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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

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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

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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

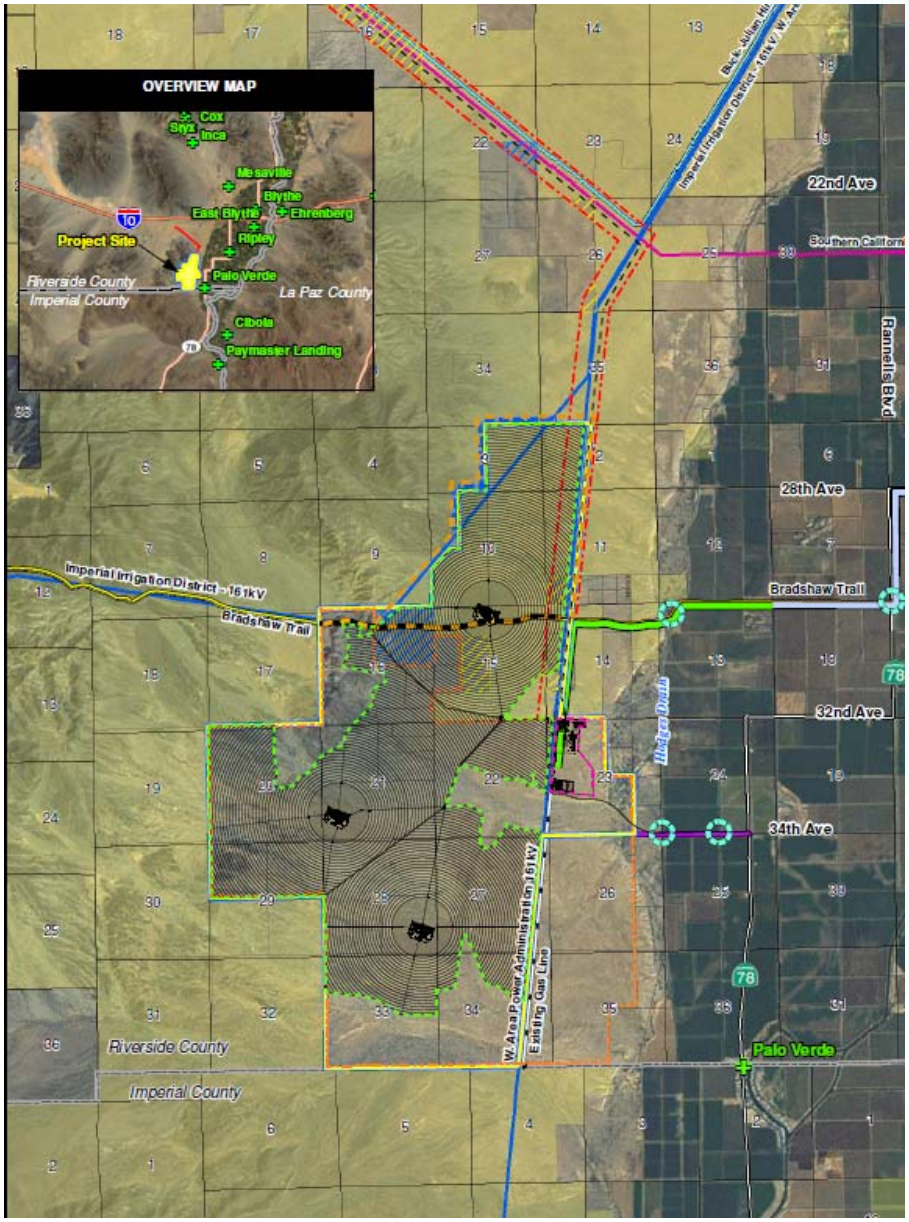
    Total Land to be Developed – 5750 acres

    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



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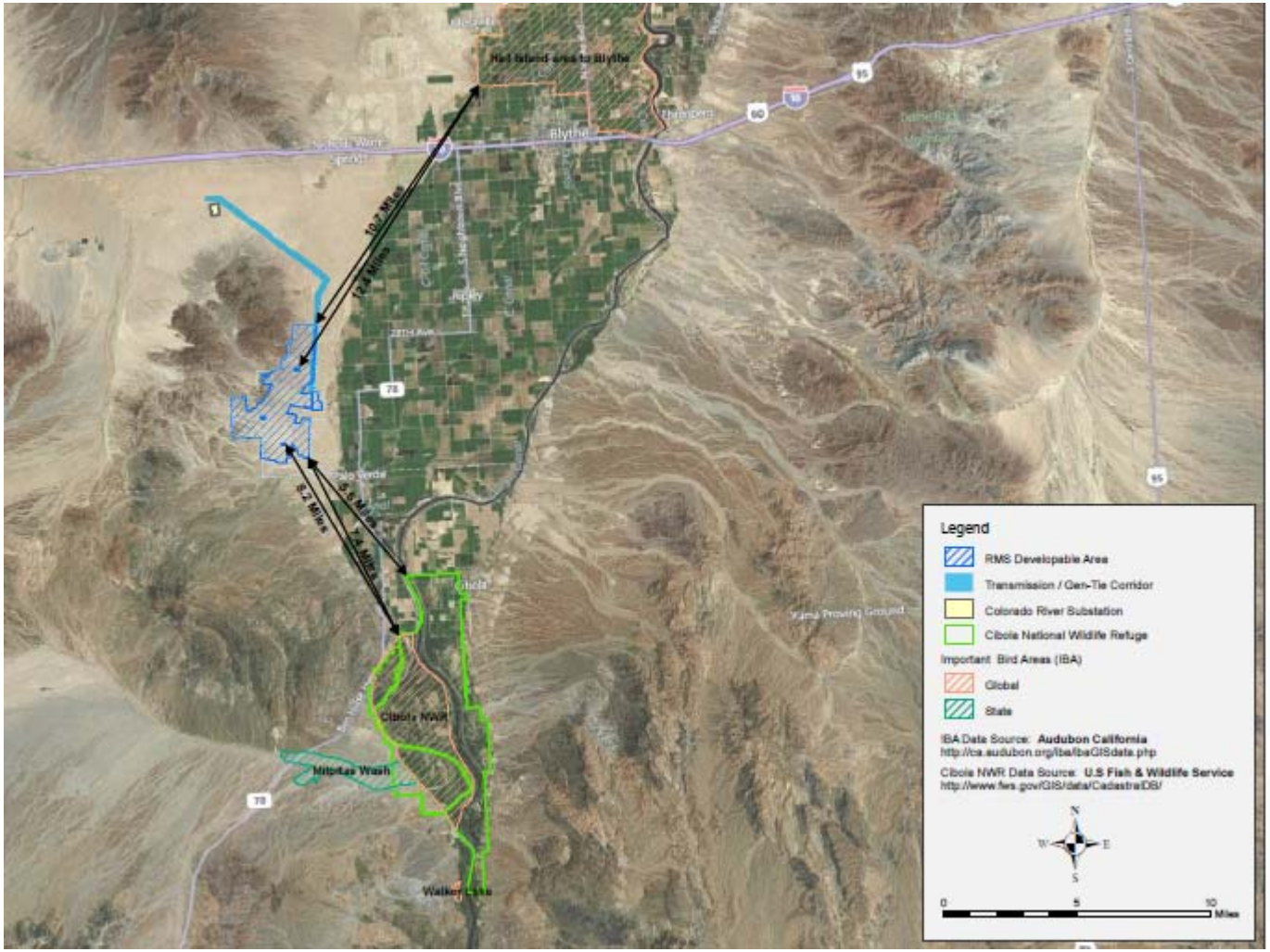
PROJECT SETTING

