S2 (burrow sites)	Present (Sep 2011); see text

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
Falco peregrinus American peregrine falcon	Nests on high cliffs, generally near water bodies; feed on birds (esp. shorebirds & waterfowl); widespread but rare worldwide	Spring - summer	Fed: none (former END) BLM: sensitive Calif: FP, S2 (former END)	Nesting: Minimal (no suitable nest sites; well outside breeding range) Foraging: Minimal (outside winter range, no suitable prey base)
Asio flammeus Short-eared owl	Breeds in marshes and densely vegetated wetlands, forages over open wetlands, ag fields, and grasslands; temperate N & S America, Eurasia	Year-around	Fed: none Calif: S3, SSC (nesting)	Breeding: Minimal (no habitat) Winter: reported near Lake Tamarisk
Asio otus Long-eared owl	Breed in riparian woodlands; forage (nocturnally) over open land; sea level to about 6000 ft. elev.; through N America and Eurasia	Year-around	Fed: none Calif: S3 SSC (nesting)	Breeding: Minimal (no habitat) Winter: Occurs at Lake Tamarisk
Chaetura vauxi Vaux's swift	Breeds central Calif. and northward, in coastal and montane forests; winters in Central and S America	Spring and fall migr. seasons	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (outside range) Migration: Present, occasional flyover
Melanerpes uropygialis Gila woodpecker	Saguaro woodlands, sometimes other woodlands; cavity nester mainly in cactus; SE Calif., S Ariz, W Mexico (incl. Baja)	Year - around	Fed: none BLM: Sensitive Calif: **END** S1S2	Nesting: Minimal (ironwood poor for nest constr.) Winter: Present (Jan 2011); see text
Lanius ludovicianus Loggerhead shrike	Woodlands, shrublands, open areas with scattered perch sites; not dense forest; widespread in N America; valley floors to about 7000 ft. elev.	Year-around	Fed: none Calif: SSC S4 (nesting)	Present (suitable habitat throughout)
Aphelocoma californica cana Scrub jay (Eagle Mtn population)	Locally endemic year-around resident in pinyon woodlands in the Eagle Mountains; long-disjunct from other populations	Year-around	Fed: none Calif: CDFG watch list, S1S2	Present (observed as transient, Oct 2011)
Toxostoma bendirei Bendire's thrasher	Joshua tree woodland, desert scrub; high cactus cover; mainly E Mojave Des in Calif. (scarce in W Mojave); American SW and mainl. Mexico; winters in S Arizona, New Mexico, and mainl. Mexico	Spring-summer	Fed: none BLM: Sensitive Calif: SSC S3	Low-Moderate; marginal habitat throughout
Toxostoma crissale Crissal thrasher	Nests in dense, low, brushy thickets of mesquite or other desert riparian shrubs; Sonoran Des, E Mojave Des, to Texas, W mainland Mexico	Year - around	Fed: none Calif: SSC S3	Low-moderate; habitat marginally suitable
Toxostoma lecontei LeConte's thrasher	Calif. deserts, SW Central Val. & Owens Val., east to Utah, Arizona; open shrubland, often sandy or alkaline flats	Year - around	Fed: none Calif: S3 (SSC in San Joaquin Val)	High; suitable habitat throughout
Pyrocephalus rubinus Vermillion flycatcher	Desert riparian woodlands and shrublands; SE Calif., east through S Texas, and S through Mexico; winters in Mexico	spring - summer	Fed: none Calif: SSC S2S3 (nesting)	Nesting: Moderate (suitable nesting habitat in ironwood stands)

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
Vermivora luciae Lucy's warbler	Cavity-nesting species; breeds in desert riparian woodlands through much of Arizona; winters on Pacific Coast of mainl. Mexico	spring - summer	Fed: none BLM: Sensitive Calif: SSC S2S3 (nesting)	Nesting: Low-moderate (margin of known range; few nest cavities avail.); singing males observed April 2011
MAMMALS				
Antrozous pallidus Pallid bat	Rock outcrops of shrublands, mostly below about 6000 ft. elev.; Calif, SW N Amer through interior Oregon and Washington; hibernates in winter	Warm season	Fed: none BLM: Sensitive Calif: SSC S3	Low potential for roosting on site; high potential for foraging in area
Corynorhinus (*Plecotus*) *townsendii* Townsend's big-eared bat (incl. "pale," "western," and other subspecies)	Many habitats throughout Calif and W N Amer, scattered pop'ns in E; day roosts in caves, tunnels, mines; feed primarily on moths	Year-around	Fed: none BLM: Sensitive Calif: SSC, S2S3	Low potential for roosting on site; high potential for foraging in area
Euderma maculatum Spotted bat	Desert (cool seasons) to pine forest (summer), much of SW N Amer. but very rare; roosts in deep crevices in cliffs, feeds on moths captured over open water	Not known	Fed: none BLM: Sensitive Calif: SSC S2S3	Low potential for roosting or foraging on site
Eumops perotis californicus California mastiff bat	Lowlands (with rare exceptions); cent. and S Calif., S Ariz., NM, SW Tex., N Mexico; roost in deep rock crevices, forage over wide area	Year-around	Fed: none BLM: Sensitive Calif: SSC S3?	Low potential for roosting on site; high potential for foraging in area
Lasiurus xanthinus (*Nycteris ega xanthina*) Western (Southern) yellow bat	Mexico and Cent. Amer., to S AZ; Riv., Imperial and San Diego Cos.; riparian and wash habitats; roosts in trees; evidently migrates from Calif. during winter	Spring-summer?	Fed: none Calif: S3	Low potential for roosting on site; high potential for foraging in area
Macrotus californicus (*M. waterhousii*) California leaf-nosed bat	Arid lowlands, S Calif., S and W Ariz., Baja Calif. and Sonora, Mexico; roost in mine-shafts, forage over open shrublands	Year-around	Fed: none BLM: Sensitive Calif: SSC S2S3	Low potential for roosting on site; high potential for foraging in area
Nyctinomops macrotis (*Tadarida molossa*) Big free-tailed bat	Roosts in crevices of rocky cliffs, scattered localities in W N. Amer. through Cent. Amer.; ranges widely from roost sites; often forages over water	Year-around (?)	Fed: none Calif: SSC S2	Low potential for roosting on site; high potential for foraging in area
Nyctinomops femorosaccus (*Tadarida femorosaccus*) Pocketed free-tailed bat	Deserts and arid lowlands, SW US, Baja Calif., mainland Mexico; Roost mainly in crevices of high cliffs; forage over water and open shrubland	Year-around	Fed: none Calif: SSC S2S3	Low potential for roosting on site; high potential for foraging in area

General References: American Ornithologists Union 1998; Barbour and Davis 1969; CDFG 2011a; 2011b; Feldhammer et al. 2003; Garrett and Dunn 1981; Grinnell and Miller 1944; Hall 1981; Rosenberg, et al. 1991; Schuford and Gardali 2008.

Conservation Status

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service). Until 1996, FWS maintained a list of Category 2 candidates, described as species of concern, but with insufficient data to support listing. This list is no longer maintained and FWS has no SOC category.

END: Federally listed, endangered.

THR: Federally listed, threatened.
Candidate: Sufficient data are available to support federal listing, but not yet listed.
Proposed: Formally proposed for federal status shown.
***State designations*:** (California Endangered Species Act, California Dept. of Fish and Game)
END: State listed, endangered.
THR: State listed, threatened.
RARE: State listed as rare (applied only to certain plants).
SSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
FP: Fully protected. May not be taken or possessed without permit from CDFG.
CDF&G Natural Diversity Data Base Designations: Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.
S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.
S1.1: Very threatened
S1.2: Threatened
S1.3: No current threats known
S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).
S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above).
S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
S5: Demonstrably secure or ineradicable in California. No threat rank.
SH: All California occurrences historical (i.e., no records in > 20 years).
SX: Presumed extirpated in California.
Definitions of occurrence probability: Estimated occurrence probabilities based literature sources cited earlier and field surveys and habitat analyses reported here.
Occurs: Observed on the site by qualified biologists.
Expected: Not observed or recorded on the site, but very likely present during at least a portion of the year.
High: Habitat is a type often utilized by the species and the site is within the known range of the species.
Moderate: Site is within the known range of the species and habitat on the site is a type occasionally used.
Low: Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons.
Minimal: No suitable habitat on the site; or well outside the species' known elevational or geographic ranges; or a focused study covering 100% of all suitable habitat, completed during the appropriate season and during a year of appropriate rainfall, did not detect the species.
Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

4.2 LISTED THREATENED OR ENDANGERED SPECIES

Gila woodpecker (*Melanerpes uropygialis*). The Gila woodpecker is listed as endangered under CESA but has no status under the federal ESA. It is identified as bird species of conservation concern (USFWS 2008). Its geographic range is generally in southern Arizona and southward into Baja California and western mainland Mexico. It occupies this range year-around (i.e., it is not migratory). In California, Gila woodpeckers are known from riparian forests along the Colorado River, and from desert wash woodlands in Imperial County (McCreedy 2008). It excavates cavity nests in large riparian trees such as cottonwoods and (in upland habitats) saguaro cacti, and feeds largely on insects, mistletoe berries, and cactus fruits (Rosenberg et al. 1991; McCreedy 2008). Its primary habitat is cottonwood-willow riparian woodland, but it also uses thickets of other desert trees (e.g., desert ironwood), as well as upland habitats, especially outside the breeding season. Desert ironwood is apparently too dense for nest excavation. Where Gila woodpeckers occur in dry desert wash woodlands, they excavate cavity nests "invariably" in large blue palo verdes rather than ironwood (McCreedy 2008). In suburban habitats, they nest in ornamental trees including athel (*Tamarix aphylla*), eucalyptus, and palms. Availability of suitable nesting trees is apparently a limiting factor in breeding habitat suitability (Grinnell and Miller 1944).

DHSP occurrence: A Gila woodpecker was observed in the southeastern part of the project site in December 2010 (AMEC 2011), but was not seen again during the BLM protocol winter season or breeding season avian point counts. The Desert Harvest project site is about 40 miles west of the Gila woodpecker's published geographic range (McCreedy 2008), but unpublished observations have been reported from Corn Springs, about 11 miles south of the site and about five miles south of the southern end of the gen-tie alignments (C. McGaugh, AMEC, pers. obs.). There is a native palm grove at Corn Springs, and Gila woodpeckers may nest in the palm trees. Also, a Gila Woodpecker was reported on 28 September 2010 at the Desert Sunlight Project site (AMEC 2011). It is possible that the Corn Springs and Desert Center areas support a small Gila woodpecker population, or that the two local observations in late 2010 were chance observations of an itinerant individual.

Desert wash woodlands on the Desert Harvest site may provide suitable nesting and foraging habitat for Gila woodpecker. The woodlands are dominated by desert ironwood trees, and most of the blue palo verdes are too small for cavity nests. However, scattered larger blue palo verde trees are present in low numbers throughout the woodlands, and could serve as suitable nest trees.

Swainson's hawk (*Buteo swainsoni*). The Swainson's hawk is listed as a threatened species under CESA but has no federal listing status. It is a migratory raptor. It breeds in open plains and prairies in the Great Plains and relatively arid areas of western North America, including the Central Valley and the western Mojave Desert in California. It winters in South America, primarily in Argentina. During the spring and fall migration seasons, Swainson's hawks are observed regularly in southern California.

DHSP occurrence: One Swainson's hawk was observed flying over the Desert Harvest project site during April 2011 (AMEC 2011). The project area may serve as incidental foraging habitat during migratory seasons, but otherwise would not support Swainson's hawks, due to the distance from its breeding range. Project development would not affect nesting habitat and has little likelihood of adversely affecting Swainson's hawk.

4.3 SPECIES PROTECTED UNDER THE FEDERAL BALD AND GOLDEN EAGLE PROTECTION ACT

Golden Eagle (*Aquila chrysaetos*). Golden eagles are year-around residents throughout most of their range in the western United States. In the southwest, they are more common during winter when eagles that nest in Canada migrate south into the region. They breed from late January through August, mainly during late winter and early spring in the California deserts (Pagel et al. 2010). In the desert, they generally nest in steep, rugged terrain, often on sites with overhanging ledges, cliffs or large trees as cover. Golden eagles are wide-ranging predators, especially outside of the nesting season, when they have no need to return daily to eggs or young at their nests. Golden eagle foraging habitat consists of open terrain such as grasslands, deserts, savanna, and early successional forest and shrubland habitats, throughout the regional foothills, mountains, and deserts. They prey primarily on rabbits and rodents but will also take other mammals, birds, reptiles, and some carrion (Kochert et al. 2002).

Threats to golden eagles include illegal shooting, power line electrocution, wind turbine strikes, and rodenticides (used for rodent control, and secondarily ingested by eagles feeding on target pest species). They also are affected by habitat loss or degradation due to land use changes such as urbanization and agriculture. The golden eagle population is estimated at approximately 27,000 in the western U.S., and an apparent ongoing decline in numbers (Farmer 2008; USFWS 2009).

Absent interference from humans, the densities of breeding golden eagle territories is limited by either prey density or nest site availability (USFWS 2009). Breeding season home range sizes vary widely. For example, in San Diego County, a study of 27 nesting pairs found breeding ranges to average 36 square miles with a range from 19 to 59 square miles (Johnsgard 1990). Eagles and other raptors forage more widely outside of the nesting season, since they have no need to return daily to eggs or young at their nests.

DHSP occurrence: The mountain ranges surrounding the project site provide suitable golden eagle nesting habitat. There were 8 inactive golden eagle nests documented to the northwest, northeast, and south of the Desert Harvest site, and one active but non-reproductive nest was reported in the Coxcomb Mountains, about 4 miles northeast of the site (BLM 2011a). Even if golden eagle territories may be inactive in a given year, they may be used in future years. Therefore, unoccupied territories are considered potentially active in future years. The proposed solar generator site and gen-tie line alignments are on the Chuckwalla Valley floor, and do not provide suitable golden eagle nesting habitat. No on-site impacts to nest sites are expected, but golden eagles are sensitive to human disturbances during the nesting season. If there is an active nest nearby, then human activity and noise during project construction could adversely affect golden eagle nesting success.

The project site and gen-tie alignments provide suitable golden eagle foraging habitat. Golden eagles could forage at the Desert Harvest site at any time of year. Foraging birds could include mated pairs using the surrounding nesting territories; or, if the territories are inactive, unmated golden eagles or adult birds whose nests may have failed, could forage over the site during breeding season. Foraging would be somewhat more common during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges.

4.4 SPECIES FULLY PROTECTED UNDER THE CALIFORNIA FISH AND GAME CODE

Most of the state's designated fully protected species occur well outside the project vicinity, but two fully protected birds could occur in the area. These are: golden eagle (discussed above, Species Protected Under the Bald and Golden Eagle Protection Act) and American peregrine falcon.

American peregrine falcon (*Falco peregrinus*). Peregrine falcons were formerly listed under CESA and ESA, but have been delisted under both Acts. They are found irregularly in the low desert region, generally during migratory and winter seasons. They have not been known to nest in the region in recent decades, though they did nest in desert mountain ranges near the Colorado River historically (Rosenberg et al. 1991; Patten et al. 2003). They feed primarily on birds captured during flight. Waterfowl and shorebirds make up a large proportion of their prey, and nest sites are often within foraging range of large water bodies.

DHSP occurrence: There is only minimal likelihood that American peregrine falcon would be found in the project vicinity, except as brief overflight during migration. Project implementation would not affect nesting habitat and has little likelihood of adversely affecting foraging behavior.

4.5 BLM SENSITIVE SPECIES

The BLM maintains a list of Sensitive Species, including species that are rare, declining, or dependent on specialized habitats (BLM 2010). It manages sensitive species to provide protections comparable to species that may become listed as threatened or endangered (i.e., candidate species for federal listing).

In addition to species addressed in this section of the BBCP, all listed threatened or endangered species (above) are managed as BLM sensitive species.

Burrowing owl (*Athene cunicularia*). The burrowing owl is a BLM Sensitive Species and a CDFG Species of Special Concern. It is a small, terrestrial owl of open country. During breeding season, it ranges throughout most of the western US. It occurs year-around in southern California, but may be more numerous during fall and winter, when migratory individuals from farther north join the regional resident population. Burrowing owls favor flat, open annual or perennial grassland or gentle slopes and sparse shrub or tree cover. They use the burrows of ground squirrels and other rodents for shelter and nesting. Availability of suitable burrows is an important habitat component. Where ground squirrel burrows are not available, the owls may use alternate burrow sites or man-made features (such as drain pipes or debris piles). In the California deserts, burrowing owls generally occur in low numbers in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant (Wilkerson and Siegel 2011). Burrowing owl nesting season, as recognized by the California Burrowing Owl Consortium (CBOC 1993), is 1 February through 31 August.

DHSP occurrence: During the desert tortoise surveys for the Desert Harvest project site (above), AMEC field biologists examined all suitable burrows for sign of burrowing owls. These field surveys correspond to 100 percent coverage Phase 2 surveys for burrowing owls, recommended by the CBOC protocol (1993). No burrowing owls or their sign were observed during these spring season surveys, or during the winter and breeding season avian point count surveys. However, two incidental burrowing owl observations were made by Aspen biologists during streambed delineation field work. In one observation, a burrowing owl was briefly seen perching and flying, but was not at a burrow. The other observation was a burrowing owl seen in the mouth of an inactive desert kit fox burrow; no burrowing owl sign (e.g., whitewash, prey remains, or owl pellets) was found at the site. Based on these field surveys and incidental observations, we conclude that the site is suitable habitat for burrowing owls during winter or breeding seasons. Breeding burrowing owls were not present on the site during the desert tortoise surveys, but they could nest on the site in future years. During fall and winter, the site appears to serve as low-density seasonal burrowing owl habitat.

Bendire's thrasher (*Toxostoma bendirei*). Bendire's thrasher is a BLM Sensitive Species and CDFG Species of Special Concern. California populations are migratory, though Bendire's thrasher is found year-around in more southern portions of its range, in southern Arizona and adjacent Mexico. The Desert Harvest site is near the southern boundary of its breeding range in California. It breeds in open, upland desert shrublands of JTNP and surrounding area, and northward through several disjunct regions of the Mojave Desert (Sterling 2008). Its habitat requirements are poorly understood, but it is generally associated with *Yucca* (e.g., Joshua tree) and *Opuntia* (cholla cacti) species on gently sloping terrain. Soil texture is apparently important to habitat suitability, perhaps because Bendire's thrashers largely forage on ground-dwelling insects. Hard rocky soils (e.g., desert pavement) and loose sands (e.g., dry wash sands) are apparently less suitable than firmly packed, fine-textured soils.

DHSP occurrence: Bendire's thrashers were not observed on the project site during the winter or breeding-season point-count surveys. Habitat throughout the site appears to be of marginal suitability, due to relatively low cover of *Yucca* and *Opuntia* species, and seemingly poorly-suitable soil texture. There is a low to moderate probability that Bendire's thrasher may occur on the site. Project development would eliminate 1,208 acres of marginally suitable habitat at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments.

Lucy's warbler (*Vermivora luciae*). Lucy's warbler is a migratory songbird that breeds in desert riparian woodlands and winters on Pacific Coast of mainland Mexico. Its breeding range extends through much of Arizona, and parts of the eastern California deserts. It is a cavity-nesting species (i.e., it generally nests in unoccupied woodpecker nests or other cavities in trees). Its primary nesting habitat is mesquite thickets, but also uses native riparian trees and saltcedar (*Tamarix* spp.).

DHSP occurrence: Two singing male Lucy's warblers were reported in April 2011 near the southwestern corner of the project area (AMEC 2011). These birds were not observed later during the nesting season (28 April survey date), though no focused surveys were conducted. It is unknown whether either or both of these birds successfully established breeding territories in the area, or moved on to another site. Suitable nesting cavities may be available in large blue palo verde trees on the site, but probably not in the more dominant desert ironwood trees (see Gila woodpecker discussion, above). Lucy's warblers may nest in desert wash woodlands on or near the proposed solar facility site or gen-tie alignment alternatives.

Project development would eliminate up to 180 acres of potential nesting and foraging habitat for Lucy's warbler on the proposed solar generator site, and could also affect smaller areas of suitable habitat along gen-tie alignments. In addition to habitat impacts, the project could cause mortality or injury to a Lucy's warbler (including juvenile birds or eggs), if an active nest were damaged or disturbed during construction or other phases of the project. Potential project impacts would be comparable to those described for nesting birds, below.

Bats. The BLM includes several bat species on its list of sensitive species. The special status bats of the local area roost in rock crevices, tunnels, or caves; one species (western yellow bat) roosts in the foliage of riparian trees. Roost sites may be used seasonally (e.g., inactive cool seasons) or daily (day roosts, used during inactive daylight hours). Maternity roosts are particularly important overall for bat life histories. Knowledge of bat distributions and occurrences is sparse. The majority of adverse impacts to bat populations in the region result from disturbance of roosting or hibernation sites, especially where large numbers of bats congregate; physical closures of old mine shafts, which eliminates roosting habitat; elimination of riparian or desert wash microphyll vegetation which is often productive foraging habitat; more general habitat loss or land use conversion; and agricultural pesticide use which may poison bats or eliminate their prey-base (Pierson & Rainey 1998; Gannon 2003). Bat life histories vary widely. Some species hibernate during winter, or migrate south. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on species. All special status regional bats are insectivorous, catching their prey either on the wing or on the ground. Some species feed mainly over open water where insect production is especially high, but others forage over open shrublands such as found on the project site.

DHSP occurrence: Project development is unlikely to affect roost sites for most special status bats, though pallid bats could roost among small rocks on the ground and California leaf-nosed bats might roost in ironwood trees between foraging bouts (Ironwood Consulting 2010). The project would eliminate 1208 acres of desert shrubland foraging habitat, including 180 acres of productive Blue Palo Verde – Ironwood Woodland foraging habitat, and would also affect smaller areas of foraging habitat along gen-tie alignments. Desert dry wash woodland attracts foraging bats due to increased insect productivity. This is especially true for California leaf-nosed bats and pallid bats that feed on large insects they glean from the foliage. Roosts for these species have been identified in mines in the Eagle and Coxcomb Mountains, north of the DHSP site (Ironwood Consulting 2010).

4.6 OTHER SPECIAL STATUS BIRD AND BAT SPECIES

Raptors. In addition to raptors discussed above, several other special-status birds of prey are found seasonally, especially during winter, in the region. These include osprey (*Pandion haliaetus*), ferruginous hawk (*Buteo regalis*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), merlin (*F. columbaris*), short-eared owl (*Asio flammeus*), and long-eared owl (*A. otus*) (Table 4). Osprey and sharp-shinned hawk were observed flying over the site during winter season point count surveys, but neither species would nest in the area (AMEC 2011). Outside their breeding seasons, these raptors need not return to their nests to feed young or tend eggs. Thus, they are able to forage over wide areas, where they capture birds or small mammals. Suitable winter or migratory season foraging habitat for all of these raptors is widely available throughout the region.

DHSP occurrence: Potential project impacts to these species and their foraging habitat would be comparable to those discussed above for wintering golden eagles. In summary, project construction would eliminate 1,208 acres of suitable foraging habitat, cause increased noise and disturbance to adjacent habitat, and may present collision or electrocution hazards, such as the gen-tie line and other project facilities.

Upland perching birds. Several upland perching bird species are included in the CDFG Special Animals compilation. These include loggerhead shrike (*Lanius ludovicianus*), LeConte's thrasher (*T. lecontei*), Crissal thrasher (*T. crissale*), the Eagle Mountains scrub-jay population (*Aphelocoma californica cana*), and vermilion flycatcher (*Pyrocephalus rubinus*). In addition, a Vaux's swift (*Chaetura vauxi*) was observed over the site during migration season (AMEC 2011); this species occurs in the area only during migration; it nests well to the north, and project development would be unlikely to affect Vaux's swift.

