



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Palm Springs Fish and Wildlife Office  
777 East Tahquitz Canyon Way, Suite 208  
Palm Springs, California 92262



In Reply Refer To:  
FWS-ERIV-11B0198-13TA0078

Mr. Pierre Martinez  
Project Manager  
California Energy Commission  
1516 Ninth Street, MS-15  
Sacramento, California 95814-5512

DEC 19 2012

California Energy Commission

**DOCKETED**

**11-AFC-04**

TN # 68947

DEC 20 2012

**Subject:** Comments on the California Energy Commission's Preliminary Staff Assessment for the Proposed Rio Mesa Solar Electric Generating Facility (11-AFC-04)

Dear Mr. Martinez:

The U.S. Fish and Wildlife Service (Service) has reviewed the California Energy Commission's (CEC) Preliminary Staff Assessment (PSA) Part B, dated October 15, 2012, for the proposed BrightSource Energy, Inc. Rio Mesa Solar Electric Generating Facility. The proposed project site is located approximately 13 miles southwest of the city of Blythe and consists of two 250-megawatt (MW) (nominal) solar concentration thermal power plants situated on private land leased from the Metropolitan Water District of Southern California. The project generation-tie line, emergency and construction electrical power supply line, and primary access road would be located on public land managed by the Bureau of Land Management (BLM). Each plant would be comprised of a central concrete tower (approximately 750-foot tall) surrounded by heliostat (mirror) fields (approximately 85,000 per plant). A common facilities area servicing both power plants would include administration, control, and maintenance facilities, a water treatment facility, and a switchyard. Each 250-MW plant requires about 1,850 acres (or 2.9 square miles) of land to operate. The total area required for both plants, including the shared facilities and generation-tie line, is approximately 6,000 acres. The CEC is the lead agency deliberating issuance of a license certifying the construction, operation and maintenance, and decommissioning of the proposed Rio Mesa project.

The primary concern and mandate of the Service is the protection of fish and wildlife resources and their habitats. The Service has legal responsibility for the welfare of migratory birds, anadromous fish, and threatened and endangered animals and plants occurring in the United States. As such, we are responsible for administering the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*); the Bald and Golden Eagle Protection Act, as amended (16 U.S.C. 668); and the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712). We recognize the need for development of renewable energy and the challenge of balancing solar energy development with conservation of natural resources in the southwest. We are working with local, State, and Federal agencies involved in desert-wide regional planning to help achieve the

various State and Federal renewable energy goals and policies guiding renewable energy programs in a manner consistent with the Service's mission.

Based on our review of the PSA, we offer in the enclosed table (Enclosure) specific comments regarding potential project impacts to: (1) bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles; (2) migratory birds; (3) threatened Mojave desert tortoise (*Gopherus agassizii*), particularly the loss of occupied and suitable habitat and increased fragmentation of the limited habitats available in this region; (4) other species and ecosystem function; and (5) conservation recommendations. General comments that summarize major issues are discussed below.

### General Comments

#### *Analytical Approach*

Because CEC's public workshops on this and other power tower projects have documented a lack of available data and various degrees of uncertainty about many of the potential biological effects, including their scope and magnitude, the effects analyses relied on numerous assumptions and inferences from related studies to draw conclusions. The levels of certainty associated with particular impacts, conclusions, and supporting rationale is variable and, when possible, should be identified in the PSA. Whereas the PSA currently describes many effects that "could" happen, the Final Staff Assessment (FSA) should more clearly differentiate the gradations of possibility, as to whether an impact or outcome is highly likely, probable, or possible, depending on the strength of supporting information.

#### *Migratory Birds*

The project is proposed on a major branch of the Pacific Flyway for numerous species along the Colorado River floodplain and adjoining lowlands that support a diverse habitat network of agricultural lands, State and Federal wildlife refuges, aquatic habitats, willow-cottonwood-mesquite riparian forests, and xeric riparian woodlands (known variously as desert dry wash, xeroriparian, or microphyll woodlands). These habitats support an abundant and diverse array of birdlife and the lower Colorado River Valley is recognized by the Audubon Society as a globally important bird area ([http://www.mapsportal.org/audubon\\_ca\\_iba/](http://www.mapsportal.org/audubon_ca_iba/)).

Avian surveys for the proposed project to date have detected 130 species, including raptors, passerines, waterfowl, and 13 species on the Service's list of Birds of Conservation Concern, even prior to completion of the full year of surveys requested by the Renewable Energy Action Team (REAT) agencies (URS 2012). Rosenberg et al. (1991) estimate that 70 percent of the approximately 440 known migratory bird species in North America use the Lower Colorado River Valley. For instance, State-listed Swainson's hawks (*Buteo swainsoni*) have been observed in kettles exceeding 100 individuals during migration throughout the area and flocks of ducks and geese also have been observed migrating above the Palo Verde Mesa (G. Mulcahy, CDFG, pers. comm. 2012). Large numbers of mourning doves (*Zenaida macroura*) make daily flights

between water sources along the river and nesting/foraging habitat in desert habitats, directly over the Palo Verde Mesa and the proposed project site (G. Mulcahy, CDFG, pers. comm. 2012). Considering the observation of four doves colliding with heliostats at the Solar One site (McCrary et al. 1986), mourning dove mortalities would be expected at the proposed site. Since turkey vultures (*Cathartes aura*) primarily rely on an acute sense of olfaction to find food sources (Houston 1986, Buckley 1996), they are particularly vulnerable in being attracted to the project site and its associated hazards because of their enhanced ability to detect odorants emanating from avian carrion. In addition, their abundance in the area (nearly 6,300 observations during project point surveys) suggests a large number of vultures may be exposed to flux and collision hazards, and other project effects (URS 2012). These examples illustrate only a few of the potential migratory bird conflicts that likely would occur and detract from several regional conservation efforts, such as the Service's national wildlife refuge complex, and Lower Colorado River Multiple Species Conservation Plan, which are conserving and restoring floodplain habitats to recover bird populations that have suffered substantial historical losses along the lower river valley.

Though few if any utility-scale power tower projects are currently in operation and biological effects remain largely unstudied (Lovich and Ennen 2011), the one intensive study that was conducted (McCrary et al. 1986) on an older form of this technology near Barstow, California documented numerous avian mortalities, particularly from collisions with the heliostats at the facility. Over the past 2 years, the REAT agencies, including the CEC, California Department of Fish and Game (CDFG), BLM, and the Service, have raised numerous concerns regarding additional threats to birds from power tower technology that were not addressed by this study and warrant further investigation (see CEC docket and workshops). As recently as the December 5, 2012, workshop hosted by CEC, it was acknowledged that no agreement has been reached on the thresholds of flux that adversely affect avian species. Because these additional threats are potentially lethal to appreciable numbers of many bird species, it is important that the PSA describe the extent of potential impacts from building and operating the proposed project.

We are concerned that two potential effects to avian species, including eagles and other special-status species, were not sufficiently addressed in the PSA. First, the PSA includes a limited discussion on the risk of birds being blinded or otherwise suffering ocular impairment from exposure to concentrated solar energy (flux). However, the PSA does not clearly explain potential risks to the eyes of different species of birds and the expected magnitude of those risks. Additional analysis or documentation is needed on this section. For our specific comments on potential ocular impairment, please see the Enclosure pertaining to section 4.2-83.

Secondly, the PSA does not consider the potential for exposed avian skin to be burned or singed when a bird flies through the flux airspace surrounding the power tower. The PSA identifies tolerance thresholds for human skin exposed to flux and states that avian tolerance levels likely are higher due to the insulating effect of feathers. However, the PSA does not address potential effects to birds' skin not fully or sufficiently covered in feathers including the exposed heads of vultures and around the eye. Given the short exposure time and low flux level required to burn human skin, we are concerned that exposed bird skin may be burned at lower flux levels than

those considered safe for bird feathers. We recommend a more in depth analysis of these potential effects be included in the FSA. In addition, the effects of multiple exposures to individual birds should also be addressed.

In addition, the PSA does not include a full year of general bird survey results or a minimum of 2 years of bald and golden eagle studies we have recommended since agency coordination began in early 2011. We understand that CEC has different data requirements and schedule constraints; however, we are concerned that insufficient data are available to conduct an adequate bird mortality impact analysis.

### *Microphyll Woodlands and Migratory Birds*

Microphyll woodlands on the project site are comprised primarily of desert ironwood (*Olneya tesota*) and blue palo verde (*Cercidium floridum*). Because of the shade, water, and nitrogen provided by ironwoods, at least 165 plant species use ironwoods as nurse trees, some of which require ironwood presence to survive (Dimmitt 2000a, Suzán et al. 1996). Microphyll woodlands are estimated to support 90 percent of the birdlife while occurring on less than 5 percent of the Sonoran Desert landscape (Dimmitt 2000b). Though bird populations in the desert are generally understudied, over the past decade, an increasing number of endangered and sensitive bird species have been documented using microphyll woodland habitat in the Lower Colorado River Valley, including Gila woodpeckers (*Melanerpes uropygialis*), Lucy's warblers (*Oreothlypis luciae*), Crissal thrashers (*Toxostoma crissale*), Bell's vireos (*Vireo bellii*), Bendire's thrashers (*Toxostoma bendirei*), and long-eared owls (*Asio otus*) (McCreedy 2011). The first three species above have been documented on the project site (URS 2012), in addition to other special-status species, such as the elf owl (*Micrathene whitneyi*) and willow flycatcher (*Empidonax traillii*), that in the California Sonoran desert primarily utilize microphyll woodlands.

The project is proposed in an extensive complex of microphyll woodlands. These stands contain trees which can be hundreds of years old (Dimmitt 2000a). These old growth stands are proposed to be removed within the project footprint. The PSA identifies that "greater clarity" is needed from the applicant about the spatial extent of vegetation disturbance that would result from the project. The existing documentation does not provide sufficient information to quantify accurately what the ecological cost of that loss would be on a regional basis, or whether enough alternative woodland is available for acquisition to partially offset the significant impacts incurred by the proposal. The proposed 3:1 mitigation to development ratio for loss of microphyll woodlands does not recognize the old growth characteristics of the microphyll woodlands found onsite, or species composition and variable ecological function of woodland stands with different size, age, percent canopy cover, and species composition characteristics (DRECP ISA 2010). We assert that the PSA oversimplifies the biological importance of microphyll woodlands on the project site by neglecting to account for stand age, size, percent canopy cover, species composition; stand structural complexity; burro deer use; and location in the migratory flyway. Based on these biological simplifications, the PSA does not provide sufficient support for the premise that a single mitigation ratio applied across the large area of the

Northern and Eastern Colorado Desert Coordinated Management Plan (BLM and CDFG 2002) adequately accounts for the loss of habitat value for the many birds, mammals, and other wildlife that differentially rely on these woodlands for food, water, and shelter. Given the importance of microphyll habitat to migrating birds, as well as the known site fidelity of some species of nesting birds, avoidance and minimization of impacts should be prioritized, and mitigation pursued as close to the project site as possible.

Lastly, we share the concern expressed in the PSA that potential effects of groundwater pumping on the local water table could have a deleterious effect on microphyll woodlands adjoining the project site, given the hydrologic dependence of these woodlands within desert washes (see specific comments under sections 4.2-48, -52, and -170, enclosed).

#### *Microphyll Woodlands and Burro Deer*

Microphyll woodlands also provide core habitat for desert mule (burro) deer (*Hemionus odocoileus eremicus*), which depend on old growth woodlands for food, shelter, water, fawning, and dispersal/migratory corridors without which they could not survive in the hottest, driest desert on the continent (Marshal et al. 2006a). Deer also depend on smaller microphyll woodland washes with lower plant biomass that may have higher rates of plant growth (Marshal et al. 2005a) and, thus, higher-quality forage (Marshal et al. 2005b). In California, the burro deer subspecies is endemic to the Sonoran Desert because the leguminous tree species that dominate these woodlands [desert ironwood and blue palo verde] cannot survive the colder winter temperatures and lack of summer rainfall in the Mojave Desert. Krausman et al. (1985) found that burro deer also use microphyll woodlands disproportionate to their occurrence in southwest deserts. Given the limited distribution of burro deer in the State and vulnerability to drought conditions, population levels fluctuate widely, leaving the population vulnerable to additional disturbances (Celentano and Garcia 1984).

Prior to habitat loss and fragmentation from utility-scale renewable energy development, threats to burro deer connectivity were not recognized as a significant problem. In the Sonoran Desert, mule deer do not traditionally migrate in predictable patterns but move nomadically across long distances based on seasonal and annual variations in temperature and precipitation, and therefore, water and food availability (Marshal et al. 2006a). Habitat fragmentation renders the population more vulnerable to stochastic events, such as recurrent drought, which can result in significant population declines (Marshal et al. 2002). Flexibility to move across its range is needed to allow access to ephemeral food and water resources, and resiliency to recover from regional declines in this harsh desert environment (Heffelfinger et al. 2006; Marshal et al. 2006a, 2006b).

The loss of habitat and displacement of burro deer from the project site would result in a net decrease to the rangewide resource base and carrying capacity of the herd (Heffelfinger et al. 2006). Finding land for acquisition of microphyll habitat should occur within the area occupied by burro deer south of Interstate 10 (I-10) but may be difficult to accomplish with the suggested 3:1 mitigation ratio. Lastly, the FSA should address the possibility that groundwater depletion associated with the project may affect the natural springs within the groundwater basin that

provide important water sources for burro deer and other wildlife or the impacts to deer movement throughout the area.

*Phasing, Alternatives, and Cumulative Effects*

Given the potential extent, magnitude, and long-term nature of habitat impacts associated with power tower development, particularly in the xeric desert environment, phasing the approval of project technologies that have not been commercially tested and proven at a utility scale would likely avoid unnecessary impacts to wildlife. Phasing could be based on the monitoring of first-generation projects to determine that losses of migratory birds and other wildlife can be effectively avoided, minimized, and mitigated to a level of insignificance.

The alternatives analysis in the PSA focused on a narrow subset of sites in the vicinity of the proposed project without assessing the entire 90,000-acre portfolio of alternative properties controlled by the applicant ([http://www.brightsourceenergy.com/stuff/contentmgr/files/0/63ecfc415e8722af38abe473ead74c8c/pdf/final\\_sce\\_cpuc\\_approval.pdf](http://www.brightsourceenergy.com/stuff/contentmgr/files/0/63ecfc415e8722af38abe473ead74c8c/pdf/final_sce_cpuc_approval.pdf)), among other potential sites. There may be other less environmentally sensitive sites in this portfolio that should be analyzed in the FSA.

Cumulative effects to migratory birds, regional bird communities, eagles, and other wildlife increase as the number of solar development proposals proliferates. In the lower Chuckwalla Valley, at least three additional right-of-way applications on BLM lands are being evaluated for construction and operation of power tower technology. One additional project in neighboring Rice Valley has been approved with construction scheduled for September 2013. Other power tower projects are being proposed or are under construction in Nevada and along the Colorado River, including in Arizona, where another such project is proposed just north of the town of Quartzsite. Build-out of proposals in California and Arizona (including the proposed project) would entail multiple towers per project, possibly resulting in 12 or more power towers within a 40-mile radius, all with the absence of any substantive data on the many potentially lethal physiological effects associated with the technology as discussed above, in our enclosed comments, and in the CEC dockets. If all or a portion of these projects are approved, the cumulative effects/take levels from power tower projects likely will be significant for many species of birds including local and migrant waterfowl, eagles and other raptors/owls, shrikes, and passerines, especially in light of project-specific impacts to special-status avifauna that have been determined in the PSA to be significant and unmitigable.

Cumulative effects to birds from multiple power tower solar projects was not fully assessed in the PSA, in part because data are not currently available to compare bird risk levels across the many proposed development sites. The current lack of available data suggests that proposed and previously approved project sites should be studied together to determine relative risk levels and least damaging alternatives/sites prior to approval of individual projects. We recommend that the CEC and other permitting agencies consider a programmatic look at power tower technology with better biological data along the I-10 corridor so that individual and cumulative project effects are better understood.

