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BrightSource

**RIO MESA SOLAR
ELECTRIC GENERATING FACILITY
CEC BIOLOGICAL RESOURCES WORKSHOP**

January 6, 2012

Rio Mesa Solar – Agenda

- Project Description
- Project Setting
- Technology
- Surveys and Results
 - Eagles
 - Owls
 - Migratory Birds
 - Flyways
 - Bats
- CEQA



Rio Mesa Solar – Introductions

- BrightSource Energy
 - Todd Stewart, Project Development Manager, BrightSource Energy
 - Kevin Bertrand, Assistant Project Development Manager, BrightSource Energy
 - Arthur Haubenstock, VP Regulatory Affairs, BrightSource Energy
 - Andrea Grenier, Lead Permitting Consultant to BrightSource Energy
 - Angela Leiba, VP and Environmental Project Manager, URS Corp.
 - Danny Franck, SEDC Manager

PROJECT DESCRIPTION



Rio Mesa Solar – Project Description

- Project Description

- Technology: BrightSource Energy's LPT Solar Thermal Power Tower Technology
- Total Output: 750 MW (Nominal)
- Plant Size: 3 X 250 MW Nominal Plants
- Homes Powered: 300,000 homes

- Solar Field Design

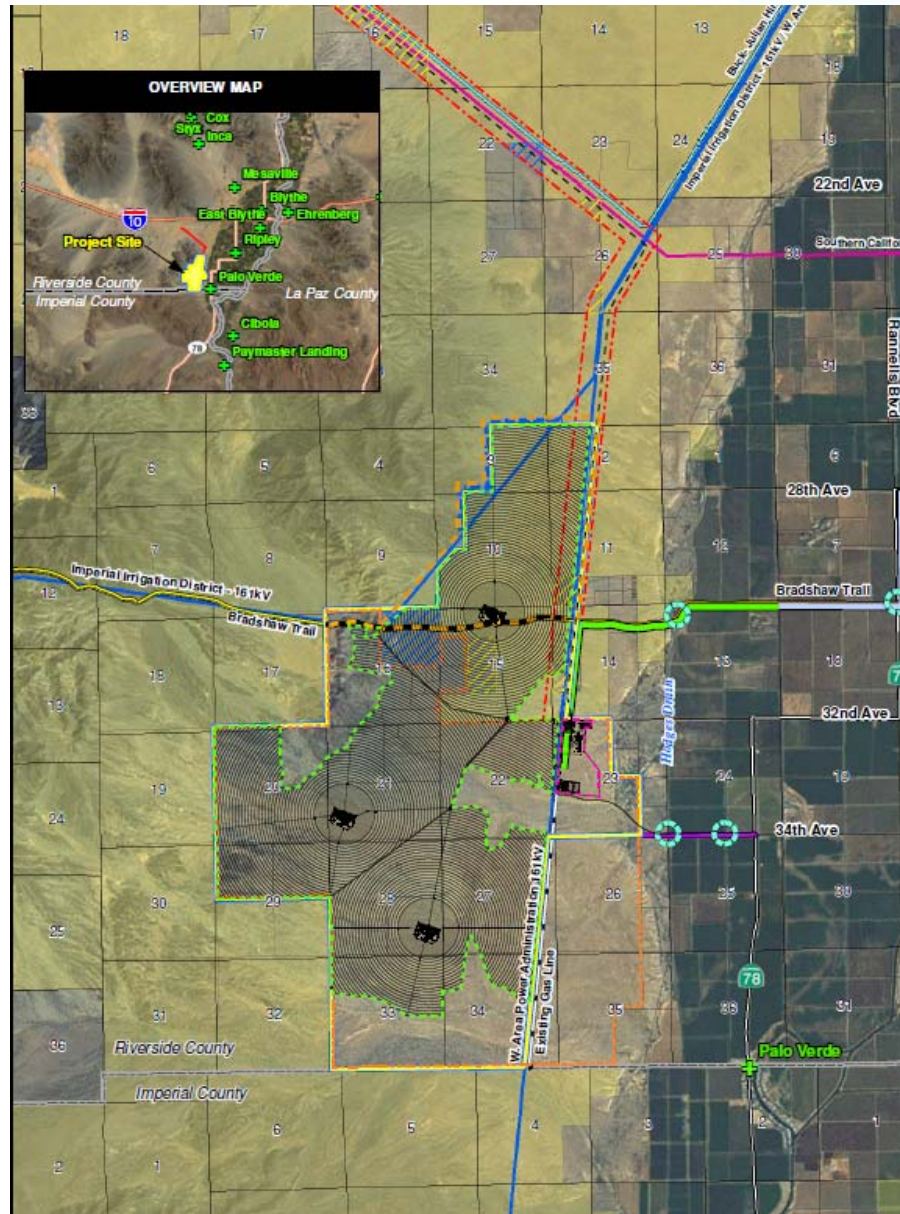
- 250 MW Platform Description
 - Approximately 85,000 heliostats per plant
- Power Tower Description
 - 760 feet total height (including SRSG and lightning antenna)
 - Concrete cylindrical as opposed to a steel lattice.

Rio Mesa Solar – Property Description

- Property Description

- Location: Riverside County, CA
- Elevation: 355-365 feet above MSL
- Size: Total Amount of Land Under Control – 6858 acres
Total Land to be Developed – 5750 acres
Gen-Tie Line Area Studied – 1330 acres, final disturbance 125 acres
- Land History: Private land: Former site proposed for a Nuclear Power Plant by SDG&E and subsequently sold to Metropolitan Water District
Public Land: Used for military training during WWII, currently used by Off Highway Vehicles
- Zoning: MWD Land: Action by Riverside Board on November 8, 2011 has brought all land into zoning conformance (Subject to CEQA review).
BLM Land: In compliance; the designations provide opportunity for development of a solar electric generation facility after CDCA Plan amendment is approved and NEPA requirements are met.

Rio Mesa Solar – Project Layout



PROJECT SETTING

Rio Mesa Solar – Relative Location



National Wildlife Refuges within 100 miles

- Havasu – 70 miles
- Bill Williams – 65 miles
- Imperial – 18 miles
- Cibola (shown) – 5.6 miles

Audubon Society Globally Important Bird Areas

Two nearest areas are shown on adjacent map and are 8+ (Cibola) and 10+ (Hall Island) miles away from closest tower of project