DHSP occurrence: Loggerhead shrikes were observed on the site routinely throughout the winter and breeding season avian point count surveys (AMEC 2011). Neither LeConte's thrasher nor Crissal thrasher have been reported on-site, but habitat is suitable and either species could occur there. Project development would eliminate 1,208 acres of suitable habitat for these species at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments. Vermilion flycatchers have not been reported on-site, but nest in similar habitat to the south (AMEC 2011) and could nest in ironwood woodlands on-site in future years. Project development would eliminate 180 acres of suitable desert woodland habitat at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments. The Eagle Mountains scrub-jay population resides year-around in pinyon woodlands in the Eagle Mountains. It is disjunct from other scrub-jay populations, and is on CDFG's "watch list" but has no other special conservation status. A scrub-jay was observed on the project site in October 2011; presumably, it was wandering or dispersing from habitat in the Eagle Mountains. However, this bird could have come from much farther away. Scrub-jays of the Great Basin population and can wander considerable distances. However, no suitable scrub-jay habitat is found in the project area. Other potential impacts to these species would be similar to those discussed below, under the MBTA.

5.0 RISK ASSESSMENT

This section of the BBCS describes project-specific risks that the DHSP would or could pose to birds and bats. The USFWS (2010b) recommends that the project-specific risk assessments for solar projects

should address the potential for take, including lethal take, based on each of the threats described below (Sections 5.1 through 5.7).

5.1 BURNING FROM CONCENTRATED LIGHT AT SOLAR ARRAYS

As a PV solar facility, the DHSP would not concentrate light for electricity generation and would not pose a burning risk to birds or bats.

5.2 TRANSMISSION LINE, DISTRIBUTION LINE, POWER TOWER, METEOROLOGICAL TOWER, OR GUY LINE COLLISION

The project component of greatest potential concern that would pose lethal collision risk to birds or bats is the gen-tie line, during the construction, O&M, and decommissioning project phases. Smaller risks would be posed by other components, during any of the three phases. These include the above-ground distribution lines, above-ground collection lines, the meteorological station(s) and any guy-wires that may support meteorological instruments, and large equipment such as cranes that would be in use during the construction and decommissioning phases. As a PV solar facility, the project would not include a power tower.

Bird collisions with power lines generally occur when: (1) a power line or other aerial structure transects a daily flight path used by a concentration of birds, or (2) migrant birds are traveling at reduced altitudes and encounter tall structures in their path. Collision rates generally increase in low light conditions, during rain, snow, or strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable near wetlands, valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths. Passerines (e.g., songbirds) and waterfowl (e.g., ducks) collide with wires (APLIC 2006), particularly during nocturnal migrations or poor weather conditions (Avery 1979). However, passerines and waterfowl have a lower potential for collisions than larger birds, such as raptors. Passerines and waterfowl tend to fly under power lines. Larger species generally fly above the power lines (generally heavy gauge conductors that are readily visible), but they may risk colliding with the lighter and less visible static or ground lines mounted higher on the same tower structures. Also, many smaller birds tend to reduce their flight activity during poor weather conditions (Avery et al. 1978). The magnitude of collision-caused bird mortality cannot be predicted without extensive information on bird species, abundance, and movements in the area.

The PV solar panels themselves may also pose a collision risk. Large-scale solar facilities present a relatively new and unresearched risk for bird collisions. Studies conducted at the Solar I facility, a central receiver solar power plant near Daggett, California, indicated that bird mortality consisted predominantly of collisions with mirrors (McCrary et al. 1986). To date, little is known regarding the avian response to reflection or glare from PV solar technology. The reflectivity of PV solar technology is lower than that of the mirrors (heliostats) used by thermal solar projects like the Solar I facility, however, it is possible that glare could affect birds to some degree if the panels reflected light and images, as they might be mistaken for open sky or water. Light reflecting from the panels could cause an increase in glare and Polarized Light Pollution (PLP). According to Horvath et al. (2010), PLP caused by anthropogenic structures can alter the ability of wildlife to seek out suitable habitat, detect or elude predators, or effectively navigate using natural polarized light patterns, ultimately affecting dispersal and reproduction.

enXco will construct all transmission lines and distribution lines according to APLIC guidelines (Mitigation Measure WIL-1) to minimize the risk of avian and bat collision, and to monitor bird fatality at the DHSP site to evaluate need for follow-up adaptive management measures (see Monitoring and Adaptive Management sections, below).

5.3 ELECTROCUTION POTENTIAL

The gen-tie line and above-ground collection and distribution lines may present electrocution risk to certain large birds. Large raptors including golden eagles, Swainson's hawks, ferruginous hawks, red-tailed hawks, prairie falcons, and other large aerial perching birds such as turkey vultures, are susceptible to electrocution on power lines because of their large size and proclivity to perch on tall structures. Transmission structure design is a major factor in causing or preventing raptor electrocutions. Electrocution occurs when a perching bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission structure with insufficient clearance between the conductor phases or conductors and grounds. The majority of raptor electrocutions are caused by distribution lines and relatively small transmission lines, energized at voltage levels between 1 kV and 69 kV. Higher voltage transmission lines are built with wider spacing between the conductors and grounds, and present reduced threat of electrocution. Electrocution can occur when horizontal separation is less than the wrist-to-wrist (flesh-to-flesh) distance of a bird's wingspan or where vertical separation is less than a bird's length from head-to-foot. Electrocution can also occur when birds perched side-by-side span the distance between these elements (APLIC 2006).

The largest bird that is likely to come in contact with the gen-tie line is golden eagle (wingspan to 7.5 feet; wrist-to-wrist length of 3.5 feet; height to 2.2 feet). The red-tailed hawk is the most common large bird that could come in contact with the gen-tie lines (wingspan to 4.7 feet; wrist-to-wrist length of 1.9 feet; height to 1.8 feet). Other large birds in the area are turkey vulture (5.8-foot wingspan, two-foot wrist-to-wrist length, 1.8 feet tall) and great horned owl (4.3-foot wingspan, 2.1-foot wrist-to-wrist length, 1.3 feet tall). Swainson's hawk has a 4.5 foot wing-span, and can be 1.3 feet tall (bird sizes from APLIC 2006). The Avian Powerline Interaction Committee (APLIC, 2006) guidelines recommend 60 inch separations between components to protect eagles and other birds from electrocution. The risk of electrocution would be minimized by implementation of Mitigation Measure MM WIL 1, which requires that the project Owner implement APLIC Guidelines for the gen-tie and all electrical components.

5.4 TERRITORY ABANDONMENT

Construction activities would cause most mobile vertebrate wildlife to leave the site, or attempt to leave. Animals dispersing from the site would be subject to further adverse effects, potentially including mortality. They would be at increased risk of predation as they flush from cover during site clearing. After leaving their home territories, displaced animals may be unable to find suitable food or cover in new, unfamiliar areas. They may attempt to return to their home ranges, possibly resulting in increased predation risk or other effects. Or, if they find food and other resources at new locations off site, these may be within the occupied territory of another individual of the same or similar species, resulting in competition for resources. These displacement effects would apply to common wildlife species and to special-status species.

5.5 NEST AND ROOST SITE DISTURBANCES

The entire project site and surrounding area provides suitable nesting habitat for resident and migratory bird species. Many adult birds would flee from equipment during initial vegetation clearance for project construction. However, nestlings and eggs would be vulnerable to impacts during project construction. If initial site grading or brush removal were to occur during nesting season, then it likely would destroy bird nests, including eggs or nestling birds. One special-status species, the burrowing owl, is unlikely to flee the site during construction, due to its characteristic behavior of taking cover in burrows. Potential project impacts and an avoidance and mitigation measure for burrowing owl are summarized below.

Some birds will likely nest in the project area during construction and O&M phases, even after initial grading and clearing. Depending on the species, birds may nest on the ground close to equipment; within the open metal framework of the panel support structures; on buildings, foundations, structures, or construction trailers; or on idle vehicles or construction equipment left overnight or during a long weekend. In areas where construction is phased (e.g., footings, or tower structures) birds may quickly use these features as nest sites. The species most likely to nest in the project area during construction are common ravens (*Corvus corax*), house finches (*Carpacus erythrinus)*, and mourning doves (*Zenaida macroura*), all of which are protected by the MBTA and Fish and Game Code Sections 3503 and 3513.

Mitigation Measure MM WIL-3 (Pre-Construction Nest Surveys and Impact Avoidance Measures for Migratory Birds) describes pre-construction surveys, buffer areas, and other requirements to avoid bird mortality. Due to the high probability that birds may nest on site during construction, MM WIL-3 requires regular monitoring of the work area throughout the breeding season. In some cases, it may be necessary to reduce buffer areas or to remove or relocate a bird nest in coordination with the resource agencies to proceed safely with construction.

Burrowing Owl. Burrowing owls have been observed on site during winter and migratory seasons, but not during breeding season (Section 3.4). However, the habitat on the project site is suitable, and burrowing owls could occupy the site in low numbers in future breeding seasons. Potential direct project impacts to burrowing owls would be similar to those described for nesting birds, but construction activities also could destroy occupied burrows or cause the owls to abandon burrows during any season. If owls were present, construction during the breeding season could cause nest abandonment, or the incidental loss of fertile eggs or nestlings. Mitigation Measure MM WIL-4 (Burrowing Owl Impact Avoidance, Minimization, and Compensation Measures) would prevent take of occupied burrowing owl burrows.

Golden Eagle. The project site does not provide suitable golden eagle nesting habitat. However, the entire DHSP project area provides suitable foraging habitat, and is within several miles of golden eagle nesting territories located in the Eagle Mountains, Coxcomb Mountains, and Chuckwalla Mountains. Most of these territories were inactive in 2010 (activity, but not reproduction, was recorded at one nest site in the Coxcomb Mountains), but there have been no subsequent surveys for nesting activity. Human intrusions near golden eagle nest sites have resulted in nest abandonment; high nestling mortality when young go unattended due to altered behavior by the parent birds; premature fledging; and ejection of eggs or young from the nest (reviewed by Pagel 2010). Project activities that result in nest-site abandonment would constitute take under the Bald and Golden Eagle Protection Act (USFWS 2007).

Project construction is not expected to cause substantial direct disturbance (e.g., noise, lighting, visual disturbance) to nest sites in the local nesting territories, due to their distance from the site. Moreover,

implementation of Mitigation Measure MM WIL-5 (Golden Eagle Pre-construction and Construction Phase Surveys) requires annual monitoring during nesting season, and requires the project Owner to prepare and implement an adaptive management plan if golden eagles are found nesting in the area at any time during project construction.

5.6 HABITAT LOSS AND FRAGMENTATION

The term habitat refers to the environment and ecological conditions where a species is found. Wildlife habitat is generally described in terms of vegetation, though a more thorough explanation often must encompass further detail, such as availability or proximity to water; suitable nesting or denning sites; shade; foraging perches; cover sites to escape from predators; soils that are suitable for burrowing or hiding; limited noise and disturbance; and many other factors that are unique to each species. Vegetation reflects many aspects of habitat, including regional climate, physical structure, and biological productivity and food resources (for many wildlife species). Thus, vegetation is a useful overarching descriptor for habitat and it is the primary factor in this analysis of impacts to wildlife habitat. Habitat loss and fragmentation resulting from the project would be offset through habitat compensation, as required by Applicant Measure AM-1 and mitigation Measure VEG-6 (below).

Habitat loss. Project construction would result in permanent and long-term impacts to approximately 1,206 acres of natural vegetation, including 1,026 acres of Creosote Bush Scrub and 180 acres of Blue Palo Verde–Ironwood Woodland. Following construction, remaining vegetation and habitat would be unsuitable for many species, particularly species with specific habitat requirements, including most special-status wildlife species. Vegetation and habitat conditions following construction would likely remain suitable for relatively common species, such as side-blotched lizard (*Uta stansburiana*), house finch (*Carpacus erythrinus*), northern mockingbird (*Mimus polyglottos*), and desert cottontail (*Sylvilagus audubonii*).

Golden eagle. Golden eagles would be likely to forage on the DHSP site at any time of year, particularly during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges. Project construction would eliminate 1,208 acres of suitable foraging habitat from within the likely foraging ranges of 3 known territories. During years when golden eagles nest in the territories surrounding the site, the project could affect the availability of foraging habitat for the nesting pairs. This habitat loss may also affect golden eagle foraging during winter and migratory seasons, or may affect foraging by unmated golden eagles during the nesting season.

A substantial loss of foraging habitat within range of a nest site could cause reduced productivity or interfere with normal feeding behavior, though enXco does not anticipate the loss of foraging habitat on the project site and gen-tie line alignment would appreciably reduce foraging habitat availability for golden eagles using territories in the surrounding mountains. The nearest golden eagle nesting territory is in the Coxcomb Mountains, about 4 miles from the DHSP site. A circle with a radius of 4 miles comprises about a 50 square mile area; the DHSP site would affect about 4 percent of that area. Further, golden eagles forage at distances much greater than 4 miles from their nests. enXco does not believe that foraging habitat loss would constitute disturbance to golden eagles (pursuant to USFWS 2007), and would not cause decrease in productivity, or substantially interfere with normal breeding, feeding, or sheltering behavior. Moreover, Mitigation Measure MM VEG-6, would require compensatory land acquisition to offset project-specific loss of foraging habitat.

Gila Woodpecker. Gila woodpecker (*Melanerpes uropygialis*) was observed within the project area during December 2010, but was not observed during the subsequent winter or spring point counts. Blue

Palo Verde–Ironwood Woodland vegetation on the site may provide marginally suitable Gila woodpecker nesting habitat, and there is a low possibility that it may nest on the site, or that the project site is near an occupied nesting territory. Project impacts to habitat can be offset through implementation of MM VEG 6 (below), which requires compensation for impacts to Blue Palo Verde–Ironwood Woodland at a ratio of 3:1.

Habitat fragmentation. Wildlife, including birds and bats, are often restricted to specific habitat types or elevations. Their habitats may be contiguous over extensive areas, or they may be scattered in patches in a landscape. For species with patchy distributions, dispersal between habitat patches may be important in colonizing (or recolonizing) areas or in supplementing demography or genetic makeup in isolated populations. Increasingly, land use planners designate wildlife dispersal corridors among open space areas to maintain movement routes for wildlife populations among the larger habitat areas. Public discussion of movement corridors tends to focus on uncommon, large, wide-ranging mammals, particularly mountain lions. But wildlife corridors also are intended to enable dispersal for other species, including small mammals, birds, amphibians, reptiles, and plants.

Beier and Lowe (1992) proposed a method for evaluating potential corridors, characterizing species as "corridor passage" and "corridor dwellers" depending on whether they would likely traverse the corridor during a single event (e.g., a mountain lion crossing from one mountain range to the other) or over a generation or longer (e.g., a population of pocket mice living within the corridor, with individual mice moving relatively short distances over time, but eventually colonizing new areas). Dispersal mechanisms relevant to birds and habitat fragmentation in the upper Chuckwalla Valley can be divided into three categories, partly analogous to Beier and Lowe's "corridor passage" and "corridor dweller" categories.

1. Species dispersing short-distances, over the course of days, weeks, or longer. This category could include non-migratory birds whose behavior or anatomy limits their flight patterns to relatively short distances. They would move on the ground or via short flights, among shrubs in contiguous or nearly-contiguous habitat areas. While almost all birds are capable of flying long distances at times (e.g., during juvenile dispersal), behavior patterns of many species prevent them from moving across unsuitable habitat blocks. This effect is especially well-known among non-migratory shrubland species of coastal southern California (Soule et al. 1988). The project would not present an absolute barrier to movement, but it could reduce movement throughout the area for resident shrubland species, possibly including loggerhead shrike, Crissal thrasher, Le Conte's thrasher, or Gila woodpecker. Any of these species would be likely to disperse around, but not across, the project site. However, dispersal probably would take place over a period of time rather than during a single event. These species are comparable to Beier and Loe's "corridor dweller" category.

2. Species dispersing by longer-distance mechanisms. This category could include migratory birds or wide-ranging non-migrants routinely flying long distances within or among habitat patches. Examples include most raptors, common raven, and migratory passarines such as Lucy's warbler and Bendire's thrasher. The project's effects on habitat fragmentation would be relatively unimportant for these species.

Equivalency analysis. The applicant, enXco, is working with Wildlands, Inc., a private firm specializing in habit preservation and management, to identify and acquire suitable compensation lands to mitigate the project's potential impacts to regional wildlife movement. The equivalency analysis will be incorporated into the project's Habitat Compensation Plan and the final Bird and Bat Conservation

Strategy. Mitigation Measure VEG-6 (below) specifies selection criteria to ensure that compensation habitat adequately offsets the project's impacts to habitat and fragmentation.

5.7 DISTURBANCE DUE TO ONGOING HUMAN PRESENCE AT THE FACILITY

Maximum noise levels during construction are estimated to range from 74.8 to 83.2 dBA at 100 feet from construction activity, and would decrease with distance away from activity. This would be a substantial increase over existing background noise levels near the solar field site, which are expected to be low, with typical daytime noise levels of 35 to 50 dBA. In addition, if construction activities were to occur at night, lighting would be required. Noise and lighting during construction would affect wildlife in adjacent habitats by disrupting foraging, breeding, sheltering, and other activities; or it cause animals to avoid otherwise suitable habitat surrounding the site. The effects of construction noise include annoyance, which causes birds and other wildlife to abandon nests or dens; increased stress hormone levels, interference with sleep and other activities; and interference with acoustic communication by masking important sounds or sound components, such as territorial calls, contact calls, or alarm calls (Dooling and Popper, 2007). Many species rely on vocalizations during the breeding season to attract a mate within their territory, and noise from construction could disturb nesting birds and other wildlife and adversely affect nesting and other activities.

Lighting during project construction may affect nocturnal wildlife species. Lighting can affect behavior and physiology, and may also increase the risk of predation of wildlife because they may be more detectable to nocturnal predators. Lighting would be likely to attract nocturnal insects and, in turn, bats; possibly including special-status bats, discussed further below. Mitigation Measure MM WIL-1 (Wildlife Impact Avoidance and Minimization) and MM VR-6 (Night Lighting Control) would minimize the impacts of noise and lighting by ensuring lighting is focused only on work areas and does not unnecessarily extend beyond work areas, and scheduling noisy construction activities near the project site perimeter outside the most sensitive season.

During operation, some birds and other small wildlife species would re-occupy the solar field site once construction activities are completed, where ongoing O&M noise and lighting may affect them. Noise and lighting may also affect wildlife in the nearby off-site habitat. These effects would be qualitatively similar to the description of construction phase effects of noise and lighting, but would be of lesser magnitude. Mitigation Measure MM WIL-1 (Wildlife Impact Avoidance and Minimization) would minimize these impacts.

5.8 ADDITIONAL RISK FACTORS

Storage ponds. During construction, storage ponds on the site would be used to store water for dust control. These ponds would be within the fenced construction area. Even though they would be fenced, they will be likely to attract birds, including ravens, and thus act as a "subsidy" (see discussion below). Storage ponds would be likely to attract nocturnal insects and, in turn, bats; possibly including special-status bats.

Evaporation ponds. The proposed evaporation ponds could affect birds by posing a drowning hazard; a water subsidy for predators; salt encrustations, which can interfere with flight or other activity; or salt toxicosis (poisoning). Mitigation Measure MM WIL-1 requires covering the evaporation pond to prevent these impacts. If the evaporation pond dries completely at times, residual salts could become airborne

and cause dust or health impacts to wildlife in surrounding habitat. Mitigation Measure MM WIL-1 would minimize this effect by ensuring that salt sediment is promptly removed at regular intervals from the evaporation pond.

Predator subsidies. Project construction, operation, and decommissioning activities could provide resources in the form of trash, litter, or water, which attract and subsidize unnaturally high numbers of predators such as common ravens, coyotes, and feral dogs. This influx of predators could cause unnaturally high predation pressure on wildlife species in the vicinity. Ravens are opportunistic omnivores and they prey on the eggs and nestlings of native birds, among many other food sources (Zeiner et al. 1990), including juvenile desert tortoises. Ravens and coyotes habituate to human activities and are subsidized by food (trash, road killed animals), water (irrigation or dust control overspray), and (for ravens) new perching, roosting, and nesting sites (transmission line structures and other structures) that are introduced or augmented by human encroachment.

Mitigation Measure WIL-8 (Raven Monitoring, Management, and Control Plan) would require management of all potential predator subsidies, monitoring of raven presence and abundance, control measures as needed, and contribution to the region-wide Raven Management Program.

5.9 CUMULATIVE IMPACTS

The development of numerous large-scale renewable energy projects, including the DHSP and other solar and wind projects in the region, would result in a substantial permanent conversion of desert habitat to industrial and commercial uses. Existing and foreseeable future projects in the NECO planning area (not including the DHSP) would result in the total projected loss of 4.5 percent of the Sonoran Creosote Bush Scrub and 6.5 percent of the Desert Dry Wash Woodland habitat in the NECO planning area (see DEIS Section 4.3.14). This would constitute a substantial cumulative impact to these plant communities and wildlife habitat through direct habitat loss and habitat fragmentation. The DHSP would contribute approximately 0.4 percent to this cumulative impact to Sonoran Creosote Bush Scrub and between 0.9 and 1.2 percent to the cumulative impact to Desert Dry Wash Woodland. The DHSP DEIS concludes that the project would contribute considerably to cumulative impacts to wildlife habitat.

Common Wildlife. The DHSP's incremental contribution to cumulative impacts to common wildlife, including most resident and migratory birds, would be habitat loss and fragmentation. Most common wildlife species range widely over California, and these species have not been identified as conservation priorities. The DHSP would contribute incrementally to impacts to common wildlife such as disruption of movement, disturbance, mortality, loss of habitat, and fragmentation. With the incorporation of recommended mitigation measures, this incremental contribution would be mitigated to the extent feasible and would not result in the loss of a population or a trend toward federal or state listing for any common wildlife species. With incorporated mitigation, the DHSP would not make a considerable contribution to the cumulative regional impacts to common wildlife, when combined with the effects of past and future projects in the NECO planning area.

Golden Eagle. The DHSP would contribute to the cumulative regional loss of golden eagle foraging habitat. Other renewable developments, both existing and proposed, in the NECO planning area would have similar impacts. Cumulatively, development in the California deserts could have substantial impacts to golden eagle foraging habitat if left unmitigated. Most projects are not likely to directly affect golden eagle nesting sites in the desert mountain ranges. Implementation of DHSP mitigation measures would minimize or offset project impacts to golden eagle foraging habitat. Mitigation Measure MM VEG-6, which would require compensatory land acquisition, would offset project-specific

loss of foraging habitat. Mitigation Measures MM WIL-5 (Golden Eagle Pre-construction and Construction Phase Surveys) requires pre-construction and construction phase surveys to ensure that project construction activities do not result in injury or disturbance to golden eagles. Implementation of these measures would substantially reduce the Proposed Action's contribution to cumulative impacts to golden eagles.

Burrowing Owl. The DHSP would contribute incrementally to the cumulative loss of burrowing owl wintering and breeding habitat. Habitat on site and along most of the gen-tie alternative alignments appears suitable for nesting and wintering. Impacts of the DHSP would be similar to other solar developments in the region, and could include loss of breeding or wintering habitat, disturbance due to human activities, and destruction of active (nesting or wintering) burrows. However, due to the low level of use, and an apparent rarity of breeding on-site, the incremental contribution of the Proposed Action or Alternatives to cumulative impacts to burrowing owls would be minor. Implementation of mitigation measures would reduce the DHSP's contribution to cumulative impacts.