*Desert Renewable Energy Conservation Plan (DRECP)*

As a REAT agency, the Service is concerned that the Rio Mesa project is proposed outside any of the mapped development focus areas proposed in all of the planning alternatives presented in the DRECP Stakeholder Committee meeting on July 25-26, 2012, and subsequent REAT agency refinements currently being considered. The reason this area is currently not being considered for inclusion in a development focus area is because of its high biological values for several species and natural communities being considered for conservation coverage by the planning effort including several State-listed bird species and extensive stands of microphyll woodland, a natural community that supports the highest levels of species diversity and abundance in the Sonoran Desert.

Conclusion

The PSA was released without a complete analysis of biological effects. Specifically, a complete quantification of expected vegetation impacts, a final delineation of microphyll woodland and State jurisdictional waters, and the full year of avian surveys (and at least 2 years of bald and golden eagle surveys) are lacking but necessary to better estimate impacts to biological resources and inform avoidance, minimization, and mitigation measures. As detailed in the enclosed specific comments and previously docketed information, the many potential hazards posed to avian species by this technology have not been fully addressed and substantial research efforts are needed to better understand the true extent of lethal threats to birdlife.

The PSA concludes the proposed project would result in significant levels of take to migratory birds and impacts to the habitat base of migratory birds, burro deer, and other wildlife. The PSA further concludes that some of these effects cannot be offset or mitigated to a level of insignificance, in part because the many forms of potential injury and death are not well enough understood to quantify, and the scope of take is large enough that it may not be feasibly offset. Based on these conclusions in the PSA and the information discussed above, we additionally remain concerned that: (1) the technology does not appear amenable to avoiding, minimizing, and mitigating take/habitat loss through adaptive management or other means; and (2) the project is proposed at a site with exceptionally high habitat value for numerous resident and migratory birds and other wildlife species.

Recommendations

Prior to proceeding, we recommend CEC consider other sites and conduct further research and analysis until biological effects of the project are demonstrated to be insignificant or fully mitigable. As described above and in our specific comments (enclosed), we recommend three areas for additional analysis: (1) collection and analysis of robust data that address the numerous questions and unknown biological impacts discussed in our specific comments, the PSA, and the CEC docket; (2) completion of a more rigorous cumulative effects analysis of the numerous power tower projects proposed within an approximately 40-mile radius of the project site; and

(3) development of a more comprehensive alternatives analysis of potentially less environmentally sensitive alternative sites.

We appreciate the opportunity to comment on the proposed project, and suggest further coordination among the REAT agencies to determine whether the DRECP interim project review process would be appropriate or effective in addressing these and other issues identified through public comment on project consistency with the DRECP planning process. For further information or questions, please contact Jody Fraser or Nisa Marks of this office at 760-322-2070.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kennon A. Corey', with a long horizontal flourish extending to the right.

Kennon A. Corey  
Assistant Field Supervisor

Enclosure

cc:

Amedee Brickey, USFWS, Sacramento, California  
Brenda Zaun, Cibola NWR, Yuma, California  
Leslie Fitzpatrick, USFWS, Phoenix, Arizona  
Ray Bransfield, VFWO, Ventura, California  
Greg Miller, BLM, Moreno Valley, California  
Holly Roberts, BLM, Palm Springs-Southcoast Field Office, California  
Kim Nicol, CDFG, Bermuda Dunes, California  
Colorado River Indian Tribes, Parker, Arizona  
Quechan Tribe, Yuma, Arizona



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Enclosure

**Review Form**  
**Preliminary Staff Assessment Part B**  
**BrightSource Energy, Inc. Rio Mesa Solar Electric Generating Facility**

**Reviewer's Names:** Palm Springs Fish and Wildlife Office

**Reviewer's Organization:** U.S. Fish and Wildlife Service

**Reviewer's Telephone numbers:** 760-322-2070

**Primary Disciplinary Area (e.g., ecology, land use planning, regulatory oversight):** Biology, endangered species, regulatory oversight (Endangered Species Act, Bald and Golden Eagle Act, Migratory Bird Treaty Act)

**Section or Chapter Number and Date of Reviewed Document:** Public Draft PSA, Part B dated October 15, 2012

Page	Comments
1.1-12	Executive Summary, Table 1: Please include the following additional projects for consideration of cumulative effects: -Chuckwalla Valley State Prison -Ironwood State Prison -Devers to Palo Verde Transmission Line 1 -Gypsum Solar Project -Golden Sun Wind Project
1.1-14	Second bullet: Please revise to state the following: "The collision, burning, and blinding/eye damage hazards are applicable for all bird species that may fly over the site or near the gen-tie line, including the special-status species. This includes area resident, nesting, wintering, and migrating birds."
Global, including 1.1-14	Third bullet, second sentence: Please add "and/or bald eagles". Given the documented use of the Colorado River flyway by wintering and migratory bald eagles, please ensure both eagle species are considered throughout the document, pursuant to the Bald and Golden Eagle Protection Act (BGEPA).
Global, including 1.1-14 4.2-6 4.2-107 4.2-108 4.2-112 4.2-184	The Service recommends preparation of an Eagle Conservation Plan (ECP) if an applicant decides to apply for an eagle take permit. Because ECPs support eagle permit applications, we prefer ECPs be limited to bald and golden eagles and refrain from treating other raptor species, even though some mitigation measures for impacts to eagles (e.g., power pole retrofitting described in proposed condition of certification BIO-12) may benefit other raptor species. We recommend other raptors, including special status species, be included in the project's Bird and Bat Conservation Strategy (BBCS) (see BIO-12). Please revise the language throughout the executive summary and biological resources sections to reflect this comment.
1.1-14	Third bullet: Throughout please use "and/or" when describing the potential to take bald and/or golden eagles, instead of varying use of "and" and "or."
1.1-14	Second to last full sentence on page: Please revise to state the following: "Staff concludes that any take of a bald and/or golden eagle, should it occur, would be significant according to CEQA."
1.1-14	To be consistent with what the Service would do if issuing an eagle permit under

	BGEPA, we recommend that qualitative cumulative effects to golden eagles be analyzed to at least 140 miles from the project boundary.
Global, including 1.1-15 4.2-7	One of Staff’s primary findings is that expected impacts often do not imply conformance with various laws, ordinances, regulations, and standards, including the MBTA and BGEPA. Throughout the document, Staff states that “unauthorized take” could violate the MBTA. For clarity, we recommend the following revision: “Pursuant to the MBTA, no permits are issued for incidental take of migratory birds. Consequently, any incidental take of migratory birds would be unauthorized.” The text should be clear that the Service cannot permit incidental take under the MBTA for construction, operation, and maintenance of the proposed project.
1.1-24	Executive Summary, Figure 1: Please show on this map the outline of all projects considered in cumulative effects analysis. The point locations currently illustrated do not clearly depict the extent of all projects proposed, under construction, or existing in the project vicinity. For clarity, please include a text-based key with project names, as the current map is difficult to decipher with the amount of text overlapping project boundaries.
4.2-1 4.2-5	While regularly scheduled, ongoing discussion about project impacts and potential compensation occurred among CEC, the Service, BLM, and CDFG (collectively, “the agencies”), the Service did not explicitly provide comments on the recommended conditions of certification, as stated in the second sentence under “Summary of Conclusions.” Please reword to: “Staff’s recommended conditions of certification were developed to reflect interagency concerns.”
4.2-2	Condition of Certification BIO-14, not BIO-13, describes recommended desert tortoise habitat compensation. Please correct in the first paragraph.
4.2-2	Mitigation for golden eagle foraging habitat is not included in BIO-9, BIO-14, or BIO-17, as described in the first paragraph. Please delete the reference to eagles or revise the first paragraph accordingly.  Golden eagle habitat is not mentioned in any of Staff’s proposed conditions of certification, despite inclusion in the effects analysis and descriptions of desert tortoise and golden eagle foraging habitat mitigation lands as synonymous (e.g., pages 4.2-6, 4.2-106). Since habitat mitigation is included in the effects section as the basis for the determination that the loss of golden eagle foraging habitat is less than significant, please include golden eagle habitat mitigation in the proposed conditions of certification.
Global, including 4.2-2	Please reconcile the description of 3,834 acres of permanent impacts to native vegetation with the 5,993 acres of project area described in the executive summary (1.1-2) and project description sections (3-1).
4.2.2	Please clarify what constitutes “permanent elimination of native vegetation and wildlife habitat.” Please specify whether the project’s proposed method of mowing vegetation to 12 to 18 inches in height is included as permanent elimination.
4.2-3	Please include a reference for the estimate that 40,000 ac of privately-owned desert woodland habitat is potentially available for acquisition as habitat mitigation.
4.2-3	Please define what is considered the project “region” within which desert dry wash

	woodland mitigation would be considered acceptable. See comments 4.2-59 and 4.2-129.
Global, including 4.2-3	Second to last paragraph, last sentence: Please revise to state the following: “Staff will coordinate with the applicant, other agencies, and public or private entities specializing in habitat acquisition and management to determine feasibility and, if necessary, identify alternate mitigation.” This provides consistency with current interagency coordination on the review and approval process of project-specific habitat mitigation proposals.
4.2-4	In the common wildlife and nesting birds section, please reword “off-site disturbances” to “off-site effects from...” The source of the described noise, lighting, and weed introductions would be on-site; the indirect effects on common wildlife and nesting birds described here would be off-site.
4.2-4	Common wildlife and nesting birds section, second sentence: Please revise to: “Gen-tie line construction would degrade habitat at work sites and in the vicinity, and...”
4.2-5	First paragraph: Please revise to state the following: “The collision, burning, and blinding hazards are applicable for all bird species that may fly over the site ...”
4.2-5	For clarity, please organize the summary of conclusions section such that all discussion of impacts to all bird species is sequential. In other words, please move the desert tortoise subsection to the beginning of the section, and then address all bird species (e.g., resident, nesting, and migratory). We recommend that federally and state listed species be addressed first in each respective section.
4.2-5	Please add BIO-15 (Raven Monitoring, Management, and Control Plan) to the list of proposed conditions of certification that would compensate for impacts to desert tortoise.
4.2-5	Please add a sentence that project activities affecting desert tortoise also would be subject to the provisions of the anticipated biological opinion for the project.
4.2-6	First paragraph, last sentence: Please revise to state the following: “...to obtain a Biological Opinion indicating the USFWS’s determination whether the project is likely to jeopardize the continued existence of the desert tortoise and obtaining an exemption from the incidental take of desert tortoise.”
4.2-6	Please articulate the goal(s) of mitigation for operational impacts to bald and golden eagles. Please describe how proposed mitigation of retrofitting power poles accomplishes this goal(s). Please discuss the rationale for proposing out-of-kind mitigation. For instance, explain how power pole retrofitting adequately compensates for mortality from concentrated solar energy, collision with heliostats, or other generation components (i.e., not transmission infrastructure). The FWS has released the technical appendices for revised Eagle Conservation Plan guidance for Land-based Wind Energy Facilities. These technical appendices include an example of a Resource Equivalency Analysis on power pole retrofitting to offset take of eagles. We recommend utilizing this REA approach for assessing the value of the proposed mitigation for golden eagles.  If it is determined that an Eagle Act take permit from the Service is needed, please

	note that the project owner would be subject to any mitigation requirements associated with that permit.
4.2-6	Second to last sentence: Please include the risk of blinding or other temporary or permanent ocular impacts when summarizing potential risks that would lead to take of bald and/or golden eagle(s).
Global, including 4.2-7	Please clarify why Staff uses the word “imply” when describing potential nonconformance of the proposed project with relevant LORS. We recommend separating the discussion into two sections; one that addresses the California state laws for which CEC is the responsible agency, and one that addresses other laws, including federal laws, for which CEC is making a determination based on interagency coordination. Please clarify what Staff’s determination is on compliance with the LORS that CEC oversees. This comment applies throughout the document.
4.2-7	Please define “near” the western edge of Gila woodpecker’s range.
4.2-7	Please add consideration of the MBTA to the summary of conclusions for elf owl and Gila woodpecker.
4.2-8	First paragraph: Proposed condition of certification BIO-17, not BIO-19, is the Burrowing Owl Impact Avoidance and Compensation Measures.
4.2-8	End of first paragraph: Please include Staff’s determination on whether effects to burrowing owl are mitigable.
4.2-8	The paragraph on other special status raptors states that BIO-1 through BIO-5 would minimize or compensate for project impacts to prairie falcon foraging habitat. Please account for impacts to foraging habitat for the other special status raptors considered here.
4.2-9	First paragraph: Please add consideration of potential blinding or other ocular impacts.
4.2-9	End of first paragraph: Please include Staff’s determination of the implications of discussed impacts for compliance with the MBTA.
4.2-9	Special status migratory and wintering birds subsection, second sentence: Please revise to state the following: “...but they are likely to fly over the site either during migration through the area or during shorter flights among regional wetland and agricultural habitats.”
4.2-9	Special status migratory and wintering birds subsection: Please add consideration of potential blinding or other temporary or permanent ocular impact.
4.2-9	Special status migratory and wintering birds subsection: Please include Staff’s determination of the implications of discussed impacts for compliance with the MBTA.
4.2-11	Please describe in additional detail the rationale used to decide possible exceptions to the “not significant” determination on the contribution of the project to cumulative effects.
4.2-14	Please change the abbreviation for Department of the Interior to DOI, instead of USDI.
4.2-15	Desert Renewable Energy Conservation Plan – Interim Planning section: As a Renewable Energy Action Team (REAT) agency, The Service is concerned the project is proposed outside any of the mapped development focus areas in all of the

	<p>planning alternatives presented in the DRECP Stakeholder Committee meeting on July 25-26, 2012, and subsequent REAT agency refinements currently being considered. The reason this site is not currently being considered for a development focus area is because of its high biological values for several species and natural communities being considered for conservation coverage by the planning effort, desert mule (burro) deer (<i>Hemionus odocoileus eremicus</i>), several State-listed bird species, and extensive stands of desert dry wash (microphyll) woodland, a natural community that supports the highest levels of species diversity and abundance in the Sonoran Desert. Please include this information in the FSA.</p>
4.2-18	<p>We recommend Staff require the temporary construction logistics area be enclosed with desert tortoise exclusion fencing. Since this area would only be used during construction and would not be included inside the permanent fencing around the project, we suggest that this area be fenced with temporary, instead of permanent, desert tortoise exclusion fencing.</p>
4.2-19	<p>Heliostat washing for 12 hours per night implies that night lighting would be required. Please discuss impacts from this activity (i.e., water usage, runoff, and night lighting) in the effects analysis sections. Please also discuss any disturbance to wildlife expected to result from personnel presence during night operations.</p>
4.2-19	<p>Please specify whether right-of-entry issues along the gen-tie line have been resolved, or how resolution would occur prior to construction.</p>
4.2-25	<p>Mojave fringe-toed lizard is the only species for which occurrence numbers were included in the summary section. Please be consistent in the type of information presented across species, or clarify why the additional information is of key importance for this species.</p>
4.2-25, 4.2-49	<p>The project site supports a higher percentage of microphyll woodland than the average across the NECO Plan area. Please discuss the biological significance of the relatively high density, high percent canopy cover, and old growth stand characteristics of the microphyll woodlands on the project site, and the implications for mitigation.</p> <p>The recent Independent Science Advisors' report on the DRECP included the following paragraph on the ecological value of microphyll woodland. Please incorporate this information into the description of the ecological importance of microphyll woodlands.</p> <p>“The ironwood is a keystone species in the Sonoran Desert due to its influence on soil nutrients and the food and cover it provides for a variety of desert biota (Nabhan and Carr 1994). Ironwood provides nesting platforms and cavities for nesting birds, and its dense canopy is utilized by nearly 150 bird species. The ironwood is the last in a phenological series of desert tree legumes to bloom following mesquite and palo verde. The Ironwood provides sustenance to invertebrates and thereby food for migrating and resident birds. In addition, ironwood is one of the longest-living plants in the Sonoran Desert, with individuals living well over 1000 years, so it serves as an extremely long-term component over centuries of extreme drought in providing a</p>