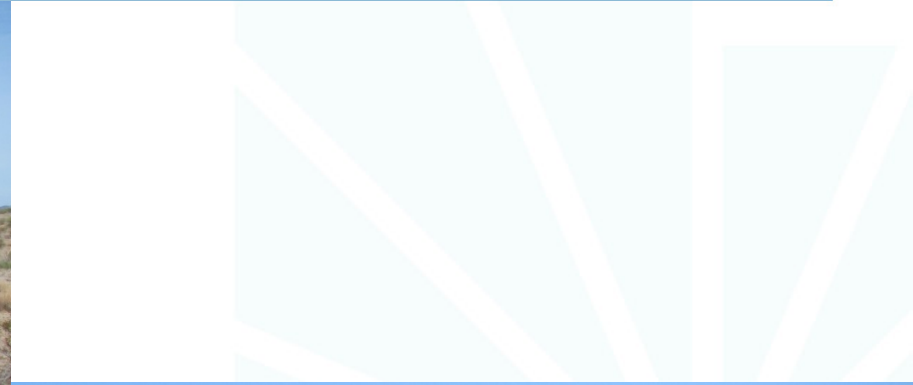
Rio Mesa Solar – Landscape



Rio Mesa Solar – Landscape



Rio Mesa Solar – Landscape



Rio Mesa Solar – Landscape



Cibola NWR – Wetlands Landscape



Cibola NWR – Wetlands Landscape



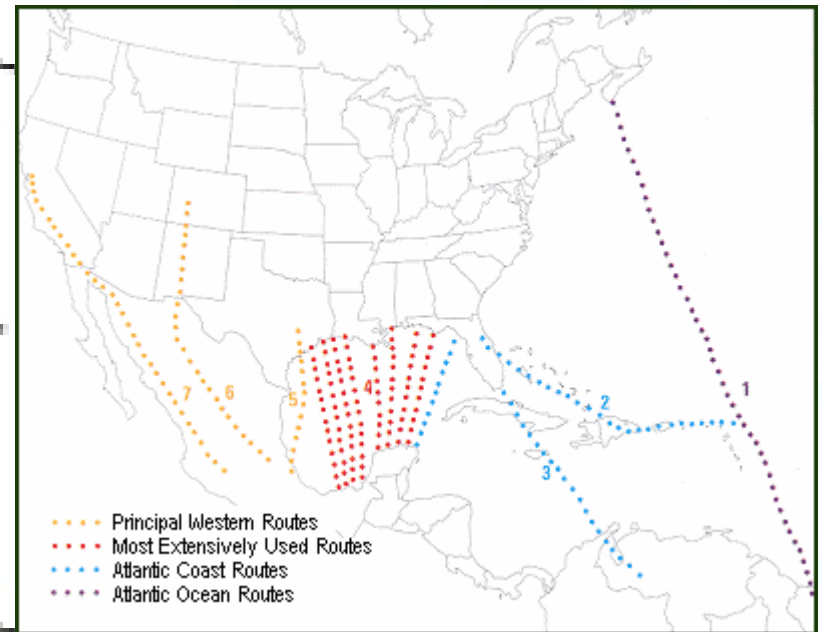
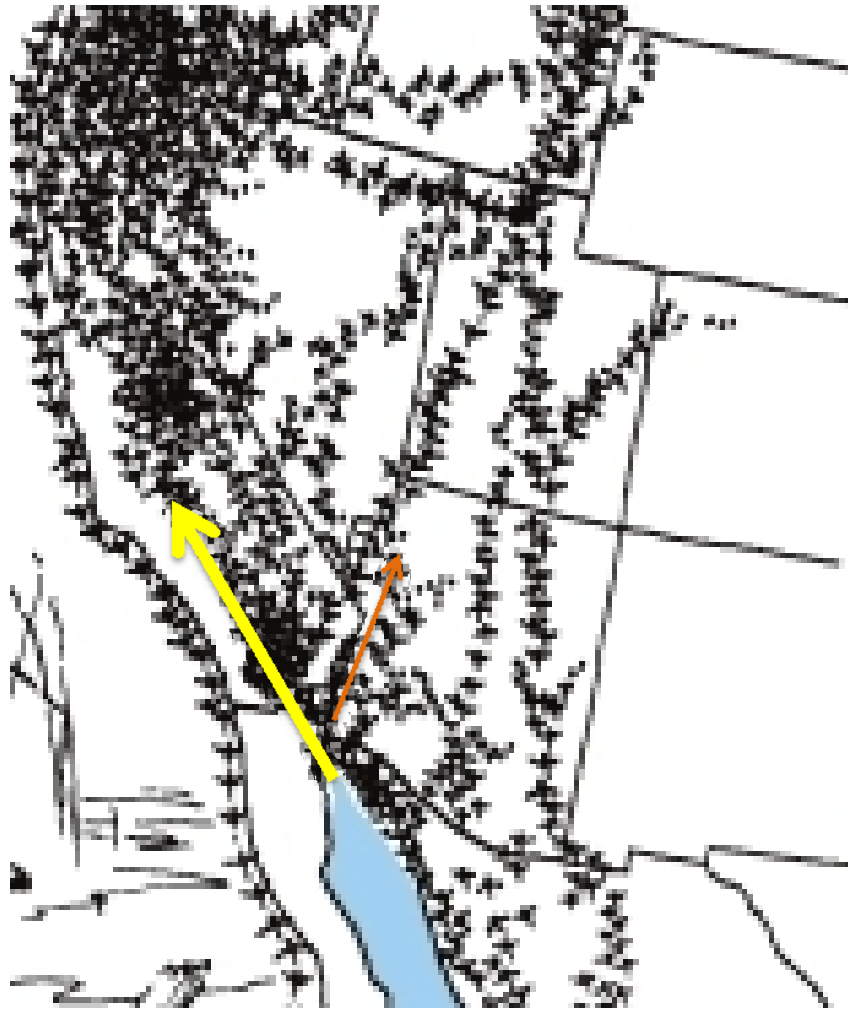
Cibola NWR – Agricultural Landscape



