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STATE OF CALIFORNIA

Energy Resources Conservation and Development Commission

In the Matter of:

APPLICATION FOR CERTIFICATION
FOR THE PALEN SOLAR ENERGY
GENERATING SYSTEM

DOCKET NO. 09-AFC-7

INTERVENOR CENTER FOR BIOLOGICAL DIVERSITY

Testimony of Pat Flanagan

**Re: Impacts to Wildlife and Ecosystems from the Proposed Palen Solar Energy
Generating System**

Docket 09-AFC-7

Exhibit 3037

Summary of Testimony

The proposed project will be harmful to numerous rare species and migratory birds and potentially will cut off connectivity based on land facets, which is crucial for species as they adapt to climate change.

Qualifications

My qualifications are provided on my Resume attached to this Testimony and as discussed below as part of my Testimony.

Statement

Experience on Solar One

I was the field personnel at the Solar One site in Daggett from September – May 1983. I want to share some experiences with you that may provide insight into the current surveying situation at Ivanpah and, if constructed Palen SEGS. I have a degree in biology for Long Beach State and while a student I conducted winter and breeding bird surveys for three years at Casper’s Regional County Park, adjacent to the Audubon Starr Ranch,

in Orange County Ca. I have and continue to use my education, enthusiasm for the ecological interactions of birds, plants, insects, and life with their structural environment. I share my field knowledge and experiences to engage both youth and adults in the natural history of their world. I also write ecosystem based curriculum for elementary schools¹ and write popular science essays for local publication. Currently I am researching and writing signs for the Joshua Basin Water District Native Plant Garden and researching and writing a guide to invasive plants for use by maintenance personnel in six western national parks.

While my field experience at Solar One was 30 years ago the solar project itself, its siting, and my birding and insect experiences were unforgettable. The 79 acres site was tiny in comparison to the approximately 6.5 square miles at Ivanpah. Although it may appear easy to find downed birds on the cleared site under the heliostats it was always worrisome for me because many of the local and migrant birds were small and inconspicuously colored. The larger darker birds would stand out. I believe Palen will not be cleared of vegetation and Ivanpah is not, and in both cases, to do a good job over such a large area it will take many field personnel walking regular routes to do an adequate job. I think 'USFWS protocol for surveying Desert tortoise may be a model to base avian surveys on for the Palen project if it should be constructed. Frankly, to me, the Ivanpah solar field looks nearly impossible for two or three people to adequately evaluate the ongoing avian mortality; an exercise in luck more than science.

1983 was a significant El Nino year and may have been responsible for the enormous number and variety of insects in the area. It was an eruption year for painted lady butterflies and a 'life experience' was being engulfed by a stream of them flying through; it seemed to last for minutes. During the hourly intervals I observed the solar field there were times when it look like a war zone, so many insects were being instantly vaporized in the flux field. Occasionally there was a substantially larger vaporization and I wondered if it was a hummingbird; there was no way to tell. The FSA mentions that McCrary did not report on how the 800 insects /minute were counted. I can tell you. I did it the same way I learned to count large flocks of birds crossing the sky at the Salton Sea. Visually divide the sky into a grid (not too many or the edge effect kicks in), identify the section of the grid to count, set the timer for 1 minute and start counting; at the end of the minute multiple by the number of cells in the grid. This is, of course, subjective, but it was my routine and I think I got pretty good at it.

The biggest joy of this experience was the evaporation ponds to the west of the solar field. My best day had 25 different shore and water bird species and over 2500 individual birds; impossible to find in most single locations on the Pacific coast. When dead birds started showing up at solar fields there was surprise about the number of birds and confusion about the availability of migration data that could inform the solar-related mortalities. There is a large body of data about migrating birds at the Salton Sea, a world renowned location for wintering birds and a hotspot for bird banding for decades. I

¹ Pat Flanagan. 2012. The Salton Living Laboratory – a science and social studies curriculum for 4th through 6th grade students in Imperial Valley. Abstract in The 2012 Desert Symposium Field guide and Proceedings. Editor Robert E. Reynolds. California State University Desert Studies Consortium

banded birds there in the late 1970s with my field ornithology class from Cal State Long Beach. The attached map² visualizes the number of birds banded at the Salton Sea and either recaptured there or recovered elsewhere. The data for the map includes 30 years of banding records provided to the Redlands Institute Salton Sea Data Project by the USGS Salton Sea Science Office.³ Some think this map is way too general and we need radar data to know where the birds are really flying. That is costly, will take time, is currently unavailable and is probably unnecessary. The banding data is reinforced by the records on eBird www.ebird.com. My memories of the Daggett Evaporation Ponds are reflected in the 118 species recorded at that site using 117 check lists available on eBird. The other water sources in the area: Barstow Water Treatment Plant, Tees and Trees Barstow Ponds, and Newberry Springs show the similar numbers and birds. Click on the link and then click on each of the light green balloons.
<http://ebird.org/ebird/hotspots?hs=L446712&yr=all&m=>