	<p>micro-habitat with less direct sunlight, lower surface temperatures, more organic matter, higher water availability, and protection from herbivores. Over the lifetime of one tree, more than 230 plant species have been recorded starting their growth within the protective microclimate under ironwood "nurse plants" (Nabhan and Carr 1994). This also creates an optimum wildflower nursery which is foraged by rabbits, bighorn, and other native species. An extraordinary level of biodiversity is created by ironwoods, including many dozens of species of bees, ant colonies, and other insects.”</p> <p>Citation: DRECP ISA (DRECP Independent Science Advisors). 2010. <i>Recommendations of Independent Science Advisors for The California Desert Renewable Energy Conservation Plan (DRECP)</i>. October 2010. (DRECP-1000-2010-008-F.) Prepared For: Renewable Energy Action Team (California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, California Energy Commission). Produced by: Conservation Biology Institute. Accessed online April 2011. &lt;<a href="http://www.drecp.org/documents/index.html#science">http://www.drecp.org/documents/index.html#science</a>&gt;.</p>
4.2-25	Third paragraph, last sentence: Please revise to state the following: “There are no existing anthropogenic barriers to wildlife movement...”
Global, including 4.2-26 4.2-29 (Table 5)	<p>Table 4: Please include the Service’s Birds of Conservation Concern to Biological Resources. Also include these species in discussions of special status species throughout the document.</p> <p>We recommend including in the third column the following definition: “Species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973” (from 1988 amendment to the Fish and Wildlife Coordination Act).</p>
4.2-39	For clarity, please include in the introductory paragraphs the definition of mitigation as used in the PSA.
4.2-39, 4.2-48	<p>Table 6: For clarity, please describe how the disturbance acreages were derived. These acreages differ from the project acreages included in the executive summary (1.1-2) and project description (3-1) sections; if this is correct, please include an explanation as to why they are different. If this is incorrect, please make the appropriate corrections throughout the document.</p> <p>Please include a table of disturbance acreages by project component (e.g., construction/laydown area, power blocks, heliostat fields, access roads on- and off-site, the administrative area, gen-tie line, etc.). This information should guide Staff’s development of final recommended conditions of certification to avoid, minimize, and mitigate anticipated project impacts.</p>
4.2-41	Impacts to common wildlife and nesting birds, second paragraph of the determination column: Please revise to state the following: “These hazards would be mitigated to less than significant for large raptors with Staff’s recommended conditions of



	certification.”
4.2-43	Third paragraph in the determination column of the burrowing owl subsection: Please revise to state the following: “however, contribution to mortality due to collision and solar energy flux hazards would remain cumulatively considerable.”
Global, including 4.2-43	“Concentrated solar energy” does not describe an effect to a bird. Please revise the list of direct impacts to describe the <u>effects</u> to a bird (e.g., blinding, singeing, burning, injury or death from collision, mortality, etc.), instead of only the cause of the effect (e.g., concentrated solar energy). Please ensure this type of imprecise wording is avoided throughout the PSA, for all species and effects.
4.2-45	Direct Impacts to Native Vegetation and Wildlife Habitat section, third sentence: To ensure consistency with the rationale described on page 4.2-46, please revise to describe construction or long-term effects, instead of temporary effects.
4.2-46	Please specify if there are any vegetation impacts that Staff are considering temporary, as defined here (e.g., lasting less than 5 years). Also, please provide rationale for temporary impacts lasting less than 5 years. As described in the first paragraph on this page, impacts to vegetation in the desert generally are considered permanent because of the lack of proven restoration methodologies and the length of time necessary to allow for natural regeneration.
4.2-46	Please revise the sentence about the impacts of vegetation mowing. Proposed vegetation treatment may be more compatible with the goals of soil and water resource conservation; however, as described in the rest of the effects section, treatment would degrade habitat value of remaining vegetation. Thus the proposed treatment would not “enhance” soil and water resource conservation.
4.2-46 4.2-47 4.2-62	<p>Please specify where vegetation would be cut to ground level, and where vegetation would be mowed to 12-18 inches in height, as described elsewhere in the PSA.</p> <p>Please separately analyze the effects of each of these vegetation treatments, and include the expected total disturbances of each type.</p> <p>Please describe how vegetation would be cut or removed during operations and maintenance to allow continued heliostat function and fire hazard management. Please describe what methods of vegetation trimming would be used (e.g., hand trimming versus mechanized), what equipment would be necessary, staging areas (i.e., areas previously disturbed by project activities or undisturbed areas), and any other information needed to assess any potential additional impacts from this component of the project description.</p>
4.2-46, 4.2-47	<p>Please elaborate on how the proposed project would “substantially degrade” habitat value and what anticipated short- and long-term effects on vegetation would be. For example, what physiological, growth, or other impacts would be expected to individual plants? How would that affect the habitat value of the vegetation? How would vegetation treatment alter the ecosystem function of plants within the project boundary? Please provide specific discussion points and supporting citations, if available.</p> <p>Please describe, with supporting citations and rationale, whether Staff anticipates</p>

	vegetation regrowth at project completion. Please describe how much time and what conditions are necessary for regeneration; whether or not the proposed project site supports appropriate conditions; and a comparison of proposed vegetation treatments to other practices. Please discuss factors such as soil impacts, weed presence, restoration requirements, and vegetation management practices (e.g., leaving roots intact, vegetation mowing, grading, etc.). If supporting literature does not exist, please describe Staff's rationale.
4.2-46	Temporary and long-term impacts subsection, last paragraph: Please clarify if temporary access roads to construction sites are proposed or not.
4.2-46	Please include a table depicting acreages in the discussion of vegetation impacts.
4.2-46	Please clarify what "heliostat support installation" is, and what anticipated associated vegetation impacts are. Please specify what associated area would be cleared and grubbed. Please specify how the area of disturbance from this activity compares to or overlaps with disturbance resulting from vegetation mowing and other project construction activities.
4.2-46	If clearing and grubbing is proposed at each tower or pull site along the proposed gen-tie, please include in the project description. Different species occur along portions of the gen-tie line than on the project generation site; consequently, clearing and grubbing along the gen-tie line could have different biological impacts that should be discussed.
4.2-47	First paragraph, last sentence: Please revise to include an assessment of long-term vegetation function with respect to baseline habitat conditions. We recommend any assessment of "benefit" or adverse impact be made against the environmental baseline.
4.2-47	Overview of wildlife habitat impacts section, second paragraph: Staff asserts that remnant vegetation after construction may be suitable for some common species. Please describe what aspects of the habitat would make that true. Please support the conclusion with specifics, citations, or supporting rationale. Similarly, please specify what aspects of remaining vegetation would make it unsuitable habitat for other species, as asserted in the subsequent sentence.
4.2-47, 4.2-49	Please include citations or a rationale supporting as the limits of indirect effects the proposed 500 foot buffer around site boundaries and 10 foot buffer next to access roads.
4.2-47	Last paragraph: Please specify what "other [indirect] effects" to wildlife habitat are anticipated.
4.2-48	First sentence: Please clarify to what circumstances Staff is referring. Be specific as to whether or not Staff expects the indirect effects of the project to vary by project component, by habitat type, by species, or by other factors.
4.2-48	Please elaborate on the statement about effects to groundwater-dependent species. Please specify what species are considered, what their expected thresholds of tolerance to water drawdown would be, and over what distance effects would be expected to extend. Please elaborate on what the consequences of being "vulnerable" to groundwater depletion are expected to be (e.g., mortality, reduced growth, smaller leaf size, etc.). If discussed elsewhere in the PSA, please refer the reader to the

	relevant page(s).
4.2-48	Please specify how indirect impacts, or the buffer area around the project, are accounted for in Staff's determination of what impacts are substantial, cumulatively significant, and mitigable.
4.2-48	Please describe earlier in the document (e.g., at first reference to one) the synonymy of desert dry wash woodland, microphyll woodland, and blue palo verde-ironwood habitat, and then be consistent throughout the PSA which term is used to describe the habitat.
4.2-49	Direct effects to native vegetation and wildlife habitat section, last paragraph: Please move this paragraph to before the last paragraph on page 4.2-47. This would clarify the transition from discussing direct effects to indirect effects.
4.2-49	Direct effects to native vegetation and wildlife habitat section, last sentence: Please revise to state the following: "These are described further in a separate section below."
4.2-49	Indirect effects to native vegetation and wildlife habitat section: Please tie each of the causes listed in the first paragraph back to what the expected effects <i>to vegetation</i> would be (e.g., reduced growth, change in the community composition, etc.).
4.2-49	Please revise the sentence about heliostat wash water to state the following: "...wash water on soil beneath the heliostats (runoff would concentrate along the driplines, affecting soil water and resultant habitat suitability for different plant species (e.g., opportunistic nonnative species versus natives)."
4.2-49	Please specify why altered drainage patterns are "especially" likely in the locations described. Please describe what project components (e.g., access roads, fences) or environmental attributes cause this likelihood (i.e., are these the areas that would be paved?). See general comment about connecting the dots between the project description and anticipated effects.
4.2-50	Please define "weed species." Previously, the document refers to nonnative or invasive species. If Staff ascribes different meanings to these three terms, please define each at first use, or use one term consistently throughout the PSA.
4.2-50	The second sentence of the paragraph beginning "human activities can..." is redundant; please delete.
4.2-50	First full paragraph, fourth sentence: Please revise to state the following: "...propagate invasive species, because these species are adapted to soil disturbance..."
4.2-50	Sentence that cites Abella et al.: Please revise to state the following: "...representing a serious threat to native desert ecosystems (Abella et al. 2008) for the reasons discussed above."
4.2-50	Sentence beginning "Thus, the proposed Rio Mesa SEGF..." Please revise to state the following: "Thus, construction of the proposed Rio Mesa SEGF, including solar generation facilities, associated gen-tie line and other facilities, would be expected to introduce and/or facilitate the spread of invasive non-native plants."
4.2-50	Second paragraph, first two sentences: Please revise as follows: "Historically, a limited suite of alien plant species have been capable of invading undisturbed desert habitat, due to the hot and arid environment, undependable timing and amount of

	annual precipitation, and often saline or alkaline soils (Mack 2002).”
4.2-50	To connect project activities, literature citations, and expected effects, please revise the sentence beginning “Shade beneath the heliostats...” as follows: “Shade beneath the heliostats would alter the microenvironment by creating a cooler, moister microhabitat (Smith 1984, Smith et al. 1987), thereby favoring weedy annual species (citation).”
4.2-50	Sentence beginning “Shading and wind...” Please revise as follows: “Shading and wind deflection caused by structures in the desert decrease soil temperature...”
4.2-50	To clarify the discussion of heliostat washing, please provide a specific description of project activities and provide context to evaluate their impact. For example, please specify the frequency of mirror washing and the expected quantity of water used per unit area or per washing event. Please then compare this to annual rainfall in the area, or provide other context that frames discussion of expected soil, vegetation, and microclimatic effects. Please provide citations and walk the reader through Staff’s assumptions and resultant conclusions about the types and magnitude of expected effects from this project activity. See general comment about connecting the dots between the project description and anticipated effects.
4.2-50	Sentence beginning with “Weeds were relatively...” Please revise to reflect baseline conditions, as follows: “Weeds are relatively low in abundance throughout the Rio Mesa SEGF site.”
4.2-50	Last sentence: Please provide a citation.
4.2-51	Sentence beginning “the potential spread or proliferation...” Please revise as follows: “The potential spread or proliferation of non-native annual grasses, combined with the proximity to ignition sources during construction and operations activities could increase the risk of fire. Effects of fire to these poorly-adapted desert communities would be harmful, particularly to cacti and most native shrub species.” Please provide appropriate citations for this section.
4.2-51	For clarity, please move the last three sentences of the first paragraph to prior to the sentence beginning “weeds tend to spread...” This would keep discussion of project effects to fire cycle in one place, before discussing other biological feedback mechanisms that may be affected. If the effects described in these three sentences have been documented elsewhere in the desert, please provide supporting citations or examples.
4.2-51	Please provide citations when describing the potential effects to native vegetation of herbicide use. Please describe what the expected end effect for native plants and wildlife of herbicide exposure is. If injury and/or mortality are expected, please include.
4.2-51	Please include grading and vegetation clearing as activities that would increase aeolian (wind) erosion of the soil. When discussing dust, please specify what areas of the project site are anticipated to cause dust problems.
4.2-51	In the last paragraph, please tie soil erosion and dust issues back to vegetation impacts. For example, discuss the ramifications for plants of loss of soil, interrupted processes of nutrient accumulation, and other effects mentioned.

4.2-51	Sentence that begins “The destruction of plants...” Please revise as follows: “...exacerbates soil erosion by creating a looser soil surface and accelerates...” If this revision changes the intent of the sentence, please clarify.
4.2-52	First paragraph: Please provide examples of what types of pollutants would be expected. If appropriate, please refer the reader to another section of the PSA.
4.2-52	First paragraph: Please cite any examples pertaining to silt deposition downstream. Please elaborate and explain what Staff’s conclusions are about impacts to water quality and hydrology downstream, and how that would affect associated vegetation.
4.2-52	Please clarify whether the project is acquiring existing and/or currently-used water rights, or if water use associated with the project would represent incremental, additional, new use. In addition, please state whether the anticipated rate and extent of groundwater drawdown is known or refer the reader to another section of the PSA. If unknown, please state Staff’s assumptions about groundwater use, plant reactions, and biological significance.
4.2-52	Hydrology and groundwater-dependent vegetation subsection: Please specify how it would be determined if plant stress or mortality are related to project activities. Please include a description of how stress or mortality would be determined, what baseline would be used for comparison, and how factors other than project water use would be accounted for. Please include detailed descriptions of the information required for the desert dry wash woodland monitoring plan described in proposed condition of certification BIO-8. Please set up here the biological basis for the proposed monitoring locations and duration of BIO-8. Please provide a framework for an adaptive management process, should project activities be found to be causing plant stress or mortality. As part of that, identify the parties that would be involved, and describe how mitigation ratios would be determined if habitat mitigation is pursued.  Please describe the geographic area across which off-site habitat acquisition would be considered to mitigate for project impacts to groundwater dependent vegetation. If in different watersheds, please describe how this would mitigate project impacts to a less than significant level. Given the importance of microphyll habitat to migrating birds, as well as the known site fidelity of some species of nesting birds, avoidance and minimization of impacts should be prioritized, and mitigation pursued as close to the project site as possible.
4.2-52	Please discuss anticipated effects, if any, of groundwater drawdown on the natural springs in the project vicinity, and the implications of that for burro deer and other wildlife populations.
4.2-52	Second paragraph: Please replace BIO-3 with BIO-8, to reflect the proposed conditions of certification.
4.2-52	Second to last sentence: Please add an “S” to USFW.
4.2-53	The citations, analysis, and discussion presented here regarding habitat mitigation ratios is the type of supporting language we recommend integrating throughout the document, to explain Staff’s rationale about biological impacts and their significance.
4.2-53	Last paragraph: The amount of suitable habitat across the range of desert tortoise is

	<p>not currently the limiting factor in terms of achieving recovery; the long-term survival and recovery of the species relies on coupling targeted land acquisition with more effective, strategic habitat management of tortoise conservation areas and associated linkages. That said, as more and more large-scale renewable energy projects are permitted and constructed, the amount of available, unfragmented habitats may become a more pressing need. We recommend incorporating this discussion, to reflect the desert tortoise recovery plan (Service 2011).</p> <p>Citation: U.S. Fish and Wildlife Service. 2011. Revised Recovery Plan for the Mojave Population of the Desert Tortoise (<i>Gopherus agassizii</i>).</p>
4.2-57, 4.2-106	<p>Please briefly justify/support Staff’s assumption that acquisition lands for native vegetation and wildlife habitat impacts would serve as suitable mitigation lands for desert tortoise habitat, burrowing owl habitat, and golden eagle foraging habitat. Each of these species has specific habitat requirements (e.g., friable soils, adequate prey base, etc.), which may not overlap completely.</p>
4.2-57	<p>Second full paragraph: Please add a sentence that states that the project proponent must fulfill the requirements for each habitat category, regardless of whether nesting of mitigation lands is implemented to the extent feasible.</p>
4.2-57	<p>Please clarify why Staff does not present the same concern about the feasibility of 3:1 mitigation of impacts to state waters that is presented for blue palo verde – ironwood habitat. These two habitat features are generally at least loosely associated.</p>
4.2-59	<p>Please provide a citation that desert dry wash woodland is “relatively rare.” If an approximate percentage for land cover exists, please include. Please compare the microphyll percent land coverage throughout the desert to that on the project site.</p>
4.2-59 4.2-129	<p>Please specify within what geographic area Staff considers it appropriate to mitigate for impacts to desert dry wash woodland. The NECO Plan area is quite large and, in some cases, overestimates the extent of desert dry wash woodlands; hence, habitat acquisition in areas farther from the project site may not mitigate for project impacts in a biologically meaningful way at least for some species. Because of the importance of desert dry wash woodland on the project site in supporting the burro deer south of I-10, all mitigation lands for desert dry wash woodland should be acquired within the range of burro deer. Mitigation lands should have comparable percent canopy coverage of desert dry wash woodland. In addition, lands should have species composition and old growth stand characteristics comparable to the woodlands on the project site.</p> <p>The project is proposed in an extensive complex of microphyll woodlands. These stands contain trees which can be hundreds of years old (Dimmitt 2000a). These old growth stands are proposed to be removed within the project footprint. The PSA identifies that “greater clarity” is needed from the applicant about the spatial extent of vegetation disturbance that would result from the project. The existing documentation does not provide sufficient information to quantify accurately what the ecological cost of that loss would be on a regional basis, or whether enough</p>