Other Special-Status Birds. The DHSP would contribute incrementally to the cumulative loss of habitat for several special-status birds. The DHSP's primary impacts to resident and migratory birds include habitat loss, disturbance to foraging and breeding, and risk of injury or mortality due to collision with project features. However, due to the availability of similar habitat in the greater Chuckwalla Valley and beyond, the DHSP's incremental contribution to cumulative impacts to resident and migratory birds would be low. This contribution would be further reduced by the implementation of mitigation measures (below).

Special-Status Bats. Bats may forage over the project area, and may be drawn to the area by the storage ponds (during construction) or the evaporation pond (during O&M). Due to the lack of extensive or high-quality roosting habitat in or near the project area, and the widespread availability of similar foraging habitat in the Chuckwalla Valley and beyond, the incremental contribution of the Proposed Action to cumulative impacts to bats would be minor. This contribution would be further reduced or offset by the implementation of mitigation measures described below.

6.0 CONSERVATION MEASURES

enXco has provided several measures as part of the project description to reduce potential impacts to biological resources, including birds and bats. These measures have been adopted into the project DEIS by incorporating them into project-specific mitigation measures proposed in Sections 4.3 and 4.4. Additional mitigation measures proposed in the DEIS encompass the substance and intent of the applicant-proposed measures, but clarify or expand on reporting requirements, timing of implementation, or other details where appropriate. Where there is a conflict between provisions of the applicant's proposed measures and the DEIS's recommended mitigation measures, the DEIS mitigation measures take precedence.

6.1 APPLICANT PROPOSED MEASURES

Applicant-proposed measures identified by enXco to reduce impacts to biological resources include the following:

AM-BIO 1: Habitat Compensation Plan. A Habitat Compensation Plan is being prepared and will be implemented by the Applicant to compensate for the loss of creosote desert scrub, desert dry wash

woodland, and jurisdictional resources. Compensation will be accomplished by acquisition of mitigation land or conservation easements or by providing funding for specific land acquisition, endowment, restoration, and management actions under one of several programs, such as the recently approved mitigation program created by AB 13. The Habitat Compensation Plan will be reviewed and approved by BLM, United States Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG). The precise details of the mitigation, including mitigation ratios, will be established in the BLM Right-of-Way (ROW) grant, USFWS Biological Opinion, and any CDFG 2081 Incidental Take Permit or CDFG 2080.1 Consistency Determination.

AM-BIO 2: Integrated Weed Management Plan. A Draft Integrated Weed Management Plan (IWMP) will be prepared pursuant to BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007) and the National Invasive Species Management Plan (NISC, 2008), and will be implemented by the Applicant to reduce the potential for the introduction of invasive species during construction, operation and maintenance, and decommissioning of the project. The draft plan will be reviewed and approved by the BLM.

AM-BIO 4: Worker Environmental Awareness Program (WEAP). The Applicant will implement a WEAP to educate on-site workers about sensitive environmental issues associated with the project. The WEAP will be administered to all on-site personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The program will be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure. BLM will be responsible for ensuring that each construction worker at the site, throughout the duration of construction activities, receives the above training.

AM-BIO 5: Vegetation Resources Management Plan. The Applicant will prepare and implement a Vegetation Resources Management Plan that contains the following components:

- A Vegetation Salvage Plan which discusses the methods that will be used to transplant cacti present within the project locations following BLM's standard operating procedures, as well as methods that will be used to transplant special-status plant species that occur in the project locations if feasible.
- A Restoration Plan which discusses the methods that will be used to restore creosote bush scrub and desert dry wash woodland habitat that is temporarily disturbed by construction activities.
- The Vegetation Salvage Plan and Restoration Plan will specify success criteria and performance standards. BLM will be responsible for reviewing and approving the plan and for ensuring that the Applicant implements the plan including maintenance and monitoring required in the plan.

AM-BIO 7: Regional Raven Management Program. The Applicant shall contribute to the USFWS Regional Raven Management Program by making a one-time payment of $105 per acre of project disturbance to the National Fish and Wildlife Federation Renewable Energy Action Team raven control account. A Draft Avian and Bat Protection Plan will be prepared and will be implemented by the Applicant to specify necessary actions to be taken to protect nesting bird and bat species, including burrowing owls, nesting birds, and roosting bats. The Draft Plan will be reviewed and approved by BLM. The Final Plan will conform to the 2010 USFWS avian and bat guidelines entitled Considerations for Avian and Bat Protection Plans U.S. Fish and Wildlife Service White Paper.

AM-BIO 8: Construction Water Storage Pond Design. The temporary construction water ponds shall be designed, constructed, and operated in compliance with all applicable regulatory requirements

with respect to design, operation, and maintenance, protection of migratory waterfowl, and raven management.

6.2 DEIS MITIGATION MEASURES

The DHSP DEIS will recommend additional mitigation measures to expand upon applicant's proposed measures above. The full text of each measure may be found in Sections 4.3 and 4.4 of the DEIS. The measures that relate to bird and bat conservation are listed and briefly summarized below.

MM VEG-1: Assign a Designated Biologist and Biological Monitors. The project owner will identify a Designated Biologist throughout the construction, O&M, and post-project decommissioning phases, and any subsequent monitoring/reporting period. MM VEG-1 describes the Designated Biologist's required qualifications, and responsibilities for monitoring, inspection, and reporting. The Designated Biologist also will be responsible for training and supervising Biological Monitors, who will be appointed as needed for the construction, O&M, and decommissioning phases of the project. The Designated Biologist will be the primary point of contact for resource agency communications.

MM VEG-2: Conduct Biological Monitoring and Reporting during Project Construction, Operations, and Decommissioning. The Designated Biologist and Biological Monitors shall ensure that construction activities are consistent with the adopted mitigation measures, and avoid disturbance to any habitat outside permitted work areas. The Designated Biologist shall have the authority and responsibility to immediately halt any project activities that are not in compliance with mitigation measures, or to order any reasonable measure to avoid take of a listed species.

The project Owner shall be responsible for ensuring that construction monitoring is conducted during all project phases. During the O&M phase, the reporting schedule will be quarterly rather than monthly. The Designated Biologist will report all special-status species observations to the CNDDB and include copes of these reports in monthly or quarterly monitoring reports.

MM VEG-3: Prepare and Implement a Worker Environmental Awareness Program (WEAP). The project owner shall prepare and implement a project-specific WEAP to be administered to all on-site personnel. The WEAP shall address conservation and protection requirements for biological resources.

MM VEG-4: Minimize Construction-Related Impacts. Project design shall minimize temporary construction work areas to the extent feasible and minimize the impacts to native vegetation and habitat.

MM VEG-5: Prepare and Implement a Vegetation Resources Management Plan. The Vegetation Resources Management Plan shall detail the methods for revegetation of temporarily impacted sites; salvage of cacti and special-status plants from the project footprint; and long-term management of vegetation within the solar facility during its operations.

MM VEG-6: Provide Off-Site Compensation for Impacts to Vegetation and Habitat. This mitigation measure provides further detail and specificity to the habitat compensation requirements described in AM-BIO-1. The measure includes compensation ratios for vegetation types and land use designations, ranging from 1:1 for upland creosote bush scrub, to 5:1 for lands within designated DWMAs, WHMAs, or desert tortoise critical habitat. The measure also specifies selection criteria, to address habitat values and biological connectivity. The compensation lands must be protected and managed in perpetuity for biological resource values, and the project owner must provide funding as described in MM VEG-6 for this long-term management.

MM WIL-1: Wildlife Impact Avoidance and Minimization. MM WIL-1 requires a variety of measures to avoid or minimize impacts to wildlife and habitat, including minimization of disturbance areas; roads; vehicle traffic; soil erosion; dust. It also requires avoidance of wildlife pitfalls or other potential entrapments; avoidance of toxic materials on unpaved road surfaces; minimization of standing water and other potential predator subsidies; and covering the evaporation ponds.

MM WIL-3: Pre-Construction Nest Surveys and Impact Avoidance Measures for Migratory and Nesting Birds. Pre-construction nest surveys for nesting birds shall be conducted prior to any construction activities that will occur during the breeding period (from February 1 through August 31). Additional specifications include:

- Coverage area to include the project site or other work areas and a 500-foot buffer;
- At least two pre-construction surveys, separated by a minimum 10-day interval; the second survey to be no more than 10 days before construction starts. Additional follow-up surveys may be required if periods of construction inactivity exceed one week in any given area;
- Reporting on survey results prior to start of construction;
- A 330-foot radius buffer zone surrounding the nests where no impacts to soils or vegetation will be permitted while the nest remains active. For any active raptor nests or bat maternity roosts, the flagged buffer zone/avoidance area shall be a 1200-foot radius surrounding the nest or roost site. This protected area surrounding the nest may be adjusted by the Designated Biologist in consultation with BLM, Riverside County, CDFG, and USFWS;
- Monitoring of any active nests within or adjacent to the work areas; until nestlings have fledged and dispersed. Activities that might, in the opinion of the Designated Biologist, disturb nesting activities shall be prohibited within the buffer zone until such a determination is made;
- Ongoing breeding-season monitoring of work areas, throughout the construction, O&M, and decommissioning phases of the project; and
- Reporting on nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be described and reported in regular monitoring and compliance reports described in MM VEG-2.

MM WIL-4: Burrowing Owl Impact Avoidance, Minimization, and Compensation Measures. This measure requires pre-construction surveys for burrowing owls; avoidance measures to and buffer areas surrounding active burrows; compensation of 19.5 acres of land for each burrowing owl or breeding pair that is displaced by construction (may be "nested" within compensation lands, per MM VEG-6); and passive relocation of burrowing owls, outside the nesting season only.

MM WIL-5: Golden Eagle Pre-construction and Construction Phase Surveys. The project owner shall contract with a qualified ornithologist to conduct winter season and nesting season surveys of golden eagle habitat use in Chuckwalla Valley and surrounding mountains within a 10-mile radius of the project site and gen-tie alignment, beginning in winter 2011-12, continuing throughout the construction phase of the project. Survey methods for the inventory shall be either ground-based or helicopter-based, as described in the *Golden Eagle Technical Guidance* (Pagel et al., 2010) or more current guidance from the USFWS. If an occupied nest is detected within 10 miles of the project site or gen-tie line alignment, the project Owner shall prepare and implement a Golden Eagle Monitoring and Management Plan for the duration of construction to ensure that project construction activities do not result in injury or disturbance to golden eagles. The Monitoring and Management Plan shall include a description of

adaptive management actions, to include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

MM WIL-6: Bird and Bat Conservation Plan. This measure requires that the project owner prepare and implement a Bird and Bat Conservation Strategy (formerly titled Avian and Bat Protection Plan) in consultation with the USFWS. This Draft BBCS was prepared in anticipation of MM WIL-6, to conform to the recommendations of the USFWS (2010b).

7.0 MONITORING AND REPORTING

7.1 BIRD AND BAT MONITORING REQUIREMENTS OF THE DEIS

Several of the mitigation measures summarized above specify monitoring and reporting requirements. The appointed Designated Biologist will be responsible for monitoring and reporting on biological resources for project activities, beginning during pre-construction surveys and continuing through the construction, O&M, and decommissioning project phases. Specific monitoring requirements related to bird and bat conservation are the following:

MM VEG-2. The Designated Biologists will report all special-status species observations to the CNDDB and include scopes of these reports in monthly or quarterly monitoring reports, and immediately report any dead or injured listed threatened or endangered species to the Wildlife Agencies.

MM WIL-3. The Designated Biologist or Biological Monitor shall monitor bird nests located during pre-construction surveys until nestlings have fledged and dispersed; shall monitor work areas, including active work areas, throughout the breeding season each year, throughout the construction, O&M, and decommissioning phases of the project; and nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be described and reported in regular monitoring and compliance reports.

MM WIL-4. If burrowing owls are passively relocated, the relocation plan will include a monitoring and reporting component.

MM WIL-5. Annual monitoring of breeding season and winter season golden eagle activity within a 10-mile radius of the project site and gen-tie alignment, beginning in winter 2011-12 and continuing throughout the construction phase of the project. The intent of this monitoring will be to expand the existing baseline data and document local golden eagle activity during throughout the period when construction activity may affect nesting or wintering golden eagle behavior. MM WIL-5 also requires monitoring and adaptive management if an occupied nest is detected within 10 miles of the project site or gen-tie line alignment.

7.2 DESERT HARVEST BIRD AND BAT MONITORING APPROACH AND STRATEGY

enXco will implement avian and bat monitoring programs consistent with the mitigation measures, summarized above, as follows:

Construction and decommissioning phase nest monitoring. enXco will contract with a qualified biologist to prepare and implement a nest monitoring plan for any bird nests within the project footprint

or the surrounding 500 foot buffer area, during nesting seasons during the construction or decommissioning phases of the project. For burrowing owls, the monitoring plan will apply to active burrows year-around during the construction or decommissioning phases. enXco will document the results of nest and burrow monitoring, including the locations and species of all nests located during field surveys, any buffer areas or other protection measures taken for each nest, and the outcome for each nest (e.g., nest abandonment, predation, or date of fledging). These results will be compiled in regular monitoring reports and provided to the USFWS.

O&M phase nest monitoring. enXco will contract with a qualified biologist to prepare and implement a monitoring plan to evaluate bird nesting activity within the project area or on the gen-tie alignment during the O&M phase of the project. The purpose of the nest monitoring will be to determine which species (if any) use the project facility for nesting, which specific structures (e.g., support framework beneath PV panels, other structures on the site, or open ground among panels) are used as nest sites, and whether the project components attract birds to unsuitable or hazardous nest sites.

O&M phase mortality monitoring. enXco will contract with a qualified biologist to prepare and implement a monitoring plan to evaluate bird and bat mortality within the project site. Examples of potential bird or bat hazards include, but are not limited to, striking the PV panels or other project components, and entanglement in netting at the evaporation pond.

Golden eagle activity. The USFWS has recommended that enXco obtain 3 years of nesting season and winter season golden eagle activity data for a 10-mile radius area surrounding the project site. To date, enXco has obtained 2010 breeding season data in the area from the Desert Sunlight EIS (BLM 2011b) and supporting documents. No winter or breeding season data on golden eagle activity were collected in the area during 2011. The Desert Sunlight project owner is required by Mitigation Measure WIL-6 of the Desert Sunlight FEIS, to obtain breeding season golden eagle activity over the same area each year throughout the active construction phase for that project. These data sets will provide breeding season golden eagle activity for the 2012 and 2013 breeding season throughout the recommended 10-mile radius surrounding the DHSP site.

enXco will contract with a qualified golden eagle biologist to conduct winter season surveys for golden eagle activity in a 10-mile radius of the Desert Harvest project site. Surveys will begin in December 2011 and continue over an 8-week period. During each survey all accessible roads in the study area will be traveled via automobile, with random stops to check the horizon for eagles with binoculars and high powered scopes. All transmission line towers and pole lines in the study area will also checked on each survey, as well as all historic cliff nest territories.

These surveys, in combination with the Desert Sunlight nesting season data from 2010 and 2012 will serve as the baseline golden eagle data for both projects. enXco anticipates that project construction, and construction-phase golden eagle activity monitoring, will be underway by winter 2012. At that point, continued monitoring will be implemented, consistent with the requirements of Mitigation Measure WIL-5.

enXco confirms its commitment to conduct a winter non-nesting survey in 2011-2012. Beyond that, enXco understands there to be four projects in the Chuckwalla Valley that are studying essentially the same foraging and nesting area for golden eagles. The Desert Sunlight project must conduct two additional breeding-season surveys, for example, and the eastern portions of those surveys overlap with the Palen project's golden eagle surveys. enXco will coordinate with the USFWS to assess golden eagle occurrence throughout the area, and to evaluate effects of the DHSP. Future surveys will be scheduled to avoid duplication of effort and to minimize disturbance to golden eagles.

8.0 ADAPTIVE MANAGEMENT

enXco will implement adaptive management measures during the O&M project phase as appropriate to minimize risks to birds and bats. There is no available baseline data regarding bird or bat mortality at industrial scale PV solar plants in the California desert. enXco will coordinate with USFWS, BLM, and CDFG to review the project's monitoring data and establish thresholds for implementation of adaptive management measures.

The primary potential for risk to birds and bats during project O&M are likely to be mortality or injury by striking PV panels, and nest failure that may result if nests are built on project components (e.g., PV panel support structures) that become vulnerable to disturbance during maintenance or other project activities.

Examples of potential adaptive management measures that may be taken include the following:

- Installation of visual screening on the perimeter fence, to minimize that likelihood that shrubland birds and bats would be attracted into the facility;
- Modifications to support structures or other facilities to exclude nesting birds (e.g., netting or shielding around framework; capping open pipes or tubing);
- Seasonal modifications to panel washing and maintenance schedules, or pre-washing inspections, to prevent damage to bird nests; or
- Visual or auditory deterrents to prevent birds or bats from accessing evaporation ponds or netting over the ponds.

LITERATURE CITED

AMEC Earth and Environmental (AMEC). 2011d. Desert Harvest Solar Project: Avian point counts in 2011d. Unpublished report prepared for Aspen Environmental Group, San Francisco, California.

American Ornithologists' Union. 1998. Check-list of the North American Birds, 7th ed. Prepared by Committee on Classification and Nomenclature. American Ornithologists' Union, Washington DC.

Aspen Environmental Group (Aspen). 2012. Biological resources technical report: Desert Harvest Solar Project. Unpublished report prepared for enXco, San Ramon, California and submitted to Bureau of Land Management Renewable Energy Coordinating Office, Moreno Valley, California.

Avery, M.L.. 1979. Review of avian mortality due to collisions with manmade structures. Bird Control Seminars Proceedings. Paper 2. Internet Center for Wildlife Damage Management, University of Nebraska, Lincoln. Online: http://digitalcommons.unl.edu/icwdmbirdcontrol/2

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA. 207 pp.

Barbour, R.W. and W.H. Davis. 1969. Bats of America. University Press of Kentucky, Lexington, Kentucky.

Beier, P. and S. Loe. 1992. A checklist for evaluating impacts to wildlife movement corridors. Wildlife Society Bulletin 20:434-440.

Bureau of Land Management (BLM). 2007. Final programmatic environmental impact statement: vegetation treatments using herbicides on Bureau of Land Management lands in 17 western states. BLM, Washington, DC. Online: http://www.blm.gov/wo/st/en/prog/more/veg_eis.html.

Bureau of Land Management (BLM). 2009. Solar facility point count protocol. Unpublished field survey protocol distributed by BLM Desert District Office, Moreno Valley, California.

Bureau of Land Management (BLM). 2010. Special status animals in California, including BLM designated Sensitive Species. BLM California State Director's Office, Sacramento. Online: http://www.blm.gov/ca/dir/pdfs/2010/im/CAIM2010-008ATT1.pdf.

Bureau of Land Management (BLM). 2011a. Notice of Intent to prepare an Environmental Impact Statement for the proposed enXco Desert Harvest Solar Farm Project, Riverside County, CA, and Possible Land Use Plan Amendment. Federal Register 76:57073-57074 (15 Sep).

Bureau of Land Management (BLM). 2011b. Desert Sunlight Solar Farm Project: California Desert Conservation Area plan amendment and final environmental impact statement. BLM Palm Springs South Coast Field Office, Palm Springs, California.

Bureau of Land Management (BLM). 2011c. Record of Decision – Desert Sunlight Solar Farm Project and Amendment to the California Desert Conservation Area Land Use Management Plan, Riverside County, California. Palm Springs South Coast Field Office Palm Springs, California. (August).

Bureau of Land Management (BLM) and California Department of Fish and Game (CDFG). 2002. Proposed Northern & Eastern Colorado Desert Coordinated Management Plan and Final Environmental Impact Statement. Prepared by the BLM California Desert District Office and the CDFG Inland, Desert and Eastern Sierra Region. July.

California Burrowing Owl Consortium (CBOC). 1993. Burrowing owl survey protocol and mitigation guidelines. Alviso, California. 13 pp.

California Department of Fish and Game (CDFG). 2010a. List of natural communities. Vegetation Classification and Mapping Program, CDFG, Sacramento. http://www.dfg.ca.gov/biogeodata/vegcamp/natural_communities.asp.

California Department of Fish & Game (CDFG). 2011a. California Natural Diversity Database (CNDDB), Rarefind, Version 3.1.1. Heritage section, CDFG, Sacramento.

California Department of Fish and Game (CDFG). 2011b. Special animals. Heritage section, CDFG, Sacramento.

Dooling R.J. and A.N. Popper. 2007. The effects of highway noise on birds. Report to the California. Department of Transportation, Division of Environmental Analysis, Sacramento, California. Online: http://www.dot.ca.gov/hq/env/bio/files/caltrans_birds_10-7-2007b.pdf

Farmer, C.J., L.J. Goodrich, E.R. Inzunza, and J.P. Smith. 2008. Conservation status of North America's birds of prey. Pages 303-419 *in* K.L. Bildstein, J.P. Smith, E.R. Inzuna, and R.R. Veit. State of North America's Birds of Prey. American Ornitholgoists' Union / Nuttall Ornithological Club, Series in Ornithology no. 3. 466 pp.

Feldhamer, G.A., B.C. Thompson, and J.A. Chapman (eds.). 2003. Wild Mammals of North America: Biology, Management and Conservation, 2nd ed. Johns Hopkins University Press, Baltimore MD.

Gannon, W.L. 2003. Bats (Vespertilionidae, Molossidae, Phyllostomidae). Pages 56-74 in Feldhamer, G.A., B.C. Thompson, and J.A. Chapman (eds.). Wild Mammals of North America: Biology, Management and Conservation, 2nd ed. Johns Hopkins University Press, Baltimore MD. 1216 pp.

Garrett, K. and J. Dunn. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Society, Los Angeles, California.

Grinnell, J. and A.H. Miller. 1944. The Distribution of the Birds of California. Cooper Ornithological Club, Berkeley (reprint 1986 by Artemisia Press, Lee Vining, Calif.).

Hall, E.R. 1981. The Mammals of North America. John Wiley and Sons, New York.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished report, Non-game Heritage Program, California Department of Fish and Game, Sacramento. 156 pp.

Horvath, G., M. Blaho, A. Egril, G. Kriska, I. Seres,and B, Robertson. 2010. Reducing the maladaptive attractiveness of solar panels to polarotactic insects. Conservation Biology 24: 1644-1653.

Ironwood Consulting, Inc. 2010 (20 Jul). Biological resources technical report: Desert Sunlight Solar Farm Project. Prepared for Desert Sunlight Holdings, LLC. 77 pp. Appendix H in Desert Sunlight Solar Farm Project: California Desert Conservation Area Plan Amendment and Final Environmental Impact Statement. BLM Palm Springs – South Coast Field Office, Palm Springs, California.

Johnsgard, P.A. 1990. Hawks, Eagles and Falcons of North America. Smithsonian Institution Press, Washington DC. 403 p.

Kochert, M. N., K. Steenhof, C. L. Mcintyre and E. H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Online: http://bna.birds.cornell.edu/bna/species/684doi:10.2173/bna.684

Laudenslayer, W.F. 1988. Desert riparian; desert wash. Pages 88-89 and 112-113 *in* K.E. Mayer and W.F. Laudenslayer, eds., Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection, Sacramento, California. 166 pp.

Laudenslayer, W.F. and J.R. Boggs. 1988. Desert scrub. Pages 114-115 *in* K.E. Mayer and W.F. Laudenslayer, eds., Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection, Sacramento, California. 166 pp.

McCrary, M. D., R. L. McKernan, R. W. Schreiber, W. D. Wagner and T. C. Sciarrotta. 1986. Avian mortality at a solar energy power plant. Journal of Field Ornithology 57:135-141.

McCreedy, C. 2008. Gila woodpecker (*Melanerpes uropygialis*). In The Desert Bird Conservation Plan California Partners in Flight. Online: http://www.prbo.org/calpif/htmldocs/desert.html.

National Invasive Species Council (NISC). 2008. 2008-2012 National Invasive Species Management Plan. 35 pp. Online: http://www.invasivespeciesinfo.gov/council/mp2008.pdf.