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

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Rio Mesa Solar – Landscape

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Rio Mesa Solar – Landscape

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Rio Mesa Solar – Landscape

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Rio Mesa Solar – Landscape

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Cibola NWR – Wetlands Landscape

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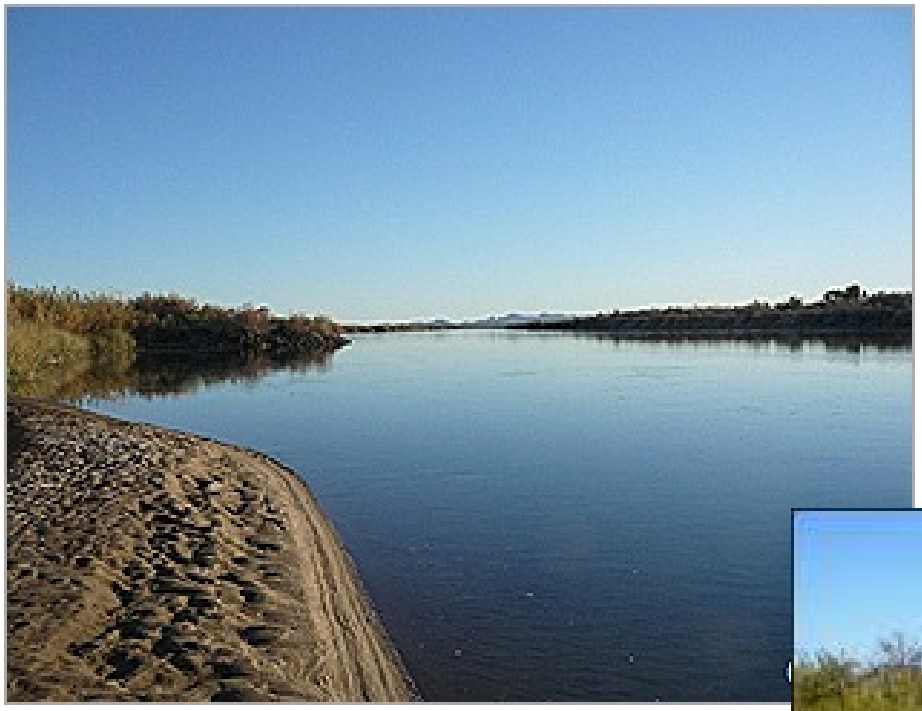
Cibola NWR – Wetlands Landscape



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Cibola NWR – Agricultural Landscape