The siting information for each bird species and for each location is available in many formats. The site is monitored by Cornell University and there are expert reviewers for each region prior to the lists being published on the website.

eBird Hotspot lists document the following number of bird species encountered at different locations in the California Desert:

DC Lake Tamarisk	202 species (Nearest to the proposed Palen project site)
Baker- behind Denny's	170 species
Baker Water TP	176 species
Chet Huffman Park	116 species
Primm Valley Golf System)	117 species (near the Ivanpah Solar Electric Generating System)

Blyth area (selected)

Palo verde Ecological Reserve	169 species
Mayflower County Park	128 species
The River Estates	106 species
Blythe Fish Ponds	92 species
Palo Verde Cemetery	45 species
Blythe -Riviera Dr.	74 species
Blythe Water TP	80 species

Salton Sea Area

There are a large number of eBird Hotspots around the Salton Sea area in different habitats including aquatic, agricultural, upland, and riparian. A bird would have no trouble seeing the Palen Power Tower when flying north in migration or on a daily foraging flight. A cursory correlation of the eBird lists among the Salton Sea, Blythe and the Colorado River clearly demonstrates this.

² Redlands Institute – Salton Sea Bird Banding Map

³http://www.spatial.redlands.edu/salton/Downloads/Shapefiles/Metadata/ss_birdband_locations_metadata.htm

These data show that the proposed project area is indeed rich in bird species, and I anticipate that if the project were to move forward, numerous mortalities for a number of species will occur due to collisions with project infrastructure or from incineration from flux. The recent data set⁴ from the Ivanpah Solar Electric Generating System confirms numerous bird mortalities and that project is not even fully in on-line operation. I am concerned about the deleterious impacts to migratory and resident birds from the proposed project. The FSA does not do an adequate job of evaluating the impacts to birds from the project. While we know little about actual migration routes of birds, and because they are likely to change in any year, the complexity of bird migration in the California deserts and in the Chuckwalla Valley in particular, should be safeguarded until those data are available. I believe the project site is inappropriate for development using the power tower technology, due to the documented bird mortality of projects at other sites. I believe the Commission should deny this project as proposed.

Additionally, I would like to bring to your attention the technical report Priority Areas for Breeding Birds within the Planning Area of the Desert Renewable Energy Conservation Plan.⁵ This report demonstrates that the DRECP planning area provides important habitat for birds, providing over 50% of the breeding range within California for at least 20 bird species. They provide both the top 10% of the landscape in importance to the breeding bird community as well as the lowest 10% of the landscape in importance to breeding birds. The Palen project is within the top 10% area. Their data is available for downloading and use.

In summary, I find the document to be lacking as it pertains to biological resources. These deficiencies need to be addressed and remedied before in a revision to the SA or other environmental documentation prior to project permitting.

Wildlife connectivity and Land Facets

The FSA concludes that the project would not result in significant unmitigated impacts to connectivity for desert tortoise and other wildlife. This conclusion appears to be based on the suitability of the five underpasses closest to the PSEGS project for wildlife movement as described by the Solar Millennium report Wildlife Movement and Desert Tortoise Habitat Connectivity (AECOM 2010). (Biological Resources 4.2-97-98)

The SC Wildlands report A Linkage Network for the California Deserts (SC Wildlands, Penrod 2012) shows a least cost corridor for the desert tortoise (a focal species) between the Chocolate Mountains and Palen-McCoy Mountains landscape blocks. (Figure 9) In preparing this study SC Wildlands used present- day land cover in their habitat and permeability models for each species. In addition, the authors state that as the climate changes the land cover types (vegetation communities) will also change in

⁴ http://docketpublic.energy.ca.gov/PublicDocuments/07-AFC-05C/TN200642_20130930T090221_Avian_Mortality_Report_912013.xlsx

⁵ C.A. Howell and S.D. Veloz. 2011. Priority areas for Breeding Birds within the Planning Area of the Desert Renewable Energy Conservation Plan. PRBO Technical Report. PRBO contribution #1823. <http://www.prbo.org/cms/574>

unpredictable ways and the current desert linkages may not function. Taking this into account they supplemented the union of focal species corridors with a union of land facet corridors. “These land facet corridors provide connectivity for land facets, which are the enduring features (topographic elements such as sunny lowland flats, or steep north-facing slopes) that will interact with the future climate to support future biotic communities.” (Penrod, p. 37)