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim golden eagle technical guidance: inventory and monitoring protocols; and other recommendations in support of eagle management and permit issuance. Division of Migratory Bird Management, Arlington Virginia. 26pp.

Patten, M.A., G. McCaskie, and P. Unitt. 2003. Birds of the Salton Sea: Status, Biogeography, and Ecology. University of California Press, Berkeley. 363 pp.

Pierson, E.D. and W.E. Rainey. 1998. California leaf-nosed bat, *Macrotus californicus* Pallid bat, *Antrozous pallidus*, Townsend's big-eared bat, *Corynorhinus townsendii*. Western mastiff bat, *Eumops perotis*, pocketed free-tailed bat *Nyctinomops femorosaccus*, and big free-tailed bat *Nyctinomops macrotis*. Pages 27-41 and 66-76 in Bolster, B.C. (ed.) Terrestrial Mammal Species of Special Concern in California. Draft Final Report prepared by P.V. Brylski, P.W. Collins, E.D. Pierson, W.E. Rainey and T.E. Kucera. Report submitted to California Department of Fish and Game Wildlife Management Division, Nongame Bird and Mammal Conservation Program for Contract No.FG3146WM. http://www.dfg.ca.gov/wildlife/nongame/ssc/1998mssc.html

Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. Birds of the Lower Colorado River Valley. University of Arizona Press, Tucson. 416 pp.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evans. 2009. Manual of California Vegetation, 2nd ed. California Native Plant Society, Sacramento, California. 1300 pp.

Schoenherr, A.A. and J.H. Burk. 2007. Colorado Desert vegetation. Pages 657-682 *in* M.G. Barbour, T. Keeler-Wolf and A.A. Schoenherr, eds., Terrestrial Vegetation of California, 3rd ed. University of California Press, Berkeley, California.

Schuford, W.D and T. Gardali (eds.). 2008. California Bird Species of Special Concern. Studies of Western Birds, No. 1, Western Field Ornithologists, Camarillo, California and California Dept. of Fish and Game, Sacramento, California. 450 pp.

Soulé, M. E., D. T. Bolger, A. C. Alberts, J. Wright, M. Sorice, and S. Hill. 1988. Reconstructed dynamics of rapid extinctions of chaparral-requiring birds in urban habitat islands. Conservation Biology 2:75 92.

Sterling, J. 2008. Bendier's thrasher (*Toxostoma bendirei*). Pages 311-315 in W.D. Schuford and T. Gardali (eds.), California Bird Species of Special Concern. Studies of Western Birds, No. 1, Western Field Ornithologists, Camarillo, California and California Dept. of Fish and Game, Sacramento, California.

US Fish and Wildlife Service (USFWS). 2007 (5 Jun). Protection of eagles; definition of ''disturb.'' Federal Register 72:31132 -31140.

US Fish and Wildlife Service (USFWS). 2008. Birds of conservation concern 2008. Division of Migratory Bird Management, Arlington, Virginia. 85 pp.

US Fish and Wildlife Service (USFWS). 2009. Final environmental assessment: proposal to permit take as provided under the Bald and Golden Eagle Protection Act. Division of Migratory Bird Management, Arlington, Virginia. 199 pp.

US Fish and Wildlife Service (USFWS). 2010a (3 Aug). Considerations for avian and bat protection plans: US Fish and Wildlife Service white paper. USFWS Director's Office, Washington, DC.

US Fish and Wildlife Service (USFWS). 2010b (2 Sep). Region 8 interim guidelines for the development of a project-specific avian and bat protection plan for solar energy plants and related transmission facilities.

Wilkerson, R.L. and R.B. Siegel. 2011. Distribution and abundance of western burrowing owls (*Athene cunicularia hypugaea*) in southeastern California. Southwestern Naturalist 56:378-384.

Zeiner, D.C., W. F. Laudenslayer, K.E. Mayer, and M. White. 1990. California's Wildlife, Vol. II: Birds. California Department of Fish and Game, Sacramento.

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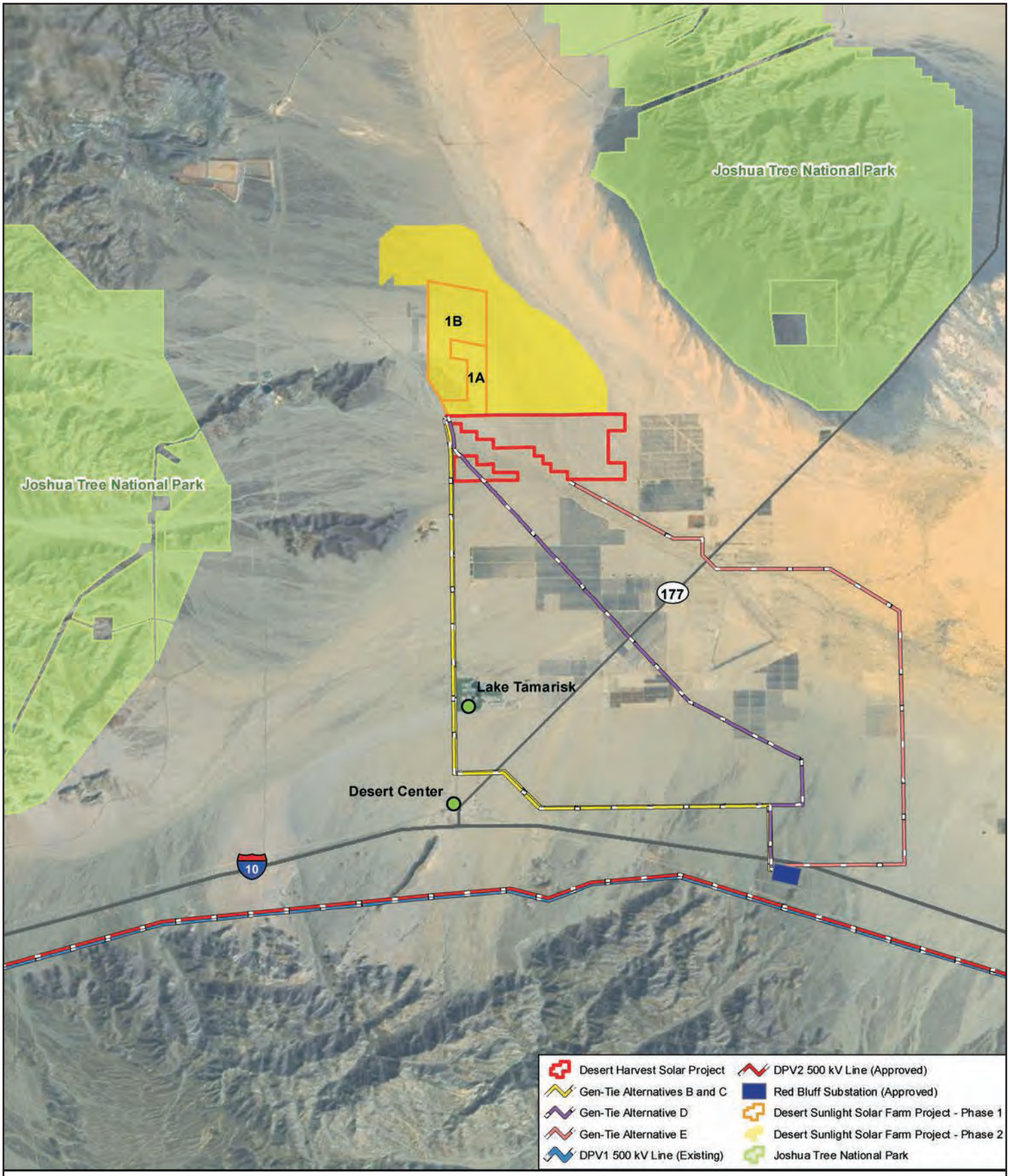
0 5 10 Miles

Figure 1
Regional Map



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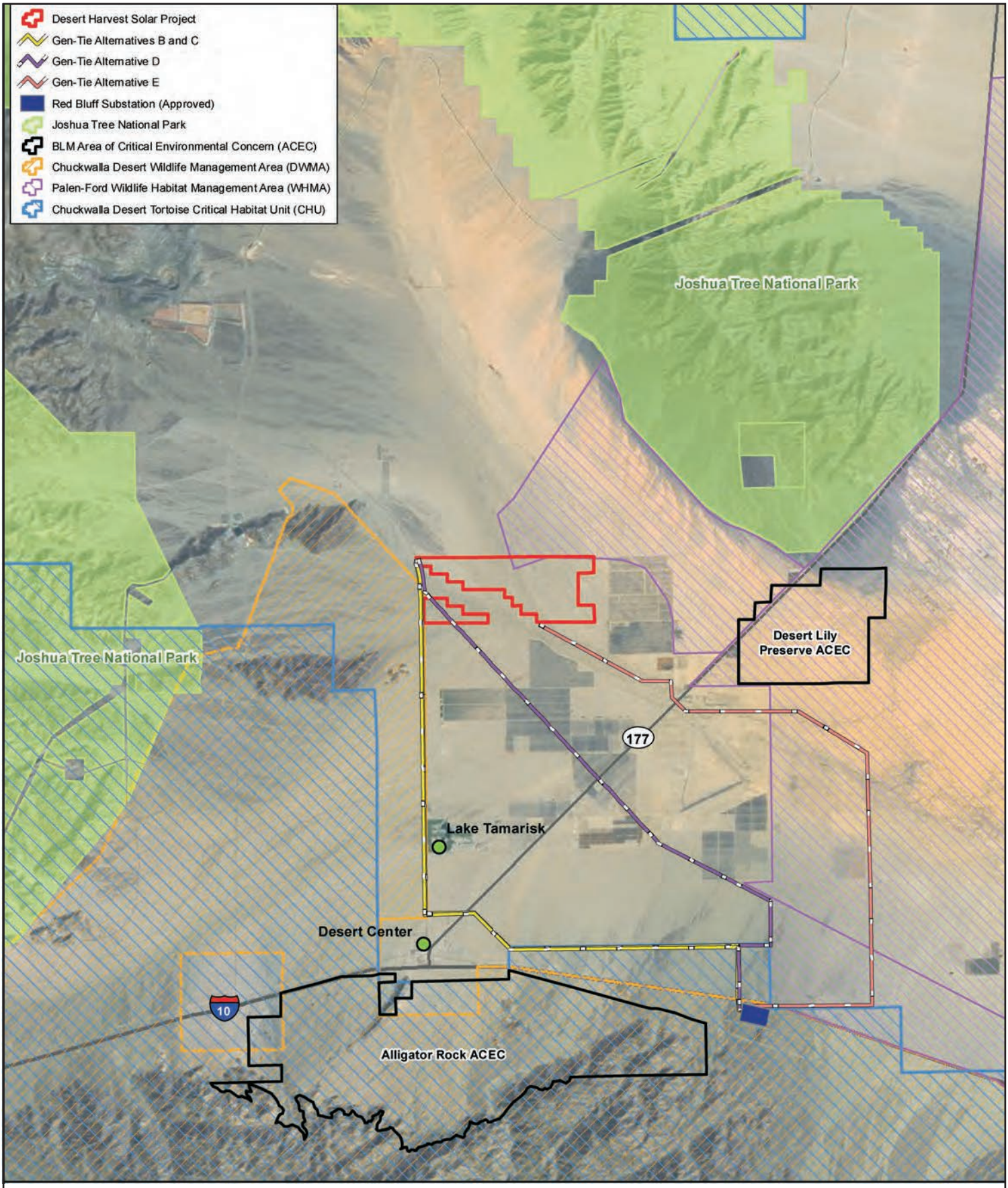
0 2 4 Miles

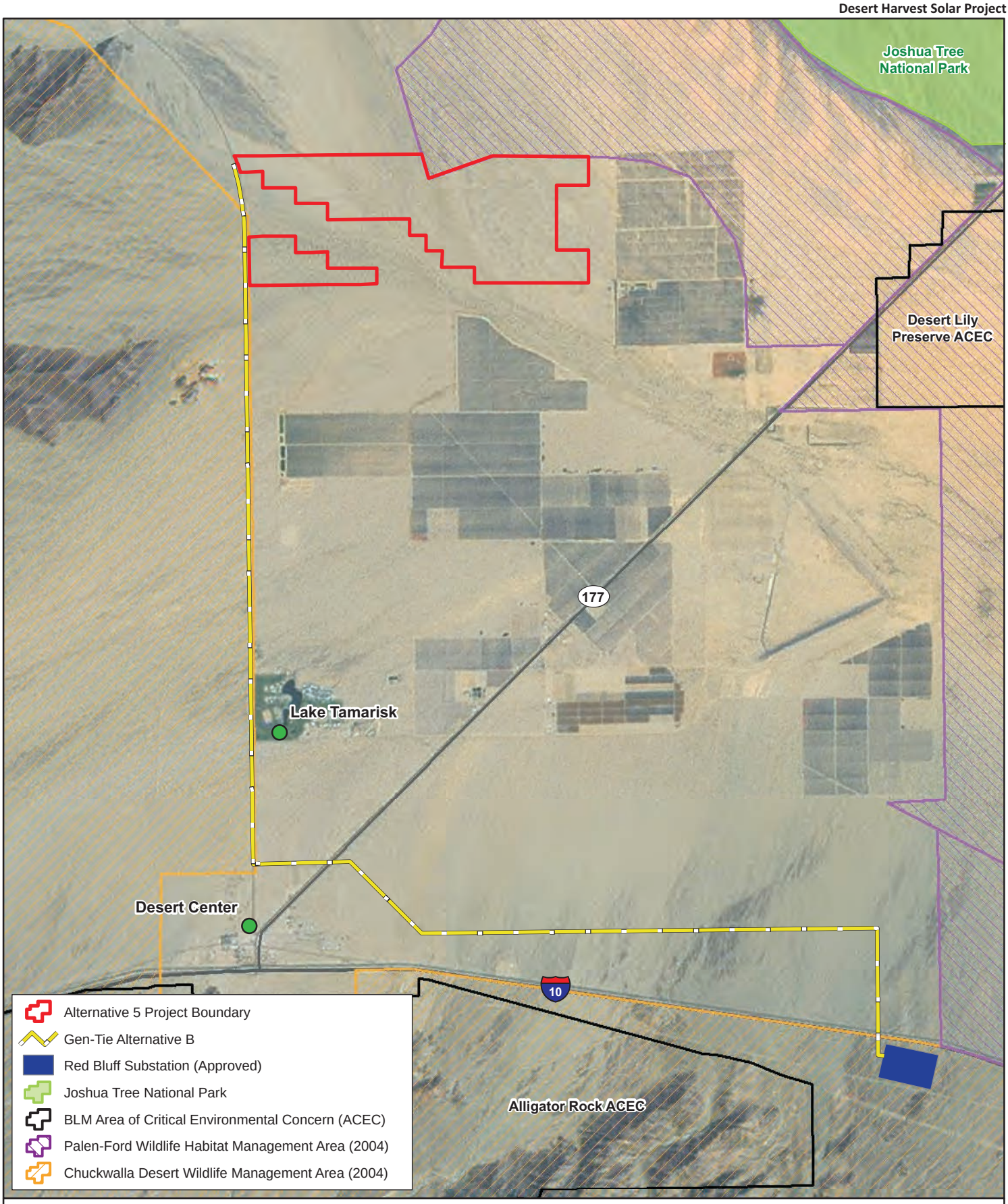
Figure 2
Project and Vicinity



Aspen Environmental Group

0 2 4 Miles

Figure 3
Wildlife Management Areas

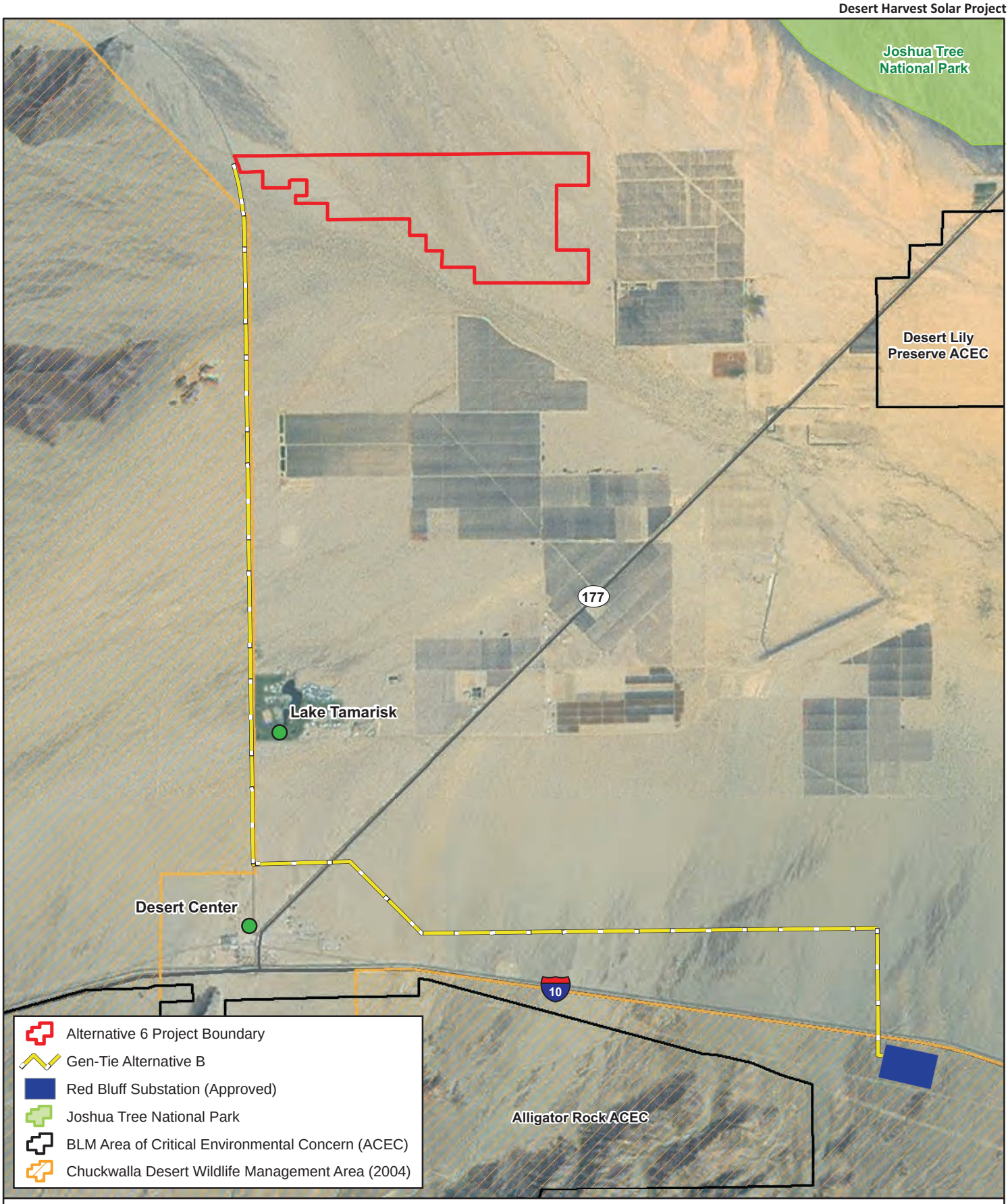


Aspen Environmental Group

0 0.5 1 2 Miles

Figure 4a

Alternative 5: Solar Project Excluding WHMA



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0 0.5 1 2 Miles

Figure 4b

Alternative 6: Reduced Footprint Solar Project

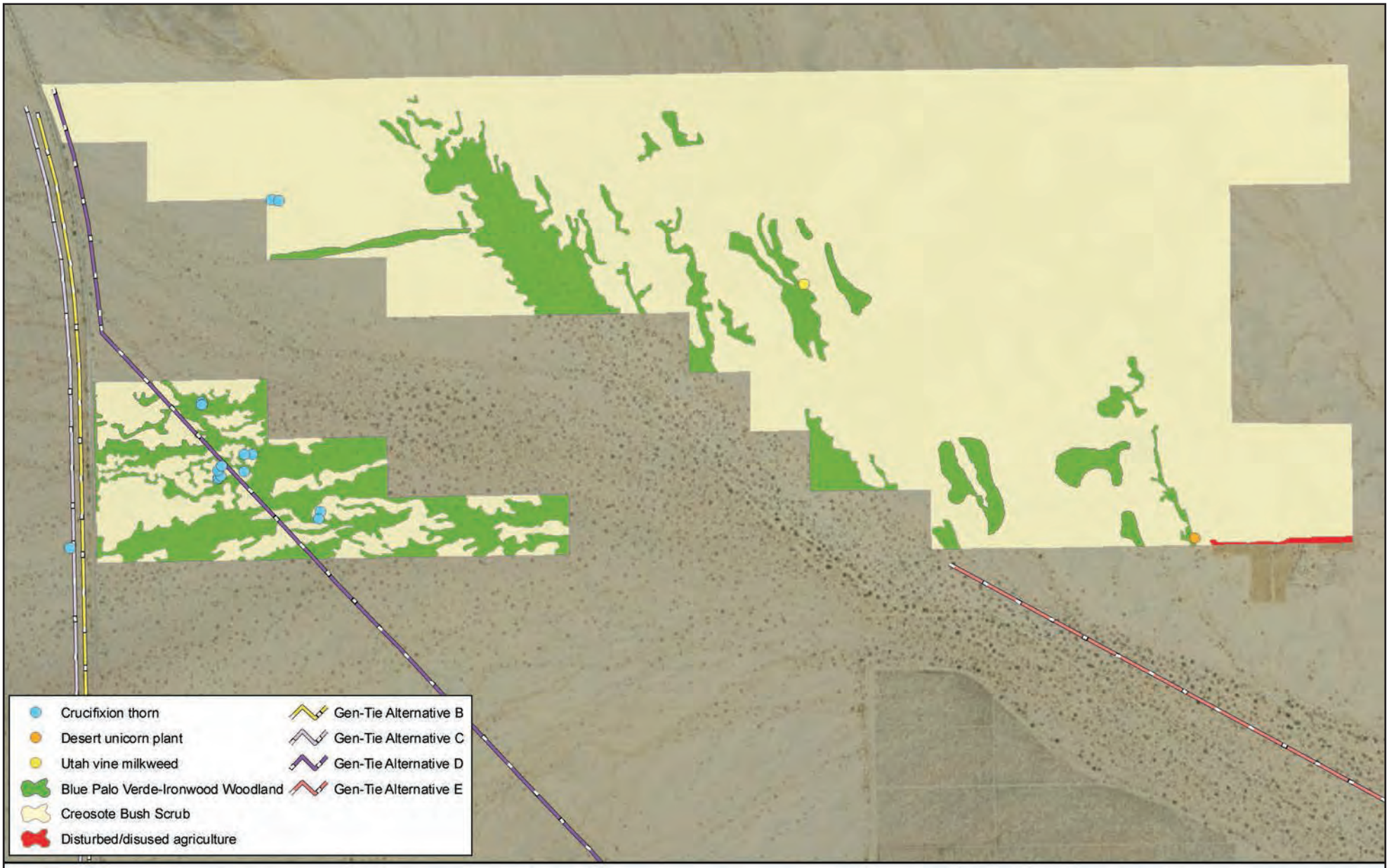

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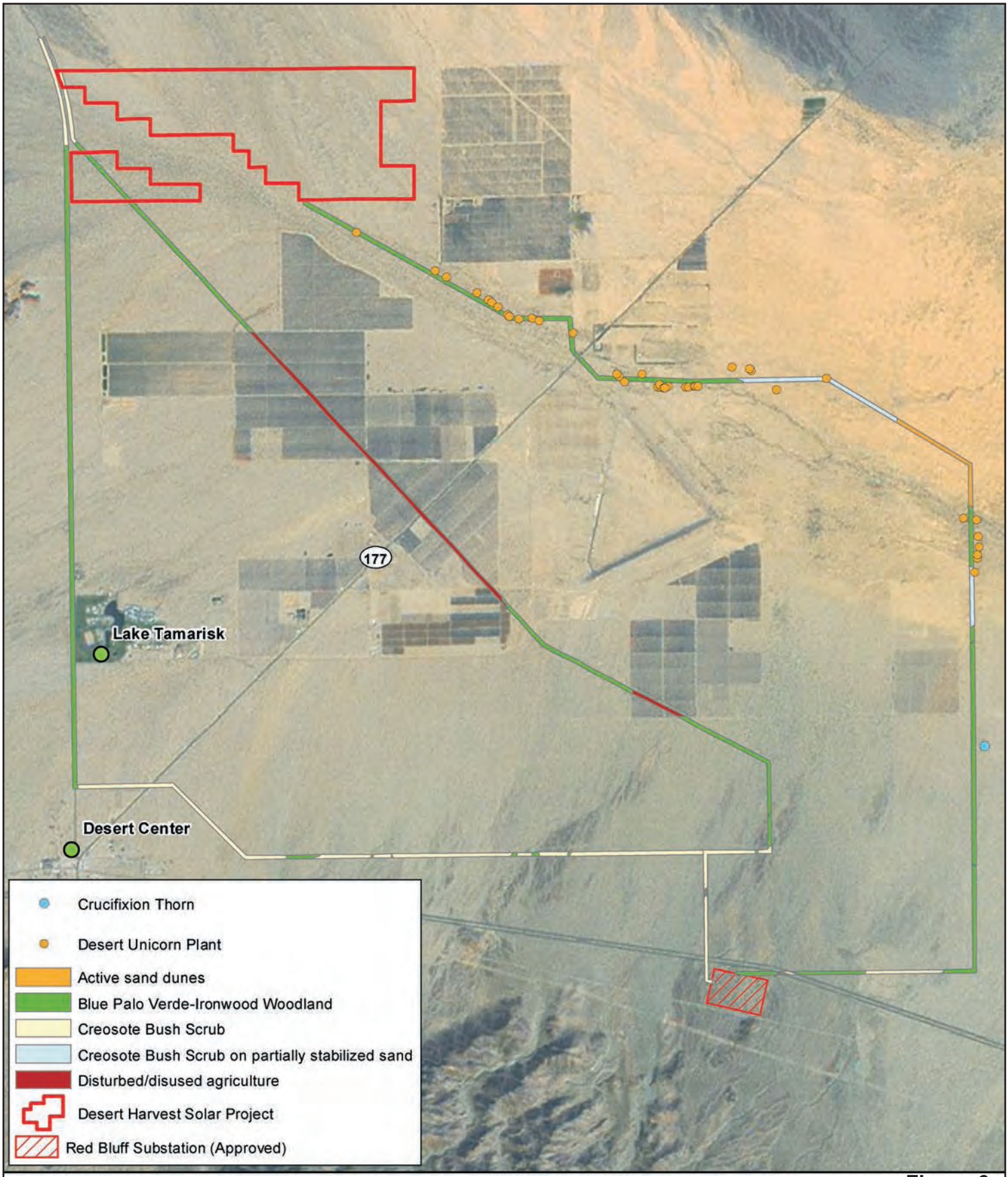
Figure 5