Cibola NWR – Agricultural Landscape

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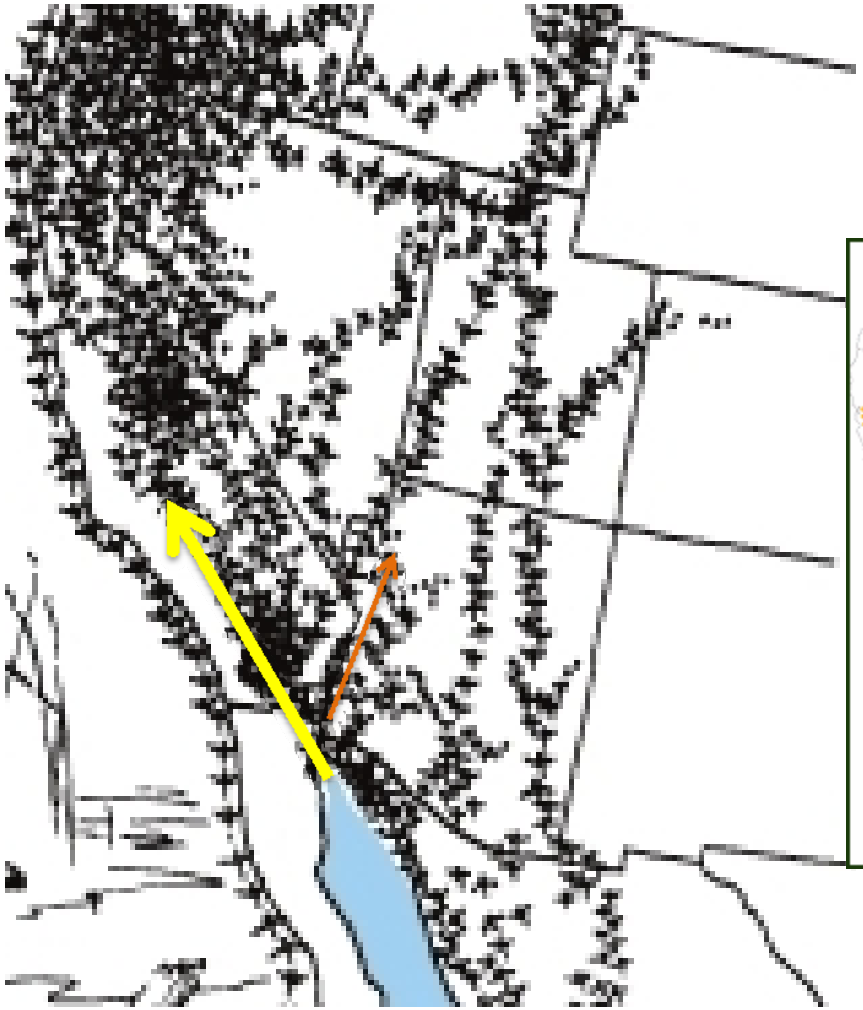
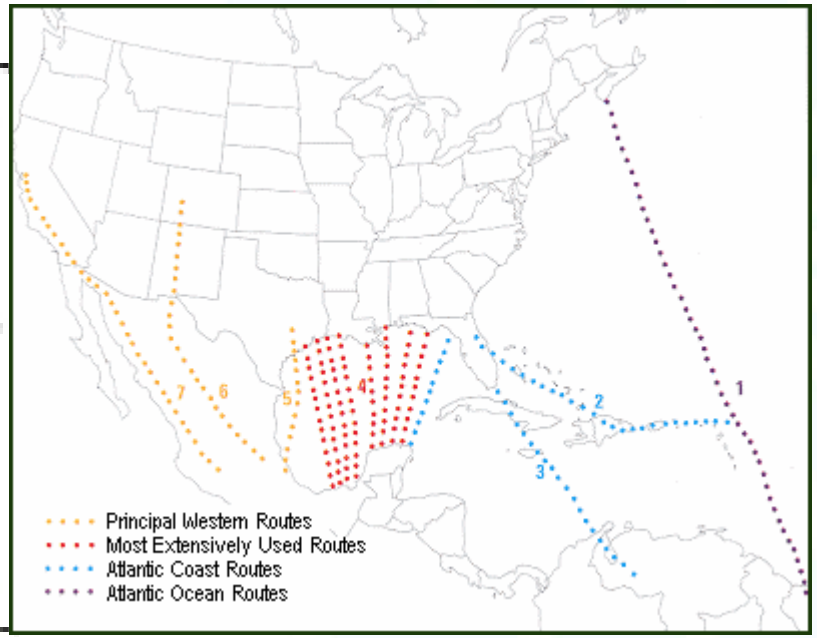
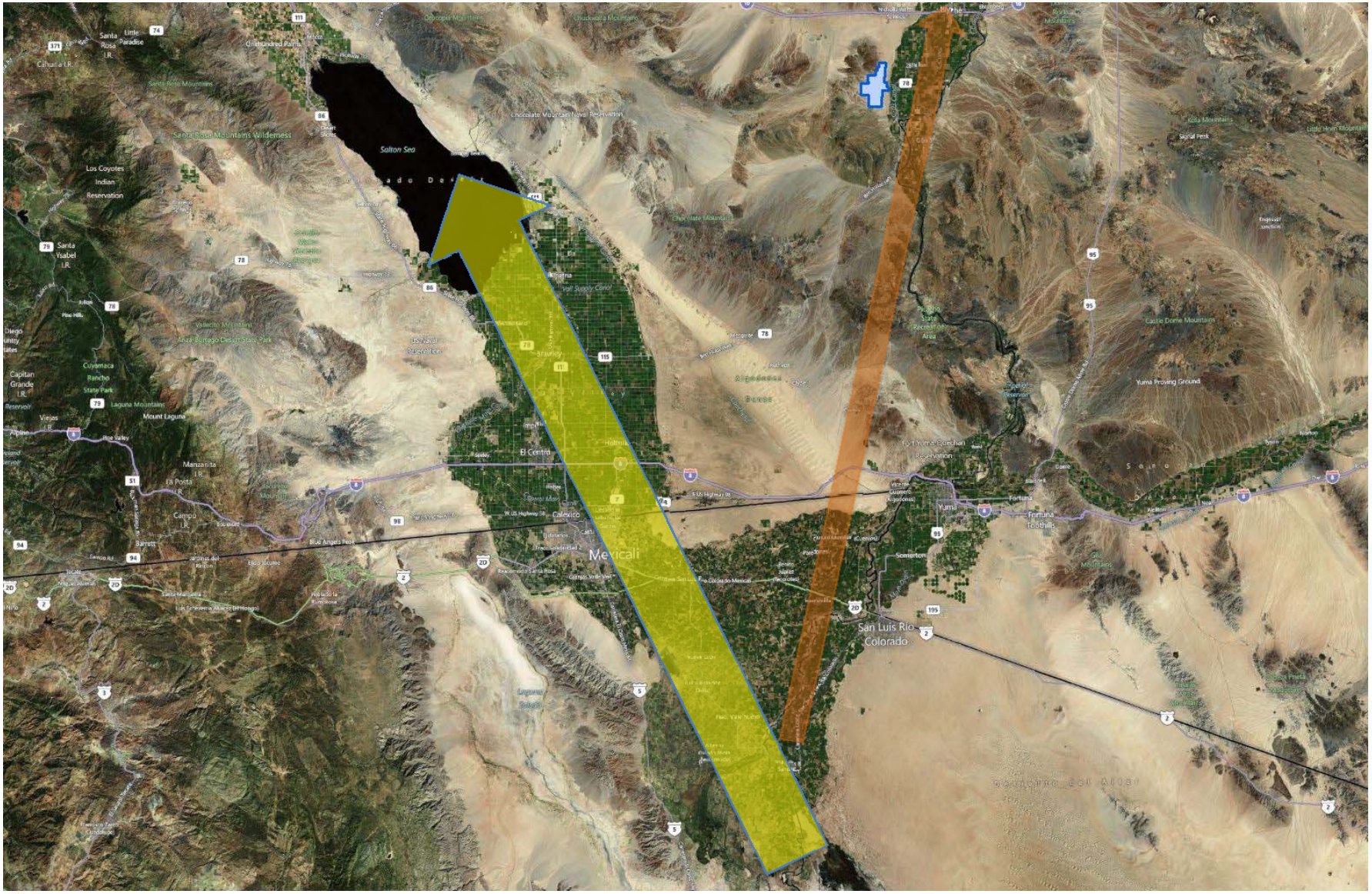
Rio Mesa Solar – USFWS and USGS Pacific Flyway Maps



