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Ivanpah Solar Electric Generating System (Ivanpah)
Avian & Bat Technical Advisory Committee (TAC) Meeting
December 8, 2015 – Meeting Notes

TAC Meeting on December 8, 2015 at California Energy Commission, Sacramento, California

TAC Members Present:	Roger Johnson – TAC Co-chair – CEC George Piantka – TAC Member - Solar Partners Mitch Samuelian – TAC Member – NRG Renew, Operations
Via Teleconference:	Mike Ahrens – TAC Co-Chair – BLM, Needles Field Office Amedee Brickey – TAC Member – USFWS Magdalena Rodriguez - TAC Member – CDFW
Invited Guests:	Doug Davis – NRG Operations Karl Kosciuch – WEST, Inc. Daniel Riser-Espinoza – WEST, Inc. Marc Sydnor – Sydnor and Associates, Inc.

Introductions

- Attendee introductions (TAC members and invited guests)

Review of Agenda

- Agenda item for consideration of a roadrunner best management practice (BMP) added.

Review of September 30th and October 9th 2015 meeting notes and follow-up actions

- Solar Partners submitted an electronic version of the roadrunner BMP.
- WEST completed initial TAC requested revisions to the Spring Report; additional revisions pending per discussion below.
- WEST provided the proposed Avian Plan modification (Revision 13) to the TAC that includes all prior TAC approved changes from Revision 12.
- WEST provided an analysis of the variation across units for species composition and bias trial results.

Revised Persistence and Mortality Estimates in the Spring 2015 Report

- WEST, Inc. presented a review of the fatality estimator, the specific effects of a coding error found in the estimates for the Spring Report and proposed a revised method to estimate carcass persistence.
    - WEST presented how the fatality model is operationalized.
    - WEST indicated that the initial estimates for the Spring Report were subject to a coding error. As a result of the coding error, carcass persistence time was not input at the exact time of removal based on camera data; instead persistence time was input as an interval between the placement of the carcass and the removal time, leading to biased-low estimation of persistence. The error propagated through fatality estimation.
    - WEST proposed a revised method of estimating carcass persistence that would reflect the TAC approval to discontinue large bird trials and separate the large and small bird models. The revised estimation method is based on the data accumulated over two years that shows distinct patterns of removal for large and small birds.

TAC Discussion:

- Discussed the number of carcasses that are monitored by cameras. WEST stated that the ABMMP requires that all carcass trials be conducted using cameras. Scavengers do occasionally move carcasses out of the field of view of the camera; however, approximately 85% of the carcasses have an exact time for scavenging or lasted the entire trial period.
- Discussed whether searcher efficiency and scavenger trials values are developed for different areas of the project. WEST stated that estimates are developed for differing areas (inner HD versus outer solar field) and categories of birds (large/small).
- Discussed whether the searcher efficiency and scavenger trials get adjusted each quarter. WEST stated that the values are adjusted each quarter. Furthermore, the persistence varies mostly by season and searcher efficiency varies by area and type of trial carcass (large, small bird, or feather spot).
- Discussed how the "top model" is selected to provide the carcass persistence and searcher efficiency values. WEST stated that the model selected has the lowest AIC value among models compared. In other words, the selected model provides the most explanatory power of the data compared to all other models.
- Discussed whether the coding error that WEST identified was present in data analysis prior to the Spring Report. WEST indicated that this coding error was not present prior to the Spring 2015 reporting period.
- Discussed the effect of the proposed separate small bird/large bird modeling. Specifically, the TAC requested how implementing the separate small/large bird carcass estimation procedure would affect the overall reliability of estimates in comparison to the previous combined modeling methodology. WEST indicated that the coefficient of variation might increase; however, the accuracy of the estimates would likely be improved. Regardless, the original modeling procedure may be used where small and large bird trials are combined in the future, should the TAC elect to do so.
- Discussed whether the modeling of small and large birds separately was conducted at other sites. WEST indicated that to their knowledge this was a new approach, but supported by (1) the wide divergence between the persistence of large and small bird carcasses, and (2) the large sample sizes for each category.
- Discussed whether the revisions were a quality assurance/quality control (QA/QC) issue. WEST indicated that the issue was a result of inadequate QA/QC for the estimates and has now put in place a QA/QC procedure to check the coding process for all future estimates.
- Discussed areas of the trials in the revised plan (Revision 13). WEST stated that the trials would be covering the areas that are proposed for surveying in that version of the plan. In other words, trials will be conducted in the tower areas of all three units and within the solar field for Unit 2.
- Discussed the number of searchers that will be in the field under Revision 13 of the plan. WEST indicated that the projected staffing is 3 people for winter/summer and 7 for fall/spring.

Follow-up Items:

- WEST to write up the proposal for the modified small/large bird carcass persistence estimation procedures and submit to the TAC for approval.
- TAC to have agency statisticians examine the proposed revised modeling procedure and provide authorization to proceed to use revised model.
- West to revise the Spring Report, pending TAC response to the proposals above.