Vegetation and Special Status Plant Locations: DHSP site



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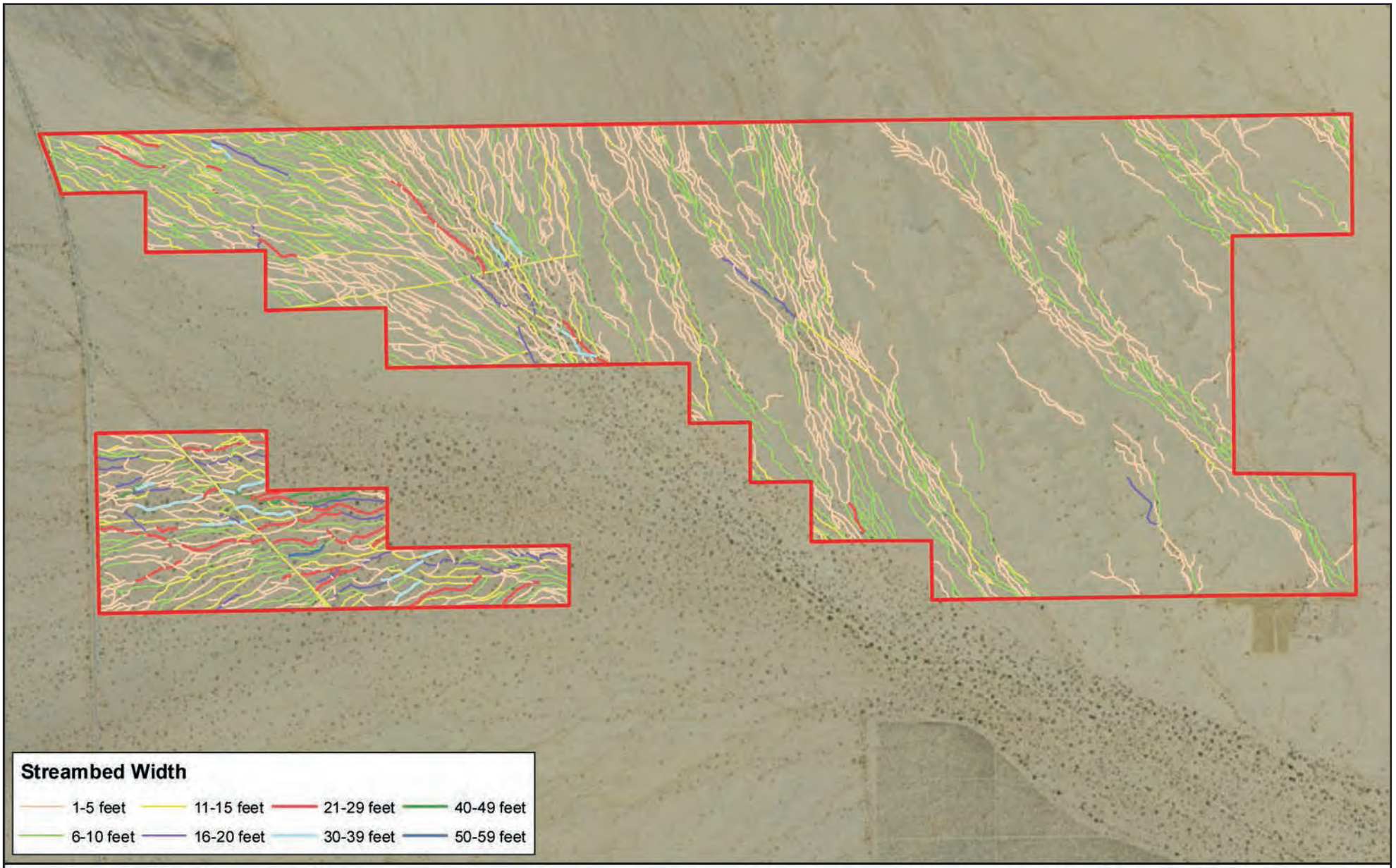
0 0.5 1 2 Miles

Figure 6
Vegetation and Special Status Plant Locations: Gen-tie Line Alignments



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Desert Harvest Solar Project

0 750 1,500 3,000 Feet

Figure 7

CDFG Jurisdictional Streambeds

Appendix C.10

Integrated Weed Management Plan

Integrated Weed Management Plan
Desert Harvest Solar Project

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July, 2012

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Appendix D. Example California BLM Pesticide Use Proposal.
Appendix E. Example California BLM Pesticide Application Records Form.

ABBREVIATIONS AND ACRONYMS

Best Management Practices	BMPs
Bureau of Land Management	BLM
California Department of Food and Agriculture	CDFA
California Department of Fish and Game	CDFG
California Environmental Quality Act	CEQA
California Invasive Plant Council	Cal IPC
Desert Harvest Solar Project	DHSP
Draft Environmental Impact Statement	DEIS
Generation interconnection line	gen-tie line
Global positioning system	GPS
Integrated Weed Management Plan	IWMP
Joshua Tree National Park	JTNP
Material safety data sheets	MSDS
Miles per hour	mph
Mitigation Measure	MM
National Environmental Policy Act	NEPA
Pesticide Application Record	PAR
Pesticide Use Proposal	PUP
Programmatic Environmental Impact Statement	PEIS
Photovoltaic	PV
Right-of-way	ROW
Standard Operating Procedure	SOP
Surface Water Protection Plan	SWPP
United States Environmental Protection Agency	EPA
United States Fish and Wildlife Service	USFWS

1.0 INTRODUCTION

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Figure 1; all figures are in Appendix A). The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2011a).

This Integrated Weed Management Plan (IWMP) describes the proposed DHSP Project activities and components that may facilitate weed infestations; summarizes baseline data regarding weeds in the project vicinity; assesses potential risks that weeds may pose to natural resources values on the project site and in the surrounding area that could result from project construction, operation, and decommissioning; and describes monitoring and control measures to be implemented to minimize those risks.

Throughout this IWMP, the word "weed" is used to include any non-native plant that may interfere with natural resource values on the DHSP site or on surrounding lands. The most important effect of weeds on natural resources is invasion into natural habitats. Invasive weeds can displace native species, supplant food plants or other wildlife habitat elements (e.g., cover), alter natural habitat structure and ecological function, alter natural wildfire patterns, or displace special-status plant occurrences and habitat (Zouhar et al. 2008; Lovich and Bainbridge 1999). Due to this damage to habitat and natural systems, these plants are considered "weeds" or "pest plants" when they invade natural landscapes (Bossard et al. 2000). The spread of invasive plants is an important threat to biological resources in the California desert. Human activities, including the proposed DHSP, can affect weed distribution and abundance in two ways: they can introduce new weed species to an area, and they can facilitate propagation and spread of weeds already present.

Weeds and pest plants addressed in this IWMP will not be limited to "noxious weeds" as designated by federal and state agencies. Instead, weeds are defined here to include any species of non-native plants identified on the weed lists of the California Department of Food and Agriculture (CDFA), the California Invasive Plant Council (Cal IPC), or of special concern identified by BLM. In addition, any non-native species found on the site that has not been evaluated for its potential to invade or alter surrounding natural lands will be considered a weed for purposes of IWMP implementation.

Numerous invasive weeds have already become widespread throughout the Colorado Desert and for some invasive species the prevention of further spread is impracticable. Examples of these species include Mediterranean split grass (*Schismus* spp.), Russian thistle (*Salsola tragus*), and Saharan mustard (*Brassica tournefortii*). Others (e.g., saltcedar, *Tamarix ramosissima*) are damaging to specific habitat types but pose little or no threat to widespread upland desert habitat.

Within the project study area, the overall prevalence of invasive species is low, generally consistent with undisturbed desert bajadas and uplands throughout the region. Invasive plant species that have been found on the solar facility site and in the surrounding areas include Mediterranean split grass, red brome (*Bromus madritensis* ssp. *rubens*), redstem filaree (*Erodium cicutarium*), Saharan mustard, London rocket (*Sisymbrium irio*), and Russian thistle.

1.1 Integrated Weed Management Plan Objectives

Weed management objectives for DHSP include the following:

Prevention. This IWMP seeks to prevent weeds already present on the site from becoming larger or more persistent infestations, and to prevent new weeds from becoming established on the site.

Detection/identification. The monitoring measures described in this plan are designed to identify weed infestations for further control efforts.

Control. Control strategies will be based on the potential threat of any given infestation. Control strategy will be based on the threat posed by a given weed species, and the location, abundance and extent of the infestation. For each infestation, potential control strategies are:

- *Eradication*. This control objective is to eliminate all individuals of a particular species within a specified area. This will be the goal for weed species that are new to the area (i.e., unknown threat) or known species posing (1) significant environmental concern; and (2) not already widespread in surrounding landscapes.
- *Suppression*. This objective will be selected for weed species and populations already widespread throughout the region and common on disturbed soils. The objective will be to reduce infestation density and minimize seed production and the threat for off-site spread; but not necessarily to reduce the total area or boundary of the infestation. This strategy will apply to many widely distributed, high-density weeds where eradication is not feasible.
- *Containment*. This objective will be aimed at preventing infestation expansion and spread, and may be conducted with or without any attempt to reduce infestation density. Containment focuses on halting spread until suppression or eradication can be implemented, and is practical only to the extent that the spread of seeds or vegetative propagules can be prevented.

2.0 PROJECT DESCRIPTION

The proposed DHSP is a 150-megawatt solar photovoltaic (PV) renewable energy generating facility and associated generation interconnection (gen-tie) line. The DHSP solar generation facility would be located on BLM-administered land north of Desert Center in Riverside County, and the 12-mile gen-tie line would primarily be on BLM land, with approximately one mile total located on Metropolitan Water District land and Riverside County land. The DHSP has a minimum expected lifetime of 30 years, with an opportunity of 50 years or more with equipment replacement, repowering, and an extension of the applicable permits, approvals and authorizations for the DHSP. Detailed descriptions of the proposed DHSP and alternatives can be found in Chapter 2 of the project's Draft Environmental Impact Statement (DEIS). A detailed description of the habitats found at the site and along the proposed and alternative gen-tie routes can be found in Chapter 3.3 of the DEIS. Figure 2 identifies the project site, the proposed gen-tie (Alternative B) and alternative routes, and the vicinity of the project area. Figures 3 and 4 identify the distribution of vegetation at the project site and gen-tie routes, respectively.

3.0 KNOWN AND POTENTIAL WEED OCCURRENCES

Within the project study area, the overall prevalence of invasive plant species is low, generally consistent with undisturbed desert bajadas and uplands throughout the region. Invasive plant species that have been found on the solar facility site and in the surrounding areas include Mediterranean split grass, red brome, redstem filaree, Saharan mustard, London rocket, and Russian thistle. Appendix B contains a summary of the invasive plant species found on site, and treatment schedule, control options,

and impacts to native vegetation and wildlife for each species. These and other invasive species with potential of occurring on the site now or in the future are listed in Table 1.

Table 1 presents threat rankings for each species as assigned by the CDFA and by Cal IPC (as applicable). Species were selected for inclusion in the table based on occurrence on or around the DHSP site and gen-tie alignments, or from comparable upland bajada habitats of the broader Colorado Desert region in California.

Two CDFA Class C weeds (Russian thistle and Mediterranean split grass) occur on the site and throughout the local area. No CDFA Class A or Class B weeds have been documented on the site.

BLM Risk Assessment guidelines recommend ranking risks according to (1) likelihood that a weed will spread to the project site, and (2) consequences of its establishment on the site.

BLM's recommended assessment of the first factor (likelihood of spread to the site) range from "none" to "high," based on occurrence and abundance in the surrounding area. However, these guidelines do not account for potential weed introduction via vehicle traffic from outside a project the area, and therefore do not address the most likely vector for weed introduction onto the DHSP site. For most weed species below, the likelihood of spread to the project site from adjacent areas is low or none (the only exceptions are those species already occurring on the DHSP site). However, any of these species, as well as species of unknown threat, could be spread to the project area by vehicle traffic during project construction, operation, or decommissioning. The most likely vector would be via seed or rhizomes that may be caught in the undercarriages of construction equipment.

Similarly, the BLM guidelines addressing consequences of establishment primarily refer to on-site consequences. These guidelines appear to address local habitat or range improvement projects, rather than land use conversions to renewable energy facilities. Whereas many weed infestations could degrade a range project, most weed infestations would have only minimal consequences for the solar facility. For the DHSP project, the most important consequences of any potential weed infestation is the likelihood that infestations may spread off the site and into surrounding natural landscapes, possibly including designated critical habitat for desert tortoise, or into Joshua Tree National Park (JTNP).

Due to the general inapplicability of the BLM guidelines to renewable energy land use conversion, the descriptions of likelihood of occurrence at the DHSP and consequences of occurrence/spread in Table 1 are based upon field experience on the site and throughout the Colorado Desert in California, rather than the BLM's recommended risk assessment methodology.

Human activities such as transportation and trade provide a constant source of new exotic species into California, including the Colorado Desert region, and serve to disperse exotic species already established into new areas. We cannot predict what new weed species might become problematic on the DHSP site or the surrounding area in coming decades. Therefore, the monitoring section of this IWMP includes measures to identify and control (generally by eradication) any non-native species new to the area that may be discovered on the site.

Table 1. Weeds of the Chuckwalla Valley Area.

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
Alhagi pseudalhagi Camel thorn	Widespread in California, many habitats, generally controlled by eradication efforts but new infestation sources are abundant in surrounding states	CDFA: A Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	Currently low, but may be introduced via vehicles or other vectors from surrounding areas; potential to colonize and infest in periodically mesic places (e.g., evaporation pond margins, leaking tanks)	Unknown likelihood of spread in arid bajada soils; high potential resource damage.
Avena spp. Wild oat	Widespread and abundant in W Calif.; less common in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations
Brassica tournefortii Saharan mustard	Widespread and abundant in Calif. deserts; common in interior valleys (e.g., W Riverside Co.); especially invasive in open sands and in disturbed soils (including natural disturbance)	CDFA: n/a Cal IPC: High Impacts/ Invasiveness/ Distribution: A/A/B	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in local naturally disturbed soils such as washes and windblown sand.
Brassica spp., Other non-native mustards	Widespread and abundant in W Calif.; less common in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: vary by species	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations
Bromus madritensis ssp. *rubens* Red brome	Ubiquitous and often abundant or dominant throughout region and throughout most of Calif.	CDFA: n/a Cal IPC: High Impacts/ Invasiveness/ Distribution: A/B/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Bromus spp. Other non-native brome grasses	Widespread and abundant in W Calif. or at higher elev. or latitude in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: vary by species	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations
Centaurea melitensis, C. solstitalis Annual star-thistles	Widespread and abundant in W Calif.; new introductions are probably chronic in region; spread may be limited in low desert by soils and climate	CDFA: varies by species Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: B/B/B	Moderate (periodic introductions are likely; potential for localized establishment in low density infestations)	Probably minimal consequence for low-density infestation; high-density infestation could cause further invasion in surrounding habitat

Table 1. Weeds of the Chuckwalla Valley Area.

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
Cynodon dactylon Bermuda grass	Widespread and abundant in much of Calif.; new introductions are probably chronic in region; in deserts, requires mesic soil conditions	CDFA: C Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	Moderate (periodic introductions are likely; potential for localized establishment in periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
Erodium cicutarium Redstem filaree; crane's bill	Ubiquitous and often abundant or dominant throughout region and throughout most of S Calif.	CDFA: n/a Cal IPC: Limited Impacts/ Invasiveness/ Distribution: C/C/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Halogeton glomeratus Halogeton	Widspread in arid regions of Calif and other western states; apparently spreading; to date, generally not invasive on well-drained bajada soils	CDFA: A Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/A/B	Moderate (periodic introductions are likely; potential for localized establishment in periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
Hirschfeldia geniculata Summer mustard; short-pod mustard	Widespread and often abundant throughout much of Calif., including deserts;	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (not reported on site, but expected in surrounding area and likely to be introduced to the site)	Minimal consequence for low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Hordeum spp. Hare barley, Mediterranean barley	Widespread and often abundant throughout much of Calif.; less invasive in well-drained desert bajadas	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (periodic introductions are likely; potential for localized establishment on roadsides or periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
Pennisetum setaceum Fountain grass	Widely planted as an ornamental, and spreading throughout S. Calif . in surrounding habitats	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	High (periodic introductions are likely; ongoing potential for establishment on the site)	High; actively spreading in low desert region surrounding areas of persistent sources, e.g., Coachella Valley
Salsola spp. Russian thistle, tumbleweed	Widespread and often abundant throughout much of Calif.; including deserts	CDFA: C Cal IPC: Limited-Moderate Impacts/ Invasiveness/ Distribution: varies by species	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Schismus spp. Mediterranean grass, split grass	Widespread and often abundant throughout much of Calif.; including deserts	CDFA: C Cal IPC: Limited Impacts/ Invasiveness/ Distribution: B/C/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat

Table 1. Weeds of the Chuckwalla Valley Area.

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
Sisymbrium irio London rocket	Widespread and often common throughout much of Calif.; less common in deserts, mainly in seasonally slightly mesic or shaded sites	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	Occurs on the site and throughout the region; shaded areas and increased moisture (through dust control, etc.) likely to cause increased densities	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Stipa capensis (=*Achnatherum capensis*) Cape ricegrass, various other common names	Established in western Coachella Valley, apparently spreading rapidly in that area	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/D	High (periodic introductions are likely; ongoing potential for establishment on the site)	High; actively spreading in low desert region)
Tamarix spp. Tamarisk, saltcedar	Widespread and strongly invasive in riparian habitats throughout California and southwestern desert regions	CDFA: B Cal IPC: Limited-High Impacts/ Invasiveness/ Distribution: varies by species	High (seed introductions likely to be constant; potential for establishment in periodically mesic places such as evaporation pond margins, leaking tanks	Moderate; already widespread in deserts, but any new persisting seed source can become source of further invasion into natural riparin habitats
Tribulus terrestris Puncture vine	Widespread, especially roadsides, disturbed sites, and agricultural lands	CDFA: C Cal IPC: n/a	High (periodic introductions are likely; ongoing potential for establishment on the site)	Moderate; apparently adapted to regional soils/climate, though may require additional water

California Department of Food and Agriculture ratings (CDFA 2011):

A: Eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state;

B: Eradication, containment, control or other holding action at the discretion of the commissioner;

C: State endorsed holding action and eradication only when found in nursery; action to retard spread outside of nurseries at the discretion of the commissioner—reject only when found in a crop seed for planting or at the discretion of the commissioner

Cal-IPC ratings: (Cal-IPC 2006):

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed.

Moderate: These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, although establishment is generally dependent on ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

4.0 DESIGNATED BIOLOGIST RESPONSIBILITIES

The Designated Biologist, to be designated by the project owner (per Mitigation Measure [MM] Veg-1) will be responsible for managing and implementing weed monitoring and control efforts, as follows:

- Scheduling all vehicle and weed monitoring for all project components;
- Verify that vehicle inspections are conducted properly and completely;
- Review planting materials, erosion control materials, and other materials to ensure weed-free certification;
- Ensuring that each person assigned to monitoring for weeds is qualified in plant identification;
- Managing weed monitoring data;
- Prioritizing and implementing control efforts;
- Communicating with the project owner and resource agencies regarding weed management needs and priorities; and
- Preparing and submitting reports.

5.0 PREVENTION

Prevention or minimization of weed introduction and establishment will be implemented as follows:

Project Design and Construction. The extent of soil disturbance will be limited to the fenced project area and the minimum necessary area at each gen-tie tower, pull site, or other work area (per MM VEG-4).

Worker Environmental Training. Weed management will be incorporated as a part of mandatory training for all contractors, subcontractors, inspection personnel, construction managers, construction personnel, groundskeepers, maintenance personnel, and all individuals bringing vehicles or equipment onto the site during construction, operations, and decommissioning phases of the project. Training will include an explanation of the importance of weed management for natural resource values; specific requirements for vehicle washing; and other applicable measures to prevent the introduction and spread of weeds. Training will be incorporated into the project's Worker Environmental Awareness Program, as required by Mitigation Measure MM VEG-3.

Project workers will be required to inspect their clothing, shoes, and personal equipment, before arriving on the site, and to remove and dispose of weed seed and plant parts. The material will be bagged for disposal in a landfill.

Vehicle Wash Station. Vehicle ingress and egress will be limited to specific sites. All vehicles and heavy equipment entering the project area for the first time will be washed to eliminate or minimize introduction of weed seeds. In addition, any vehicle that has been operated off of paved roads or parking areas off the site (e.g., to shuttle workers or deliver materials and supplies) will be washed before re-entering the site. Vehicles delivering materials or personnel to a designated parking or laydown area will not require washing; however, these designated parking and laydown areas will be subject to weed monitoring and control (Sections 6 and 7, below).