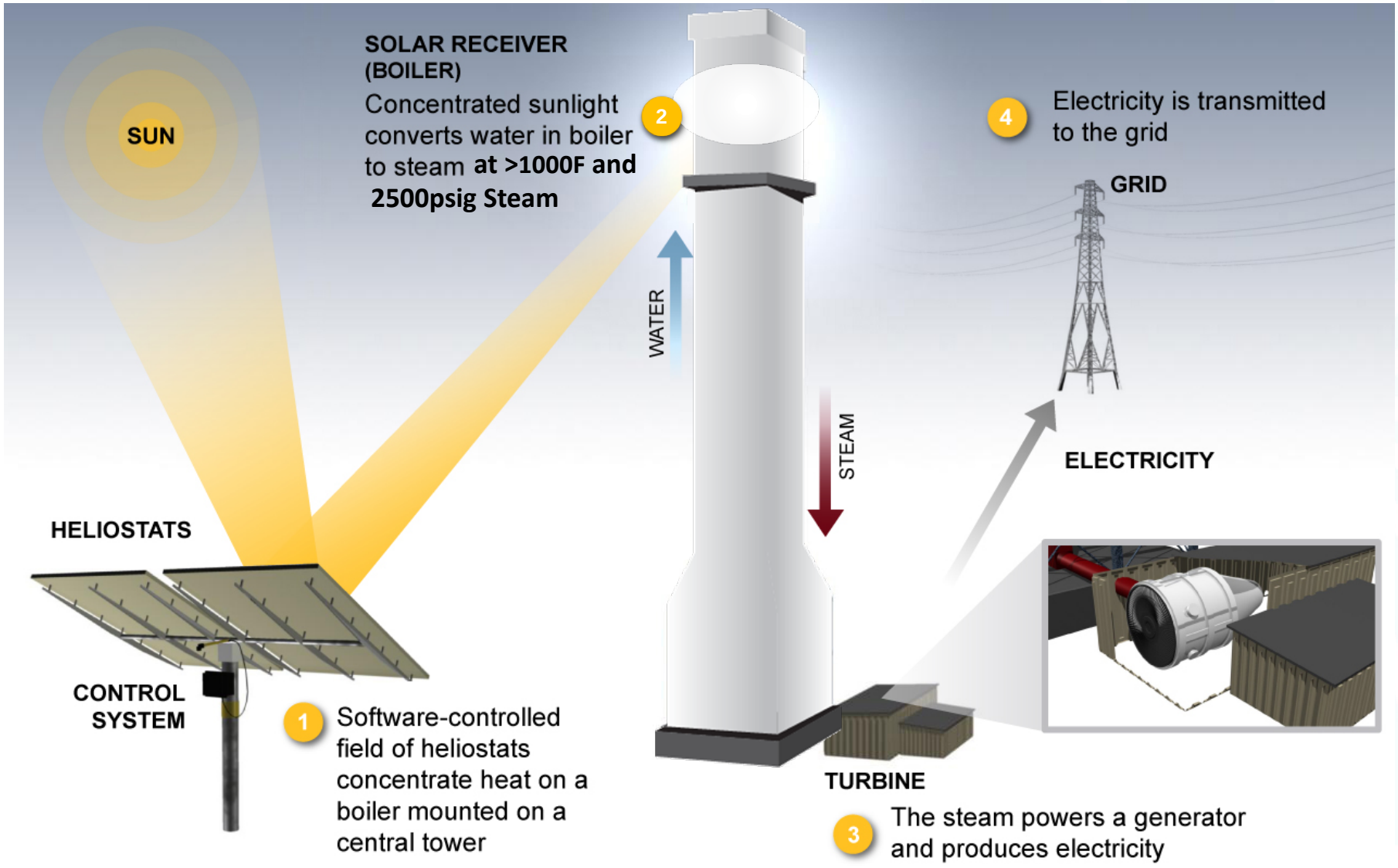


Southern CA/Mexico – Pacific Flyway Satellite View



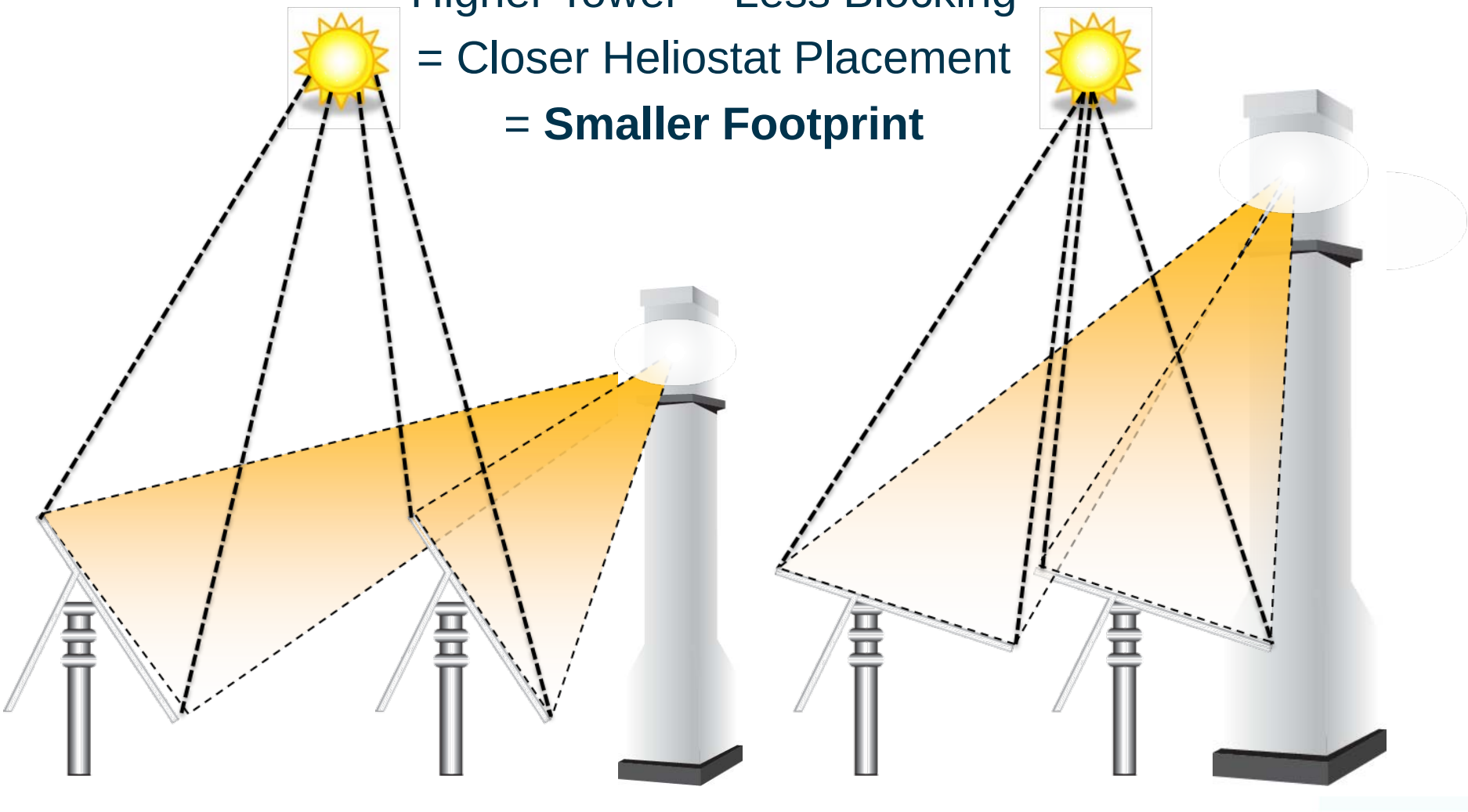
PROJECT TECHNOLOGY

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)