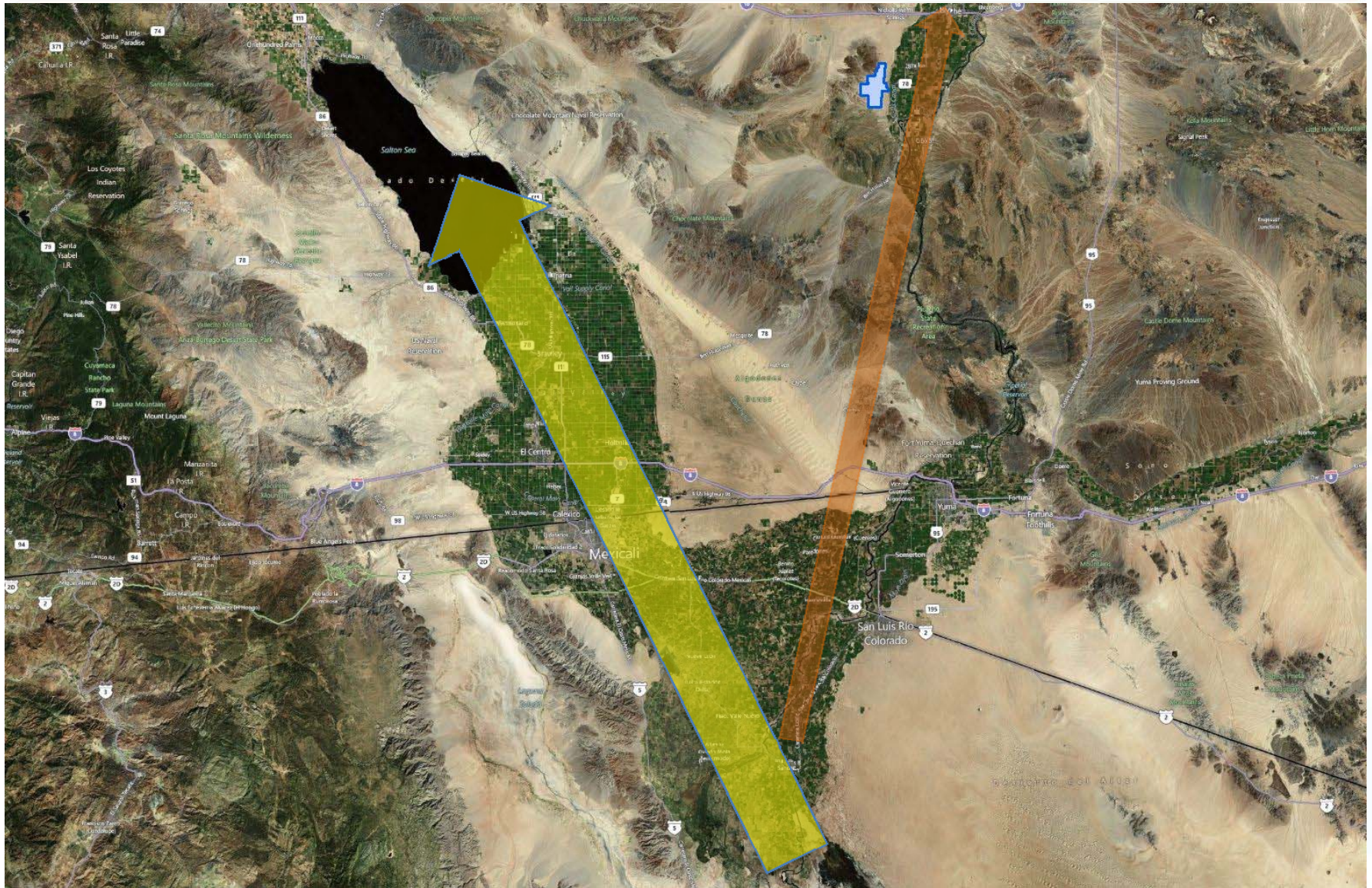
Cibola NWR – Agricultural Landscape



Rio Mesa Solar – USFWS and USGS Pacific Flyway Maps

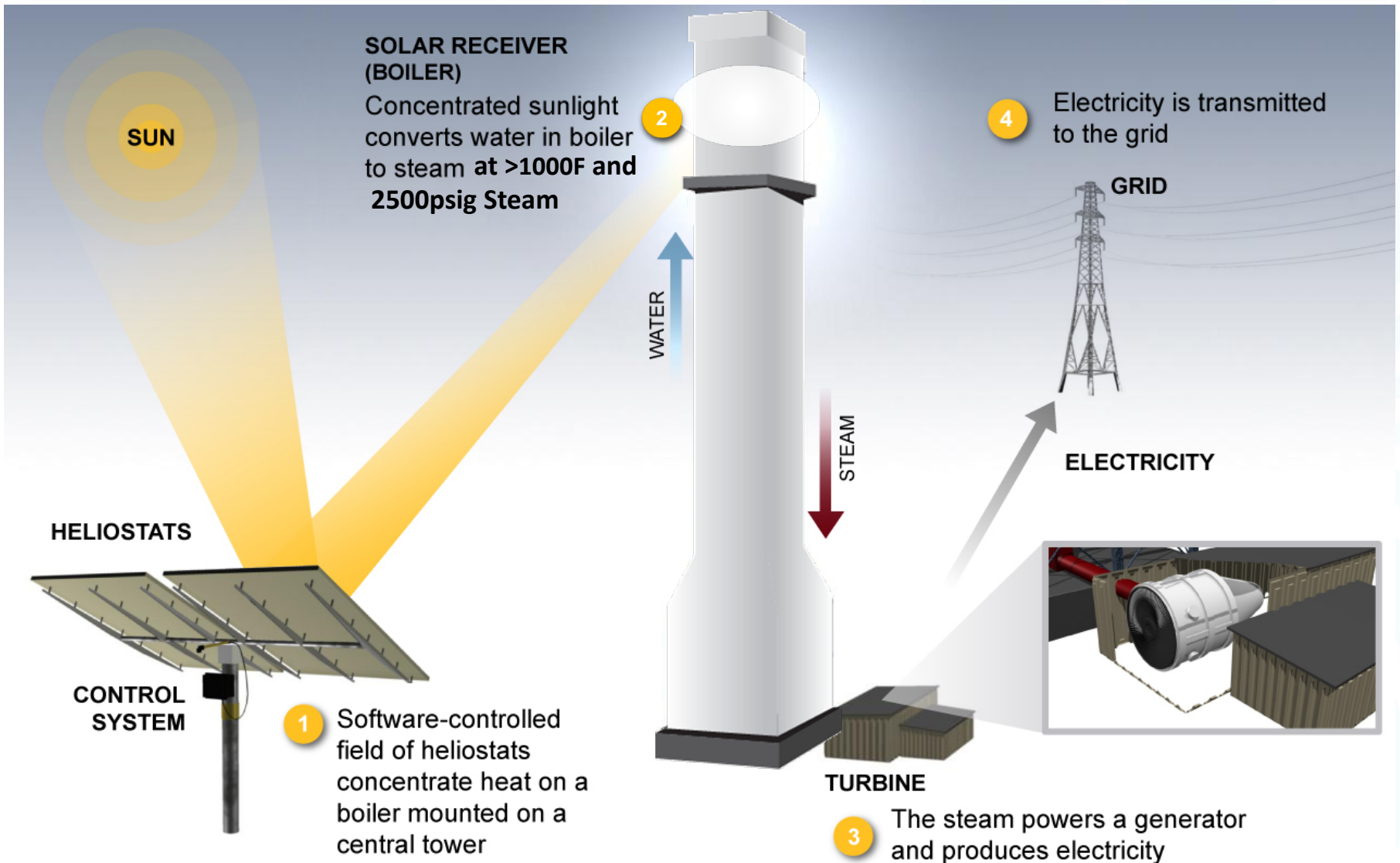


Southern CA/Mexico – Pacific Flyway Satellite View



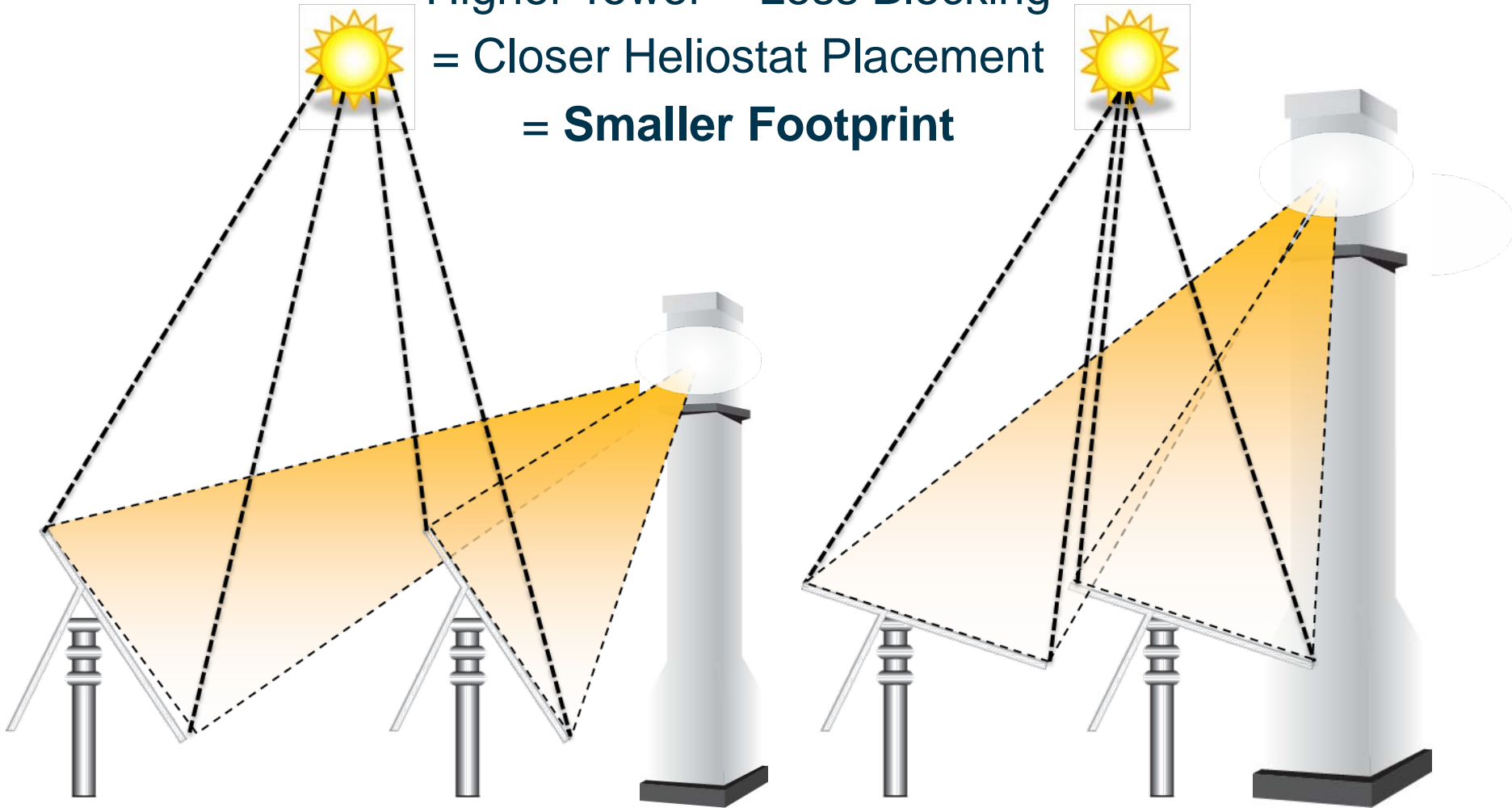