	<p>alternative woodland is available for acquisition to partially offset the impacts incurred by the proposal. The proposed 3:1 mitigation to development ratio for loss of microphyll woodlands does not recognize the old growth characteristics of the microphyll woodlands found onsite, or species composition and variable ecological function of woodland stands with different size, age, percent canopy cover, and species composition characteristics (DRECP ISA 2010). We assert that the PSA oversimplifies the biological importance of microphyll woodlands on the project site by neglecting to account for stand age, size, percent canopy cover, species composition; stand structural complexity; burro deer use; and location in the migratory flyway. Based on these biological simplifications, the PSA does not provide sufficient support for the premise that a single mitigation ratio, applied across the large area of the NECO Plan, adequately accounts for the loss of habitat value for the many birds, mammals, and other wildlife that differentially rely on these woodlands for food, water, and shelter.</p> <p>Citation:  Dimmitt, M.A. 2000a. Fabaceae (legume family). In <i>A Natural History of the Sonoran Desert</i> (S.J. Phillips and P.W. Comus eds.). Arizona-Sonora Desert Museum Press. Tucson, Arizona:227-239.</p> <p>DRECP ISA (DRECP Independent Science Advisors). 2010. <i>Recommendations of Independent Science Advisors for The California Desert Renewable Energy Conservation Plan (DRECP)</i>. October 2010. (DRECP-1000-2010-008-F.) Prepared For: Renewable Energy Action Team (California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, California Energy Commission). Produced by: Conservation Biology Institute. Accessed online April 2011.  <a href="http://www.drecp.org/documents/index.html#science">http://www.drecp.org/documents/index.html#science</a>.</p>
4.2-59	Last phrase on the page: Please specify the circumstances under which Staff would consider it appropriate to consider alternate mitigation, what types of mitigation would be considered, how alternatives would be evaluated, and what parties would be involved in deciding mitigation suitability.
4.2-60	Please delete the second sentence of the first paragraph; the information is irrelevant to assessing impacts to waters of the state.
4.2-60	Please add discussion of the low frequency, high intensity nature of storm flow in the desert.
4.2-61	Last paragraph: For clarity, please substitute “row” for “subsection” when describing the impacts to waters of the state entry in Table 9.
4.2-61	<p>Table 9: Please clarify whether both the project generation facility and gen-tie line are included in the temporary construction acreages.</p> <p>Please reconcile the “temporary construction” impacts identified in Biological Resources Table 9 with the long-term and construction impacts described on 4.2-46, reflective of slow recovery times in the desert.</p>

4.2-62	Please include details relative to water diversion, storm drainage control, and the storm water management system, and what modifications to existing flow would be implemented as part of the proposed project (e.g., culverts, barriers, etc.). In particular, please provide specifics such that the phrase “to the extent practicable” can be removed, and the reader clearly understands what activities are included in the project description. Please ensure that anticipated effects to vegetation and habitat value resulting from changes in flow are documented and analyzed.
4.2-62	End of third paragraph: Please revise as follows for clarity “...about 0.5 percent of the total state jurisdictional acreage associated with the project.”
4.2-63	Please support, elaborate, and justify the stated conclusion that alterations to storm flows would be “relatively minor.”
4.2-64	First paragraph: Please include discussion of off-site, downstream impacts.
4.2-64 (and 4.2-61)	Please include a separate, concluding paragraph at the end of the section on impacts to waters of the state that describes the unknowns due to the lack of a LSAA application. Please include a discussion of what the next steps are and what types of questions would be resolved by receiving the application.
4.2-65	Please discuss the extended drought in this region, and the limitations of data collected. Please identify any assumptions made regarding the data submitted.
4.2-66	Please define what would constitute “substantial adverse impacts” to Harwood’s milk-vetch or Harwood’s eriastrum and the likelihood that such impacts would occur. Please specify why it is unknown whether such impacts would occur, as implied by the phrase “should they occur.” If additional data are needed, please specify what information is needed, and whether data limitations are based on applicant actions or environmental constraints. Please apply the same comments to the subsequent discussions for ribbed cryptantha, desert unicorn plant, or Utah vine milkweed.
4.2-66	For clarity, we recommend moving the impact evaluation and mitigation strategy section to follow the direct and indirect impacts sections. This order would correlate all expected impacts to the determination of the significance of each impact, followed by the discussion of Staff’s conclusions and commensurate mitigation.
4.2-66	Last paragraph: Please define “special circumstances.” Please explicitly state Staff’s conclusion on whether or not those are met. Also, please provide support for the implied conclusion that conditions for special circumstances under CEQA are not met.
4.2-67	Please include citations throughout this page of descriptions of plants’ ranges, threats, and habitat requirements.
4.2-67	Threats subsection, last sentence: Please clarify whether <u>existing</u> disturbances <u>are</u> located on existing access routes and utility alignments, or if this statement refers to expected project-related disturbances. If the latter, please explain why Staff anticipates that project-related disturbances would be localized on access routes and utility alignments, when vegetation disturbance and clearance would occur and vegetation community and microclimate conditions on-site would be expected to change.  Please also specify whether the referenced access routes and utility alignments are



	existing or those proposed in association with the proposed project.
4.2-67	Status as peripheral populations subsection: When describing Harwood’s milk-vetch occurrences, please reconcile the statement that occurrences on the project are at the “western limits” of the plant’s range, when the plant is also found in San Diego and Imperial Counties. If appropriate, please revise to be the “northwestern limits,” or state that its geographic distribution is centered farther east.
4.2-68	Fourth full paragraph: Please identify whether there is suitable habitat or extant downstream occurrences of the special-status plants considered here. If yes, please describe. If no, please state so. In either case, provide the context necessary to support the determination of the likelihood of downstream effects put forth in the document.
4.2-68	Please describe the habitat in interior Ventura County where the CBI (2000) study was conducted, and explain the limitations or appropriateness of extrapolations about rare plants from that study to the proposed project site.
4.2-68	Please elaborate Staff’s comment about invasive ant species. Please provide citations, and identify any known source populations in the area, and the likelihood of colonization of the area.
4.2-69	Conclusions and discussion of special-status plant mitigation section, first sentence: Please add “according to the significance criteria described above” to the end of the sentence.
4.2-70	Please change the section header “overview of impacts to wildlife” to be “construction impacts to wildlife,” to better reflect the section’s contents and mirror the subsequent heading “operational impacts to wildlife.”
Global, including 4.2-70	Common wildlife subsection: Please provide an overview of the results of pre-project surveys for each resource, to assist in understanding the magnitude of expected effects. Please also discuss any other relevant data sources, such as regionally available avian radar data, avian surveys from Cibola National Wildlife Refuge, CDFG occurrence records, and long-term dove coo count survey transects in the project vicinity.
4.2-70	Common wildlife subsection, second paragraph: Please revise as follows: “...and other less mobile species could occur during site clearing or mowing, grading, and movement of equipment and vehicles.”
4.2-70	Common wildlife subsection, second paragraph, second sentence: Please revise as follows: “Wildlife could become entrapped in open trenches or pipes during construction...” This revision would also reflect recommended condition of certification BIO-5.
4.2-70	Please address increased intra- and inter-specific competition that may result from common wildlife dispersal to off-site habitat.
4.2-70	Please provide a citation for the vegetation treatment at Hidden Hills.
4.2-67 4.2-70 4.2-122	The concepts pertaining to peripheral populations apply to more species than just special-status plants.  Please discuss in the common wildlife subsection or wildlife movement section the

population-level impacts of habitat loss from the proposed project or cumulative projects to common and special-status wildlife species. The deserts of southern California are among the hottest and driest places in North America. Individuals surviving in harsh or novel habitat, often at the edge of a species' distributional range, can play an important genetic and geographic role in the survival of the species in the face of environmental fluctuations. Strong selection pressure can result in behavioral and physiological adaptations that facilitate survival in harsher climates (Lesica and Allendorf 1995). These adaptations can confer genetic benefits that contribute to greater survivability of individuals, and ultimately the species, in response to long-term, wide-scale environmental changes. In addition, peripheral populations typically have lower population densities, and consequently are more resistant to density-dependent sources of mortality, such as disease (e.g., Burdon and Chilvers 1982). In a study of 245 imperiled species worldwide, Channell and Lomolino (2000) found that 68% of surveyed species retained a greater than expected portion of their distribution in habitat peripheral to the historical range. Given the above, areas supporting peripheral populations can function as refugia against environmental catastrophes and as a source for recolonization of depleted/extirpated core populations of a species (Nielsen et al. 2001, Flannery 2001).

According to climate change models, conditions currently present in parts of the Colorado and Sonoran deserts are expected to expand to other parts of the California deserts (Allen 2012), with an associated shift in vegetation (Notaro et al. 2012). Populations in the Colorado/Sonoran desert of wide-ranging species such as desert tortoise or bighorn sheep often demonstrate genetic and morphological adaptations distinct from other parts of a species' range. Consequently, the genetic diversity presumably present in populations from the hottest and driest parts of species' ranges may become increasingly important for ensuring the species' persistence.

Literature Cited:

- Allen, R.J. 2012. Climate change scenarios in Southern California. Presentation at University of California Riverside's Center for Conservation Biology and University of California Cooperative Extension's Climate Change Workshop. May 22, 2012, University of California Riverside, Palm Desert, California.
- Burdon, J.J. and G.A. Chilvers. 1982. Host density as a factor in plant disease ecology. *Annual Review of Phytopathology* 20:143-166.
- Channell, R. and M. V. Lomolino. 2000. Dynamic biogeography and conservation of endangered species. *Nature* 403:84-86.
- Flannery, T. 2001. *The Eternal Frontier*. Atlantic Monthly Press, New York.
- Lesica, P. and F. W. Allendorf. 1995. When are peripheral populations valuable for conservation? *Conservation Biology* 9:753-760.

	Notaro, M., A. Mauss, and J.W. Williams. 2012. Projected vegetation changes for the American southwest: combined dynamic modeling and bioclimatic-envelope approach. <i>Ecological Applications</i> 22:1365-1388.
4.2-71	Please include a paragraph prior to the one starting “Staff concludes...” that describes potential impacts associated with ponding of water used in dust control, any water ponds or water storage tanks used during construction, and any other water source.
4.2-72	Since this section focuses on wildlife impacts, please tie the impacts to vegetation described in the first paragraph back to expected impacts to wildlife.
4.2-72	For consistency, please retile the nesting birds section to “construction impacts to nesting birds.” Alternately, please make the text smaller and lowercase, and reduce to be a subsection of the construction impacts to wildlife section, above.
4.2-72	Please clarify what effects Staff expects to nesting adult birds, and provide supporting rationale and citations. If no effects are expected to nesting adults, please specify.
4.2-72	Second paragraph, first sentence: If nesting adult birds flee the project site, any associated nestlings or eggs would likely die. Please discuss this potential impact, its likelihood, and what measures would be taken to avoid it.
4.2-72	Second paragraph, third sentence: Please revise as follows: “...it would likely destroy bird nests, and any associated eggs or nestling birds.”
4.2-72	Please discuss impacts to nesting birds resulting from causes other than noise levels (e.g., human and vehicular activity).
4.2-72	Please provide citations throughout the discussion of noise impacts. Please explain why Staff concludes that impacts from noise to nesting birds, including special-status species, during construction would be less than significant.
4.2-74	Roads and traffic subsection: Please specify whether Staff expects project activities to lead to new, unauthorized vehicle routes.
4.2-74	Please delete the clause “if dilute saline wastewater is present in the evaporation ponds.” Ravens generally are attracted to any water source in the desert, and would not be limited to dilute saline wastewater. Please also tie this discussion back to its biological importance. A suggested revised sentence would read, “In addition, water in the evaporation ponds could serve as a water subsidy for ravens, who predate on desert tortoise and other reptiles (see discussion...).”
4.2-74	End of the second paragraph on evaporation ponds: Please revise as follows: “(...other special status species) and that would be already exposed to other project-related sources of mortality (see above).”
4.2-74	Last paragraph, second sentence: Please state “For example” prior to describing salt toxicosis at the Harper Lake.
4.2-75	In the first sentences on this page, please make the transition from a documented example to discussion of projected project impacts clearer. As written, it is unclear if the last two sentences of this paragraph related to the example or if they are anticipated effects from the proposed project. Please also add a paragraph that describes what effects are anticipated at the Rio Mesa site, and how those are mitigated by recommended conditions of certification.

4.2-75	Please revise the sentence that references a subsection entitled “Operational Impacts to Birds and Bats.” No such section, as titled, exists in the PSA.
4.2-75	<p>Netting may not be sufficient to avoid bird mortalities at evaporation ponds, as described. For example, numerous bird mortalities have occurred at the ponds at Desert Sunlight Solar Farm, despite netting around the ponds at that facility (K. Simon, Ironwood Consulting, 2012 pers. comm.). Mortality at the evaporation ponds included entanglement in the netting, drowning, and fence collision. Consistent and frequent monitoring is essential to ensure netting integrity and effectiveness.</p> <p>Citation: K. Simon. Nov. 12, 2012. Email to M. Massar [BLM], L. LaPre [BLM], L. Chow [Ironwood Consulting], C. Slaughter [Ironwood Consulting]. Subject: Avian and Bat Mortality/Injury/Relocation Figure and Tables. Includes attachments: table of avian mortality and injury at Desert Sunlight Solar Farm as of Nov. 12, 2012, and Avian and Bat Injury and Mortality Map.</p>
4.2-75	Please clarify what polarized light pollution is, and what time of day it occurs (e.g., during the day or night).
4.2-75	Please elaborate what is meant by the project having a “mirage effect.” Please tie back to the heliostat field potentially looking like the sky or water.
4.2-76	End of first sentence: Please revise as follows “...present collision risks for birds or bats, as discussed in more detail below.”
4.2-76	The sentences “Nocturnal visibility of the gen-tie... insects (and feeding bats).” are mostly redundant to information presented subsequently. Please delete.
4.2-76	Please move the sentence “During daylight, the mirrored...commonly strike).” to the bullet describing potential collisions with heliostats.
4.2-76	Second paragraph: Please revise the description of heliostat field from “many large mirrors” to state the actual number of heliostats that would be installed.
4.2-77	<p>Please discuss the second enumerated point under the gen-tie line bullet in more detail. Please tie back to biological conditions on the proposed project site, specifically bird flight in the area, as birds potentially take off from or land at agricultural fields, the Colorado River, or suitable migration stopover habitat in the vicinity of the proposed project site. Please include agricultural fields, not just nearby wetlands, in the discussion.</p> <p>Site-specific conditions such as these increase the risk of bird injury or mortality from the proposed project, due to increased probability of exposure compared to other locations in the desert. Only the site-specific factors that decrease risk to birds are discussed here, potentially biasing Staff’s determination of significance. Please discuss the factors raised in this comment, and how they do or do not affect Staff’s determination.</p>
4.2-77	Please account for the low detectability of bat mortality when describing bat collisions with transmission lines in the gen-tie bullet.
4.2-77	Please cite any evidence that supports Staff’s conclusion that the “most likely” collision risk for bats is from project vehicles and defend this likelihood determination. If this type of mortality for bats has not been documented, please

	explain Staff's rationale.
4.2-77 4.2-87 4.2-107 4.2-108	<p>Please discuss bird injury or mortality from collision with project fencing. This has occurred on other utility-scale solar projects in the I-10 corridor. Therefore, please include a measure in proposed condition of certification BIO-5 that would require project fencing to be designed in a way to be visible to birds and minimize the risk of collision and injury.</p> <p>For suggestions, please see studies conducted on fence marking in grouse habitat. For example:  Christiansen, T. 2009. Fence marking to reduce greater sage grouse (<i>Centrocercus urophasianus</i>) collisions and mortality near Farson, Wyoming – summary of interim results. Wyoming Game and Fish Department.  Stevens, B.S. 2011. Impacts of fences on greater sage-grouse in Idaho: Collision, mitigation, and spatial ecology. M.S. Thesis, University of Idaho.</p> <p>Wolfe, D.H., M.A. Patten, and S.K. Sherrod. 2009. Reducing grouse collision mortality by marking fences (Oklahoma). <i>Ecological Restoration</i> 27(2):141-143.</p>
4.2-77	Please clarify what is meant by “undocumented” birds. We assume it to mean birds not detected during mortality monitoring.
4.2-77	Please add discussion of carcass detectability to the last paragraph on the page. For example, please add “detected” to the sentence “The bulk of <i>detected</i> bird mortality...”
4.2-78	Table 11: Please specify whether the acreages considered in the “Acreage/MW” column refers to the total project acreage or the acreage of heliostat field.
4.2-78	Last paragraph: Please specify how much shorter the heliostats at the proposed project would be compared to Solar One. Please also describe the rationale connecting heliostat height with the probability of bird collisions. Please describe both the applicant's rationale in asserting this would reduce collision hazard, and Staff's rationale that collision risk is more likely a function of total area of mirror surface than heliostat height.
4.2-79	In the first paragraph, please revise Staff's word choice about projected, estimated, and predicted bird mortality rates. A projection requires the most data, because it relies on knowledge of existing trends. Predictions require data and observations, but not knowledge of trends. Estimations are best guesses, and do not require grounding in data, observations, or trends. The sentence that extrapolations of mortality rate are intended as “rough projections” and “not...estimated or predicted mortality rate” thus does not make sense. Please clarify.
4.2-79	Please clarify why further consideration and variables “may” imply overestimation or underestimation. The factors presented either imply overestimation or imply underestimation.
4.2-79, 4.2-86	Second bullet (4.2-79), third bullet (4.2-86): Please revise as follows: “No incidentally or anecdotally observed [collision][radiant energy flux] mortality at BrightSource's SEDC project.”