An on-site wash station will be provided for most vehicle washing, near the entrance to the project site at Kaiser Road. Off-site washing may be acceptable only under the following conditions:

- The driver certifies that the vehicle has been fully washed, including the undercarriage, tires, insides of fenders, and other areas where mud or debris may collect, and that the interior has been swept or vacuumed;
- The driver provides a receipt or other verification of off-site washing;
- The vehicle is inspected on-site by a Biological Monitor (MM VEG-1) to confirm no accumulated mud or debris, or other material.

All vehicles arriving from off-site locations will be required to stop for inspection. Vehicles that have not been washed off-site will be washed before entering the site. Vehicles that were washed off-site but which appear to the inspector to have accumulations of mud or debris on the vehicle or equipment that could harbor weed seeds will be required to be washed again before entering the site. Heavy equipment entering the site on trailers must also be washed. The Biological Monitor will ensure that vehicles and equipment are free of soil and debris capable of transporting weed seeds, roots, or rhizomes before the vehicles and equipment are allowed to use access roads.

The wash station will be constructed with either a concrete wash pad or a completely cleared and compacted soil or gravel pad. Silt fencing, weed-free certified hay bales, or other means of trapping wash water, sediment, seeds, and other debris will be installed around the perimeter of the wash station. The wash station's location and proposed containment methods will be reviewed and approved by BLM prior to putting it into use.

Vehicles will be washed with high-pressure water equipment, concentrating on tracks, tires, and the undercarriage, including axles, frame, cross members, motor mounts, and on undersides of fenders, steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept or vacuumed and refuse will be disposed of in covered waste receptacles. Sediment accumulated from the washing area will be shoveled out regularly and placed in sealed containers for disposal in a landfill. If removal requirements exceed the capability of the wash station, equipment will be washed elsewhere before being allowed on the site.

A current written log of on-site vehicle washing and verification/inspection of off-site vehicle washing will be kept on the project site throughout the construction, operations, and decommissioning project phases. Electronic copies of the wash logs will be submitted with the annual reports (Section 8).

Weed-Free Materials. Any plant materials (such as hay bales, wattles, or other erosion control materials) brought onto the site shall be certified weed free. Any seed used in revegetation efforts or for erosion control will be certified weed free, and will consist only of plant species native to the Chuckwalla Valley. Additional products such as gravel, sand bags, silt fences, and mulch may also carry weeds. Such products will be obtained from suppliers who can provide weed free certified materials. Where feasible, mulch used for erosion control will be generated from native vegetation cleared from the site itself. The Designated Biologist will be responsible for checking deliveries and confirming certification of all materials.

Revegetation. enXco will reestablish soil stability and vegetation on temporarily disturbed sites by preparing and implementing a Vegetation Resources Management Plan (described in MM VEG-5). Reclamation, revegetation, or restoration shall occur on all temporarily disturbed areas, including, but not limited to, temporary access roads, construction work temporary lay-down areas, and staging areas.

6.0 MONITORING

6.1 Weed Identification, Mapping, and Data Management

Effective monitoring for weed infestations necessitates accurate identifications of weeds, and accurate distinction among native and non-native species, during early growth (i.e., before the plants set seed, to allow for early control or eradication). All weed monitoring will be conducted by a biologist familiar with the regional flora and familiar with seedling and early vegetative growth forms of regional weeds (Table 1) and common native species. All monitoring reports will include comprehensive species lists of all native and non-native species observed in the survey area. Any species not recognized in the field will be collected and identified using regional identification manuals (e.g., Baldwin et al 2002). Botanists will make pressed specimens of seedling, early-flowering, and mature samples of native and non-native species for further reference. Any species not readily identifiable using regional identification manuals will be preserved as a labeled specimen and forwarded to a recognized herbarium for identification by experts.

For certain weed species already known from the project site, or that are ubiquitous in the region, infestations will be recorded where the density and extent is greater (based on visual estimation) than baseline abundance in the surrounding natural landscape. This will apply only to the following 5 species (see Table 1):

- Saharan mustard
- Red brome
- Redstem filaree
- Russian thistle (tumbleweed)
- Mediterranean grass (split grass)

Baseline abundance will vary from year to year, depending on rainfall. Surveys to date have not identified any infestations at the project site that exceed the density and extent of those on surrounding lands; however, because of the potential for baseline abundance to vary, the Designated Biologist and qualified monitors will develop brief guidelines to estimate baseline abundance for each seasonal monitoring period. For all other non-native species, every occurrence documented during monitoring efforts will be recorded and targeted for follow-up control.

The locations of all weed infestations noted during monitoring efforts will be documented using hand-held global positioning system (GPS) units, and short descriptions of the location, extent, abundance, and phenology of each weed species (if known) will be recorded. Locations of any species (other than the 5 above), including any species not previously known from the site will also be flagged in the field to enable precise control efforts or other follow-up measures (see Section 7). All monitoring data will be retained and managed by the Designated Biologist in a spreadsheet or other data management software, along with follow-up data regarding control efforts, and follow-up monitoring.

6.2 Scheduling and Field Methods

Monitoring for weeds will be conducted throughout the entire project area, including the solar generator site (including all ancillary facilities, parking areas, administrative sites, and other related facilities); the off-site administration building and adjacent project-related facilities; all linear project components (gen-tie line; underground infrastructure connection between southern and northern PV generation fields); and throughout a 100-foot buffer area in any undisturbed lands adjacent to any project area.

Monitoring will be conducted twice annually throughout the construction, operations, and decommissioning phases of the project, and for a minimum 3-year period following decommissioning, or until any high-priority target weed species have been effectively controlled or eradicated. Complete weed-monitoring surveys will be conducted once in early spring (February or March) to detect winter-germinating species before they set seed; and once in late summer or early fall, to detect summer-germinating species. Depending on timing and amount of annual rainfall on the site (per the data collected at the on-site meteorological station) survey schedules may be adjusted or suspended, based on recommendation of the Designated Biologist and written agreement of BLM, California Department of Fish and Game (CDFG), and US Fish and Wildlife Service (USFWS).

Full-coverage weed monitoring of the project area will be conducted by walking over all access routes, parking areas, lay-down areas, or other disturbed areas (including internal roads throughout the site, the gen-tie line access route, the Kaiser Road right-of-way (ROW) on the underground infrastructure connection between the two solar generator areas, and the off-site administrative building) and throughout a 100-foot buffer in natural lands surrounding the sites. Special emphasis will be given to areas vulnerable to colonization including: roadsides, soil stockpiles, wash stations; previously disturbed areas, areas of prior weed infestation, areas near known weed infestations, and all areas with disturbed soils.

Along the project's linear features, and in the buffer areas surrounding project areas, monitors will also record locations of special status plant occurrences or any other biological resources where herbicide application would be inappropriate.

In addition, the Designated Biologist or other qualified Biological Monitor (per MM VEG-1) will periodically monitor all water sources or other wet areas on the site to check for water leaks and to determine if any weeds have become established. These areas will include, but will not be limited to:

- Water tanks;
- Storage and evaporation ponds;
- Roadsides where dust control water may collect;
- Water pipelines on the ground surface;
- Wells and associated facilities;
- Bathrooms, eating areas, wash stations, or any other sites where workers may use water.

Monitoring of these sites will be conducted monthly at minimum, and records of each monitoring date and results will be maintained in the project data files.

7.0 WEED CONTROL

7.1 Control Strategies and Prioritization

Weeds will be controlled according to abundance and extent of infestations and potential threat to offsite habitat. The control strategy for weeds that are ubiquitous in the region (e.g., red brome, redstem filaree, and Saharan mustard) will be suppression, with the objective of maintaining densities and extent at or below baseline levels. Strategies for weeds that are actively spreading in the region (e.g., Cape ricegrass), species that are strongly invasive in riparian habitats (e.g., saltcedar), or species altogether new to the region will be immediate eradication if possible, and containment until eradication is complete.

Infestation sites flagged during monitoring (Section 6, above) will be targeted for control as early as feasible, to prevent weeds from going to seed, reestablishing their seed bank, and spreading farther. Until control is implemented, the infestations will be surrounded by temporary orange vinyl construction fencing to prevent vehicles or pedestrians from entering the area and risking further spread of the targeted weeds. The Designated Biologist will be responsible for ensuring that temporary fencing is in place.

Specific control measures will be planned and implemented for each infestation. The Designated Biologist will review and approve each control measure prior to its implementation.

Weed infestations on linear project features; in high-traffic areas such as project staging areas, operating areas; and along access routes shall be high priority for control. Weeds that are common within the site and surrounding area will generally be given low priority where they occur in relatively low densities or in the interior of the area, distant from surrounding native vegetation. However, these infestations will be given higher priority if abundance is high enough to create a significant new propagule source that may increase weed infestation densities on adjacent lands.

7.2 Mechanical Control

Where weed infestations are small, or where they are adjacent to native vegetation or other sensitive biological resources (e.g., the site perimeter or in buffer areas), mechanical control methods will be implemented. Mechanical control may be appropriate for any of the three control strategies (suppress, contain, or eradicate), depending on the species and extent of the infestation.

Mechanical control methods include hand pulling of weeds and the use of hand or power tools to uproot, girdle, or cut plants. Lever arm tools such as Weed Wrench™ and Root Jack™ may be used to pull out woody shrubs such as tamarisk. Hand removal by pulling is appropriate when the plants are large enough that they will not break and leave the roots in the soil, where they would be likely to resprout. For control of small numbers of rooted woody species, this is the most effective method.

Hand pulling is less effective for weed species that spread via rhizomes or roots (e.g., Bermuda grass). Hoeing or other methods may be effective for these infestations, by carefully avoiding any adjacent native plants. Hoeing or other mechanical disturbance should not be used if weeds have set seed, to avoid further seed dispersal. Hoeing works best on patches of small weeds and on weeds that have a single root mass. It is less effective on larger weeds that can regenerate from cut roots.

Power weed-whips can be used for removal of tall annual species (such as Saharan mustard) but they should not be used on weeds approaching maturity, unless all cut material is carefully collected and

removed from the site. Even seeds that have not matured at the time of cutting can finish maturing on the cut material, and then propagate the infestation.

Any plant material removed by mechanical control methods will be bagged and removed from the site, and transported to a landfill in a covered vehicle. No mulch or green waste from weed material will be stored or disposed of on the site.

7.3 Overview of Chemical Control

Where infestations are too large for effective mechanical control, and are not adjacent to native vegetation or other sensitive biological resources, herbicides generally will be used for control. Herbicides may be used for any of the three control strategies (suppress, contain, or eradicate), depending on the species and extent of the infestation.

Only certain herbicides are approved for use by the US Environmental Protection Agency (EPA), and only a subset of these are approved for use on BLM public land in California (Appendix C). This section describes the permitting and regulatory requirements relevant for chemical control of invasive weeds, the types of herbicides available, general application and handling procedures, specific herbicide application methods for pre- and post-emergent control.

PERMITTING AND REGULATORY REQUIREMENTS. Contractors applying herbicides must possess required permits from the state and Riverside County Agricultural Commissioner (as applicable). Permits may contain additional terms and conditions in addition to those described in this plan. Only a State of California and federally certified contractor will be permitted to perform herbicide applications. All herbicides will be applied in accordance with applicable laws, regulations, and permit stipulations. Only herbicides and adjuvants approved by the State of California and federal agency for use on public lands will be used within or adjacent to the project site. A list of approved herbicides and adjuvants is provided in Appendix C.

Guidelines for the use of approved herbicides are presented in the Chemical Pest Control Manual (BLM, n.d.). These guidelines require submittal of a pesticide use proposal (PUP) and pesticide application records (PAR) for the use of herbicides on BLM lands. A sample form required for the submittal of a PUP is included in Appendix D and a sample PAR form is included in Appendix E.

TYPES OF HERBICIDES. Herbicides can be characterized as pre-emergent, post-emergent, selective, and non-selective. A pre-emergent herbicide is one that generally controls un-germinated seeds by inhibiting germination. Post-emergent herbicides are generally lethal to plants after germination, but not to seeds. A few herbicides have both pre- and post-emergent activity. Herbicides can be selective or nonselective. If an herbicide is selective, it will affect some species of plants and not others, e.g., monocots (grasses) vs. dicots (broadleaf plants). A non-selective herbicide is one that is lethal to any plant species to which it is applied.

Herbicides kill plants through contact or systemic action. Contact herbicides are most effective against annual weeds and kill only the plant parts to which the chemical is applied. Systemic herbicides are absorbed either by roots or foliar parts of a plant and are then translocated within the plant. Although systemic herbicides can be effective against annual and perennial weeds, they are particularly effective against established perennial weeds. Pre-emergent herbicides inhibit germination of annuals from seed, but generally do not control perennial plants that germinate from bulbs, corms, rhizomes, stolons, or other vegetative structures. Common herbicide classes include the following:

Dinitroaniline Type: Examples of this class are pendimethalin (Weedgrass™), trifluralin (Treflan™), benefin (Balan™), and combinations of these. These herbicides provide for pre-emergence control of annual grasses and other annuals. Some of these herbicides should not be applied in temperatures above 90 degrees Fahrenheit (°F). All of these herbicides need to be watered into the soil for proper activation. Some persist for several months.

Dithiopyr (Dimension™): A selective herbicide primarily used for pre-emergence annual grass control in established turfgrass. However, it can be used for post emergence control of young grass seedlings. Dithiopyr breaks down in soil due to chemical and microbial degradation.

Glyphosates: The most commonly used post-emergent, non-selective herbicides are in a group called glyphosates. Glyphosate (e.g., Rodeo™, Roundup™, and Accord™) is a nonselective, systemic herbicide that is effective on many annual and perennial plants. Glyphosate is most effective if the entire plant is covered. Glyphosate should not be applied when the temperature exceeds 90°F. Glyphosate has a relatively low degree of oral and dermal acute toxicity (EPA 1993). It is considered to be immobile in soil and readily degrades by soil microbes. Glyphosate is minimally toxic to birds, fish, aquatic invertebrates, and honeybees (EPA 1993).

APPLICATION AND HANDLING. It is the responsibility of the herbicide user to observe all directions, restrictions, and precautions on herbicide labels. Store all herbicides in original containers with labels intact and behind locked doors. Keep herbicides out of the reach of children. The following general precautions will be implemented for herbicide application:

- Use herbicides at correct label application rates and intervals to avoid illegal residues or injury to plants and animals.
- Use herbicides carefully to avoid drift or contamination of non-target areas.
- Surplus herbicides and containers should be disposed of in accordance with label instructions to prevent contamination of water and other hazards.
- Follow directions on the herbicide label regarding restrictions as required by state or federal laws and regulations.
- Avoid any action that may threaten a rare, threatened, or endangered species or its habitat.

LIMITATIONS. Herbicide applications must follow EPA label instructions. Application of herbicides will be suspended when any of the following conditions exists:

- Wind velocity exceeds 6 miles per hour (mph) during application of liquids or 15 mph during application of granular herbicides.
- Snow or ice covers the foliage of weeds.
- Precipitation is occurring or is imminent.
- Air temperatures exceed 90°F.

TRANSPORT AND MIXING. Herbicides will be transported within the project site with the following provisions:

- Only the quantity needed for that day's work will be transported at any given time.

- Concentrate will be transported in approved containers only and in a manner that will prevent tipping or spilling, and in a location that is isolated from the vehicle's driving compartment, food, clothing, and safety equipment.
- Mixing will occur over a drip-catching device, and at a distance greater than 200 feet from open or flowing water, wetlands, or other sensitive resources. No herbicides will be applied at these areas unless authorized by appropriate regulatory agencies.
- Herbicide equipment and containers will be inspected for leaks daily. Disposal of spent containers will be in accordance with the herbicide label.
- During the operations phase of the project, herbicides will be stored only in cabinets of approved design and will be under lock and key.

SPRAY METHODS. Vehicle-mounted sprayers (e.g., handgun, boom, and injector) will be used only in open areas that are readily accessible by vehicle. Hand application methods (e.g., backpack spraying) that target individual plants will be used to treat small or scattered weed populations or in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically throughout treatment to ensure proper application rates.

HERBICIDE SPILLS AND CLEANUP. Reasonable precautions will be taken to avoid herbicide spills. In the event of a spill, immediate cleanup will be implemented. Contractors will keep spill kits in their vehicles and in herbicide storage areas to allow for quick and effective response to spills. The following items are to be included in the spill kit:

- protective clothing and gloves
- absorptive clay, "kitty litter," or other commercial adsorbent
- plastic bags and bucket
- shovel
- fiber brush and screw-in handle
- dust pan
- caution tape
- highway flares (use on established roads only)
- detergent

Response to herbicide spills will vary with the size and location of the spill, but general procedures include the following:

- traffic control
- dressing the cleanup team in protective clothing
- stopping the leaks
- containing the spilled material
- cleaning up and removing the spilled herbicide or contaminated adsorptive material and soil
- transporting the spilled herbicide and contaminated material to an authorized disposal site

HERBICIDE APPLICATION METHODS BY PLANT TYPE. Controlling post-emergent herbaceous species:

- Apply a foliar application of Round-up™ or Rodeo™ on each plant at a minimum rate of 2.5 percent (plus 2 percent by volume [V/V] of nonionic surfactant). Apply Roundup™ in upland areas. Apply Rodeo™ in areas that are in immediate contact with wetlands and/or other water bodies. The Designated Biologist will determine the appropriate herbicide to use at each location.
- Provide applications on a spray-to-wet basis with coverage uniform and complete.
- Avoid contact with established native shrub and grass species.
- Temporarily discontinue work in the event of gusty winds or winds in excess of 6 mph.
- Temporarily discontinue in the event of rainfall.
- Ensure applicators possess current pest control licenses valid in the State of California and wear gloves, masks, and long sleeves as protection from chemical injuries.
- Leave sprayed vegetation undisturbed for 7 days until visible effects of herbicide application are present such as wilted and brown foliage.
- If any seed reached maturity, remove all treated plant materials by placing all noxious weed material potentially containing propagules in durable bags. Bags shall be sealed prior to transport. Noxious weed material shall be disposed of by covered transport to an appropriate landfill.

Controlling post-emergent woody species:

- Cut sprouts or woody stems to a height of 12 inches or less above ground and remove all aboveground debris for disposal at a suitable landfill.
- Apply Round-Up™ or Rodeo™ at a 100 percent rate to the cut sprouts or stems within 2 minutes of cutting. Use Round-up™ in upland areas. Use Rodeo™ in areas that are in immediate contact with wetlands and/or other water bodies. The Designated Biologist will determine the appropriate herbicide to use at each location.
- Cover all loads with a tarpaulin to transport vegetation trimmings.
- Apply follow-up foliar applications as described in the previous section to stem regrowth that occurs after initial control effort.
- Continue monitoring cut stems for as long as necessary to ensure complete mortality.

Controlling seed banks with pre-emergent herbicides:

Pre-emergent herbicides may be used in areas that have repeated infestations of annual weeds, with evidence of a persisting seed bank. These areas will be sprayed with pre-emergent herbicides during appropriate pre-germination periods. Application will follow the spray application guidelines described above for post-emergent herbaceous species.

7.4 Proposed Herbicide Application

The primary use of herbicides at the DHSP will be for control of invasive annual herbaceous upland weeds expected to propagate on disturbed soils throughout all project facilities. The most common annual upland weeds are likely to be Saharan mustard, red brome, redstem filaree, and Mediterranean

grass. Herbicide treatment will be utilized within the solar generator site and related facilities, on disturbed soils at the gen-tie structures and other work sites (only as compatible with revegetation efforts). Herbicides will not be utilized within or adjacent to any undisturbed native vegetation, e.g., buffer areas beyond the perimeter of the DHSP site or disturbed work areas, or margins of work sites on the gen-tie line. Herbicide treatments conducted on the gen-tie line or at any other location outside the project's desert tortoise exclusion fence would use only the herbicide Glyphosate, which has been shown to have low toxicity to test animals.

The method of herbicide treatment for the control of upland weeds would not be expanded beyond those herbicides analyzed in the BLM's 2007 *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS). Under this alternative, ground applications of herbicides approved for use in California such as Glyphosate-, Imzazpyr- or Clopyralid-based herbicides would be used at application rates consistent with the label and the 2007 PEIS. Application methods consistent with the label would be used to treat upland weeds. These methods would consist of using a hand held compression sprayer or backpack sprayer. All treatments would be supervised or overseen by a certified pesticide applicator who is knowledgeable in plant identification and familiar with proper herbicide application techniques.

Access to the treatment sites would be by existing roads or new roads to be constructed as a part of the DHSP. No additional access routes would be constructed for weed management, and there would be no vehicle access off established roads. Herbicide, equipment, and personnel would be brought to treatment sites by a truck, van, or car.

All herbicide application would conform to requirements of DHSP DEIS MMs quoted below:

Mitigation Measure HZ-1.5 (Use licensed herbicide applicator) requires that:

> *"During the construction and operational phases of the project, the contractor or personnel applying herbicides shall have all the appropriate State and local herbicide applicator licenses and comply with all State and local regulations regarding herbicide use. Herbicides shall be mixed and applied in conformance with the product manufacturer's directions. The herbicide applicator shall be equipped with splash protection clothing and gear, chemical resistant gloves, chemical spill/splash wash supplies, and material safety data sheets (MSDS) for all hazardous materials to be used. To minimize harm to wildlife, vegetation, and waterbodies, herbicides shall not be applied directly to wildlife, products identified as non-toxic to birds and small mammals shall be used if nests or dens are observed, and herbicides shall not be applied within 50 feet of any surface waterbody when water is present. Herbicides shall not be applied if it is raining at the site, rain is imminent, or the target area has puddles or standing water. Herbicides shall not be applied when wind velocity exceeds 10 miles per hour. If spray is observed to be drifting to a non-target location, spraying shall be discontinued until conditions causing the drift have abated.*
>
> *Prior to any herbicide application, the herbicide applicator shall contact the Environmental Monitor to show where work will be done and to receive information/ training about potentially sensitive biological resources that may be within the area to be sprayed and methods to apply to minimize those impacts. A Worker's Training Manual shall be prepared and include a provision on herbicide application. Once facility operation commences, this Manual shall be given to any herbicide applicator to be reviewed prior to spraying.*
>
> *Monitoring: Compliance will be verified by onsite environmental monitor during construction, and by Operations Plant Manager.*

Applicant Measure WR-1 (Manage Hazardous Materials and Use SPCC Plan) requires that the applicant or its agents will take numerous measures to manage hazardous materials:

- *Train construction staff in the management of hazardous materials and use of spill control and cleanup equipment;*
- *Have a clear chain of command within the organizational structure with responsibility for implementing, monitoring, and correcting Best Management Practices (BMPs);*
- *Cover and contain hazardous materials so that they are not in contact with precipitation or runoff;*
- *Store hazardous materials in one or more central areas, and institute rules requiring all hazardous materials to be secured at the end of the day;*
- *Maintain good inventory records; store hazardous liquids and dispensing equipment in secondary containment;*
- *Maintain adequate quantities of spill containment and response equipment at readily accessible points throughout the site;*
- *Identify the worst case and most likely spill scenarios, and provide spill response equipment adequate to respond to these scenarios;*
- *Use chemicals presenting the least environmental hazard wherever possible;*
- *Store the smallest quantities of hazardous materials possible on the site;*
- *Maintain site security to reduce vandalism;*
- *Require all contractors to abide by the program BMPs and to identify any hazardous materials and specific BMPs pertaining to their trade or activity.*
- *The SPCC Plan for the site would address storage of mineral oil contained in transformers. A SPCC Plan is required when 10,000 gallons or more of mineral oil in electrical equipment is contained on site, or when 1,320 gallons of petroleum is stored on the site, although an SPCC Plan can be voluntarily implemented for lesser quantities. The SPCC Plan would address methods and procedures for managing these products, lighting, security, containment requirements, training requirements, staff responsibilities for inspecting storage and dispensing equipment; and equipment and procedures for responding to a spill or release of stored petroleum products.*
- *Riprap increases surface roughness and slows runoff velocities, decreasing sediment transport, and increasing flow depth. Riprap would be used in conjunction with decompaction of soil, as riprap would not mitigate flow or volume.*
- *Check whether dams can be constructed to address specific post-development hydraulic characteristics, if needed.*

Mitigation Measure WAT-9 (Accidental Spill Control and Environmental Training) requires:

> *"Prior to the onset of construction of the project, the following specifications must be provided by the Applicant to the BLM: define areas where hazardous materials would be stored, where trash would be placed, where rolling equipment would be parked, fueled and serviced, and where construction materials such as reinforcing bars and structural steel members would be stored. The Applicant shall also prescribe hazardous materials handling procedures for reducing*

the potential for a spill during construction, and shall include an emergency response program to ensure quick and safe cleanup of accidental spills. These specifications may be included in the Surface Water Protection Plan (SWPP) described in MM WAT-4, or may be included as a separate plan. Compliance will be verified by the Environmental Monitor at the time of construction."