PROJECT TECHNOLOGY

Rio Mesa Solar –Technology Summary



Rio Mesa Solar – Improved Land Efficiency

Higher Tower = Less Blocking
= Closer Heliostat Placement
= **Smaller Footprint**



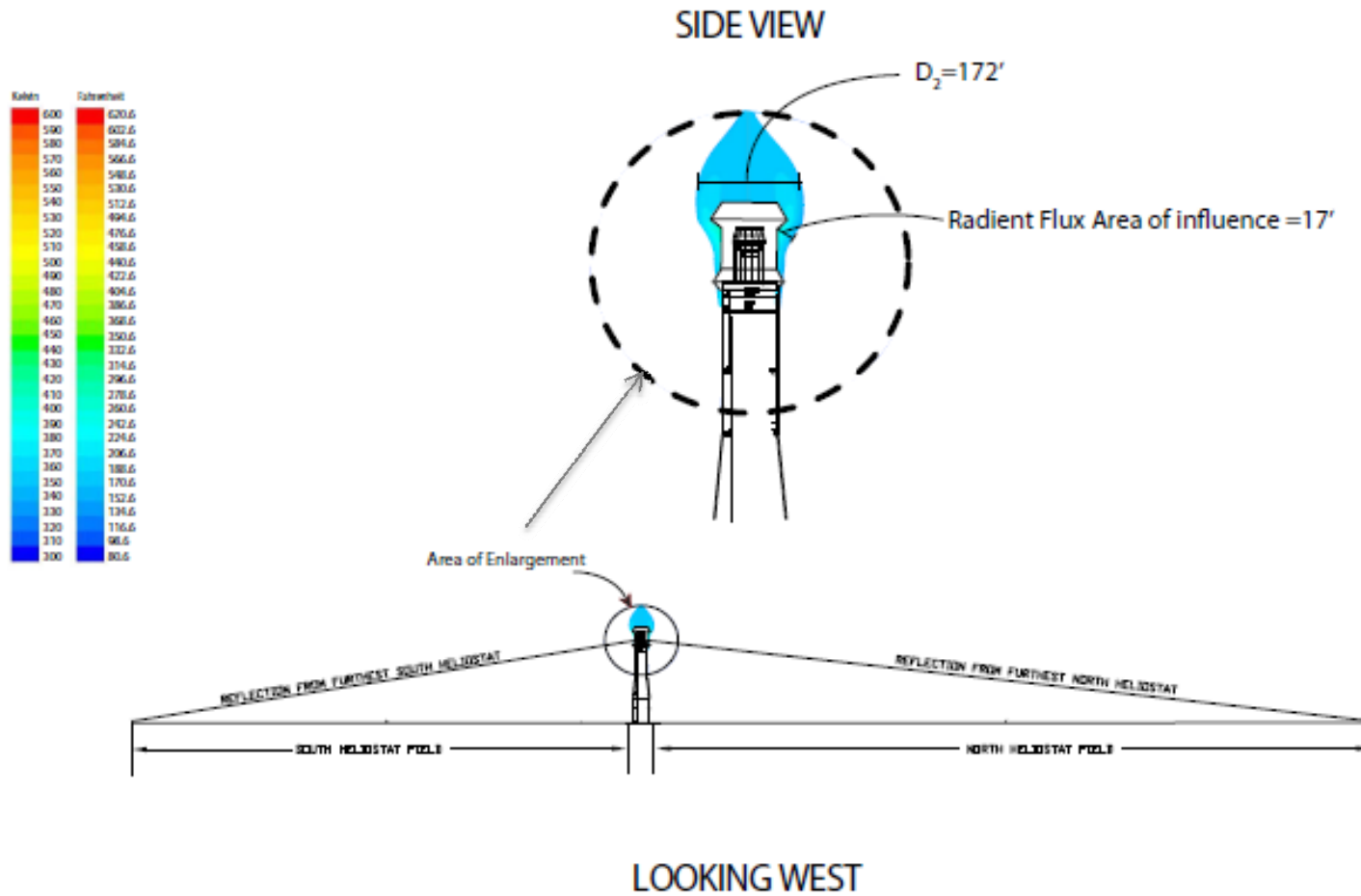
Rio Mesa Solar – LH-2 Heliostat (RMS slightly larger)



