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**Ivanpah Solar Electric Generating System (Ivanpah)
Avian & Bat Technical Advisory Committee (TAC) Meeting**
September 15, 2016 – Meeting Notes

TAC Meeting on September 15, 2016 at the California Energy Commission

Attendees: Michael Lewis – TAC Co-chair – CEC
Amedee Brickey – TAC Member – USFWS
Magdalena Rodriguez - TAC Member – CDFW
Joe Douglas – CEC
Christina Root – CEC
Eric Knight – CEC
Doug Davis – Solar Partners I, II and VIII, LLC
Daniel Riser-Espinoza – WEST, Inc.
Karl Kosciuch – WEST, Inc.
Marc Sydnor – Sydnor and Associates, Inc.

Via Webex: Michael Ahrens – TAC Co-chair – BLM
George Piantka – TAC Member - Solar Partners I, II and VIII, LLC
Katherine Maikis - BLM NFO Biologist

Introductions

- Attendee introductions (TAC members and invited guests)

Review of Agenda

- Agenda items reviewed. No additions.

Review of July 5, 2016 Meeting Notes and Follow-up Actions

- TAC decided to defer review of the July 5, 2016 meeting notes until new CEC TAC member has reviewed notes in conjunction with the 2015 – 2016 Winter Report.
- TAC will review the notes from July 5th and Winter Report prior to docketing.

Review of 2016 Spring Report Presentation by WEST:

- WEST presented a review of the Spring 2016 Report
 - Mean carcass persistence time (small birds) was greater than the survey interval of one week (large bird persistence time testing discontinued per Revision 13 of the Avian and Bat Monitoring and Management Plan (Plan)).
 - Overall searcher efficiency exceeded plan assumptions.
 - The pattern of detections was influenced by unplanned forced outages at the facility, potentially decreasing mortality.
 - Overall, per Plan, mortality levels are consistent with the low category.

TAC Discussion:

- TAC discussed whether the two deterrence technologies (chemosensory and acoustic) are deployed at all units. NRG representatives confirmed the deterrents are deployed and operating at all units.
- TAC discussed discontinuance of the large bird carcass trials. WEST explained that the TAC had approved discontinuing such trials because large bird carcasses were consistently persisting at least 6 weeks.
- TAC discussed whether WEST uses the same personnel for searchers. WEST explained that the program uses a core staff of personnel that is supplemented each spring/fall. Core staff has been maintained and supplemental staff has been fairly consistent.
- TAC discussed whether there are any estimates of the populations of bats in the area. WEST indicated that there are none to their knowledge and that bat populations are typically difficult to determine. No special status bats have been detected.
- TAC discussed what constitutes an incidentally discovered carcass. WEST explained that an incidental detection is a carcass that is not found through a systematic survey, but by project staff or others, or one found outside the formal search areas.
- TAC discussed whether the unknown bird fatalities are attributable to the project. WEST explained that the determination of unknown cause of death is based on the lack of evidence of singeing or of collision. Furthermore, natural background fatalities are assumed to occur and the potential for scavengers to create multiple feather spots from one carcass exists. Multiple feather spots could cause double counting and artificially inflate the estimates.
- TAC discussed carcasses with “other” as the designated cause (those not attributed as collision, singed, or unknown). WEST explained that detections with “other” as cause in the Spring Report were those entrapped in buildings or structures and provided as part of the estimates of project-related cause.
- TAC discussed who developed the statistical model used to estimate fatalities. WEST explained that Manuela Huso of the USGS developed the model used.
- TAC discussed the unplanned forced outages. WEST explained that the unplanned forced outages extended past the end of the seasonal report and those additional dates will be addressed in the next seasonal report. Solar Partners explained that Unit 1 was out for a transmission line repair, Unit 2 was a generator outage and Unit 3 was associated with the fire that was reported.
- TAC discussed the determination of low impacts as per the Plan. WEST explained that effects to individual species are low - the determination reflects an evaluation per individual species estimates.
- TAC discussed how the unplanned forced outages will affect the comparability of the spring estimates to previous years. WEST explained that the results in the report reflect the operation of the facility at the time; however, WEST will consider if alternative

analysis methods exist to account for the outage when making comparisons of seasonal estimates.

- TAC discussed the disposition of peregrine falcon injury detected at the facility. Solar Partners stated that the bird expired from injuries and the reporting has been updated to reflect the disposition.

Follow-up Items:

- WEST to correct Spring Report to:
 - Fix a minor typographical error for the confidence interval for singed class estimates as reported in the table in the Spring Report.
 - revise the periods of the outages to end with the current season; reporting of outage dates past this season will be reflected in the next seasonal report.
- WEST to examine the potential to determine a means to adjust for unplanned forced outages to allow comparison across seasons and years.

Presentation of the Summer Monitoring Efforts

- WEST presented Summer 2016 monitoring efforts.
 - Carcass removal times were consistent with the previous summer seasons
 - Searcher efficiency rates exceeded plan assumptions
 - Patterns and magnitude of detections were consistent with previous summer seasons.