4.2-79,	To reflect the previously presented argument about heliostat height, please add a bullet to the list of factors likely leading to overestimation of mortality that describes the lower heliostats at the proposed project than Solar One.
4.2-79,	Third bullet: Please revise as follows: "...reflective surface rather than size of individual heliostats."
4.2-79, 4.2-86	Please add a bullet to the list of factors likely leading to an underestimation of mortality that describes birds taking off and landing in the vicinity. See previous comment (4.2-77) about bird behavior, habitat use, and project location.
4.2-79, 4.2-86	Please tie the list of factors likely leading to an underestimation of mortality back to project location. For example, when describing proximity to wintering waterfowl habitat and refuges (third bullet), please add "i.e., at and near the Colorado River, approximately 4 mi away."
4.2-80, 4.2-86	Please add a bullet to the list of factors likely leading to an underestimation of mortality that Solar One was graded, where the heliostat field at Rio Mesa would maintain some native vegetation. While this is desirable for multiple reasons, it may support greater insect abundance and diversity on the project site, which in turn may lead to greater avian use of the project site.
4.2-81	Second paragraph, sentence that describes an object placed in the path of reflected energy: Please revise as follows: "An object, such as a bird, located in the path of reflected energy..."
4.2-81	Table 12: Please acknowledge that effects due to bird size and coloration are not included, which thus presents an oversimplified view of BrightSource Energy's (BrightSource) findings.
4.2-82	Sentence starting with "And damage to insulating feathers." Please revise as follows: "...thermoregulation (body temperature control) in nature."
4.2-82	Second paragraph, first sentence: Please revise as follows: "13 of the bird carcasses detected (19 percent)..."
4.2-82	It is unknown whether aerial foragers' higher risk of burning observed in the McCrary et al. (1986) study was due to their feeding behavior (as attributed in the paper) or these species' relative abundance in the area. Please add this to the second paragraph.
4.2-82	Please insert a sentence immediately before the last sentence of the second paragraph that connects bird injury to the likelihood of mortality. In other words, please discuss the low probability of survival for any injured bird that may fly beyond site boundaries.
4.2-82	Third paragraph, second sentence: Please revise as follows, to account for the impact of size on observed effects of flux exposure: "Carcasses of three different-sized species (chickens..."
4.2-82	Please explain Staff's rationale that the type of feather and tissue damage observed in BrightSource's study would be "likely to kill" living birds.
4.2-82	Please add a sentence following the third sentence of the last paragraph that water loss and/or feather deformation are irreversible once it occurs.
4.2-83	Third paragraph, second sentence: Please revise as follows: "For human eyes, the maximum permissible exposure (MPE)..."

4.2-83	Third paragraph: Please provide citations for the human MPE levels described here. Please discuss the consequences for human eyes if exposed for longer than the identified MPE thresholds. Please specify if temporary or permanent blinding is expected, if discomfort is experienced, and any other relevant details.
4.2-83	Third paragraph, third sentence: Please revise as follows: “The Rio Mesa SEGF would concentrate sunlight at much higher radiant flux values than these (i.e., up to 600 kW/m <sup>2</sup> ).”
4.2-83	Please describe why Staff believes that birds may be at risk of eye damage or permanent blindness.
4.2-83	<p>Please list the known and suspected variables pertaining to expected avian ocular impacts, and how those relate to Staff’s analysis and conclusions. See general comments.</p> <p>For example:</p> <ul style="list-style-type: none"> <li>A. Flight over and near the heliostats: How do the effects of oblique and direct exposure of reflected sunlight and flux differ from one another? What is the volume of airspace within which the potential for eye injury or blindness occurs, and how does that compare to the zone of increased flux?</li> <li>B. Eye damage risk: Is eye damage risk higher “especially near the SRSGs”: How does proximity to the SRSGs relate to the risk of blinding or eye injury, and at what scale is this relevant (i.e., closer/farther from the tower within the volume of increased flux, or closer/farther across the project site generally)?</li> <li>C. What types of vision damage are suspected and/or probable to occur from exposure to the project? Is anticipated damage short- or long-term, additive, or permanent, and what physiological and ecological effects does eye damage have on the bird’s behavior and survival? At what point would eye injury likely result in immediate or delayed mortality, and would the bird be expected to die on- or off-site?</li> <li>D. What are the anticipated effects from one-time (acute) versus cumulative (chronic) exposures? Please explain differences in biology and ecology for acute and chronic exposure.</li> <li>E. When would damage to peripheral vision (i.e., differences in effect to central and temporal fovea) be expected, and what are the implications of that for bird behavior and mortality? What is the volume of airspace within which potential adverse effects to vision may occur?</li> </ul>
4.2-83	Please consider the different anatomy, physiology, and function of different avian eyes when addressing the comment immediately above. Eye structure varies enormously by species. Different species have different placement of the central and temporal fovea (retina structure) to optimize movement detection, scanning, detail view, and binocular vision, according to differing life history needs among species.
4.2-83	Please discuss the implications of any ocular damage, including blinding or cumulative effects to avian eyes.
4.2-83	Please provide a figure that depicts the “complex” volume within which elevated

	radiant flux levels would occur.
4.2-84	Please justify the determination that exposure to 25 kW/m <sup>2</sup> would cause significant damage to flight feathers, eyes, or skin, and clarify whether Staff believes this is the threshold at which such injury and/or mortality would occur. Please reconcile this statement with the 4 kW/m <sup>2</sup> potentially lethal threshold described in Appendix BIO1. Please acknowledge the unknowns and uncertainty involved, as done in Appendix BIO1, or refer the reader to that appendix.
4.2-84	Please discuss the difficulties of detecting birds that fly off-site or otherwise die “within a few days” of flying over the site. Please address how Staff proposes the applicant monitor, detect, measure, or otherwise be accountable for these impacts.
4.2-84	Third paragraph: Please discuss the unknown variables pertaining to anticipated bird behavioral response to the facility. Please identify any assumptions used in developing the effects analysis, and their basis. The Service is not aware of any peer-reviewed literature that would illustrate bird behavioral responses to power towers, and the effectiveness of those responses at avoiding impact.
4.2-84	Fourth paragraph: Please identify all assumptions used to develop flight times and speeds. Please include the assumption of straight-line flight path, and constant flight speed. Please discuss that flight speeds, flight paths, behavior, size, and coloration vary with species, and may affect the relative risk to different species from exposure to flux.
4.2-84	Fourth paragraph, last sentence: Please define “hazardous” and specify what risks are considered, including mortality and different types of injury.
4.2-84	Last paragraph: Please mention the process of seeking a take permit pursuant to BGEPA, in order to provide context to the discussion of the Service’s wind energy risk assessment model.
4.2-85	The first sentence on the page states that discrepancies between modeled and actual fatalities are “probably” attributable to the difficulty of accounting for local topographic conditions or eagle flight behavior. Please identify whether this conclusion is from the cited papers (e.g., de Lucas et al 2008; Ferrer et al. 2011) or is Staff’s conclusion. If the former, please move the citations to the end of the sentence. If the latter, please explain or delete. Please also acknowledge that the discrepancy may be attributable to survey effort and imperfect surveyor detection.
4.2-85	Second paragraph: Please state why Staff considers impacts to bats from concentrated solar energy unlikely and why it is expected that bats would avoid the SRSGs and other project components.
4.2-85	Please explain why Staff believes that the relative surface of heliostats is the best available proxy for hazardous airspace at each project, when extrapolating from Solar One.
4.2-84 4.2-85	The potentially significant effect Staff expects from radiant energy flux, coupled with the lack of information that would lead Staff to be able to quantify expected bird mortalities, underscores the importance of including robust monitoring of operational impacts, should the project be approved and built. Please discuss the need for monitoring of post-construction, operational impacts. Given the large number of unknowns about this technology’s biological impacts, robust monitoring over



	multiple years of operation is critical to validate Staff assumptions, gather data about project impacts, and inform adaptive management decisions.
4.2-85	End of the third paragraph: Please refer the reader to proposed condition of certification BIO-12.
4.2-86	Please discuss observed patterns of avifauna movement across the project site. Migrating avifauna move north-south across the project site. Avifauna using the project site and its vicinity as stop over habitat may move east-west across the site to access the river and agricultural lands to the east. In addition, some bird species, such as mourning and white wing doves, move east-west across the project site during daily movements from the desert, where they nest, to the agricultural lands and river area, where they feed and obtain water.
4.2-86	In the first sentence of the evaporation ponds subsection, please replace “waterfowl” with “all birds.”
Global, including 4.2-87	Collisions subsection, first paragraph: Please note that the Service’s comments on any BBCS written for the proposed project are recommendations, not requirements. Please ensure this language is reflected throughout the document.
4.2-87	Collisions subsection, first paragraph, last sentence: Please clarify whether Staff is requiring up-front implementation of described “remedial actions,” or if they would be included as part of an adaptive management framework described in the BBCS.
4.2-87	Collisions subsection, third paragraph: Please relate monitoring of operational impacts to the list of unknowns pertaining to impacts associated with implementing this technology at the scale proposed for this project. See comparable comments for flux impacts, 4.2-84-85.
4.2-87 4.2-88	Data Request 44 asked the applicant to conduct a minimum of one full year of bird surveys. The PSA does not include a full year of general bird survey results and at least 2 years of bald and golden eagle studies that we have recommended since agency coordination began in 2010. Under the current Committee-ordered timeline, the Final Staff Assessment would be published prior to completion of those surveys. As a result, we are concerned that insufficient data are available to conduct an adequate mortality risk model or impact analysis. Please discuss in the FSA the implications of the lack of these results for the impacts analysis and Staff conclusions.
4.2-88	First paragraph: Please clarify to what Staff refers when mentioning “further analysis.”
4.2-88	Concentrated solar energy subsection: Please discuss the implications of conclusions presented for implied compliance with applicable LORS.
4.2-89	Please specify what is meant by “unique features” that may support localized populations of special-status invertebrate species.
4.2-90	Second paragraph: Please update Couch’s spadefoot toad data to reflect occurrences located during the summer 2012 monsoons, including occurrences at the Genesis Solar Energy Project and in the vicinity of the Colorado River Substation.
4.2-93	Desert tortoise section, first paragraph: Please revise to reflect Murphy et al. 2011, and the recognition that the listed entity is distinct from desert tortoise populations east of the Colorado River (the Sonoran population). The listed entity is considered

	<i>Gopherus agassizii</i> . Please also revise the third sentence as follows: "...recent evidence recognizes them as a distinct species..."
4.2-95	<p>Ravens have now been observed predating on adult desert tortoises (Walde et al. 2012). To reflect this, please delete "juvenile" from the sentence beginning "Juvenile tortoises are vulnerable to predation..."</p> <p>Citation: Walde, A. D., A. P. Woodman, W. Boarman, T. Esque, K. Nussear, K. Drake, and K. Berry. 2012. "Documentation of predation on adult desert tortoises," white paper based on work at Ft. Irwin.</p>
4.2-95	<p>Second paragraph: Please insert at the end of the paragraph the following: "To maintain population and genetic connectivity, it is essential that habitat linkages between and among populations (i.e., within and among recovery units and designated critical habitats) are conserved. For gene flow to occur across the range, populations of desert tortoises need to be connected by areas of occupied habitat that support sustainable numbers of reproductive individuals. Recent research provides evidence that genetic differentiation within the Mojave population is consistent with isolation by distance in a continuous-distribution model of gene flow. Populations at the farthest extremes of the distribution are therefore the most differentiated and a gradient of genetic differentiation occurs between those populations, across the range of the species (Britten et al. 1997; Edwards et al. 2004; Murphy et al. 2007; Hagerty and Tracy 2010). Genetic analyses also suggest that levels of gene flow among subpopulations of desert tortoises were likely high, corresponding to high levels of habitat connectivity (Murphy et al. 2007; Hagerty 2008). In essence, the Mojave population historically represents a series of continuous, overlapping home ranges within suitable habitats whose boundaries between divergent units may be validated by ecological or major topographic features, such as steep mountainous terrain or, even more significantly, the Colorado River (Germano et al. 1994; Service 2008; Nussear et al. 2009)."</p> <p>Citations: Britten, H.B., B.R. Riddle, P.F. Brussard, R. Marlow, and T.E. Lee. 1997. Genetic delineation of management units for the desert tortoise, <i>Gopherus agassizii</i>, in northeastern Mojave Desert. <i>Copeia</i> 1997:523-530.</p> <p>Edwards, T., C.S. Goldberg, M.E. Kaplan, C.R. Schwalbe, and D.E. Swann. 2004. Implications of anthropogenic landscape change on inter-population movements of the desert tortoise (<i>Gopherus agassizii</i>). <i>Conservation Genetics</i> 5:485-499.</p> <p>Germano, D.J., R.B. Bury, T.C. Esque, T.H. Fritts, and P.A. Medica. 1994. Range and habitat of the desert tortoise. Pages 57-72 in R.B. Bury and D.J. Germano (eds.), <i>Biology of the North American Tortoises</i>. National Biological Survey, Fish and Wildlife Research 13, Washington, D.C.</p>

	<p>Hagerty, B.E. 2008. Ecological genetics of the Mojave Desert tortoise. Ph.D. Dissertation. University of Nevada, Reno.</p> <p>Hagerty, B.E., and C.R. Tracy. 2010. Defining population structure for the Mojave desert tortoise. Conservation Genetics. DOI 10.1007/s10592-010-0073-0.</p> <p>Murphy, R.W., K.H. Berry, T. Edwards, and A.M. McLuckie. 2007. A genetic assessment of the recovery units for the Mojave population of the desert tortoise, <i>Gopherus agassizii</i>. Chelonian Conservation and Biology 6:229-251.</p> <p>Nussear, K.E., T.C. Esque, R.D. Inman, L. Gass, K.A. Thomas, C.S.A. Wallace, J.B. Blainey, D.M. Miller, and R.H. Webb. 2009. Modeling habitat of the desert tortoise (<i>Gopherus agassizii</i>) in the Mojave and parts of the Sonoran deserts of California, Nevada, Utah, and Arizona. U.S. Geological Survey Open-file Report 2009-1102. 18 pp.</p> <p>U.S. Fish and Wildlife Service (Service). 2008. Draft revised recovery plan for the Mojave population of the desert tortoise (<i>Gopherus agassizii</i>). California and Nevada Region, Sacramento, California.</p>
4.2-97	First sentence: Please specify what the expected sources of injury or mortality of desert tortoises along the transmission line during construction would be.
4.2-97	First full paragraph, first sentence: Please revise as follows: “During construction of generation facilities and transmission line structures, and possibly during operation...”
4.2-97	Second paragraph, first sentence: Please revise as follows: “For tortoises near but not within the generation site...”
4.2-97	Indirect effects to desert tortoise section, first paragraph: Please add evaporation ponds and construction water sources to the list of common sources of subsidies for predators.
4.2-97	Indirect effect to desert tortoise section: Please discuss nonnative plants, fire regime, and disease exposure.
4.2-100	When discussing the impacts of proposed conditions of certification on desert tortoises, please include BIO-1, including the Designated Biologist, Authorized Biologist(s), and Biological Monitors.
4.2-100	Please add a sentence that all handling of desert tortoises, including but not limited to translocation, would be conducted in accordance with the BO and associated plans.
4.2-101	Please remove consideration of the applicant’s proposed land use in evaluating the current, baseline habitat characterization.
4.2-103	Please incorporate spring 2012 survey results into the sections on special-status birds.
4.2-104	Golden eagles forage in the valleys and flat lands surrounding the mountains that provide suitable nesting habitat. Please revise the sentence that starts “The mountain ranges to the north...” accordingly.
4.2-104	Fourth paragraph: Please add that foraging eagles may also include the resident pair.