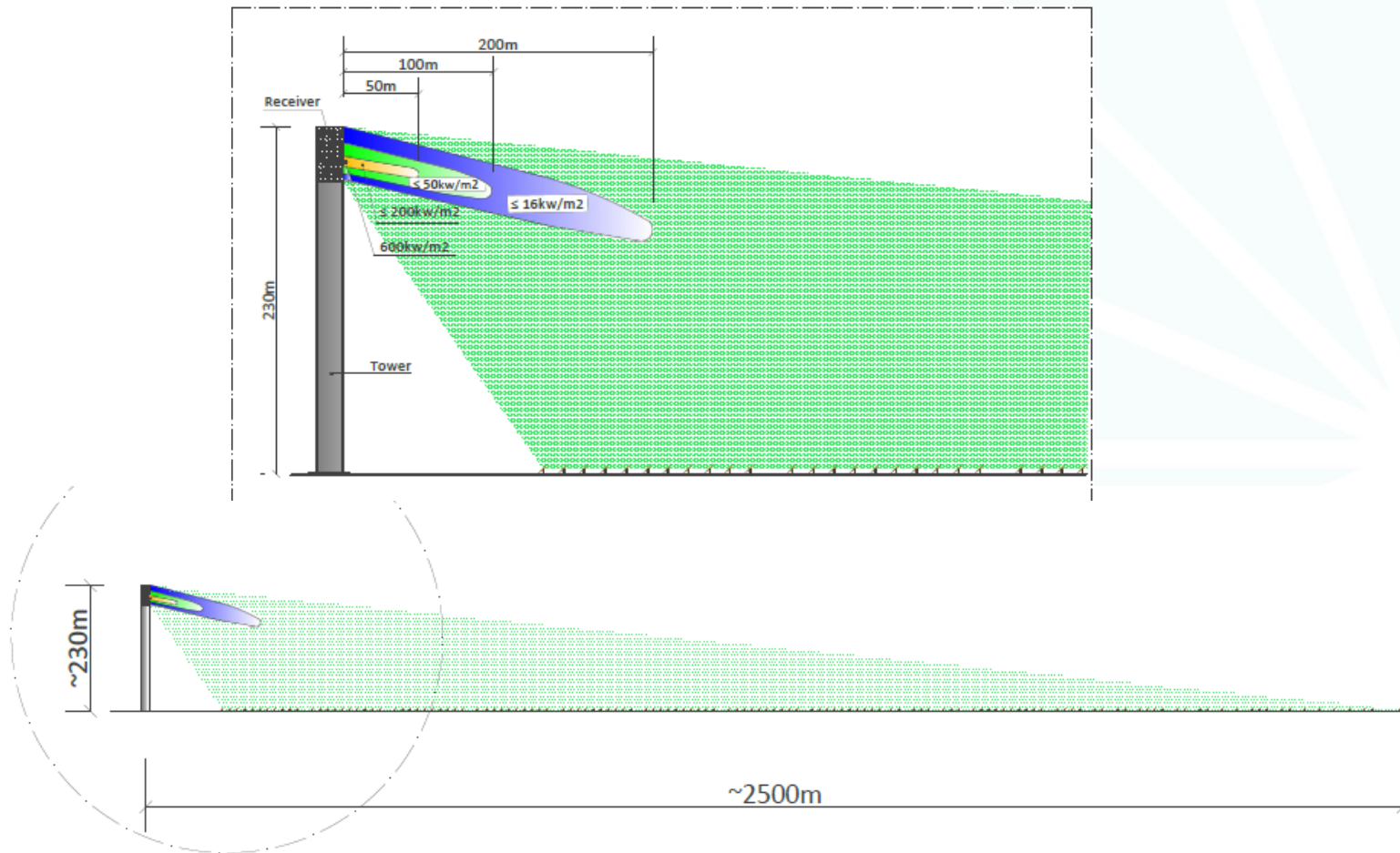
approximately 7.4 by 10.5 ft per mirror

Rio Mesa and Hidden Hills Heliostats approximately 18% larger

Rio Mesa Solar – Radiant Energy Flux at SRSG



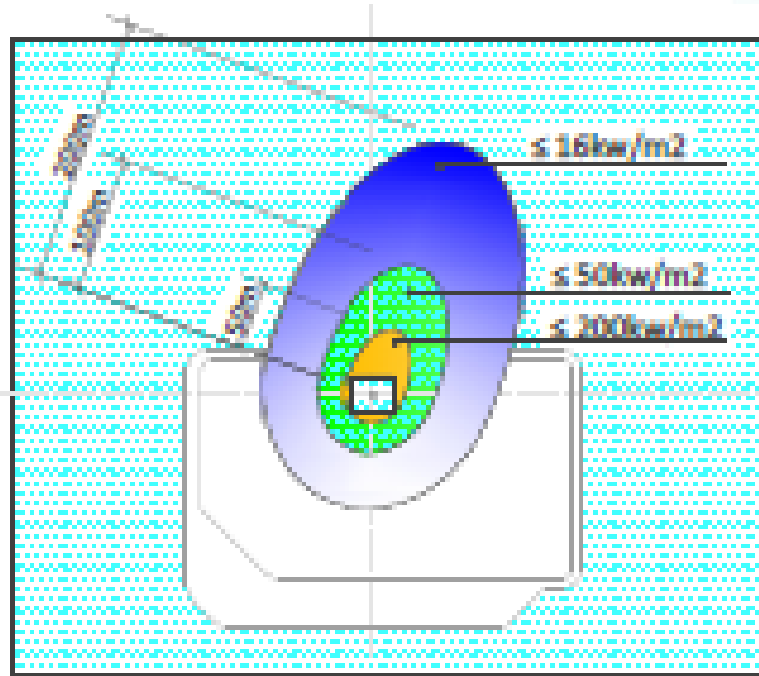
Rio Mesa Solar – Reflected Solar Flux Map (Profile View)



Cross Section of flux Intensity on 250MW LPT Receiver

BSII Doc ID: 60082-120104-1203

Rio Mesa Solar – Reflected Solar Flux Map (Plan View)



AVIAN SURVEYS AND RESULTS

Rio Mesa Solar – Surveys for Golden Eagles

- **What has been done:**
 - Breeding Season: Followed Pagel protocol, 2 helicopter surveys in 2011, March for nests, followed up in May to check for occupation.
 - Nonbreeding Season: Followed BLM protocol, 16 transects.
- **Results of the surveys:**
 - No active nests found within 10 miles of the project site.
 - 4 inactive nests found within 10 miles of the project site. [EN Map](#)
- **Why we believe that this is sufficient:**
 - Biology Work Plan submitted to all regulatory agencies; no changes recommended
 - BLM approved Work Plan and recommended contracting WRI
 - WRI followed Pagel protocol

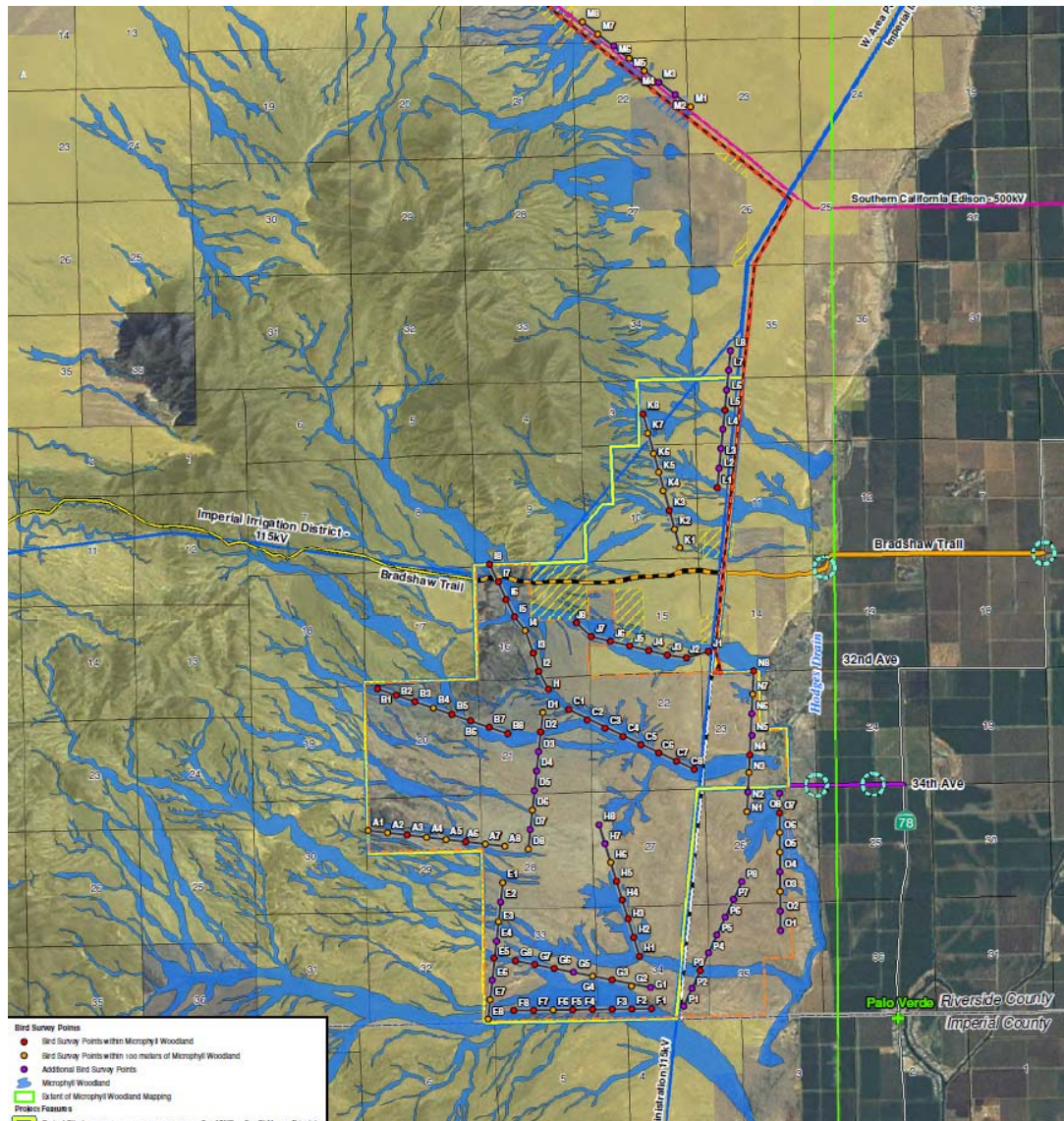
Rio Mesa Solar – Surveys for Burrowing Owls