Land facets can be used to coarse-filter conservation planning for core areas or for conservation linkages. (Beier and Brost, 2010; Brost and Beier, 2012) each land-facet corridor should support movement of species associated with that facet in any future climate, and the high diversity corridor should support species movements during periods of climate instability. The land facet corridors complement, rather than replace, focal species corridors. (Penrod, p.15) And, the land facet corridors do not model warm-to-cool corridors or the opposite because “in this landscape the transition can best occur in the huge wildland blocks, where all land facets are juxtaposed in complex ways, rather than in relatively short and narrow corridors. Instead the corridor for each land facet is intended to support movements that can occur in a few days to several years (e.g., a few generations for a plant, small mammal, or small reptile). Landscape-extent range shifts involving several degrees of latitude would occur over several decades across the network of Landscape Blocks and Linkages.” (Penrod, p.16)

The following is an exercise in how the combined Tortoise Least Cost Union corridors and the Land Facet Unions work together in planning for Desert tortoise recovery.

As part of this testimony I attach maps of five (of the 22) land facet linkage planning areas. From north to south they are:

- 1) Mojave National Preserve - Stepladder Turtle Mountains;
- 2) Stepladder Turtle Mountains - Palen McCoy;
- 3) Palen McCoy Mountains - Whipple Mountains;
- 4) Joshua Tree National Park - Palen McCoy Mountains; and
- 5) Palen McCoy Mountains - Chocolate Mountains.

Each land facet planning area is contained within the Least Cost Union (LCU) corridors for Desert tortoise (*Gopherus agassizii*). Figure 9 Least Cost Corridors for Desert tortoise is attached. For this exercise I did not include the entire tortoise range.

To visualize the relationship between the LCU and the Land Facet Union I have attached Figure 32.

The Desert tortoise was selected as a focal species for the desert connectivity project because it is an umbrella species for coachwhip, glossy snake, desert, horned lizard, western banded gecko, and leaf-nosed snake and moves through many desert habitats. The conceptual basis for model development for the Desert tortoise LCU assumed the following: Desert tortoises are found on flats, valleys, alluvial fans, bajadas, sand dunes, rocky outcrops, mountainous slopes, and gently sloping hills in creosote bush

scrub, saltbush scrub, Blackbush scrub, cheesebush scrub, and scrub steppe communities. (Penrod references the USFWS 1994) (Penrod, p.34) Desert tortoise is, perhaps, the most troublesome and difficult of the threatened and endangered species at risk from utility scale solar development. The connectivity studies, if used as a regional tool, provide guidance for project configuration and mitigation.

The Palen McCoy Mountains – Chocolate Mountains Land Facets

As a tool for regional management, the California Desert Connectivity Project provides guidance for project siting, configuration, and mitigation strategies. For the Desert tortoise, a core landscape block connecting the Sonoran and the East Mojave deserts is the Palen McCoy Mountains. The low and middle elevation slopes and gentle canyons are important for tortoise movement over time between the Mojave National Preserve, the Stepladder Turtle Mountains, the Whipple Mountains, Joshua Tree National Park, and the Chocolate Mountains.

The 8 square mile PSEGS appears to be spread across the land facets blocking many of the strands connecting the Palen McCoy Mountains to the Chocolate Mountains. The overlap between the land facets and the project footprint must be analyzed if we are to know the extent of the loss and if there are mitigation measures.

The table below is presented to help the reviewer compare the land facets in each of the planning areas as they relate to Desert tortoise movement over time and space. Use with the Land Facet maps with Figures 9 and 32.

Land facet	Mojave National Preserve – Stepladder Turtle Mtns	Stepladder Turtle Mtns- Palen-McCoy Mtns	Palen-McCoy Mtns – Whipple Mtns	Joshua Tree National Park – Palen McCoy Mtns	Palen McCoy Mtns– Chocolate Mtns
Low elev. gentle canyons	X	X	X	X	X
Low elev. steep canyons	X				X
Steep canyon bottoms				X	
High elev. gentle canyons					X
High elev. steep canyons			X		X
Mid elev. moderately steep canyons			X		
Low elev. gentle slopes		X			X
Steep shaded slopes				X	
Mid elev. gentle	X	X	X		

slopes					
Mid elev. slopes					
Mid elev. steep slopes	X				
Mid elev. moderate insolation gentle slopes					
High elev. shaded steep slopes			X		X
High elev. sunny steep slopes			X		
High elev. sunny slopes				X	X
Highest elev. sunny slopes					X
Low elev. gentle ridges	X		X	X	
Low elev. steep ridges	X		X	X	
Mid elev. steep ridges					X
Mid elev. moderately gentle ridges			X		
High elev. steep ridges			X		X
High elev. gentle ridges					X
High Interspersion*	X		X	X	X

*See explanation for High Interspersion below.