4.2-104	The definition of disturb is “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” [50 CFR 22.3]. Consequently, loss of foraging habitat to a degree that affects productivity would constitute take. Please discuss project impacts in this light.
4.2-105	Please identify where Topoc Marsh is in relationship to the project site.
4.2-105	Please articulate the distinction between a determination of significance and take, either quantitatively or with citations and associated explanation. Please clarify why Staff considers loss of habitat to be significant but not rise to the level of take. Please explain the applicant’s rationale that no eagle take is likely to result from the project, and provide the counterarguments that lead to Staff’s conclusions. Please discuss what Staff anticipates eagle behavior would be around the project site, and how that influences Staff’s determinations.
4.2-105	Please add a paragraph under the habitat loss subsection that states, as implied elsewhere, that there is no suitable bald eagle foraging or nesting habitat on-site, and Staff’s conclusions about impacts to bald eagles.
4.2-105	Operational impacts subsection, third sentence: Please revise to state that the project has the potential to take one or more bald <i>and/or</i> golden eagles over the life of the project.
4.2-105	Please include discussion that golden eagles may be attracted to the project site to scavenge on the carcasses of any other birds killed due to exposure to concentrated solar energy, thereby increasing their own exposure to project-related threats.
4.2-106	Please see comments on proposed condition of certification BIO-16, regarding the Golden Eagle Nest Monitoring Plan.
4.2-106	We recommend post-construction monitoring eagle use of the project site and surrounding landscape for a minimum of 3 years during operations and maintenance, and increase monitoring intensity and duration if initial efforts indicate that take of eagles may be occurring. See comments on BIO-16.
4.2-107	Please justify the conclusion that the project would have a “minimal or negligible” impact on foraging habitat. Please describe what constitutes suitable habitat, and compare that to existing conditions on the project site.
4.2-107	Please explain why Staff determined that any take of a Swainson’s hawk would be significant according to CEQA.
4.2-107	Staff states that prairie falcon biology is “much like” that of golden eagles. Please describe the aspects of prairie falcon foraging behavior (i.e., cruising at low altitude [~10-12 feet above ground]) that are substantially different from golden eagle foraging behavior. Please discuss the resultant risk of prairie falcon collision with project security fencing. See comment for 4.2-77.
4.2-110	Please explain how the applicant determined observed western burrowing owls were not resident birds, and if Staff agrees with that conclusion.
4.2-111	Please justify the use of 300 acres as an estimated home range size for burrowing owls. Burrowing owl home range sizes in optimal habitat (irrigated grasslands or
4.2-194	

	<p>alfalfa) range from 279 to 596 acres (Haug and Oliphant 1990; Rosenberg and Haley 2004; Gervais et al. 2003). Home range size, or the area needed to support foraging, is likely larger in desert scrub because of the sparse prey base.</p> <p>Citations:</p> <p>Gervais, J.A., D.K. Rosenberg, and R.G. Anthony. 2003. Space use and pesticide exposure risk of male burrowing owls in an agricultural landscape. <i>The Journal of Wildlife Management</i> 67(1):155-164.</p> <p>Haug, E. A. and L.W. Oliphant. 1990. Movements, activity patterns, and habitat use of burrowing owls in Saskatchewan. <i>The Journal of Wildlife Management</i> 54(1):27-35.</p> <p>Rosenberg, Daniel K., and Katherin L. Haley. 2004. The ecology of burrowing owls in the agroecosystem of the Imperial Valley, California. <i>Studies in Avian Biology</i> 27: 120-135.</p>
Global, including 4.2-113	<p>Please note that smaller raptors are also susceptible to electrocution, depending on the type of power pole (Lehman et al. 2007; Lehman et al. 2010). Please discuss in Staff's determination of significance.</p> <p>Citations:</p> <p>Lehman, R.N., P.L. Kennedy, and J.A. Savidge. 2007. The State of the Art in Raptor Electrocution Research. <i>Biological Conservation</i> 136(2):159-174.</p> <p>Lehman, R.N., J.A. Savidge, P.L. Kennedy, and R.E. Harness. 2010. Raptor electrocution rates for a utility in the intermountain western United States. <i>Journal of Wildlife Management</i> 74(3):459-470.</p>
4.2-113	Gila woodpecker subsection, first paragraph: Please provide citations when describing habitat preferences.
4.2-114	Please explain why Staff concludes that impacts to Gila woodpecker from habitat loss would be less than significant under CEQA.
4.2-115	Sentence that begins "Taken together, Staff concludes..." Please revise as follows: "Taken together, Staff concludes that these conditions of certification are feasible and effective and that their implementation would avoid any potential take during construction of these species..."
4.2-115	Last full sentence: Please explain why Staff does not expect that habitat impacts from project construction would "meaningfully affect" special-status migratory and wintering birds.
4.2-117	<p>Obtaining nutritionally adequate forage is likely more important to burro deer habitat preferences than protection from predators. Please delete or qualify in accordance with the citation; dense vegetation would only protect from non-sit-and-wait predators, which are not the primary predators of burro deer (e.g., mountain lions).</p> <p>Please briefly summarize what is known about burro deer use of the project site and</p>

	<p>vicinity. Project survey methodology did not include track surveys on the existing access roads around and throughout the project site (i.e. the powerline road that runs north-south along the project site), which would have demonstrated the numbers and frequency of deer crossing the project site (G. Mulcahy, pers. comm. 2012). However, burro deer and their sign have been observed regularly along the Palo Verde Mesa and its base, and several deer poached in the vicinity of Bradshaw Trail and the project site, (G. Mulcahy, pers. comm. 2012).</p> <p>Please discuss the importance of the project vicinity for burro deer connectivity. Given the expansive spatial requirements needed to sustain wide-ranging populations of large mammals within a resource-limited environment, the loss of thousands of acres of high value woodland habitat onsite, and loss of habitat connectivity to key resources offsite, would be difficult to offset because the loss of habitat and displacement of burro deer from the project site would result in a net decrease to the range-wide resource base and carrying capacity of the herd (Heffelfinger <i>et al.</i> 2006),</p> <p>Please discuss the relative importance of the project site for burro deer access to the Colorado River and water in agricultural ditches. The project site is important to burro deer in part because microphyll woodlands on the mesa connect desert habitats to the adjoining agricultural lands along the river in the Palo Verde Valley. These agricultural lands provide one of the few remaining sources of food and water along the floodplain.</p> <p>Citation:  Mulcahy, G. [CDFG], J. McKeever [CDFG], S. Sharma [CDFG], P. Sorensen [Service], and N. Marks [Service]. Pers. comm. November 27, 2012. Phone call to discuss project impacts from the Rio Mesa project, and the PSA for that project.</p>
4.2-120	If relocation methods for kit foxes are documented to be effective for badger relocation, please cite or describe; if not, please explain Staff's rationale in proposing this measure.
4.2-121	Desert wash microphyll woodland identified as productive foraging habitat for bats is present in the region and on the project site. Given that elimination of this habitat is identified as one of the adverse effects in the region, please address cumulative effects of loss of this habitat from the project.
4.2-123	First sentence: Please describe the likelihood that key species of interest would use the identified lands that would remain after construction. Please include discussion of habitat suitability. For example, the habitat east of the project is less suitable for desert tortoises than the project site. Please revise accordingly the discussion of movement opportunities that would remain after construction of the proposed project. Please also add discussion of the ways in which development on the scale of the proposed project would adversely affect the ability for landscapes to shift and accommodate climatic and other change over time.
4.2-123	For desert tortoises, movement among habitat regions is generally less meaningful

	<p>than maintaining sufficient suitable habitat to support continuously overlapping home ranges. In other words, for gene flow to occur across the range, populations of desert tortoises need to be connected by areas of occupied habitat that support sustainable numbers of reproductive individuals. Evidence from desert tortoise population genetic studies and distribution indicates that individual desert tortoises breed with their neighbors, those desert tortoises breed with other neighbors, and so on. The movements that maintain genetic diversity across populations occur over generations and not necessarily during the life span of a single desert tortoise. Therefore, for gene flow to happen reliably, populations need to be connected across the range by occupied areas of habitat linkages that support sustainable numbers of desert tortoises. Please revise the discussion of desert tortoises in habitat “corridors” to reflect the above.</p>
4.2-123	<p>Please explain why Staff believes that burro deer and other large mammals would adapt to the changed land use and move their east to west movements to be north or south of the proposed project. Woodland cover and water availability are the two most important resources that determine burro deer distribution and movement; deer that do not learn how to access historically-used water sources by going around the project site (for example between the Mule Mountains and water in the agricultural ditches to the east) may face increased risk of mortality or predation (G. Mulcahy, pers. comm. 2012).</p> <p>Citation:  Mulcahy, G. [CDFG], J. McKeever [CDFG], S. Sharma [CDFG], P. Sorensen [Service], and N. Marks [Service]. Pers. comm. November 27, 2012. Phone call to discuss project impacts from the Rio Mesa project, and the PSA for that project.</p>
4.2-124	<p>Please note that Staff’s definition of cumulative effects differs from that in the Service’s eagle conservation planning guidance. This is important to the Service with regard to any potential eagle take permit application, analysis of the potential for take, and the ramifications of that take.</p>
Global, including 4.2-125	<p>Please biologically justify the use of the NECO planning area as the scale for evaluation of cumulative effects. Please explain how the choice of this area relates to what is biologically meaningful for individuals and populations of the species under consideration. In each cumulative effects subsection, please biologically justify the area used to evaluate the significance of cumulative effects.</p>
4.2-126	<p>In the paragraph between bullet lists, please define the “general vicinity” of the proposed project, and how that relates to the NECO planning area defined as the area within which cumulative effects are considered.</p>
4.2-126	<p>Please add to the list of cumulative projects: Blythe Airport Solar Energy Project, Blythe Mesa Solar Energy Project, McCoy Solar Energy Project, Palen Solar Energy Project, Palo Verde Mesa Solar Energy Project, Rice Solar Energy Project, and Sonoran West Solar Generation Facility. Please also consider projects in Arizona, including a proposed power tower project north of Quartzite, Arizona, that are within a comparable distance from the proposed project as those already considered in the</p>

	PSA.
4.2-127	Please provide the rationale that supports Staff’s conclusion that cumulative effects of renewable energy projects to vegetation communities in the NECO planning area are “considerable.”
4.2-127	Last paragraph, first sentence: Please revise to emphasize the unforeseen effects. Proposed conditions of certification BIO-1 through BIO-8 would minimize project impacts to biological resources, and minimize the probability of <i>unforeseen</i> effects (i.e., by placing habitat under permanent conservation, unforeseen projects cannot use that land for development). However, these proposed conditions of certification do not minimize cumulative loss (i.e., decrease the net loss currently expected from the list of past, present, and reasonably foreseeable projects).
4.2-127	Proposed conditions of certification BIO-7 and BIO-19 also minimize cumulative effects of the proposed project. Please add discussion of these conditions to this section.
4.2-128	Please explain Staff’s reasoning that supports the conclusion that the contribution of the proposed project to loss of native vegetation and wildlife habitat is not cumulatively considerable.
4.2-129	Please address the ecological significance of cumulative effects to desert dry wash woodlands. Please relate to the habitat values described in comment 4.2-25 and 4.2-49. Please include explanation of the biological significance of the region within which Staff considers it appropriate to seek mitigation parcels. Please justify how the area within which acreage would be acquired mitigates the biological effects of the project. See general comments in our cover letter for additional detail. We recommend that all mitigation occur within the range of burro deer, not within the larger NECO Plan area.
4.2-129	Please explain how Staff would determine whether cumulative impacts to jurisdictional waters remain cumulatively considerable if 3:1 mitigation for these impacts is determined to be infeasible because of the lack of willing sellers or available lands for acquisition.
4.2-130	First paragraph, last sentence: Please identify which projects are being referred.
4.2-130	Potential effects from the project, second paragraph: Please add introduction of nonnative plants and changes in the fire cycle.
4.2-130	Please add proposed conditions of certification BIO-1 to the list of measures that would avoid and minimize impacts to desert tortoises.
4.2-131	Please identify what the scope of cumulative effects analysis for golden eagles is. We recommend using a 140-mile radius around the project, in accordance with the juvenile dispersal distance and definition of a local area population of golden eagles (Service 2009).  Citation: U.S. Fish and Wildlife Service. 2009. 50 CFR Parts 13 and 22: Eagle Permits; Take Necessary To Protect Interests in Particular Localities; Final Rules.
4.2-131	Golden eagle subsection, first paragraph, last sentence: Please revise as follows: “The cumulative loss of golden eagle foraging habitat throughout the region may



	result in abandonment of nesting territories or non-reoccupation of otherwise suitable and historically used territories.”
4.2-132	Please see comments on proposed condition of certification BIO-16, regarding the Golden Eagle Nest Monitoring Plan.
4.2-132	Please discuss the cumulative effects expected from all proposed power tower projects within the area considered. In the lower Chuckwalla Valley, at least three additional right-of-way applications on BLM lands are being evaluated for construction and operation of power-tower technology. One additional project in neighboring Rice Valley has been approved but not yet constructed. In addition, several other power-tower projects are being proposed along the Colorado River, including in Arizona, where another such project is proposed just north of the town of Quartzsite. Build-out of these six proposals (including the proposed project) would entail multiple towers per project, likely resulting in twelve or more power towers within a 40-mile radius, all with the absence of any substantive data on the many potentially lethal physiological effects associated with the technology as discussed here, in the PSA, and in the CEC docket. Cumulative effects to migratory birds, regional bird communities, eagles, and other wildlife increase as the number of solar development proposals proliferates. If all or a portion of these proposals are approved, the cumulative effects/take levels from power-tower projects likely would become significant for many species.
4.2-134	Please reword or clarify what is meant by species expected to use the site “regularly but uncommonly.”
4.2-141	Bullet 1, first sentence: Please revise as follows to accurately reflect the referenced REAT request: “...requested that the applicant provide at least a full year of bird and bat surveys...”
4.2-141	Bullet 3, first sentence: Please revise as follows: “Clarification of the total acreages of permanent and temporary, direct and indirect impacts by vegetation type and by project feature (e.g., construction laydown area, heliostat field, power block, etc.)...”
4.2-143	Please clarify what is meant by “specific agency policies” and how those relate to requirements for the Designated Biologist.
4.2-143	Please clarify what is meant when Staff says requirements for the Designated Biologist may be adjusted over time to reflect the “status of special-status species in the vicinity.”
4.2-143	Please clarify what is meant when Staff states the Designated Biologist may also be “assigned” as a desert tortoise Authorized Biologist. The Service retains approval authority for Authorized Biologists, in accordance with any biological opinion issued for the proposed project and our most recent desert tortoise guidance.
4.2-143	In the paragraph before the bullets delineating the duties of the Designated Biologist, please delete “construction-related.” We recommend having a Designated Biologist on-site during any ground disturbance, grading, boring, or trenching activities, regardless of the phase of the project.
4.2-143	Bullet 3, second part: Please revise the Designated Biologist responsibilities. For example, the Designated Biologist should ensure proper implementation of all conditions of certification and any other relevant biological resource measures (i.e.,