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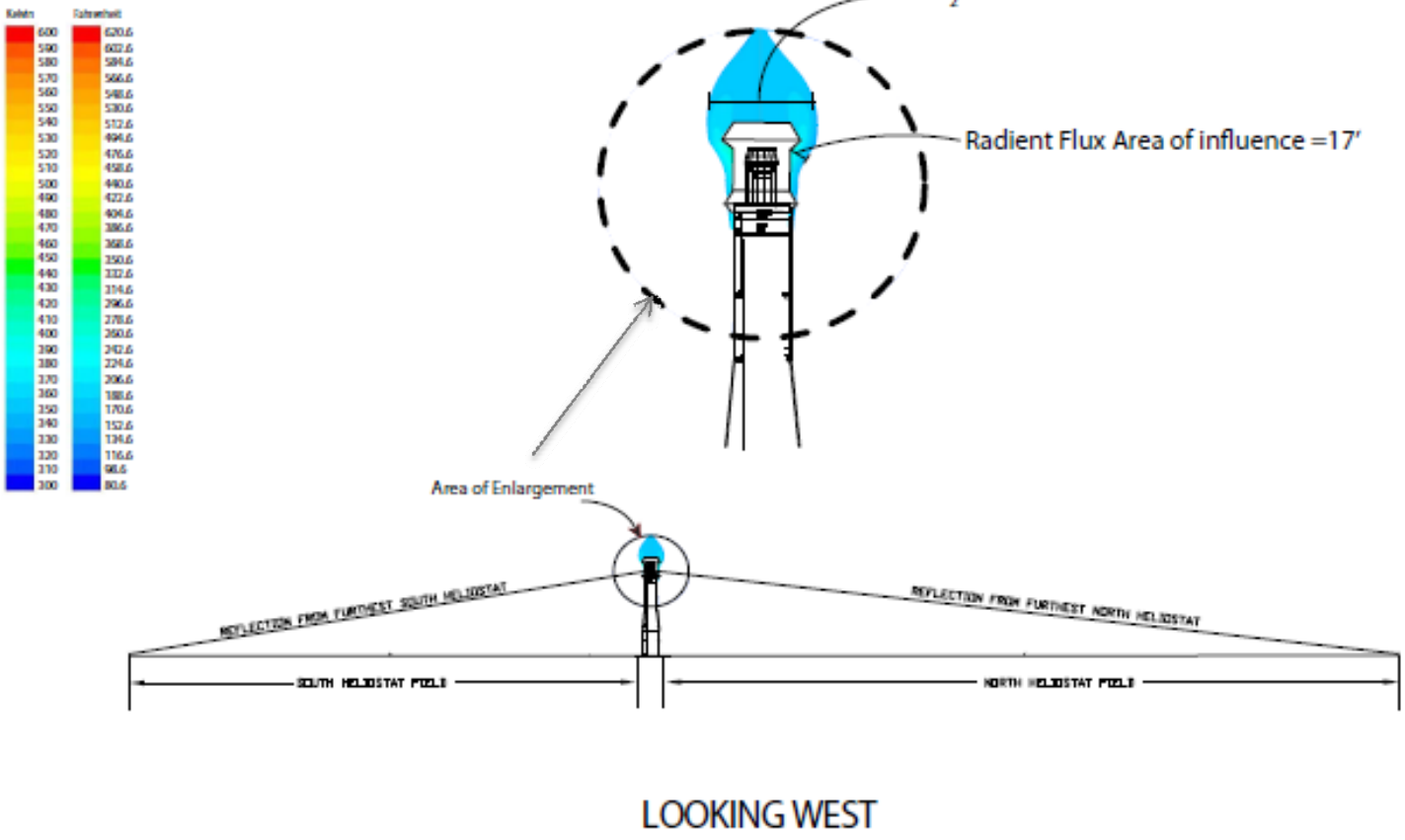
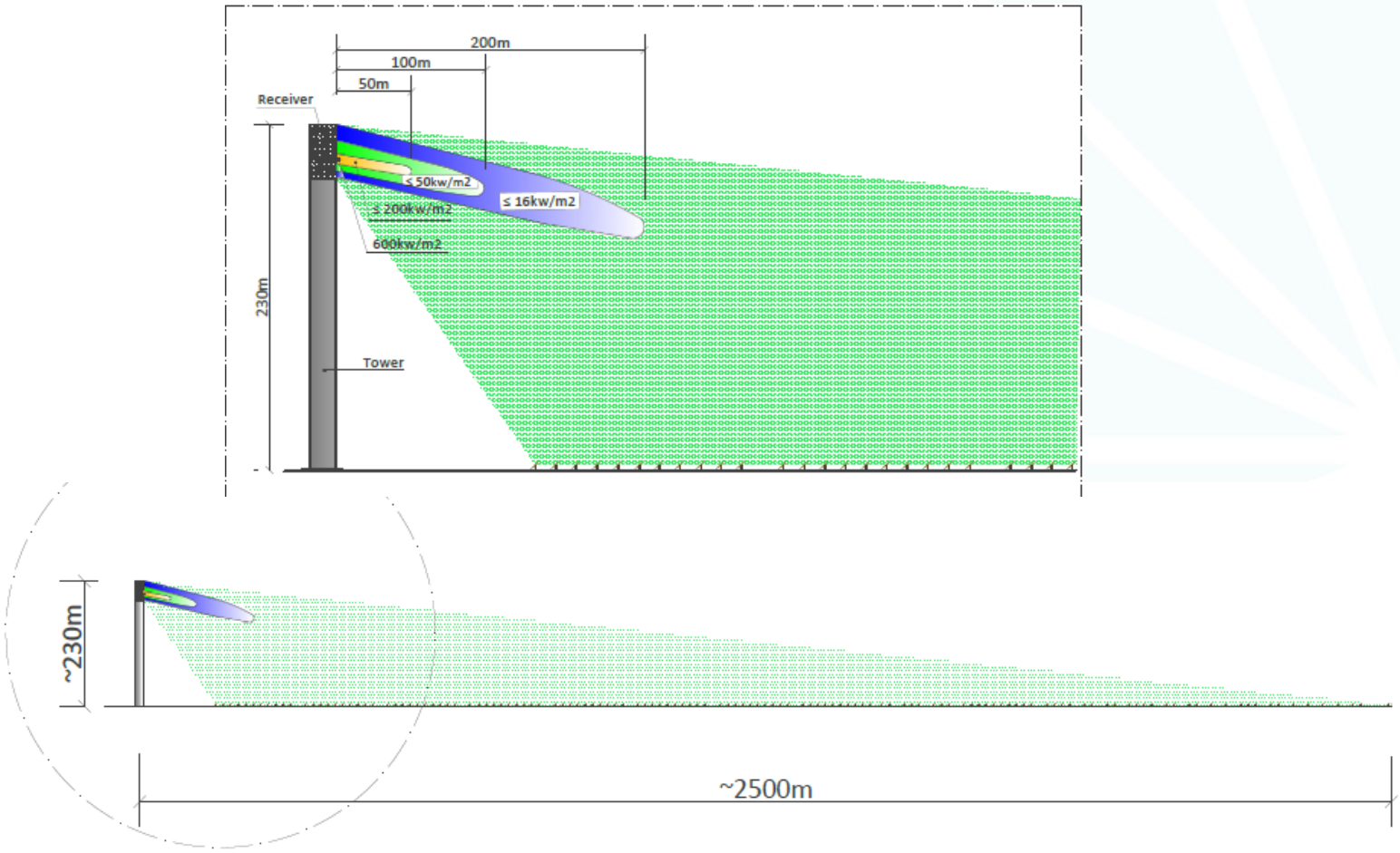
Rio Mesa Solar – Radiant Energy Flux at SRSG