Mitigation Measure MM VEG-8 includes numerous measures for streambed protection, including the requirement that that "Mixing of herbicides and adjuvants in the field would be conducted outside of jurisdictional wash habitat and in areas that would not allow drainage to a water body in the case of a spill. This is consistent with the SOP for water resources."

The mitigation measures quoted above are consistent with applicable Standard Operating Procedures (SOPs) and mitigation measures contained in the PEIS. If cases of any conflict between project mitigation measures and SOPs, the more restrictive of the two standards will apply.

There are no riparian, wetland, or aquatic habitats on the project site, and mitigation measures require that water overflow from tanks, pumps, or other sources must be monitored and controlled. Therefore, there will be little opportunity for weeds that are invasive in these habitats to become established on the site. In the even that salt cedar or similar species colonize around project facilities, the weed monitoring program (Section 6) will identify these plants before they become significant infestations, and control will generally be by mechanical means (pulling). In the unlikely event that salt cedar becomes well-enough established that mechanical pulling is ineffective, then cut-stump treatment using Imazapyr or Triclopyr may be implemented, and only away from any open water. This IWMP does not propose to use herbicides in or around open water at any time.

Table 2 provides an herbicide application matrix that outlines herbicides, application rate treatment method(s), and treatment timeframe for a variety of weeds that could occur on site.

Table 2. Herbicide Application Matrix

Weed Species	Treatment Timeframe	Treatment Method(s)	Active Ingredient / Application Rate
Salt cedar (tamarisk)	Year-around	Cut stump or foliar	Imazapyr (3 qt./ acre) or Triclopyr (2 gal./acre)
Saharan mustard	Early spring	Foliar	Glyphosate (4 qt./ acre)
Camelthorn	Spring or fall	Foliar	Imazapyr (3-4 pt./ acre)
Russian thistle	Early spring	Foliar	Imazapyr (2-3 pt./ acre) or Glyphosate (4 qt./ acre)
Common annuals, including red brome, redstem filaree, and Mediterranean grass	Spring	Foliar	Glyphosate (1 qt./ acre)

7.5 Potential Effects of Herbicide Use

Herbicides pose risks to terrestrial and aquatic vegetation. Most aquatic herbicides, and several terrestrial herbicides, are non-selective and could adversely impact non-target vegetation. Accidental spills and herbicide drift from treatment areas could be particularly damaging to non-target vegetation on BLM land, and crop plants or other vegetation found on privately-owned lands near treatment areas. Herbicides may also pose risks to terrestrial or aquatic animal species. Herbicides that persist on site could adversely affect animals that feed on target plants or are exposed to the herbicides (e.g., by

digging or rolling in treated soil). Accidental spills and herbicide drift from treatment areas could reach non-target vegetation or habitat on public or private lands near treatment areas. Section 7.4 includes specific measures to avoid application at project perimeters, in the vicinity of native vegetation or special-status plants, and to avoid overspray or spillage in any areas. In addition, Section 7.4 describes proposed usage and formulations of herbicides at the DHSP. Use of herbicides would be in accordance with the measures and standard operating procedures in the BLM's Herbicide PEIS. As described in Chapter 1 of the DHSP DEIS, that document is tiered to the Herbicide PEIS. Complying with the measures and standard operating procedures in the Herbicide PEIS, MM PHS-9, as well as other limitations described above, would avoid potential adverse effects of herbicides to native vegetation and special-status plants. Risks to vegetation from proposed herbicides would be similar to, or less than, risks from currently-available herbicides. Buffer zones would be used to reduce the risks to vegetation from herbicide treatments.

8.0 REPORTING

Throughout the construction, operation, and decommissioning phases, and for a minimum of 3 years following completion of decommissioning, the Designated Biologist will be responsible for providing annual Weed Management Reports to the BLM, CDFG, USFWS, and JTNP for review and approval. In addition, the Designated Biologists will be responsible for providing a short memo to each agency after completing each of the two annual monitoring efforts (early spring and late summer/early fall). These memos will simply summarize the results of monitoring and briefly describe planned (or completed) control efforts, and highlight any new or unexpected findings, particularly any weeds new to the site or to the area.

Each annual report will include the following contents:

- The location, species, extent, and density of weeds on the site. Data will include maps, text, tabular data, and photographs of any significant findings (previously unrecorded weed species, or any dense weed infestations resistant to control and threatening to spread off-site);
- Management efforts, including date, location, type of treatment implemented, results, and ongoing evaluation of success of treatment; and
- Information on implementation and success of preventative measures, including status of equipment wash facilities, list of workers that have completed the worker environmental training program, and copies of vehicle wash logs.

9.0 LITERATURE CITED

Baldwin, B. G., S. Boyd, B. J. Ertter, R. W. Patterson, T. J. Rosatti, D. Wilken, and M. Wetherwax (eds.). 2002. The Jepson Desert Manual: Vascular Plants of Southeastern California. University of California Press, Berkeley, California. 624 pp.

BLM (Bureau of Land Management). 2007. Final programmatic environmental impact statement: vegetation treatments using herbicides on Bureau of Land Management lands in 17 western states. BLM, Washington, DC. Online: http://www.blm.gov/wo/st/en/prog/more/veg_eis.html.

_____. 2011a. Notice of Intent to prepare an Environmental Impact Statement for the proposed enXco Desert Harvest Solar Farm Project, Riverside County, CA, and Possible Land Use Plan Amendment. Federal Register 76:57073-57074 (15 Sep).

_____. 2011b. Desert Sunlight Solar Farm Project: California Desert Conservation Area plan amendment and final environmental impact statement. BLM Palm Springs South Coast Field Office, Palm Springs, California.

_____. 2011c. Record of Decision – Desert Sunlight Solar Farm Project and Amendment to the California Desert Conservation Area Land Use Management Plan, Riverside County, California. Palm Springs South Coast Field Office Palm Springs, California. (August).

_____. 1980 (amended 1999). California Desert Conservation Area Plan. U.S. Department of the Interior, Bureau of Land Management, California Desert District, Riverside.

_____. n.d. BLM Manual 9011 - Chemical Pest Control.

BLM (Bureau of Land Management) and CDFG (California Department of Fish and Game). 2002. Proposed Northern & Eastern Colorado Desert Coordinated Management Plan and Final Environmental Impact Statement. Prepared by the BLM California Desert District Office and the CDFG Inland, Desert and Eastern Sierra Region. July.

Bossard, C. C., J. M. Randall, and M. C. Hoshovsky (eds.). 2000. Invasive Plants of California's Wildlands. University of California Press, Berkeley. 360 pp. [pp. 18-19].

CDFA (California Department of Food and Agriculture). 2011. Integrated Pest Control. http://www.cdfa.ca.gov/plant/ipc/index.html

CDFG (California Department of Fish and Game). 2010a. List of natural communities. Vegetation Classification and Mapping Program, CDFG, Sacramento. http://www.dfg.ca.gov/biogeodata/vegcamp/natural_communities.asp.

Cal-IPC. 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, CA.

EPA (Environmental Protection Agency). 1993. *Glyphosate Reregistration Eligibility Decision*. p. viii. http://www.epa.gov/REDs/old_reds/glyphosate.pdf

Holland, R. F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished report, Non-game Heritage Program, California Department of Fish and Game, Sacramento. 156 pp.

Laudenslayer, W. F. 1988. Desert riparian; desert wash. Pages 88-89 and 112-113 *in* K. E. Mayer and W. F. Laudenslayer, eds., Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection, Sacramento, California. 166 pp.

Laudenslayer, W. F. and J. R. Boggs. 1988. Desert scrub. Pages 114-115 *in* K. E. Mayer and W. F. Laudenslayer, eds., Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection, Sacramento, California. 166 pp.

Lovich J. E., D. Bainbridge. 1999. Anthropogenic degradation of the southern California desert ecosystem and prospects for natural recovery and restoration. Environmental Management 24:309-326.

NISC (National Invasive Species Council). 2008. 2008-2012 National Invasive Species Management Plan. 35 pp. Online: http://www.invasivespeciesinfo.gov/council/mp2008.pdf.

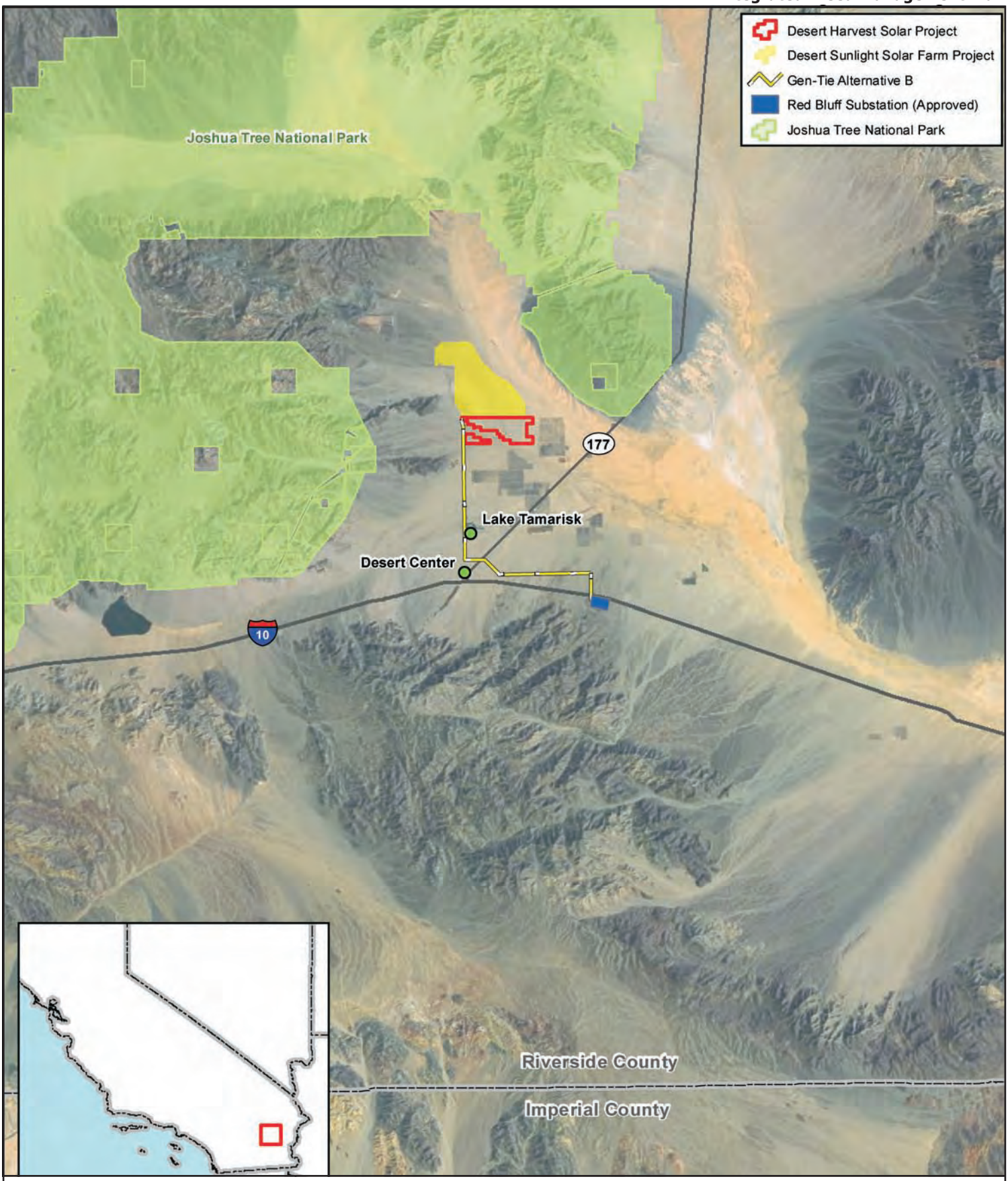
Sawyer, J. O., T. Keeler-Wolf, and J. M. Evans. 2009. Manual of California Vegetation, 2nd ed. California Native Plant Society, Sacramento, California. 1300 pp.

Schoenherr, A. A. and J. H. Burk. 2007. Colorado Desert vegetation. Pages 657-682 *in* M. G. Barbour, T. Keeler-Wolf and A. A. Schoenherr, eds., Terrestrial Vegetation of California, 3rd ed. University of California Press, Berkeley, California.

Zouhar, K., J. K. Smith, S. Sutherland, and M. L. Brooks. 2008. Wildland Fire in Ecosystems: Fire and Nonnative Invasive Plants. General Technical Report RMRSGTR-42-Vol. 6, USDA Forest Service Rocky Mountain Research Station, Ogden, Utah: 355 pp

Appendix A

Figures



Aspen Environmental Group

0 5 10 Miles

Figure 1
Regional Location

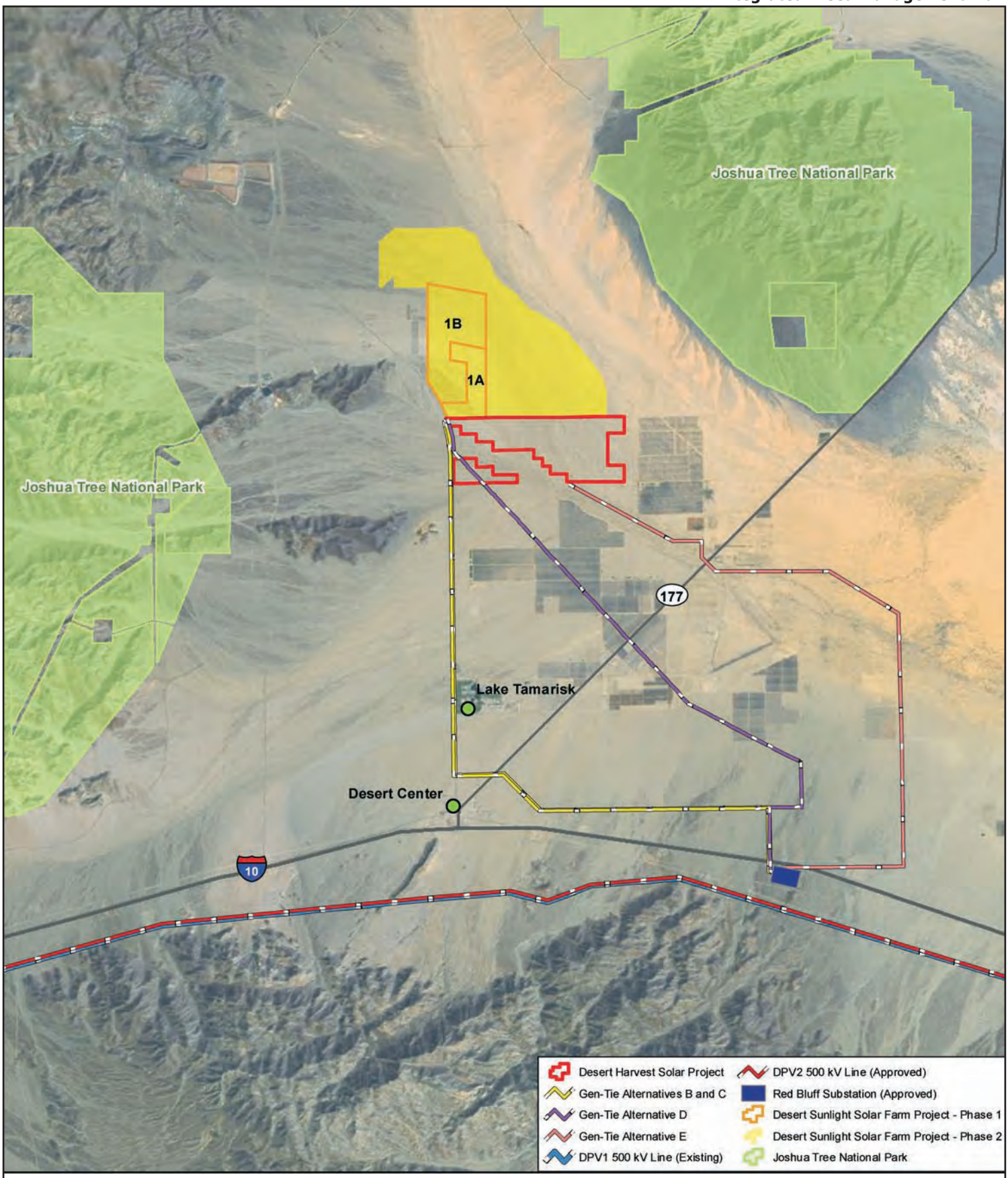


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Figure 2
Project and Vicinity