- **What has been done:**
 - Conducted CA Burrowing Owl Consortium Survey Protocol surveys in Spring 2011.
 - 100% site coverage pedestrian survey followed by 4 days of burrow observation.
- **Results of the surveys:**
 - 2 incidental owl sightings during other surveys
 - 17 burrows with signs of owls were found, however no physical owls were noticed.
- **Why we believe that this is sufficient:**
 - Entire project surveyed using approved protocols
 - Preclearance surveys will be performed prior to construction activities mitigating the need for additional surveys.

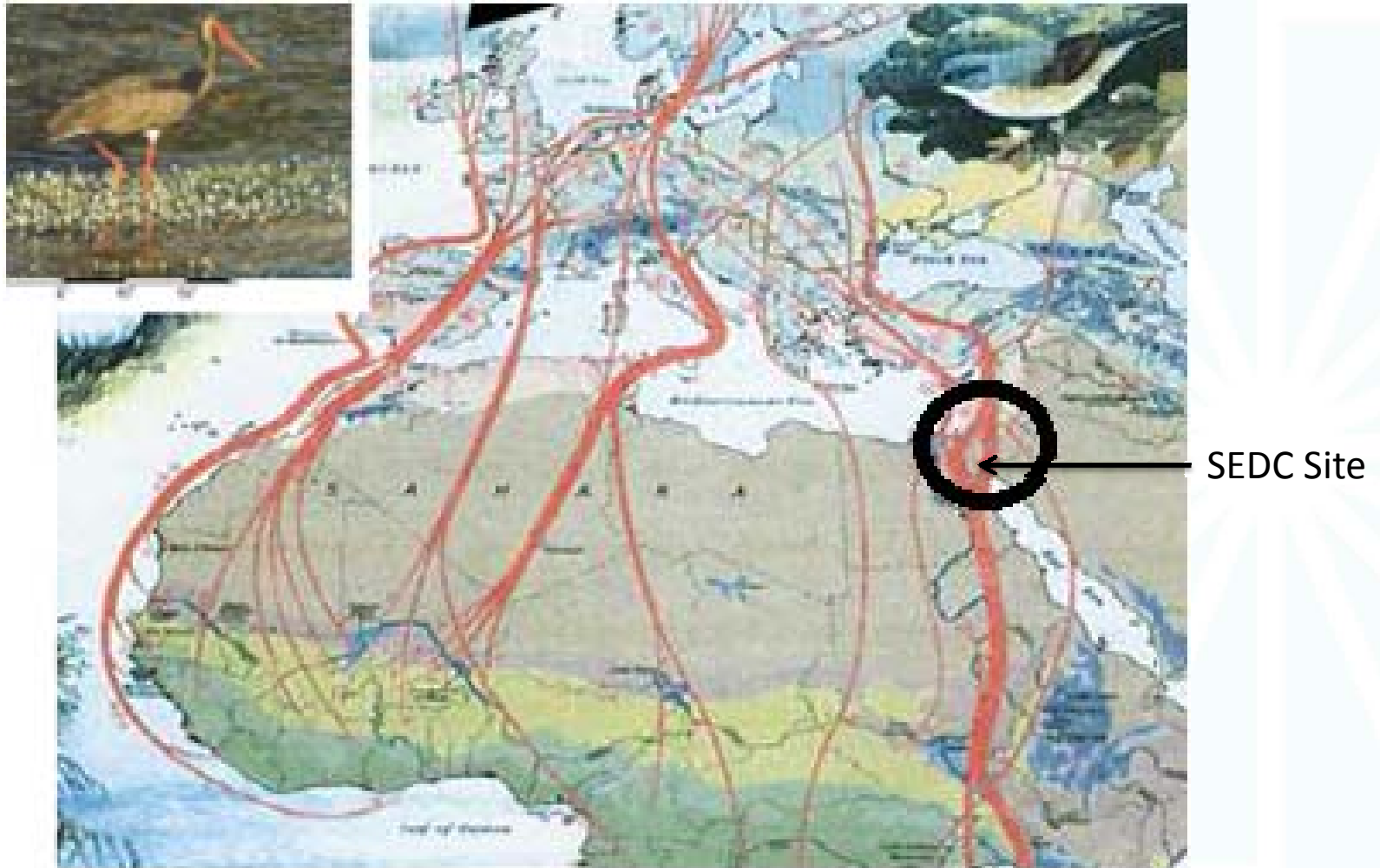
Rio Mesa Solar – Surveys for Migratory Birds

- **What has been done:**
 - Breeding Season: BLM solar energy protocol for bird point count surveys – 1 transect per sq mile = 16 total transects. (March-April)
 - Nonbreeding Season: BLM solar energy protocol for bird point count surveys - 1 transect per sq mile = 16 total transects. (November 2011 - December 2011)
 - ~75% of surveys were performed within Microphyll Woodlands. (See next slide)
- **Results of the surveys:**
 - Conclusions are that impacts to migratory birds are less than significant. Please see [Table](#),
- **Why we believe that this is sufficient:**
 - Project site is located in desert scrub habitat at least 1 mile from agricultural lands.
 - Breeding season and non-breeding season surveys conducted.
 - BLM approved survey protocol as sufficient for their regulatory requirements.

Rio Mesa Solar – Avian Transects vs. Microphyll Woodlands



Rio Mesa Solar – BSE Pilot Plant is in a Migratory Flyway



SEDC site has reported no significant avian issues in 3.5 years of operation

Rio Mesa Solar – Surveys for Bats

- **What has been done:**
 - 2 nights with Pat Brown at Hodge and Roosevelt Mines.
 - Incidental observations of bats were noted at dusk after spring surveys.
- **Results of the surveys:**
 - Bats were detected during these informal monitoring events.
- **What we propose:**
 - 1 year of acoustic (Anabat) monitoring.