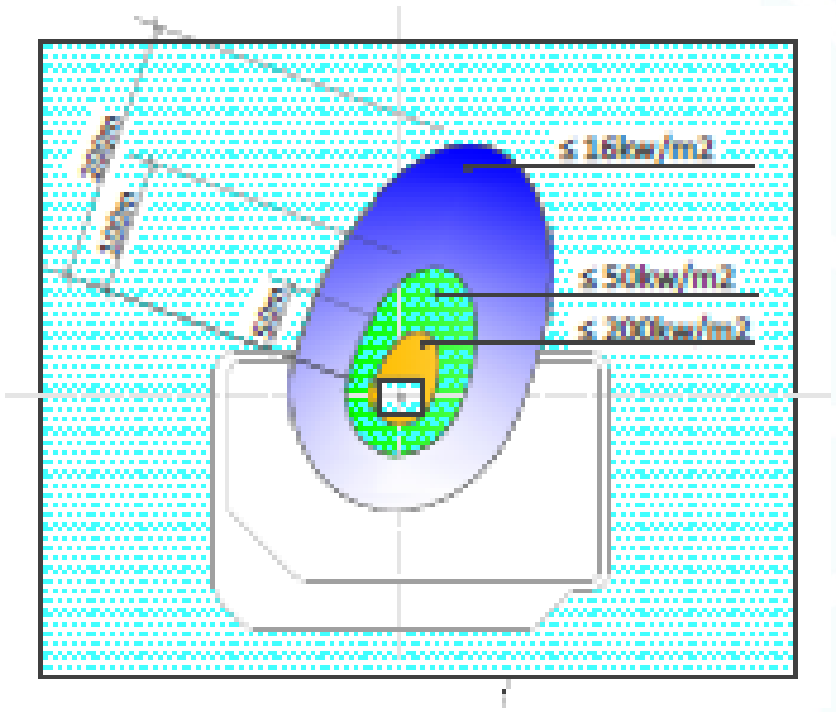
Rio Mesa Solar – Reflected Solar Flux Map (Profile View)



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.