“In each land facets linkage design, one corridor optimizes connectivity for high interspersion (local diversity) of land facets; this corridor is intended to accommodate rapid, short-distance range shifts, interactions between species, and ecological processes. This corridor also allows for short-distance (intra-corridor) movements from low to high elevation or from warm to cool aspects. Each of the other corridors optimizes connectivity for one facet type, and is intended to facilitate movement of species associated with that facet, today and in the future.” (Penrod, p 40)

The land facets were defined separately for each linkage planning area and should not be considered Identical to all facets with the same name throughout the desert region.

Based on the above data and analysis, I believe that the proposed project will greatly restrict if not eliminate connectivity that is essential to keeping the Colorado and Mojave deserts connected in light of on-going climate change. While I believe that the proposed project is poorly sited and that the commission should reject the proposal based

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Education (selected)

Bachelor of Arts Degree in Biology, Long Beach State University
Graduate coursework in Field Ornithology, Long Beach State University
Short courses in Geographic Information System, basic map design, and remote sensing
Short courses in audience evaluation, interpretive writing and signage, exhibit development and design
Workshops in organizational management, grant writing, and writing

Experience (selected)

Writer	The Sun Runner	Current
Naturalist	29 Palms Inn	Current
Curriculum Development	Desert Protective Council	2007-2011
Desert Associate	California Wilderness Coalition	2002-2003
Conservation Outreach Director	San Diego Natural History Museum	2000-2002
Director of Informal Education	San Diego Natural History Museum	1995-2000
Education Coordinator	Tijuana River National Estuarine Research Reserve	1985-1995
Naturalist, Owner	Anza-Borrego Desert Tours	1981-1985
Biological Monitoring	Solar One Power Plant, Daggett, CA	1981-1984
Botany Instructor	Audubon Ecology Camp in the West, Dubois WY	1979-1983
Field Assistant	Solar One Energy Power Plant	1982-1983
Visitor Center Lead	ABDSP Visitor Center	1979-1981
Laboratory Assistant	Botany and Plant Pathology, Purdue University	1961-1966

Overall

For over 40 years I have worked professionally as a science educator. I have led naturalist tours throughout the western deserts and Baja California, conducted weeklong desert workshops, trained hundreds of teachers and docents, made presentations to adult and youth groups, developed science curriculum and implemented the programs into schools. I write popular articles on natural history topics and land use planning issues. Evaluations comment on my ability to develop rapport with my audience, to communicate my love of nature, and to interpret natural features, ecological relationships, and regional biodiversity in an original and compelling manner.

Recognition

2003 Conservation Award. Soroptimist International of Twentynine Palms
2001 San Diego National Wildlife Refuge Complex. Recognition by the U.S. Fish and Wildlife Service *for significant contributions to the Tijuana Slough National Wildlife Refuge.*
1997 Washington D.C. National Oceanic and Atmospheric Administration. *Excellence Award for Coastal and Ocean Resource Management in the category of Excellence in Promoting Cultural and Ethnic Diversity.*

1997 Tijuana River National Estuarine Research Reserve. Binational GIS Awards Ceremony.
Recognition by NOAA *for your vision and leadership that made possible the development of the Geographic Information System for the Tijuana River Watershed to promote education, land use planning, and ecological preservation and restoration.*

Declaration of Pat Flanagan

Re: Impacts to Wildlife and Ecosystems from the Proposed Palen Solar Energy Generating System

DOCKET NUMBER 09-AFC-7

I, Pat Flanagan, declare as follows:

- 1) I am currently a naturalist, writer and environmental consultant. I have worked as a scientific educator for over 40 years.
- 2) My relevant professional qualifications and experience are set forth in the attached resume and the attached testimony and are incorporated herein by reference.
- 3) I prepared the testimony attached hereto and incorporated herein by reference, relating to the impacts of the proposed project on wildlife.
- 4) I prepared the testimony attached hereto and incorporated herein by reference relating to the proposed Palen Solar Electric Generating System in the Chuckwalla Valley in Riverside County.
- 5) It is my professional opinion that the attached testimony is true and accurate with respect to the issues that is addressed.
- 6) I am personally familiar with the facts and conclusions described within the attached testimony and if called as a witness, I could testify competently thereto.

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

Dated: October 15, 2013

Signed:



At: 29 Palms, California

on the new data and analysis, at a minimum, if the proposed project was to move forward, significant mitigation must be incorporated, including for desert tortoise at a much greater level than 1:1, in order to provide adequate connectivity in key areas identified above for all the species that currently occupy or even occasionally use the proposed project site. Absent permanent conservation of these important connectivity areas, the proposed project which purports to mitigate climate change impacts by replacing fossil fueled electricity generation will doom local species by failing to maintain pathways for them to escape the consequences of on-going climate change.

In summary, I find the document to be lacking as it pertains to biological resources particularly bird species and wildlife connectivity. These deficiencies need to be addressed and remedied in a revision to the FSA before the proposed project is permitted in order for the Commission to fully understand the impacts of the proposed project.