	those in the biological opinion and/or Final environmental impact statement).
4.2-143	Bullet 4: Please delete “verbal or”; updates should be provided in writing.
4.2-143	The Service does not need to be provided weekly updates. Please provide us quarterly reports on project construction, as well as notification, within timeframes designated elsewhere, of any reports of mortality or injury of a federally-listed species.
4.2-144	Bullet 6: Please add “familiarity with the other requirements pertaining to biological resources, including those of the biological opinion and EIS.”
4.2-144	Bullet 8: Please revise as follows “...of any non-compliance with any biological resources condition of certification, biological mitigation measures or permit conditions.”
4.2-144	Bullet 11: We recommend revising as follows: “Conduct continuous compliance inspections throughout the initial site preparation activities, including but not limited to, the installation of desert tortoise exclusion fencing, pre-construction clearance surveys, and initial clearing, grubbing, grading, mowing, and other site preparation activities. Provide weekly reports per bullet 4 to the CPM and BLM. After initial clearance, conduct monthly compliance inspections of all project activities throughout the construction and decommissioning phases of the project, and provide monthly compliance reports per bullet 12.”
4.2-144	Please specify the time period over which the Designated Biologist would be responsible for preparing and submitting monthly compliance reports.
4.2-144	Bullet 13: The Service requests quarterly (vs. weekly) reports. See above comment. Also, please add “BLM, CDFG, and FWS” to the list of agencies receiving reports.
4.2-144	Bullet 14: Please delete as it is redundant with bullet 6.
4.2-144	Bullets 14 and 9: Please clarify distinction between the two; if redundant, please delete one or consolidate.
4.2-144	Please add a bullet to the list of duties and responsibilities of the Designated Biologist that states: “Notify the CPM, BLM, CDFG, and FWS at least 14 days prior to the initiation of ground-disturbing activities.”
4.2-144	Please add a bullet to the duties and responsibilities of the Designated Biologist that states: “During the operations phase of the project, conduct quarterly compliance inspections, conduct weed monitoring and control (per BIO-7), and prepare and submit quarterly compliance reports and any other reports required in the conditions of certification to the CPM, BLM, CDFG, and FWS.”
4.2-144	Bullet 16: The Service should be notified verbally immediately, and in writing within 5 days of an incident that results in injury or mortality of a listed species. To the extent known, written or verbal notification should include the date, time, and location of the incident; number of discovered specimens; cause of injury or death; and any other pertinent information. Injured animals, if deemed treatable, should be transported under humane conditions to a qualified veterinarian or certified wildlife care facility, with the Service apprised of the final disposition. Care must be taken in handling sick or injured individuals to ensure effective treatment and care can be administered, and in handling dead specimens to preserve biological material in the

	best possible state. The finding and relevant details should be immediately reported to the Service.
4.2-145	<p>Please note that the Service approves Authorized Biologists on a project-by-project basis, pursuant to the biological opinion for each project. Approval for one project does not guarantee approval for other projects. The authorized biologist for a given project must be qualified to implement all tortoise-related measures described in the biological opinion for that project. Conversely, the authorized biologist for a given project need not be qualified to conduct activities that constitute take of a desert tortoise but which are not included in the biological opinion for that project. For example, <i>if</i> the biological opinion finds that drawing blood from tortoises is not necessary for this project, the authorized biologist need not be qualified to do so.</p> <p>Please revise Bullet B accordingly throughout.</p>
4.2-145	First sentence: Please reword to “The project owner shall ensure at least one Authorized Desert Tortoise Biologist is assigned to the project at all times.”
4.2-145	First paragraph, second to last sentence: Throughout the life of the project, at least one authorized biologist should be present whenever any activity that would constitute take of a desert tortoise, pursuant to the federal Endangered Species Act, may occur. This is not limited to handling or translocation. Please revise to state, “...during the life of the project during which take of a desert tortoise may occur, including construction, operation, and post-project closure phases...”
4.2-145	Bullet 1: BIO-9 does not pertain to desert tortoise. Please revise to include the appropriate proposed condition of certification.
4.2-145	Last paragraph, first sentence: Please delete what is in parentheses. Only the authorized biologist should handle tortoises.
4.2-145	Last paragraph, second sentence: Please revise to state, “...shall include all responsibilities described by the USFWS’s biological opinion...”
4.2-146	Bullet 1: Please revise to state, “...familiarity with the conditions of certification, BRMIMP, WEAP, other tortoise measures including those in the biological opinion and EIS, and USFWS guidelines on desert tortoise...”
4.2-146	Bullet 5, first sentence: Please delete “during construction.” A desert tortoise injured from project activities should be taken to a wildlife rehabilitation or veterinarian clinic regardless of the phase of the project.
4.2-146	Bullets 5 and 6: The Service should be notified immediately if any desert tortoises are found sick, injured, or dead in the action area. Immediate notification means verbal (if possible) and written notice within 1 workday, and must include the date, time, and location of the carcass, and any other pertinent information. Care must be taken in handling sick or injured individuals to ensure effective treatment and care can be administered, and in handling dead specimens to preserve biological material in the best possible state.
4.2-146	Bullet 2, last sentence: Biological monitors and an authorized desert tortoise biologist should be on site for all project-related activities that occur outside of desert tortoise exclusion fencing. Accordingly, please delete “ground disturbing.”
4.2-147	Please reword the responsibilities of the desert tortoise monitors to reflect the

	Service's guidelines, available here: <a href="http://www.fws.gov/ventura/species_information/protocols_guidelines/index.html">http://www.fws.gov/ventura/species_information/protocols_guidelines/index.html</a>
4.2-147	Please include in the duties of biological monitors: -Administer the WEAP (BIO-4); -Clearly mark areas with sensitive biological resources during construction, operations, and decommissioning, and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions, including the conditions of certification; -Inspect active construction or maintenance activity areas where animals may have become trapped prior to construction commencing each day. At the end of each work day, inspect for the installation of structure that prevent entrapment or allow escape during periods of construction activity. -Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way, and relocate them if necessary. If a desert tortoise is found, contact an Authorized Biologist to assist in the tortoise's translocation.
4.2-147	Bullet D: Please revise as follows: "The Designated Biologist, Authorized Desert Tortoise Biologist, and Biological Monitors shall have the authority to immediately stop any activity that is not in compliance with the conditions of certification, minimization measures, and biological permit conditions."  Also, revise as follows "...shall halt any site mobilization, ground disturbance, grading, boring, trenching, and construction, operation, or decommissioning activities as specified..."
4.2-148	If the desert tortoise Authorized Biologist is replaced, the Service, CDFG, and BLM should be involved in selecting a replacement. The Service retains authority to approve, on a project-specific basis, Authorized Biologists, pursuant to the biological opinion issued for the project.
4.2-148	Fifth paragraph: Specify what training the Authorized Biologist would provide biological monitors. The Authorized Biologist should be providing training specifically for desert tortoise-related activities. Otherwise, we recommend training be the primary responsibility of the Designated Biologist.
4.2-148	Sixth paragraph: Please revise as follows: "...grading, construction, operation, and decommissioning activities."
4.2-148	Given review by each of the REAT agencies, as well as the stated goal to consolidate in one place all biology-related measures, please include in the Biological Resources Mitigation Implementation and Monitoring Plan (BIO-2) any avoidance and minimization measures included in other permit documents, such as the biological opinion, EIS, and CDFG-CEC MOU pursuant to CESA.
4.2-149	Bullet 4: Please include decommissioning.
4.2-150	Please specify to whom the project owner shall submit the final BRMIMP.
4.2-150	Third paragraph, second to last sentence: Please revise as follows: "...to determine appropriate mitigation for such impacts and if any other actions are needed."
4.2-151	Please include a comparable 30-day notification requirement prior to and following completion of decommissioning.

4.2-152	First sentence: Please revise as follows: "...adjusted up or down to reflect any revised cost estimates recommended by REAT and any change in the acreages of the project description."
4.2-152	Bullet 1a: Please include a more specific requirement for compensatory land acquisition to be protected in perpetuity.
4.2-154	Bullet 4c: Please include consultation with BLM and FWS, in addition to CDFG.
4.2-155	Bullet 2: Please reference a PAR analysis.
4.2-159	Bullet 3a: The mitigation land management plan should be prepared contemporaneously with the PAR, since one document informs the other. Please revise accordingly the timeline for submission.
4.2-161	Bullet 9: Please revise as follows: "report all observations of listed species or their sign to the Designated Biologist or biological monitors..."
4.2-161	Please add a bullet to BIO-4 that states: "Provide contact information for the Designated Biologist and biological monitors for notification of any dead or injured wildlife species encountered during project-related activities."
4.2-162	First sentence: Please specify if the CPM is responsible for any <i>changes</i> to measures, or <i>compliance</i> with all measures, or some other detail.
4.2-162	Bullet 1: Please add "Project personnel should also remain inside delineated disturbance limits."  Also, please revise as follows: "...for compliance with regulatory terms and conditions, and document each inspection."
4.2-162	Bullet 4: Biological monitors should also walk ahead of equipment during mowing activities.
4.2-163	Bullet 5: Along the transmission line, all disturbance limits should be flagged. Biological monitor(s) should also be present during any work along the transmission line (i.e., any work conducted outside the area enclosed by desert tortoise exclusion fencing).
4.2-163	Bullet 5, last sentence: Please add "temporary" to the description of desert tortoise exclusion fencing along the gen-tie line.
4.2-163	Bullet 8: Please revise the description of evaporation pond netting to be "no larger than 2-cm square."
4.2-163	Please define "regularly," for monitoring evaporation ponds. We recommend at least daily inspection of the netting.
4.2-163	We recommend netting be suspended a minimum of 5 feet above the water surface.
4.2-163	If water used during construction would be stored in ponds, please implement similar measures as bullet 8 for those ponds, and inspect fill stations regularly for ponding. If construction water would be contained in storage tanks, please inspect regularly for leakage or ponding around the tanks.
4.2-163	We recommend evaporation ponds be lined, to minimize salt build-up in the soil and facilitate long-term restoration.
4.2-163	Bullet 11: Please quantify what is meant by "loud" construction noises.
4.2-164	Bullet 13a: Please revise to reflect that only desert tortoise Authorized Biologists

	approved for this project may handle or relocate a desert tortoise. The Designated Biologist or biological monitors may handle other wildlife; however, if a desert tortoise is trapped, the Authorized Biologist should be contacted immediately and move the individual.
4.2-164	Bullet 13a: The project site would be enclosed by desert tortoise exclusion fencing. Please reconcile.
4.2-165	Bullet 13: Please revise as follows: "...left open, overnight, or for longer than a day."
4.2-165	Bullet 14: Please add "Areas with consistent pooling will be filled within 24 hours to allow drainage and prevent puddles from forming, or the source of the water addressed."
4.2-165	Please specify what data would be collected about the carcass of any special-status species killed on project roads prior to removing it. In the event that a golden eagle carcass is found, the Service and CDFG should be informed immediately. A permit is necessary prior to possession of the carcass. Please note that a migratory bird special purpose utility permit would be necessary prior to possessing any avian carcass.
4.2-165	Please add an additional measure describing data collection and disposition of carcasses found in any part of the project site other than the access roads.
4.2-166	Please note that any pre-project ground-disturbing activities (such as those described here) in suitable desert tortoise habitat could result in take, and therefore should be coordinated with the agencies prior to taking place.
4.2-166	Bullet 20: Please move "outside the permanently fenced area" to follow "all unused material and equipment."
4.2-166	Please include soil decompaction and seeding or replanting in measure BIO-6.
4.2-167	Bullet 3: We suggest revegetation monitoring occur on a quarterly basis for at least three years, to mirror fall and spring plant surveys and capture presence of different species groups.
4.2-168	If a 1-mile radius is the expected radius of effect, this should be described and documented in the indirect effects section, with supporting references or examples from previous projects. Please reconcile the 1-mile buffer with the 500-foot buffer used in 4.2-48.
4.2-168	Bullet 2: Please specify whether the assessment described here is an assessment of individual species that may enter the project site (as implied by current wording) or of potential vectors that may facilitate weed establishment. The latter is both more feasible and more helpful, and could inform the prevention plan described in bullet 3.
4.2-168	Bullet 3: Please specify if the goal is prevention of weed introduction, establishment, spread, or all of the above.
4.2-168	Bullet 4: Please define what is meant by an "appropriate" buffer, and how it relates to the 1-mile radius described in bullet 1.
4.2-168	Bullet 6: Please have treatment of weed infestations occur at least twice annually, to reflect the summer- and winter-seeding species, and to make consistent with proposed condition of certification BIO-9 bullet 6. We recommend immediate treatment if suggested by monitoring observations.

4.2-168	Please qualify the provision for when weed control efforts may cease for any impact site. Revise as follows: "...when no new seedlings or resprouts...weed control efforts may cease for that impact site unless future monitoring documents the return of the infestation, at which point it will be treated as above."
4.2-169	Please note that many species will regrow a second seedhead. Consequently, manual control of these species is unlikely to be effective under the framework above, where treatment occurs once per year. For these species, manual control would require multiple visits in a short time period to any given infestation.
4.2-170	Please add topsoil, gravel, and fill dirt to the bullet delineating resources that shall be weed-free.
4.2-170 4.2-52	<p>Please describe in the relevant indirect effects section how monitoring and control site distances for desert dry wash woodland vegetation were selected, and how these compare to the distance over which groundwater effects may extend. Please compare these distances to the size of the groundwater subbasin, basin, and catchment in which the project is proposed. Please summarize the amount of expected drawdown in each of these areas, and in areas within the expected cone of depression that support groundwater-dependent vegetation. Please describe the types of variables that would be monitored.</p> <p>We recommend locating the control site for vegetation monitoring in an adjacent groundwater subbasin, at a location determined by a hydrologist. Please specify where, in relation to groundwater basin and subbasin boundaries, the control site is proposed.</p> <p>We recommend monitoring of off-site dry wash woodland within the same groundwater subbasin for the life of the project. Because of the life span of desert dry wash woodland plants, the natural occurrence of prolonged drought in the desert, and expected groundwater use, monitoring during construction and three years of operations may not be sufficient to detect the types of stress that may result from groundwater depletion, and would not be sufficient to detect plant mortality.</p> <p>Although deep-rooted desert wash species are groundwater-dependent, subsurface flow and streamflow also contribute to their survival, growth, and reproduction. Consequently, we recommend installation of piezometers in addition to groundwater monitoring wells at the monitoring locations described in proposed condition of certification WATER SUPPLY-4 and BIO-8.</p>
4.2-171	Please add language to bullet 1 or 2 that the DDWWMP should provide a specific description of the protocol to be followed at each monitoring location.
4.2-171	Bullet 3, second sentence: Please revise as follows: "...to interpret the results and determine appropriate adaptive management measures, if any."
4.2-171	Please specify if temporary supplemental watering has been documented to be effective or not. If so, please provide a citation.
4.2-173	Please specify the geographic area within which Staff considers it appropriate to locate mitigation lands. While the effects analysis uses the NECO plan area or

	Desert Tortoise Recovery Unit as the cumulative effects area, these are fairly large areas to constitute “as close as possible” or “surrounding” the project site.
4.2	Please include somewhere in the proposed conditions of certification or elsewhere a table with the preliminary acreages proposed for mitigation lands, by mitigation component (e.g., desert tortoise, desert dry wash woodlands, special-status plants, etc.).
4.2-178	Bullet c, last sentence: Does not state what the strategy would include; please complete the sentence.
4.2-181	The Service should be notified immediately by phone, and in writing within 5 calendar days, if any federally listed threatened or endangered species not addressed in the biological opinion issued for the project is discovered at any time on the project site. Please revise the last sentence of BIO-10 accordingly. Please also reconcile that sentence with the timeframe specified in BIO-12.
4.2-181	We recommend the Nesting Bird Management Plan be incorporated as a separate section into the BBCS.
4.2-181	Bullet b: The last preconstruction clearance survey for nesting birds should be conducted a maximum of 2 to 3 days prior to the start of construction activity. This period reflects the amount of time necessary to build a nest; surveys conducted further in advance of construction thus are less likely to detect all nests on site and allow for the establishment of appropriate buffers. Please revise accordingly.
4.2-182	Bullet e: Relocation of an active nest would be considered take, pursuant to the MBTA. Please delete. Also, nest avoidance buffers for any given species should be consistently applied throughout the construction area. Revision of avoidance buffers should only occur after approval by the CPM and agencies. Please revise accordingly.
4.2-182	Bullet f: Please specify the distance of the buffer around the project site within which nest monitoring would occur. We recommend a minimum 500 foot buffer to raptor nests and 330 foot buffer to all other bird nests, as described earlier in the PSA.
4.2-182	Bullet i: Please clarify what is encompassed by the “specific actions”. Please describe any data to be collected, including photographs, location, nest status, and the buffer implemented.
4.2-182	Please add a bullet that nest surveys would be performed on any equipment or project structures left inactive for a period of greater than 3 days during the construction period.
4.2-182	The Nesting Bird Management Plan should include specific details as to how any disturbance to the nest by nest surveyors would be avoided.
4.2-182	Bullet b: Please provide a rationale for conducting a pre-construction survey for nesting birds approximately 20 days before the start of construction. Performing two surveys likely would increase the percentages of nests detected. However, because nests can be built in 2 to 3 days, data collected in surveys 20 days before construction would be of minimal to no utility. If two surveys are conducted, it would provide more reliable information about the presence of nests on site if the first survey is conducted within 10 days of the start of construction.