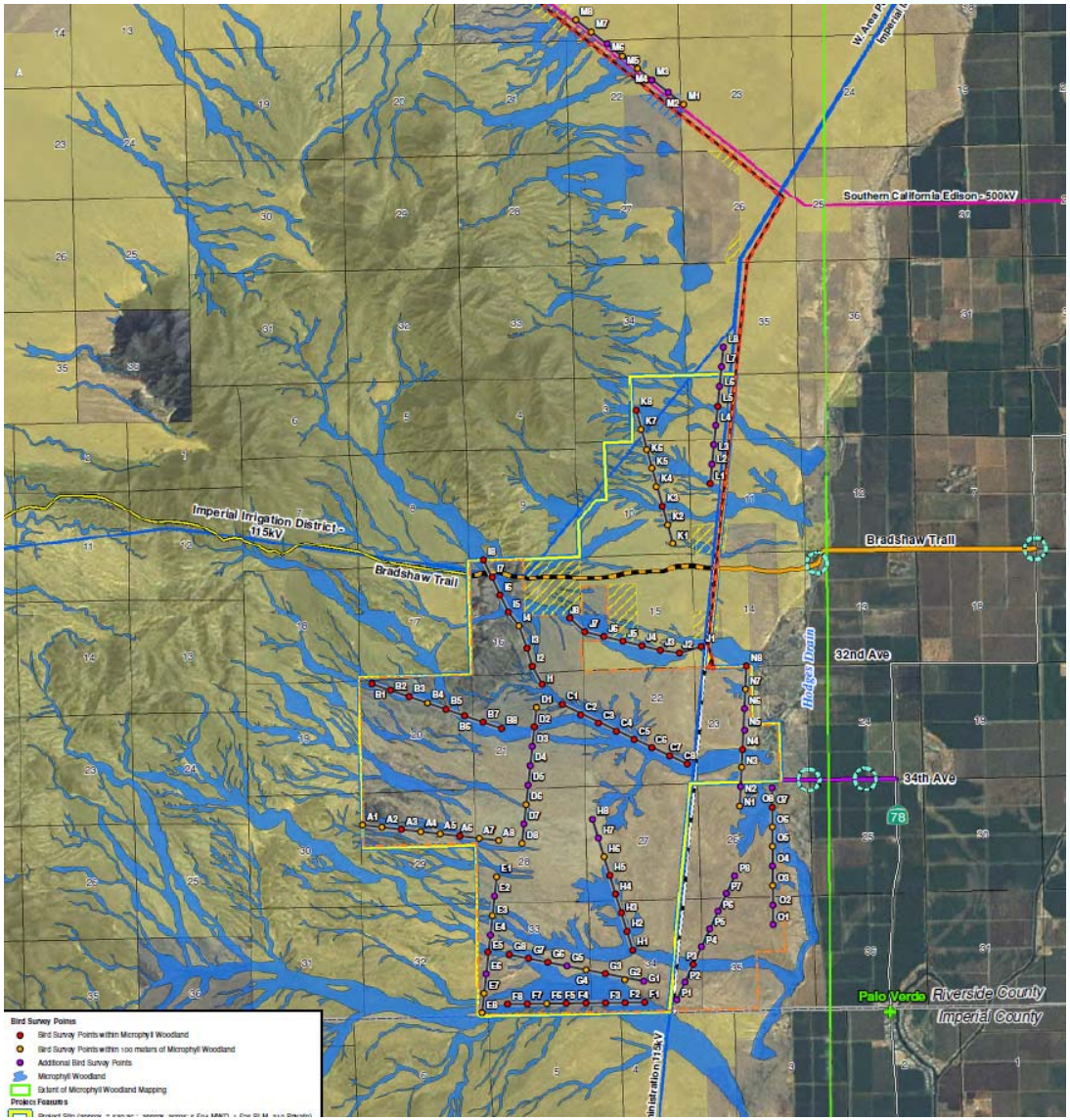
- **Results of the surveys:**
  - 2 incidental owl sightings during other surveys
  - 17 burrows with signs of owls were found, however no physical owls were noticed.

- **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.

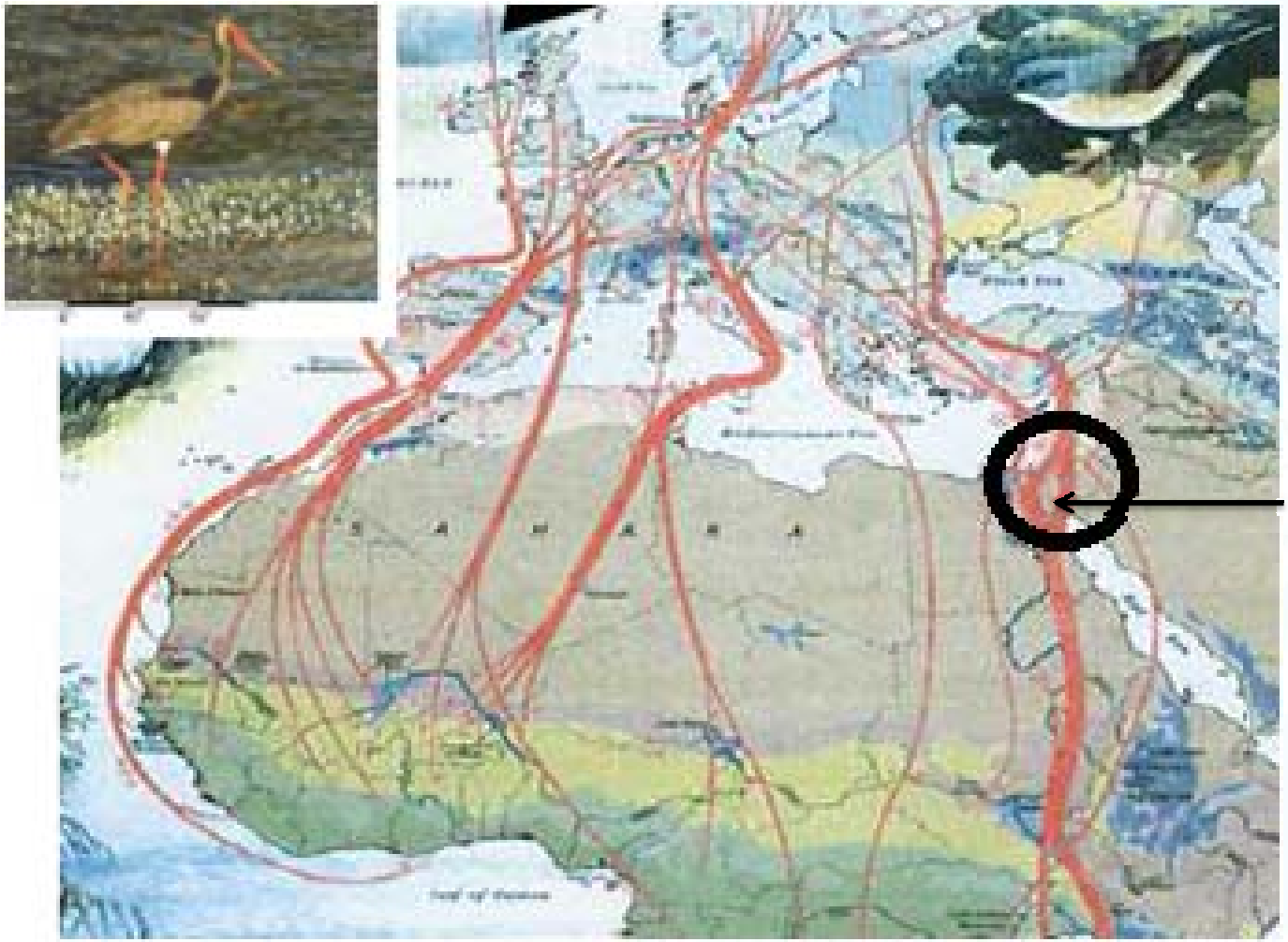
Rio Mesa Solar – Surveys for Migratory Birds