CEQA

Other Project Avian Survey requirements for permitting

- Over the past 5 years, the following list of projects were successfully permitted in California and Nevada utilizing avian survey protocols equal to or less stringent than already conducted on the Rio Mesa Solar Project:
 - Blythe 2
 - Tonopah
 - Palen
 - Imperial Valley
 - Calico
 - Rice
 - Ivanpah



Questions and Answers

Table 1

| Bird Species Observed | | | | | | |
|-----------------------|------------------------------|--|-----------------------|-----------------------------|------------------------------|----------------------------|
| 4-Letter Code | Common Name | Scientific Name | ESA/FWS (FE, FT, BCC) | CESA/CDFG (CE, CT, FP, SSC) | Total # Observed Spring 2011 | Total # Observed Fall 2011 |
| ABTO | Abert's towhee | <i>Melospiza aberti</i> | | | 0 | 2 |
| AMGO | American goldfinch | <i>Carduelis tristis</i> | | | 0 | 3 |
| AMKE | American kestrel | <i>Falco sparverius</i> | | | 2 | 3 |
| ANHU | Anna's hummingbird | <i>Calypte anna</i> | | | 15 | 4 |
| ATFL | Ash-throated flycatcher | <i>Myiarchus cinerascens</i> | | | 304 | 26 |
| AWPE | American white pelican (SSC) | <i>Pelecanus erythrorhynchos</i> | | DFG:SSC | 14 | 0 |
| BARS | Barn swallow | <i>Hirundo rustica</i> | | | 18 | 0 |
| BCGN | Black-capped gnatcatcher | <i>Poliophtila nigriceps</i> | | | 2 | 0 |
| BCHU | Black-chinned hummingbird | <i>Archilochus alexandri</i> | | | 4 | 0 |
| BEWR | Bewick's wren | <i>Thryomanes bewickii</i> | | | 0 | 5 |
| BGGN | Blue-gray gnatcatcher | <i>Poliophtila caerulea</i> | | | 8 | 2 |
| BHCO | Brown-headed cowbird | <i>Molothrus ater</i> | | | 12 | 0 |
| BHGR | Black-headed grosbeak | <i>Pheucticus melanocephalus</i> | | | 2 | 0 |
| BLGR | Blue grosbeak | <i>Guiraca caerulea</i> | | | 1 | 0 |
| BRBL | Brewer's blackbird | <i>Euphagus cyanocephalus</i> | | | 2 | 1 |
| BRSP | Brewer's sparrow | <i>Spizella breweri</i> | USFWS:BCC | | 38 | 0 |
| BTGN | Black-tailed gnatcatcher | <i>Poliophtila melanura</i> | | | 84 | 71 |
| BTSP | Black-throated sparrow | <i>Amphispiza bilineata</i> | | | 9 | 15 |
| BUOR | Bullock's oriole | <i>Icterus bullockii</i> | | | 11 | 0 |
| CACW | Cactus wren | <i>Campylorhynchus brunneicapillus</i> | | | 23 | 7 |
| CHSP | Chipping sparrow | <i>Spizella passerina</i> | | | 6 | 1 |
| CLSW | Cliff swallow | <i>Petrochelidon pyrrhonota</i> | | | 62 | 0 |
| COHA | Cooper's hawk (SSC) | <i>Accipiter cooperii</i> | | DFG:WL | 1 | 0 |
| COHU | Costa's hummingbird | <i>Calypte costae</i> | | | 1 | 0 |
| COPO | Common poorwill | <i>Phalaenoptilus nuttallii</i> | | | 1 | 0 |
| CORA | Common raven | <i>Corvus corax</i> | | | 7 | 6 |
| CRTH | Crissal thrasher (SSC) | <i>Toxostoma crissale</i> | | DFG:SSC | 1 | 0 |
| ECDO | Eurasian collared-dove | <i>Streptopelia decaocto</i> | | | 3 | 0 |
| EUST | European starling | <i>Sturnus vulgaris</i> | | | 2 | 0 |
| FEHA | Ferruginous hawk (SSC) | <i>Buteo regalis</i> | USFWS:BCC | DFG:WL | 0 | 1 |
| GAQU | Gambel's quail | <i>Callipepla gambelii</i> | | | 53 | 39 |
| GHOW | Great horned owl | <i>Bubo virginianus</i> | | | 2 | 0 |
| GIWO | Gila woodpecker (SSC) | <i>Melanerpes uropygialis</i> | USFWS:BCC | CESA: Endangered | 4 | 1 |
| GRRO | Greater roadrunner | <i>Geococcyx californianus</i> | | | 1 | 1 |
| GTGR | Great-tailed grackle | <i>Quiscalus mexicanus</i> | | | 5 | 0 |
| HEWA | Hermit warbler | <i>Centroica occidentalis</i> | | | 1 | 0 |
| HOFI | House finch | <i>Carpodacus mexicanus</i> | | | 36 | 143 |
| HOLA | Horned lark (SSC) | <i>Eremophila alpestris</i> | | DFG:WL | 21 | 114 |
| HOOR | Hooded oriole | <i>Icterus cucullatus</i> | | | 3 | 12 |
| HOSP | House sparrow | <i>Passer domesticus</i> | | | 0 | 9 |
| LASP | Lark sparrow | <i>Chondestes grammacus</i> | | | 1 | 0 |
| LBWO | Ladder-backed woodpecker | <i>Picoides scalaris</i> | | | 14 | 5 |
| LEGO | Lesser goldfinch | <i>Carduelis psaltria</i> | | | 14 | 1 |
| LENI | Lesser nighthawk | <i>Chordeiles acutipennis</i> | | | 18 | 0 |
| LETH | Le Conte's thrasher (SSC) | <i>Toxostoma lecontei</i> | USFWS:BCC | DFG:SSC | 1 | 3 |
| LOSH | Loggerhead shrike (SSC) | <i>Lanius ludovicianus</i> | USFWS:BCC | DFG:SSC | 58 | 16 |
| LUWA | Lucy's warbler (SSC) | <i>Oreothlypis luciae</i> | USFWS:BCC | DFG:SSC | 15 | 2 |