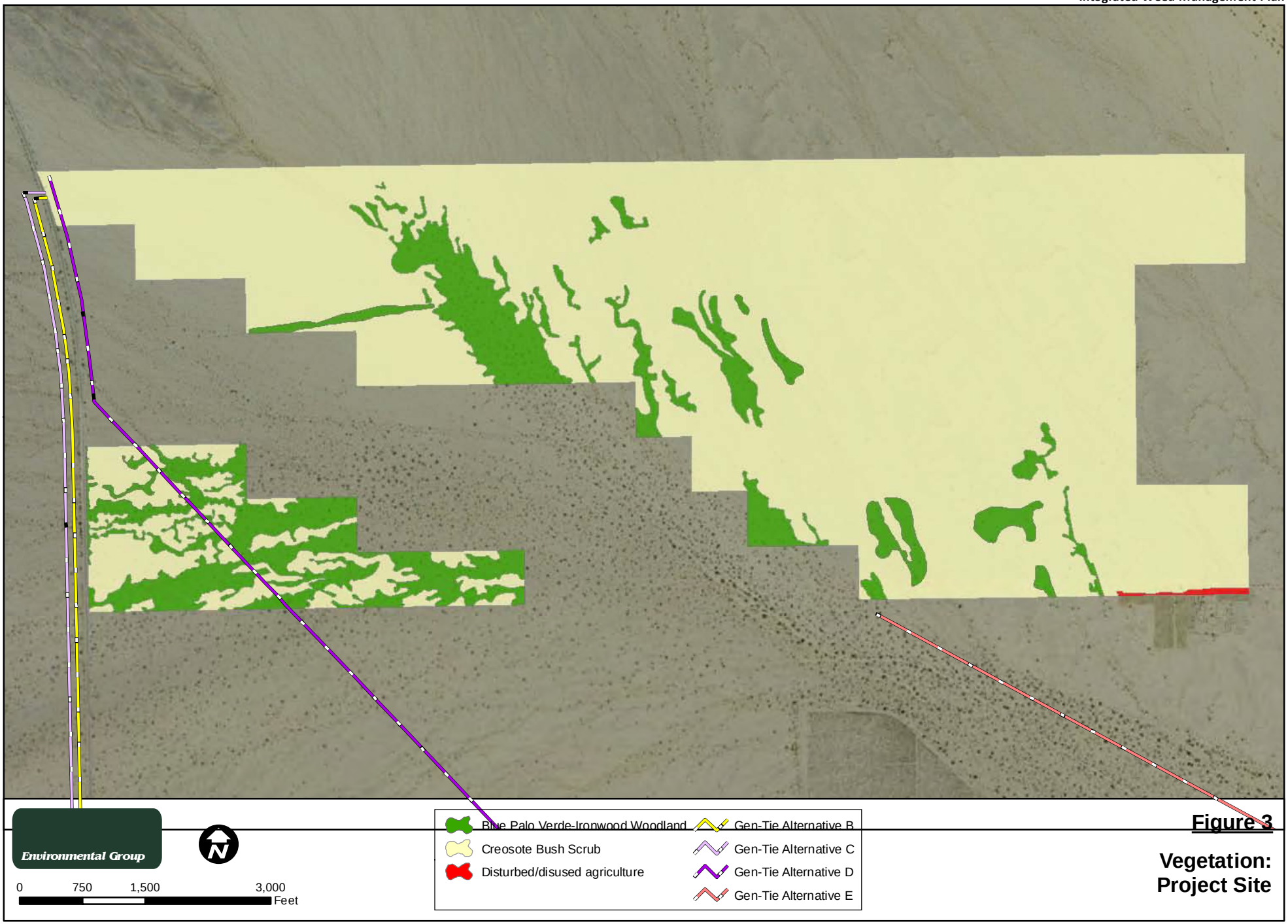

Figure 3

Vegetation: Project Site

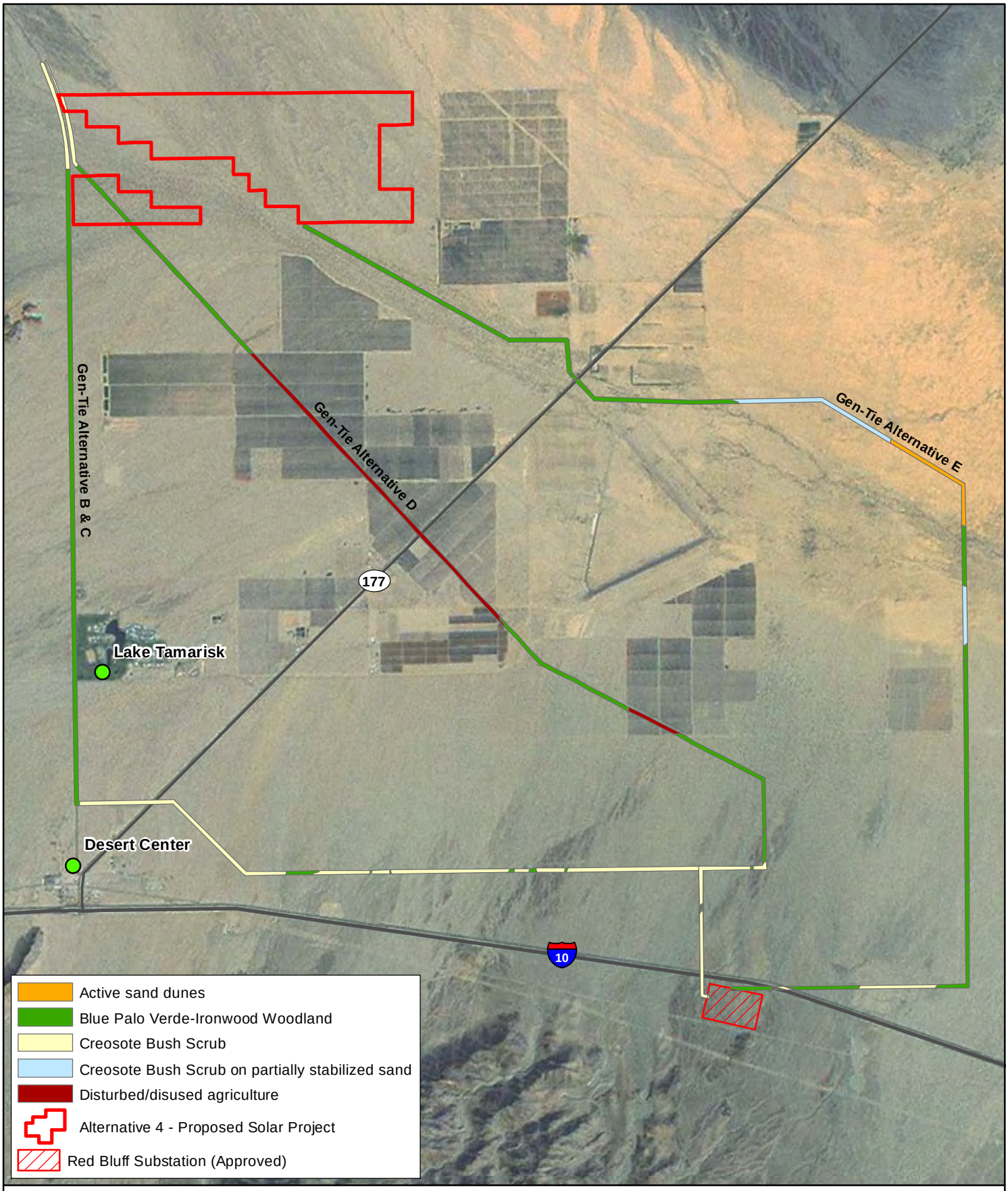

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Figure 4

Vegetation:
Gen-Tie Line Alignments

Appendix B

Approved Herbicides and Adjuvants

	Appendix B Summary of Invasive Plant Species within the DHSP Study Area and the potential effects of herbicide use on vegetation and wildlife.*						
	Saharan Mustard (*Brassica tournefortii*) **Cal-IPC Rating: High**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Saharan mustard is an annual herb native to Mediterranean climates of North Africa, the Middle East, and southern Europe that has invaded the low elevation deserts of the southwest United States—southern Nevada, southern California, Arizona, New Mexico, and west Texas. It typically occurs in sandy or gravelly soil, although it is also able to grow on alluvial fans and rocky hillsides. Unlike many invasive plants it does not require disturbed soil to become established. Saharan mustard is a robust, fast-growing annual with a basal rosette of leaves and densely branching stems with stinging hairs (University of Nevada Cooperative Extension [UNCE] 2002). The basal rosette can grow to 3 feet in diameter. The erect stem can be 4–40 inches tall and highly branched, and forms a "tumbleweed" when the plant dries and the stem breaks off. Seeds germinate following the first winter rains; the plants flower as early as December or January, and may set seed as early as February. The flowers are small and pale yellow. Each long fruit pod can contain up to 9,000 1 millimeter-wide seeds that have a very high germination rate.	Saharan mustard was documented throughout the study area at low densities. Minimal consequence to native vegetation for chronic low-density infestation; high-density infestation could cause further invasion in local naturally disturbed soils such as washes and windblown sand. Primary impacts to native vegetation would be competition for water and interference with native seed germination and establishment, should Saharan mustard densities become high. Saharan mustard forms dense stands that crowd out native annuals and shrub seedlings. It has a competitive edge due to its early phenology, which allows it to establish roots and collect soil moisture before later-germinating native species.. Low-density infestations likely have little impact on wildlife, but at higher densities Saharan mustard could compete with and reduce the productivity of native plants, thereby altering the availability of forage plants and the characteristics of their habitat structure. It also promotes the spread of fire.	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to flowering.	Minimize the creation of new disturbed areas. Control of Saharan mustard along roadsides will help to prevent its spread to new areas. Avoid driving vehicles or walking through infested areas once this plant has gone to seed, especially following a rain event, as the mucilaginous coating on the seeds allow them to stick to objects and be transported. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Hand-hoeing seedlings or digging out small plants is an effective means of controlling this species in areas where the infestation is small and contained. It is especially effective if the invasion is new and a seed bank has not accumulated. Any physical removal should be conducted prior to the plant's producing seed. Any vegetative material should be bagged, carried off-site, and disposed of in a responsible and legal manner to prevent the spread of weeds. Care should also be taken during transport of the materials to ensure they are secure (and do not, for example, fly out of the back of a truck). A site should be revisited in order to catch later-germinating plants, especially if there have been multiple rain events. Weed whipping is not recommended as the plants will simply continue to grow from the remaining portion of the plant (UNCE 2002). Plants growing in areas with lower mustard density often have more access to resources and subsequently produce a high number of seeds (Trader et al. 2006); therefore, even areas of apparently light infestation should be treated, when possible.	Glyphosate (4 qt./ acre maximum). Saharan mustard is often the first winter annual to germinate in an area, making effective herbicide treatment possible while minimizing impacts to non-target species. According to the National Park Service (NPS), Saharan mustard can be controlled with glyphosate (1.5 lb/acre) (Mau–Crimmins et al. 2005), which kills fewer native forbs than Triclopyr and Chlorsulfuron (Sahara Mustard Consortium). Application of post-emergent herbicides should be done prior to the development of seed pods, which may still ripen following herbicide treatment (UNCE 2002). Refer to specific product labels for proper application rates and restrictions.	Glyphosate is a non-selective systemic herbicide that can damage all plants to varying degrees. However, it has low residual activity, so it is not effective for an extended period of time. Exposure via direct spray poses a moderate to high risk to sensitive plant species and low to moderate risk to tolerant plant species; Low to moderate risk to sensitive species is predicted for ground broadcast and aerial applications at the maximum application rate, at off-site distances of 100 feet or less. Drift from ground broadcast applications at the typical application rate would pose a low risk to sensitive species within 25 feet. Drift also could affect lichens and bryophytes. If glyphosate was directly applied using a backpack sprayer, little if any damage due to drift would be anticipated. Plant species are not likely to be affected by runoff of glyphosate under any conditions. There is little indication that adverse effects to aquatic plants are plausible for typical applications of glyphosate (BLM 2007). Potential impacts to native plants would be avoided or minimized through measures described in Section 7.4 of the IWMP.	Direct glyphosate spray of a small animal and an insect, both assuming 100% absorption, poses a low risk at the typical application rate and a moderate risk at the maximum application rate. Consumption of vegetation contaminated by a spill poses a low risk to small mammals for scenarios involving for the maximum application rate only. A large mammal consuming contaminated vegetation would face low acute risk for scenarios involving the typical application rate, moderate acute risk, for scenarios involving the maximum application rate, and low chronic risk for scenarios involving the maximum application rate; a large bird consuming contaminated vegetation would face a low acute and chronic risk. Consumption of contaminated insects would pose a low risk to small mammals and small birds if the herbicide was applied at the typical application rate or a moderate risk if applied at the maximum rate. Acute risks from glyphosate exposure are low at the typical application rate under all scenarios, and there are no chronic risks. Exposure scenarios with the greatest risk are direct spray and acute consumption of contaminated vegetation and insects. Spot applications would have lower risks than broadcast applications, as fewer non-target areas would be impacted. Potential impacts to native plants would be avoided or minimized through measures described in Section 7.4 of the IWMP.

	Red Brome (*Bromus madritensis* ssp. *rubens*) **Cal IPC Rating: High**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Red brome is an annual grass native to southern Europe, northern Africa, and southwestern Asia; it is thought to have become established in California in the mid-1800s and have become naturalized by the late 1800's (Brooks 2000). Its distinctive brush-like inflorescences are reddish purple at maturity. Because it is a prolific seed producer and colonizer, It emerges in early winter following rainfall but remains inactive until spring when rainfall and warmer temperatures stimulate growth and flowering. Plants growing in dry conditions may be less robust and have a more open panicle. Red brome has become widespread in the Sonoran Desert (Van Devender 1997) and, although it is not typically a prolific invader in desert habitats, it can be abundant in slightly moist microhabitats such as beneath perennial shrubs, around rocky outcrops, and along margins of roads and washes (Brooks 2000).	Red brome can negatively impact habitat in several ways, including competition with native species for moisture, nutrients, and light; conversion of native plant communities to non-native grasslands; promotion of wildfires and alteration of fire regimes; and injury to native and domestic animals (Brooks 2000).Low-density infestations likely have little impact on wildlife. At high densities, red brome reduces ecosystem functioning by increasing the fire frequency, altering hydrology, lowering habitat value for wildlife, and displacing plants that are better forage for wildlife.	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to flowering.	Minimize the creation of new disturbed areas. Control of this species along roadsides will help to prevent its spread to new areas. Avoid driving vehicles or walking through infested areas once this plant has gone to seed. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Because it is an annual plant, manual removal of plants through pulling or hoeing can be effective, if done before seeds mature. This is most feasible with small infestations as it is labor intensive. Any cut or pulled vegetative material containing inflorescences should be bagged, carried off-site, and disposed of in a responsible and legal manner to prevent the spread of weeds. Care should also be taken during transport of the materials to ensure they are secure (and do not, for example, fly out of the back of a truck).	Glyphosate (1 qt./ acre). Herbicide should only be applied prior to seed set. Glyphosate is an effective herbicide for reducing populations of red brome. Refer to specific product labels for proper application rates and restrictions.	Glyphosate: see above.	Glyphosate: see above.

	Redstem Filaree (*Erodium cicutarium*) **Cal IPC Rating: Limited**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Redstem filaree is a non-native annual forb native to the Mediterranean region. It was likely introduced to California in the mid-1700's. It favors well-drained clay, loam, or sandy soils, and is a rapid colonizer of disturbed sites (Howard 1992). Redstem filareecan grow up to 20 inches tall but is highly variable in size. It has hairy leaves with finely dissected, often toothed, lobes.	Redstem filareeis is widely distributed, but apparently has limited impacts on most native vegetation. If it spreads or increases in density, its negative effects on native plant establishment and growth would likely increase. Redstem filaree provides seasonal forage for rodents, desert tortoise, big game animals, and livestock. The seeds are eaten	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to flowering.	Minimize the creation of new disturbed areas. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Hand pull or remove using hoes or other hand tools.	Glyphosate (1 qt./ acre). Refer to specific product labels for proper application rates and restrictions.	Glyphosate: see above.	Glyphosate: see above.

The young leaves form a basal rosette, with older leaves growing up to 12 inches in height (Howard 1992). The plant has one main taproot, usually about 3 inches long. The pink, 5-petaled flowers contain persistent flower styles, which are attached to the fruit at the base, are up to 2 inches long and coil at maturity. When moistened, these styles uncoil and can push the sharp-pointed seed up to 1 inch into the soil. Seeds can remain viable for many years, resulting in a potentially large seed bank (Howard 1992). Redstem filaree germinates in late fall, slows growth during the colder winter months, then rapidly grows, flowers, and produces fruits once the weather warms (Howard 1992).	by upland game birds, songbirds, and rodents (Howard 1992). However, at high densities, it can compete with and reduce the productivity of native plants, thereby altering the availability of higher-quality forage plants and the characteristics of their habitat structure.						
	Russian Thistle (*Salsola* spp.) **Cal IPC Rating: Limited-Moderate**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Russian thistle, also commonly called "tumbleweed," is an invasive, bushy summer annual native to Eurasia and north Africa. It was introduced to the U.S. in the 1870s. It is frequent in agricultural areas, roadsides, and deserts; it highly favors disturbed sites. Russian thistle can grow to as much as 4 feet in height. Upper leaves have sharp tips and each flower is subtended by 3 spine-tipped leaves, making this a prickly plant to handle, especially as it matures and dries. It is a prolific seed producer, with 1 plant having as many as 100,000 seeds. Russian thistle germinates and grows in several cycles, from late spring through summer, and flowers from mid-summer through early fall. When seeds mature, the entire plant breaks at ground level from its main taproot and 'tumbles' along the ground with the wind, dispersing seed.	This species currently has limited impacts on native vegetation due to its low numbers. If it spreads or increases in density, its negative effects on native plant establishment and growth would increase. Primary impacts to native vegetation would be competition for water, interference with native seed germination and establishment, increased fire return intervals, and altered hydrology, should Russian thistle densities become high. At high densities, Russian thistle reduces ecosystem functioning by increasing the fire return interval, altering hydrology, and lowering habitat value for wildlife by changing habitat structure and displacing plants that are better forage for wildlife.	Late spring: Locate areas of infestation. Late spring/summer: Manual and chemical control will need to be conducted several times as new plants germinate.	Minimize the creation of new disturbed areas. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Before flowering, young plants can be removed at ground level and left to die in situ. After flowering, plants should be broken off at the base of the plant, immediately bagged, and properly and legally disposed. During transport, care should be taken to prevent the dispersal of seed or any vegetative portion of the plant.	Imazapyr (2-3 pt./ acre) or Glyphosate (4 qt./ acre). Refer to specific product labels for proper application rates and restrictions.	Glyphosate: see above. Off-site Imazapyr drift could cause damage to sensitive plant species at distances of less than 900 feet from the application site after both ground broadcast (low boom) at the typical application rate, and possibly at distances greater than 900 feet after applications at the maximum application rate (low to moderate risk for ground applications at both application rates), depending on site-specific conditions. In addition, wind erosion of soil contaminated with imazapyr could lead to adverse effects to sensitive plants, particularly in relatively arid environments. In relatively arid areas in which microbial degradation may be the predominant factor in the decline of imazapyr residuals in soil, residual toxicity to sensitive plant species could last for several months to several years (estimated at 10 months to 5.5 years. Effects to	Glyphosate: see above. Direct spray of imazapic is not likely to pose a risk to terrestrial animals. Therefore, use of imazapic would primarily affect wildlife through habitat modification. Its use could benefit wildlife by controlling invasive plant species and promoting the establishment and growth of native plant species that provide more suitable wildlife habitat and forage (BLM 2007)

						aquatic plants are also plausible and accidental spills pose a high risk to aquatic plants (BLM 2007). Potential impacts to native plants would be avoided or minimized through measures described in Section 7.4 of the IWMP.	
	Mediterranean Grass, Split Grass (*Schismus* spp. including *S. barbatus*) **Cal IPC Rating: Limited**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Mediterranean grass (*S. barbatus*) and related species are annual grasses is native to Eurasia and Africa. Mediterranean grass was first documented as introduced to Arizona in 1926, but has since become widely established in the southwestern United States. It is particularly well adapted to sandy soils and rapidly establishes in roadsides, fields, and disturbed sites. A study at Joshua Tree National Park found that its growth is enhanced by proximity to the common native desert shrub white bursage (*Ambrosia dumosa*) and that high density may decrease the ability of bursage seed to become established (Rodriquez-Buritica and Miriti, 2009). Mediterranean grass grows in small, tufted clumps, up to 11 inches tall. It has a shallow, fibrous root system. Germination is in early winter, then growth may slow until triggered by increased rainfall or warmer temperatures . It plant can grow rapidly from a seedling to reproductive maturity in as little as 2 weeks.	Widespread throughout the DHSP site at low densities. Current impacts are likely low; however, an increase in its abundance could result in competition for water and may affect native seed germination and establishment. At high density, Mediterranean grass also increases the fuel load and continuity, facilitating more-frequent fires and subsequent type conversion to weedy areas as less fire-tolerant native plants are destroyed. Low-density infestations likely have little impact on wildlife. At high densities, Mediterranean grass reduces ecosystem functioning by increasing the fire return interval, altering hydrology, lowering habitat value for wildlife, and displacing plants that are better forage for wildlife.	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to flowering.	Minimize the creation of new disturbed areas. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Difficult to control manually because of its small size; however, manual removal, with immediate bagging of the entire plant, is the appropriate method for plants that are already in flower.	Glyphosate (1 qt./ acre). Herbicide application results in high mortality if conducted prior to flowering. Refer to specific product labels for proper application rates and restrictions.	Glyphosate: see above.	Glyphosate: see above.
	London Rocket (*Sisymbrium irio*) **Cal IPC Rating: Moderate**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
London rocket is an annual plant native to southern Europe. It was first reported from Los Angeles, California in the early 1900s. It is	London rocket occurs at low density on the DHSP site and throughout the region. Shaded areas and increased moisture	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to	Minimize the creation of new disturbed areas. Clean vehicles and equipment before entering the project site. Monitor yearly for	Hand-hoeing seedlings or pulling/digging out individual plants is an effective means of controlling this species in areas	Glyphosate (4 qt./ acre maximum). Spray with post-emergent herbicide; after senescence and if seed reached	Glyphosate: see above.	Glyphosate: see above.

naturalized in much of western North America and Mexico and is found in many habitats, such as abandoned fields, waste places, vacant lots, roadsides, orchards, off-highway vehicle staging areas, pastures and livestock watering sites, playas, and open deserts. In desert and semi-desert habitats, it is commonly found along washes in locally dense stands (Halvorson and Guertin, 2003). London rocket is an erect herb that grows to 20 inches tall or more, and is much-branched from near the base of the plant. It has a coarse taproot. In California, germination occurs from October to March, with the plant maturing from April through May (Halvorson and Guertin, 2003).	(through dust control, etc.) are likely to cause increased densities. There is minimal consequence to native vegetation for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat. Primary impacts to native vegetation would be competition for water and interference with native seed germination and establishment, should London rocket densities become high. Low-density infestations likely have little impact on wildlife, but at higher densities London rocket could compete with and reduce the productivity of native plants, thereby altering the availability of forage plants and the characteristics of their habitat structure. It also promotes the spread of fire.	flowering.	new individuals.	where the infestation is small and contained. Any physical removal should be conducted prior to the plant's producing seed. Care must be taken to remove the taproots to prevent regeneration. Any vegetative material should be bagged, carried off-site, and disposed of in a responsible and legal manner to prevent the spread of weeds. Site should be revisited in order to catch later-germinating plants, especially if there have been multiple rain events.	maturity, remove with flail mower and bag for disposal. Refer to specific product labels for proper application rates and restrictions.		

* No distinct populations of any weed species were mapped in the DHSP study area, because all 6 weed species that are present on site are broadly distributed across the site in low to very low densities. There were no areas with weeds dense enough to map as a discrete occurrence, or extensive enough to meet the minimum vegetation mapping unit (approximately 0.15 acre [6,500 square feet]).

Literature Cited

Brooks, M. L. 2000. *Bromus madritensis* ssp. *rubens*. In *Invasive Plants of California's Wildlands,* edited by C. C. Bossard, J. M. Randall, and M. C. Hoshovsky. University of California Press, Berkeley.

Bureau of Land Management (BLM). 2007. Final programmatic environmental impact statement: vegetation treatments using herbicides on Bureau of Land Management lands in 17 western states. BLM, Washington, DC. Online: http://www.blm.gov/wo/st/en/prog/more/veg_eis.html.

Halvorson, W. L. and P. Guertin. 2003. USGS Weeds in the West Project: Status of Introduced Plants in Southern Arizona Parks – Factsheet for *Sisymbrium irio* L. U.S. Geological Survey / Southwest Biological Science Center, Sonoran Desert Field Station, University of Arizona. December 31.

Howard, Janet L. 1992. Erodium cicutarium. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2012, June 26].

Mau–Crimmins, T. M., S. E. Studd, and M. S. Mauzy. 2005. Exotic Plant Management Plan for Montezuma Castle and Tuzigoot National Monuments. Technical Report NPS/IMR/SODN-001 (July). National Park Service. Denver. http://er.uwpress.org/cgi/reprint/26/1/44

Rodríguez-Buriticá, S. and Miriti, M. N. 2009. Biting the hand that feeds: the invasive grass *Schismus barbatus* (Poaceae) is facilitated by, but reduces establishment of, the native shrub *Ambrosia dumosa* (Asteraceae). Journal of Vegetation Science, 20: 241–250.

Trader, M. R., M. L. Brooks, and J. V. Draper. 2006. Seed production by the non-native *Brassica tournefortii* (Sahara mustard) along desert roadsides. Madron˜o, 53:313–320.

University of Nevada Cooperative Extension (UNCE). 2002. Identifying and Managing Sahara Mustard. Fact Sheet 05-02. http://www.unce.unr.edu/publications/files/nr/2005/FS0502.pdf Accessed in winter 2011.

Van Devender, T.R. 1997. Exotic Plants in the Sonoran Desert Region, Arizona and Sonora. California Exotic Pest Plant Council. 1997 Symposium Proceedings.

Appendix C

Example California BLM Pesticide Use Proposal

Appendix C
Example California BLM Pesticide Use Proposal

PROPOSAL NUMBER:
REFERENCE NUMBER:

FIELD OFFICE _____ **COUNTY** _____

LOCATION:
_____

DURATION OF PROPOSAL:

_____

I. PESTICIDE APPLICATION (including mixtures and surfactants):

	Trade Names	Common Names	EPA Registration No.	Manufacturer	Formulations (Liquid or Granular)	Method of Application
1						
2						
3						

MAXIMUM RATE OF APPLICATION:	
USE UNIT ON LABEL:	**POUNDS ACID EQUIVALENT/ACRE:**
1.	1.
2.	2.

INTENDED RATE OF APPLICATION:

APPLICATION DATES:

NUMBER OF APPLICATIONS:

II. PEST (List specific pest(s) and reason(s) for application):

III. MAJOR DESIRED PLANT SPECIES PRESENT:

IV. TREATMENT SITE: (Describe land type or use, size, stage of growth of target species, slope and soil type).

Example California BLM Pesticide Use Proposal

ESTIMATED ACRES

V. SENSITIVE ASPECTS AND PRECAUTIONS: (Describe sensitive areas [e.g., marsh, endangered, threatened, candidate and sensitive species habitat] and distance to treatment site. List measures taken to avoid impact to sensitive areas).

VI. NON-TARGET VEGETATION: (Describe the impacts, cumulative impacts, and mitigations to non-target vegetation that will be lost as a result of this chemical application).

VII. INTEGRATED PEST MANAGEMENT: (Describe how this chemical application fits into your overall integrated pest management program for the treatment area.)

Originator: _____ Date: _____
Company Name: _____
Phone: _____

Certified Pesticide Applicator:
_____ Date: _____
(Signature)

Field Office Pesticide/Noxious Weed Coordinator
_____ Date: _____
(Signature)

APPROVALS:
_____ Date: _____

BLM Assistant Field Manager
Renewable Resources
(Signature)

APPROVALS (State Office Use Only):
_____ Date: _____
BLM State Pesticide Coordinator
(Signature)
_____ Date: _____
Deputy State Director, Natural Resources,
Lands and Planning
(Signature)

_CONCUR OR APPROVED
_NOT CONCUR OR DISAPPROVED
_CONCUR OR APPROVED WITH MODIFICATIONS

Appendix D

Example California BLM Pesticide Application Records Form

Appendix D
Example California BLM Pesticide Application Records Form

1. General Information

a. Project Name: _____

b. Operator: _____

c. Pesticide Use Proposal Number: _____

d. Reference Number: _____

2. Name of Applicator or Employee(s) Applying the Pesticide:

_____

_____

3. Date(s) of Application: _____ _____ _____

(MONTH, DAY, YEAR)

4. Time Frame of Application: _____

5. Location of Application: T_____ , R_____ , and Sec. _____

County _____

6. Type of Equipment Used: _____

_____

7. Pesticide(s) Used: _____

Company or Manufacturer's Name: _____

_____

Trade Name: _____

_____

Type of Formulation: Liquid ____/ Granular ____/

8. Rate of Application Used:

a. Active Ingredient per Acre_____

b. Volume of Formulation per Acre_____

9. Treatment Area

a. Actual Area Treated: _____

b. Total Project Area: _____

10. Primary Pest(s) Involved: _____

_____

11. Stage of Pest Development: _____

_____

12. Site Treated: ____/ Native Vegetation ____/ Seeded Vegetation ____/ Other

13. Weather Conditions:

a. Wind velocity:_____ b. Wind direction _____ c. Temperature _____

14.Monitoring Record (IF INSUFFICIENT SPACE-CONTINUE ON BACK):

This record is required and must be completed, except for monitoring within 24 hours after completion of application of pesticides. This record must be maintained for minimum of 10 years.