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

MERL	Merlin (SSC)	*Falco columbarius*		DFG:WL	0	1
MGWA	MacGillivray's warbler	*Oporornis tolmiei*			7	0
MODO	Mourning dove	*Zenaida macroura*			483	20
NOFL	Northern flicker	*Colaptes auratus*			0	3
NOHA	Northern harrier (SSC)	*Circus cyaneus*		DFG:SSC	1	1
NOMO	Northern mockingbird	*Mimus polyglottos*			8	6
NRWS	Northern rough-winged swallow	*Stelgidopteryx serripennis*			3	0
OCWA	Orange-crowned warbler	*Vermivora celata*			5	0
PEFA	Peregrine falcon (SSC)	*Falco peregrinus*	USFWS:BCC	DFG:FP	0	1
PHAI	Phainopepla	*Phainopepla nitens*			76	86
PRFA	Prairie falcon (SSC)	*Falco mexicanus*		DFG:WL	1	6
RCKI	Ruby-crowned kinglet	*Regulus calendula*			1	0
RCSP	Rufous-crowned sparrow	*Aimophyla ruficeps*		DFG:WL (Southern California rufous-crowned sparrow)	3	0
ROPI	Rock pigeon	*Columba livia*			0	1
ROWR	Rock wren	*Salpinctes obsoletus*			0	12
RTHA	Red-tailed hawk	*Buteo jamaicenis*			17	14
RWBL	Red-winged blackbird	*Agelaius phoeniceus*			8	0
SAGS	Sage sparrow	*Amphispiza belli*			0	40
SAPH	Say's phoebe	*Sayornis saya*			9	46
SAVS	Savannah sparrow	*Passerculus sandwichensis*			6	0
SSHA	Sharp-shinned hawk (SSC)	*Accipiter striatus*		DFG:WL	0	1
SWHA	Swainson's hawk (SSC)	*Buteo swainsoni*	USFWS:BCC	CESA: Threatened	1	0
TOWA	Townsend's warbler	*Dendroica townsendi*			2	0
TRES	Tree swallow	*Tachycineta bicolor*			660	0
TUVU	Turkey vulture	*Cathartes aura*			34	2
VASW	Vaux's swift (SSC)	*Chaetura vauxi*		DFG:SSC	28	0
VERD	Verdin	*Auriparus flaviceps*			247	83
WAVI	Warbling vireo	*Vireo gilvus*			4	0
WCSP	White-crowned sparrow	*Zonotrichia leucophrys*			22	11
WEBL	Western bluebird	*Sialia mexicana*			0	9
WEKI	Western kingbird	*Tyrannus verticalis*			38	1
WEME	Western meadowlark	*Sturnella neglecta*			0	2
WIWA	Wilson's warbler	*Wilsonia pusilla*			19	0
WTSW	White-throated swift	*Aeronautes saxatalis*			8	0
WWDO	White-winged dove	*Zenaida asiatica*			33	0
YRWA	Yellow-rumped warbler	*Dendroica coronata*			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	*Melozone aberti*			2
AMGO	American goldfinch	*Carduelis tristis*			3
AMKE	American kestrel	*Falco sparverius*			3
ANHU	Anna's hummingbird	*Calypte anna*			4
ATFL	Ash-throated flycatcher	*Myiarchus cinerascens*			26
BEWR	Bewick's wren	*Thryomanes bewickii*			5
BGGN	Blue-gray gnatcatcher	*Polioptila caerulea*			2
BRBL	Brewer's blackbird	*Euphagus cyanocephalus*			1
BTGN	Black-tailed gnatcatcher	*Polioptila melanura*			71
BTSP	Black-throated sparrow	*Amphispiza bilineata*			15
CACW	Cactus wren	*Campylorhynchus brunneicapillus*			7
CHSP	Chipping sparrow	*Spizella passerina*			1
CORA	Common raven	*Corvus corax*			6
FEHA	Ferruginous hawk (SSC)	*Buteo regalis*	USFWS:BCC	DFG:WL	1
GAQU	Gambel's quail	*Callipepla gambelii*			39
GIWO	Gila woodpecker (SSC)	*Melanerpes uropygialis*	USFWS:BCC	CESA: Endangered	1
GRRO	Greater roadrunner	*Geococcyx californianus*			1
HOFI	House finch	*Carpodacus mexicanus*			143
HOLA	Horned lark (SSC)	*Eremophila alpestris*		DFG:WL	114
HOOR	Hooded oriole	*Icterus cucullatus*			12
HOSP	House sparrow	*Passer domesticus*			9
LBWO	Ladder-backed woodpecker	*Picoides scalaris*			5
LEGO	Lesser goldfinch	*Carduelis psaltria*			1
LETH	Le Conte's thrasher (SSC)	*Toxostoma lecontei*	USFWS:BCC	DFG:SSC	3
LOSH	Loggerhead shrike (SSC)	*Lanius ludovicianus*	USFWS:BCC	DFG:SSC	16
LUWA	Lucy's warbler (SSC)	*Oreothlypis luciae*	USFWS:BCC	DFG:SSC	2
MERL	Merlin (SSC)	*Falco columbarius*		DFG:WL	1
MODO	Mourning dove	*Zenaida macroura*			20
NOFL	Northern flicker	*Colaptes auratus*			3
NOHA	Northern harrier (SSC)	*Circus cyaneus*		DFG:SSC	1
NOMO	Northern mockingbird	*Mimus polyglottos*			6
PEFA	Peregrine falcon (SSC)	*Falco peregrinus*	USFWS:BCC	DFG:FP	1
PHAI	Phainopepla	*Phainopepla nitens*			86
PRFA	Prairie falcon (SSC)	*Falco mexicanus*	USFWS:BCC	DFG:WL	6
ROPI	Rock pigeon	*Columba livia*			1
ROWR	Rock wren	*Salpinctes obsoletus*			12
RTHA	Red-tailed hawk	*Buteo jamaicenis*			14
SAGS	Sage sparrow	*Amphispiza belli*			40
SAPH	Say's phoebe	*Sayornis saya*			46
SSHA	Sharp-shinned hawk (SSC)	*Accipiter striatus*		DFG:WL	1
TUVU	Turkey vulture	*Cathartes aura*			2
VERD	Verdin	*Auriparus flaviceps*			83

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