| | | | | | | |
|------|-------------------------------|-----------------------------------|-----------|---|-----|-----|
| MERL | Merlin (SSC) | <i>Falco columbarius</i> | | DFG:WL | 0 | 1 |
| MGWA | MacGillivray's warbler | <i>Oporornis tolmiei</i> | | | 7 | 0 |
| MODO | Mourning dove | <i>Zenaida macroura</i> | | | 483 | 20 |
| NOFL | Northern flicker | <i>Colaptes auratus</i> | | | 0 | 3 |
| NOHA | Northern harrier (SSC) | <i>Circus cyaneus</i> | | DFG:SSC | 1 | 1 |
| NOMO | Northern mockingbird | <i>Mimus polyglottos</i> | | | 8 | 6 |
| NRWS | Northern rough-winged swallow | <i>Stelgidopteryx serripennis</i> | | | 3 | 0 |
| OCWA | Orange-crowned warbler | <i>Vermivora celata</i> | | | 5 | 0 |
| PEFA | Peregrine falcon (SSC) | <i>Falco peregrinus</i> | USFWS:BCC | DFG:FP | 0 | 1 |
| PHAI | Phainopepla | <i>Phainopepla nitens</i> | | | 76 | 86 |
| PRFA | Prairie falcon (SSC) | <i>Falco mexicanus</i> | | DFG:WL | 1 | 6 |
| RCKI | Ruby-crowned kinglet | <i>Regulus calendula</i> | | | 1 | 0 |
| RCSP | Rufous-crowned sparrow | <i>Aimophila ruficeps</i> | | DFG:WL (Southern California rufous-crowned sparrow) | 3 | 0 |
| ROPI | Rock pigeon | <i>Columba livia</i> | | | 0 | 1 |
| ROWR | Rock wren | <i>Salpinctes obsoletus</i> | | | 0 | 12 |
| RTHA | Red-tailed hawk | <i>Buteo jamaicensis</i> | | | 17 | 14 |
| RWBL | Red-winged blackbird | <i>Agelaius phoeniceus</i> | | | 8 | 0 |
| SAGS | Sage sparrow | <i>Amphispiza belli</i> | | | 0 | 40 |
| SAPH | Say's phoebe | <i>Sayornis saya</i> | | | 9 | 46 |
| SAVS | Savannah sparrow | <i>Passerculus sandwichensis</i> | | | 6 | 0 |
| SSHA | Sharp-shinned hawk (SSC) | <i>Accipiter striatus</i> | | DFG:WL | 0 | 1 |
| SWHA | Swainson's hawk (SSC) | <i>Buteo swainsoni</i> | USFWS:BCC | CESA: Threatened | 1 | 0 |
| TOWA | Townsend's warbler | <i>Dendroica townsendi</i> | | | 2 | 0 |
| TRES | Tree swallow | <i>Tachycineta bicolor</i> | | | 660 | 0 |
| TUVU | Turkey vulture | <i>Cathartes aura</i> | | | 34 | 2 |
| VASW | Vaux's swift (SSC) | <i>Chaetura vauxi</i> | | DFG:SSC | 28 | 0 |
| VERD | Verdin | <i>Auriparus flaviceps</i> | | | 247 | 83 |
| WAVI | Warbling vireo | <i>Vireo gilvus</i> | | | 4 | 0 |
| WCSP | White-crowned sparrow | <i>Zonotrichia leucophrys</i> | | | 22 | 11 |
| WEBL | Western bluebird | <i>Sialia mexicana</i> | | | 0 | 9 |
| WEKI | Western kingbird | <i>Tyrannus verticalis</i> | | | 38 | 1 |
| WEME | Western meadowlark | <i>Sturnella neglecta</i> | | | 0 | 2 |
| WIWA | Wilson's warbler | <i>Wilsonia pusilla</i> | | | 19 | 0 |
| WTSW | White-throated swift | <i>Aeronautes saxatalis</i> | | | 8 | 0 |
| WWDO | White-winged dove | <i>Zenaida asiatica</i> | | | 33 | 0 |
| YRWA | Yellow-rumped warbler | <i>Dendroica coronata</i> | | | 20 | 184 |

Table 2

| Bird Species Observed Fall 2011 | | | | | |
|---------------------------------|---------------------------|--|-----------------------|-----------------------------|------------------|
| 4-Letter Code | Common Name | Scientific Name | ESA/FWS (FE, FT, BCC) | CESA/CDFG (CE, CT, FP, SSC) | Total # Observed |
| ABTO | Abert's towhee | <i>Melospiza aberti</i> | | | 2 |
| AMGO | American goldfinch | <i>Carduelis tristis</i> | | | 3 |
| AMKE | American kestrel | <i>Falco sparverius</i> | | | 3 |
| ANHU | Anna's hummingbird | <i>Calypte anna</i> | | | 4 |
| ATFL | Ash-throated flycatcher | <i>Myiarchus cinerascens</i> | | | 26 |
| BEWR | Bewick's wren | <i>Thryomanes bewickii</i> | | | 5 |
| BGGN | Blue-gray gnatcatcher | <i>Poliophtila caerulea</i> | | | 2 |
| BRBL | Brewer's blackbird | <i>Euphagus cyanocephalus</i> | | | 1 |
| BTGN | Black-tailed gnatcatcher | <i>Poliophtila melanura</i> | | | 71 |
| BTSP | Black-throated sparrow | <i>Amphispiza bilineata</i> | | | 15 |
| CACW | Cactus wren | <i>Campylorhynchus brunneicapillus</i> | | | 7 |
| CHSP | Chipping sparrow | <i>Spizella passerina</i> | | | 1 |
| CORA | Common raven | <i>Corvus corax</i> | | | 6 |
| FEHA | Ferruginous hawk (SSC) | <i>Buteo regalis</i> | USFWS:BCC | DFG:WL | 1 |
| GAQU | Gambel's quail | <i>Callipepla gambelii</i> | | | 39 |
| GIWO | Gila woodpecker (SSC) | <i>Melanerpes uropygialis</i> | USFWS:BCC | CESA: Endangered | 1 |
| GRRO | Greater roadrunner | <i>Geococcyx californianus</i> | | | 1 |
| HOFI | House finch | <i>Carpodacus mexicanus</i> | | | 143 |
| HOLA | Horned lark (SSC) | <i>Eremophila alpestris</i> | | DFG:WL | 114 |
| HOOR | Hooded oriole | <i>Icterus cucullatus</i> | | | 12 |
| HOSP | House sparrow | <i>Passer domesticus</i> | | | 9 |
| LBWO | Ladder-backed woodpecker | <i>Picoides scalaris</i> | | | 5 |
| LEGO | Lesser goldfinch | <i>Carduelis psaltria</i> | | | 1 |
| LETH | Le Conte's thrasher (SSC) | <i>Toxostoma lecontei</i> | USFWS:BCC | DFG:SSC | 3 |
| LOSH | Loggerhead shrike (SSC) | <i>Lanius ludovicianus</i> | USFWS:BCC | DFG:SSC | 16 |
| LUWA | Lucy's warbler (SSC) | <i>Oreothlypis luciae</i> | USFWS:BCC | DFG:SSC | 2 |
| MERL | Merlin (SSC) | <i>Falco columbarius</i> | | DFG:WL | 1 |
| MODO | Mourning dove | <i>Zenaidura macroura</i> | | | 20 |
| NOFL | Northern flicker | <i>Colaptes auratus</i> | | | 3 |
| NOHA | Northern harrier (SSC) | <i>Circus cyaneus</i> | | DFG:SSC | 1 |
| NOMO | Northern mockingbird | <i>Mimus polyglottos</i> | | | 6 |
| PEFA | Peregrine falcon (SSC) | <i>Falco peregrinus</i> | USFWS:BCC | DFG:FP | 1 |
| PHAI | Phainopepla | <i>Phainopepla nitens</i> | | | 86 |
| PRFA | Prairie falcon (SSC) | <i>Falco mexicanus</i> | USFWS:BCC | DFG:WL | 6 |
| ROPI | Rock pigeon | <i>Columba livia</i> | | | 1 |
| ROWR | Rock wren | <i>Salpinctes obsoletus</i> | | | 12 |
| RTHA | Red-tailed hawk | <i>Buteo jamaicensis</i> | | | 14 |
| SAGS | Sage sparrow | <i>Amphispiza belli</i> | | | 40 |
| SAPH | Say's phoebe | <i>Sayornis saya</i> | | | 46 |
| SSHA | Sharp-shinned hawk (SSC) | <i>Accipiter striatus</i> | | DFG:WL | 1 |
| TUVU | Turkey vulture | <i>Cathartes aura</i> | | | 2 |
| VERD | Verdin | <i>Auriparus flaviceps</i> | | | 83 |

| | | | | | |
|------|-----------------------|-------------------------------|--|--|-----|
| WCSP | White-crowned sparrow | <i>Zonotrichia leucophrys</i> | | | 11 |
| WEBL | Western bluebird | <i>Sialia mexicana</i> | | | 9 |
| WEKI | Western kingbird | <i>Tyrannus verticalis</i> | | | 1 |
| WEME | Western meadowlark | <i>Sturnella neglecta</i> | | | 2 |
| YRWA | Yellow-rumped warbler | <i>Dendroica coronata</i> | | | 184 |