TAC Discussion:

- TAC discussed the types of carcasses used for trials. WEST stated that non-native house sparrows and quail are used.
- TAC discussed how the feather spots are defined and the search methods for feather spots. WEST explained that feather spots are individual feathers, or a clump of feathers, from the same species found within a 20-meter area that may indicate a fatality.
- TAC discussed how searcher efficiency trials are typically conducted. WEST explained that the trial carcasses and feather spots are typically placed the night before a standard search by the designated biologist and the surveys are conducted by WEST staff the next day.
- TAC discussed the elevated searcher efficiency for feather spots relative to small birds. WEST explained that searchers may perceive feather spots more easily, since they typically move in the wind and/or occupy a greater area against the landscape.
- TAC discussed the days of the unplanned forced outages in summer. Solar Partners indicated that these outages extended from the end of the spring survey season through June 19th for Unit 2, and June 7th for Unit 3.

Follow-up Items:

- WEST to detail the dates of the unplanned forced outages in the Summer Report.

Discussion of Year 4 Monitoring:

- WEST presents data for consideration for the Year 4 monitoring plan and recommendations:
 - Year 3 monitoring modifications are reflected in the Plan Revision 13 and relied on analysis of the Year 1 and 2 data.
 - All monitoring (Years 1-3) has required examination of the tower area and heliostat area; however, single effects are unique and collision effects are not.
 - Review of Years 1 and 2 data show that results across the heliostat field are consistent over years/seasons, the vast majority of the detections are unknown cause and few detections from singeing.
 - Species detected in heliostat areas are fairly common birds, known cause is overwhelmingly from collision, and impacts are consistent with the low category.
 - Recommendation is to continue monitoring through December 15th under Revision 13 sampling protocols to allow for a full year of biologically informed seasonal data for annual and seasonal comparisons.
 - Recommendation is to then retain the tower area monitoring and sampling protocol as per Revision 13 for Year 4 and to remove heliostat area monitoring in Year 4.

TAC Discussion:

- TAC discussed how the biologically informed seasons were defined. WEST explained that the definition of the seasons in the original Plan (Revision 12) was initially an informed approximation; the biologically informed season dates were then developed for comparison purposes using the detections and species of migrants versus residents that are indicative of the migration patterns.
- TAC discussed comparison of the collision fatality levels to solar trough or photovoltaic. WEST stated that the data for the comparison is lacking and they have not examined that issue.
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- TAC discussed the recommendation for extending Revision 13 sampling protocols until the end of the biologically informed seasons. WEST stated that the proposal is to obtain and analyze the data as per biologically informed seasons to allow three years of comparative estimates by extending year three to December 15th.
- TAC discussed where the singeing effects occur versus where the deterrence is thought to be effective. Solar Partners indicated that deterrence is designed to affect a localized area around the tower; however, the contractors for the deterrence systems are currently exploring upgrades to expand the area of the deterrence effect.
- TAC discussed the upgrading of deterrence systems. Solar Partners stated that the proposed improvements are intended to provide greater amplitude of the sonic deterrence and to extend the area of influence to a larger area. In addition, the deterrence sounds will be modified to increase the number of species deterred from the area.
- TAC discussed the Sandia National Laboratory study that is intended to provide advanced heliostat deployment algorithms to decrease flux concentrations and avian mortality. Solar Partners stated that the study is likely to produce some results by next summer.

- TAC discussed the potential to determine the deterrence effects in year to year or season to season comparison of the data or estimates. WEST explained that the deterrence effect is difficult to determine since the number of birds moving through the valley may vary and this variance may be larger than the deterrence effects.
- TAC discussed the distance from the tower and where flux effected fatalities are found. WEST stated that approximately 98% of singed detections occur in the tower area. The small number detected outside of this area are usually either scavenged and may have been moved, or are injured, ambulatory birds that may have walked outside of the tower area.
- TAC discussed the unknown mortalities that occur in the heliostat fields. WEST stated that high percentages of unknowns are feather spots, and based on a review of the carcass persistence trial camera data, multiple feather spots were created in approximately 30% of trials where the carcass remained in place suggesting that it is possible that some feather spots represent one carcass. However, quantifying the number of feather spots generated from a carcass cannot be quantified from the bias trial data.
- TAC discussed whether unknown fatalities include birds affected by flux. WEST stated they are confident that birds showing evidence of singe are identified accurately in the laboratory at the project. No carcasses that have been reported as unknown have been re-classified as flux affected when examined by the USFWS OLE forensic laboratory.

Follow-up items:

- Solar Partners to obtain an update for the Sandia National Laboratories study for the TAC.
- Agencies will discuss Year 4 monitoring and bring back a recommendation.
- Agencies to have a call on Friday 23rd, 1:00 PM.
- October meeting with TAC to be scheduled.

Additional Topics

None

Next Meeting:

October 12th 10:00 am (to be rescheduled)