	<p>Regardless of if one or two surveys are conducted, the last pre-construction clearance survey for nesting birds should be conducted a maximum of 2 to 3 days prior to the start of construction activity. If only one survey is performed, it should be conducted 2 to 3 days before the start of construction. This period reflects the amount of time necessary to build a nest; surveys conducted further in advance of construction thus are less likely to detect all nests on site and allow for the establishment of appropriate buffers. We similarly recommend that follow-up surveys be conducted in any are if inactivity exceeds 2 to 3 days.</p> <p>Please revise bullet b accordingly.</p>
4.2-183	Bullet c: Please add “and documented”.
4.2-183	Verification section: Please provide the agencies, as well as the CPM, with written descriptions of survey methods and results.
4.2-183	Bullet 1: Please include BLM in review of the monitoring study, as structures and activities associated with the gen-tie are involved.
4.2-183, 4.2-185	Bullet 1: Due to the large number of unknowns (described in our comments, the PSA, and the CEC docket log) about the avian impacts of this technology, as well as cumulative effects concerns, we recommend that the project be monitored for bird injuries and fatalities for the life of the project. A monitoring strategy should be coordinated among the applicant and permitting agencies.
4.2-183	Bullet 2: We agree that preparation of a Bird and Bat Conservation Strategy (BBCS) provides an appropriate vehicle to describe anticipated avian impacts, the extent to which avoidance and minimization of those impacts is feasible, and whether take of bald or golden eagles is anticipated. Please be advised that a BBCS does not constitute a permit for take authorization; therefore, it does not limit or preclude the Service from exercising its authority under any law, statute, or regulation, nor does it release any individual, company, or agency of its obligations to comply with Federal, State, or local laws, statutes, or regulations. However, if a violation occurs, the Service may consider the project proponent’s documented efforts to incorporate and implement the Service’s recommendations. If it is determined that take of bald and/or golden eagles is likely to occur as a result of project implementation, the FSA and conditions of certification should require the applicant to submit an Eagle Conservation Plan (ECP), consistent with Service guidance. This document may serve as the basis for an application for a take permit under BGEPA.
4.2-184	First paragraph, last sentence: Please add, “and 3) any other project components.”
4.2-184	Bullet 2: We recommend the BBCS include a detailed description of monitoring protocol (pursuant to bullet 1), and establish an adaptive management framework for the project. We recommend the Nesting Bird Management Plan (BIO-11) be included as a discrete section of the BBCS. We recommend the BBCS include a detailed protocol for data collection associated with any bird carcasses found on or around the project site, and a detailed description of protocol for carcass disposition. Please include these elements in this bullet.

4.2-184	The Service recommends preparation of an ECP if the applicant intends to pursue an eagle take permit. Otherwise, we recommend treating eagles in discrete subsections of the BBCS.
4.2-184	Bullet 3, first paragraph: We recommend the ECP, or eagle sections of the BBCS, include a description of any other ongoing eagle survey efforts during construction or operations. Also, please specify the time period over which identified surveys of eagle breeding sites within a 10 mile radius of the project site would be conducted. We recommend a minimum of the construction period and at least 3 years of operations.
4.2-184	Please note that the Service recommends any mitigation for take of bald and/or golden eagles be within the same Bird Conservation Region as the proposed project (Service 2011).  Citation: U.S. Fish and Wildlife Service. 2011. Draft Eagle Conservation Plan Guidance.
4.2-184	Please justify, here or in the effects section, why Staff selected a 20-mile radius requirement for the inventory of existing electrical distribution lines. Please articulate how this relates to the local golden eagle nesting territories (within 10 miles of the project site) and the local area population of golden eagles (within 140 miles of the project site) and bald eagles (within 43 miles of the project site).
4.2-184	Please identify in the effects section what data are available to support a quantitative determination of the anticipated project-related take, referenced here, for bald eagle, golden eagle, Swainson’s hawk, or other large special-status raptors. If supporting data are not available, please explain how Staff anticipates implementing this portion of BIO-12.
4.2-184	Please articulate in the effects analysis Staff’s goals and rationale in prescribing 11 power pole retrofits for each large raptor taken by the project. Please allow for implementation of other, additional mitigation if recommended by the agencies or required as part of an eagle permit, if one is needed.
4.2-184	Bullet 3, second paragraph: Please add “The ECP shall include descriptions of any other mitigation measures deemed necessary by the agencies.”
4.2-184	Last paragraph, first sentence: Please revise as follows: “...instead move heliostats into a stowed position or another alternative configuration when the power plant is in standby mode or when individual heliostats are not in use.”
4.2-184	Please revise the last sentence to be included in the BBCS, not ECP, as the described reporting schedule pertains to all activities related to bird or bat conservation or protection. Please then move this sentence to the end of bullet 2, which describes the BBCS, rather than under bullet 3, describing the ECP. Please add a comparable sentence that the ECP include a reporting schedule for all activities related to eagles.
4.2-185	BIO-13: For specificity, permanent desert tortoise exclusion should be used to effectively exclude desert tortoise from the project site, thereby sufficiently protect them from injury and mortality. Please revise as follows: “...(1) installing permanent desert tortoise exclusion fencing around the solar generator site...”
4.2-186	Bullet 3, first sentence: Please revise as follows: “Permanent desert tortoise

	exclusion fencing shall be installed around the entirety of the project site.”
4.2-187	Bullet d: Disposition of carcasses located within project fencing is not currently described in BIO-5. Please see comment recommending insertion of a wildlife mortality reporting and disposition protocol measure (4.2-165).
4.2-188	Please specify that any temporary desert tortoise exclusion fencing would be removed upon completion of project activities in the area.
4.2-188	Bullet 4: Please substitute “biological monitors” for “project biology staff.”
4.2-189	Please include in BIO-14 a mechanism to adjust compensation acreages to reflect final disturbed and fenced acreages, as described in BIO-3.
4.2-191	Verification section, first sentence: Please notify CDFG, BLM, and FWS, in addition to the CPM, when NFWF has received and accepted payment to the account supporting the regional raven management program. Revise as follows: “...shall provide written notification to the CPM, CDFG, BLM, and FWS that NFWF has received...”
4.2-191	Please justify in the effects section why golden eagle nesting surveys are limited to the construction period. Please also justify why surveys are limited to nesting eagles. Monitoring should also occur at times of the year which will capture eagle use of the area by floaters, subadults, and fledged juveniles of both eagle species. We recommend including at least 3 years of monitoring during the operations phase, because the nature of eagle behavioral response to power towers is unknown.
4.2-192	Please specify late December to early February as the appropriate time to conduct golden eagle courtship and nesting surveys.
4.2-192, 4.2-132	The Golden Eagle Monitoring and Adaptive Management Plan should be developed prior to the start of construction activities and included as part of the BBCS or ECP. The timeline for development of the monitoring/adaptive management plan as proposed here does not allow for implementation of a plan in time to avoid injury or disturbance to golden eagles. The time required to find and fund a contractor to develop a plan that meets agency standards likely would extend long enough past when the eagle(s) were first detected that it would be beyond the nesting season or have missed a substantial percentage of the construction period. Consequently, the plan should be developed and in place prior to the start of construction activities. Please revise bullet 4 and the verification section accordingly.
4.2-192, 4.2-132	Please identify the baseline against which project-related disturbance to eagle behavior would be identified, and which agencies would be responsible for making that determination.
4.2-193	Bullet 1, bullet 3a: Replacement burrows for burrowing owls should be located in one of two locations: either within 100 meters (328 ft) of occupied burrows that would be destroyed by project construction (so individual owls would be most likely to find the replacement burrows), or far enough from the project boundary that foraging burrowing owls would be unlikely to encounter project development. Surveys therefore should quantify and precisely map unoccupied burrows suitable for burrowing owls in two different areas. All burrows within 100 meters (328 feet) of occupied burrows that would be destroyed by project construction should be mapped. Burrowing owls subjected to “passive relocation” (eviction) are not likely to find

	<p>replacement burrows that are located more than 100 meters from their current burrow (Trulio 1997). If refuge burrows are greater than 100 meters from the occupied burrow, it should be assumed that the evicted owls will succumb to predators within a few weeks and lost from the population. We recommend the project mitigate this adverse impact by placing an equal or larger number of burrowing owls and high-quality forage habitat into conservation. Consequently, burrows should be mapped at one or more offsite locations far enough from the planned heliostat array and flux zone such that burrowing owls nesting on the mitigation sites would be unlikely to encounter project development during foraging. These replacement burrows should be located at least 3 kilometers from the nearest project boundary (Rosenberg and Haley 2004; Gervais et al. 2003).</p> <p>Citations:</p> <p>Gervais, J.A., D.K. Rosenberg, and R.G. Anthony. 2003. Space use and pesticide exposure risk of male burrowing owls in an agricultural landscape. <i>The Journal of Wildlife Management</i> 67(1):155-164.</p> <p>Rosenberg, Daniel K., and Katherin L. Haley. 2004. The ecology of burrowing owls in the agroecosystem of the Imperial Valley, California. <i>Studies in Avian Biology</i> 27: 120-135.</p> <p>Trulio, L.A. 1997. Strategies for protecting western burrowing owls (<i>Speotyto cunicularia hypugaea</i>) from human activities. United States Department of Agriculture Forest Service, General Technical Report NC, 461-465.</p>
4.2-193	<p>Bullet 3b: Two artificial burrows are sufficient if preconstruction monitoring of an occupied burrow render a high level of confidence that the burrow is occupied by one unpaired bird, and that brooding females are not present underground with food delivered by their mate. For relocation of breeding pairs and family groups, we recommend providing a replacement complex with a minimum of eight artificial burrows. Burrowing owls shift nests often to escape the heavy build-up of parasites that develop in their tunnel systems, and parents distribute older nestlings among several burrows to protect against predators.</p>
4.2-194	<p>Bullet c: Please revise the nonnative species coverage requirement to apply only to nonnative shrubs and tall semi-woody weeds. Nonnative grasses in the genera <i>Bromus</i> and <i>Schismus</i> benefit burrowing owl foraging.</p>
4.2-193 4.2-195	<p>Bullet 2a: We recommend non-disturbance buffers around any occupied burrow be marked by stakes and flagging, instead of fencing. Predatory birds such as ravens, raptors, and loggerhead shrikes can perch on fencing and predate on burrowing owls as they emerge from burrows.</p>
4.2-196	<p>Please justify in the effects section the use of a 250-foot buffer for desert kit fox dens. Please reconcile this buffer from the introductory paragraph with the 300 to 500 foot avoidance buffer zone described in 1c around any active natal dens found during preconstruction surveys.</p>
4.2-197	<p>Bullet 2: Please explain in the effects section the biological justification for a 10-</p>

	mile qualitative and 1-mile quantitative evaluation area of suitable habitat.
4.2-198	Bullet a: Please specify that the project proponent be fiscally responsible for the veterinary care of any injured animal.
4.2-199	Bullet c: To ensure most effective exclusion of desert tortoises from the project site, revise as follows: “The desert tortoise exclusion fencing shall be secured directly to the outside of the security fence...”
4.2-199	Please see comment 4.2-165 on a mortality reporting procedure. Please consider requesting development of a mortality/carcass reporting and disposition plan, or including that as a subsection of the BRMIMP (BIO-2).
4.2-200	We recommend that the decision to use the advance mitigation option (BIO-19) be approved by the agencies prior to the project owner taking action. Please add language to that effect in BIO-19.
4.2-200	Verification section, second sentence: Please revise as follows: “...provide proof of participation to the CPM, BLM, and FWS, to be verified by CDFG, prior to any ground disturbance.”
4.2-201	We recommend that the purpose of activities in the Closure, Revegetation, and Reclamation Plan be restoration, not reclamation. Please revise BIO-20 accordingly.
4.2-221	Please reconcile the stated conclusion that the SRSG would need to be replaced about every 4 years with BrightSource’s statement, and Staff’s resultant conclusions, that the solar power plant would be in full standby “a few minutes in an entire year during an unusual or emergency episode” (4.2-83).
4.2-223	Please explain how Staff arrived at the conclusion that avian exposure to concentrated solar flux would be from 20 seconds to 4 minutes during each pass through the field.
4.2-223	Extrapolating from the statement that bare human skin exposed to 5 kW/m <sup>2</sup> would experience first-degree burns within 20 seconds, second-degree burns within 30 seconds, and third-degree burns within 50 seconds with an associated 1 percent fatality rate, it is probable that exposed skin of birds (e.g., the heads of vultures or around the eye) would be burned as a result of the project. Given the short exposure time and low flux level required to burn human skin, we are concerned that birds may be burned at lower flux levels than those Staff considers safe for bird feathers. Please address this in the effects section.
4.2-223	Please specify if Staff’s conclusion that damage to barbules from exposure to flux would be “essentially instantaneous” applies to all durations and levels of flux exposure.
4.2-223	Please consider potential damage to avian eyes when stating that damage to surface feathers is one of the most sensitive types of adverse effects.
4.2-225	Exposure to flux may also affect multiple feathers at once, such that birds’ ability to maneuver, their flight speed, or aerodynamics may be compromised. While complete loss of a feather usually triggers new growth of a replacement feather, feather damage does not. Consequently, any damaged feathers would not be replaced until the next molt cycle, meaning adverse effects, and resultant increased mortality risk, could last many months. Further, feather damage from flux exposure would be additive to any naturally-occurring feather damage. Please discuss this in the effects

	section.
6.1-4	Please describe the rationale for not including in the alternatives analysis project locations beyond those included in the Application for Certification. Alternative sites for power tower technology may be less injurious to the number of species and abundance of resident and migratory bird populations. ( <a href="http://www.brightsourceenergy.com/stuff/contentmgr/files/0/63ecfc415e8722af38abe473ead74c8c/pdf/final_sce_cpuc_approval.pdf">http://www.brightsourceenergy.com/stuff/contentmgr/files/0/63ecfc415e8722af38abe473ead74c8c/pdf/final_sce_cpuc_approval.pdf</a> ),
6.1-22 6.1-26	Please describe the data on which the assessment of biological resources on the Sonoran West site is based. Please compare the surveys that have been conducted at Sonoran West to those at Rio Mesa, and explain how conclusions are supported.
6.1	As discussed during REAT agency meetings and project-specific workshops, coordination of and the ultimate outcome of the Least Environmentally Damaging Practicable Alternative (LEDPA) analysis pursuant to section 404(b)(1) and authorized by the Army Corps of Engineers has not been completed. We remain concerned that this process has not identified the LEDPA, which may be different than the configuration analyzed under the PSA.