Avian and Bat Monitoring and Management Plan (Proposed Revision 13)

- The TAC suggested minor revisions to the Avian and Bat Monitoring and Management Plan, proposed Revision 13.

Discussion

- Discussed that the coefficient of variation plot provided in the plan is now based on the site data. The data used for the coefficient of variation is documented in the text and tables within Revision 13.

Follow-up:

- NRG to revise the plan with the revisions recommended by TAC and re-submit.

Summer 2015 Report

- WEST, Inc. presented the Summer 2015 report
    - The summer period was shifted to accommodate the request of the USFWS to survey for days not included in the first year of surveys.
    - WEST indicated that this shift resulted in the summer period extending into the fall migration season and resulted in a report where the dates are not comparable to the previous summer season.
    - WEST recommended aligning the dates for the summer 2015 surveys with the summer 2014 season to provide comparable estimates for the summer seasons.

TAC Discussion:

- Discussed whether the species composition indicated the period deemed as fall contained more migrant species. WEST stated that the summer/fall demarcation is supported by the species composition and by the increasing mortality.
- Discussed whether to bin the historical data from previous surveys to account for seasonality. WEST indicated that a review of the data would need to be conducted to determine the appropriateness of re-binning the data.
- Discussed the effects of providing estimates when there are different survey intervals, for example between the summer and fall seasons. WEST explained that the Huso estimator accounts for each individual carcass by the search interval. Therefore, all estimates will be comparable, since the estimator includes adjustment by interval, by individual carcass.
- Discussed the annual report and requested that a year-on-year comparison be provided along with estimates by season. WEST indicated that the annual report will also have re-estimates as per the previous annual report. Re-estimation is necessary, since additional bias trials being conducted throughout the year are included in the re-estimation; thus, the precision of the seasonal estimates is improved in the annual report.
- Discussed the procedure for the submission and review of the report. The TAC prefers that the annual report be based up the previous year's report and a subsequent meeting be held to obtain the input of the TAC after the submission of the initial draft.

Follow-up:

- WEST will align the summer report dates for 2015 to match the 2014 summer report dates.
- Additional days requested by the USFWS will be shifted into the fall season.
- The annual report submission and review will proceed as discussed.

Fall 2015 Report Preview:

- WEST presented the preliminary avian use, bias trial, and detection data for birds and bats during the Fall 2015 survey season.

TAC Discussion:

- Discussed the carcass persistence trials, and the difference between median, mode and probability for persistence trials. WEST explained that the median and mode are presented in the preliminary data to

give a comparable summary statistic for the season, the probability of finding a carcass is estimated through the modeling procedure and gives us the carcass persistence necessary for the fatality estimates.
- Discussed whether all trials are used in the estimation of carcass persistence. WEST indicated that all trials are used to develop the estimates.
- Discussed the difference between the searcher efficiency and scavenger trials. WEST explained that the placed and available carcasses for searcher efficiency are not monitored by cameras, but instead are placed by the designated biologist prior to the searches conducted in the field.
- Discussed the range of species that roadrunners have scavenged. WEST stated they do not have that data but will inquire with field staff.
- Discussed specifics on where the bat detections are found. WEST indicated that Unit 3 ACC was the location of all detections. Solar Partners indicated that an ultrasonic detector has been purchased to monitor the deterrence and that four units were not functioning at that location during part of the fall season. These units have been restored to normal function.

Follow-up:
- WEST to provide range of species that are scavenged by roadrunners to the TAC.

Additional Topics
- Solar Partners presented a roadrunner BMP that will allow for "escape hatches" through the fence to allow roadrunners to escape potential predators and potentially to mitigate the roadrunner mortality that has occurred along the fence line.
- Each of these "escape hatches" will be camera monitored to determine if the roadrunners are using the BMPs.

TAC discussion:
- Discussed whether the design has any sharp edges. Solar Partners explained that the fence cuts will be bent back to the last link and tied to prevent sharp edges.
- Discussed the number of escape hatches proposed. Solar Partners stated that four would initially be installed one in each direction along the fences in Unit 1. The TAC requested that Solar Partners consider the use of straw bales in lieu of wooden platforms as part of the escape hatch design.
- Discussed the specific locations of the BMP placements.
- Discussed the frequency of camera monitoring at each location. Solar Partners indicated that each location is continuously monitored via camera traps. The data from these cameras is collected weekly.
- Discussed the potential for allowing additional roadrunners on site that may increase the scavenger rate. Solar Partners indicated that is possible, but the reduction of the mortality of the roadrunners is the objective of this BMP. WEST indicated that carcass persistence monitoring onsite will still allow for adjustment of estimates and that cameras for these trials will indicate the type of predators. Predator composition can therefore be examined to determine if the proportion of roadrunners is increasing.
- The TAC discussed the timing of the implementation of this measure. Solar Partners indicated that the first four escape hatches would be installed by the end of the year, should approval be forthcoming.

Follow-up:
- TAC to provide formal approval for roadrunner BMP.

Next Meeting:

March 11th, 2016 at Sacramento, CEC.