

NOTES | 8/13/2009 Conference Call

Altamont Pass Wind Resource Area Scientific Review Committee

Prepared by the Center for Collaborative Policy

Reviewed and approved by the SRC

Discussion Topics

Discuss Unresolved Monitoring Analytical Issues: Scavenger Removal Rate Overview of Analytical Approach to Diablo Winds

Meeting Outcomes

- The SRC agreed that the Monitoring Team should develop its own scavenger removal rate. However, because of a concern about its precision, the SRC recommended that the Monitoring Team look at variability before applying the method.
- The SRC also asked for final graphs that are clear and reliable (with clear captions), are accompanied by a discussion of caveats and limitations, and a discussion of the utility of each method.
- The Monitoring Team will use a survival model to analyze the scavenger removal rate.

Action Items

- Julie Yee will consider the carcass transition issue and bring a proposal to the August 20 conference call meeting.
- The Monitoring Team will work up the curve data for August 20.

Announcements

The SRC's in-person meeting will be a full three days, from September 22-24.

SRC Member Shawn Smallwood has a new PIER report on a spatial model of burrowing owl burrow sites in the Altamont Pass, to help guide turbine relocations or repowering siting. The report is posted on the California Energy Commission PIER website.

Public Comment

Renee Culver of NextEra noted that P114, NextEra Response to M32, had not been included on the agenda's list of related materials.

Discuss Unresolved Monitoring Analytical Issues: Scavenger Removal Rate

Related Documents

[M32 APWRA draft 48-hour Search Interval \(KB\) Study](#)

[P111 SRC Comments on Draft 48-Hour Search Interval \(KB\) Study](#)

[M34 Subcommittee Meeting Notes 7-24-09](#)

Monitoring Team Project Manager Doug Leslie said that, since the last meeting, the Monitoring Team realized that the discussions on the draft 48-Hour Search Interval (KB) Study and the subcommittee meeting are intertwined, and that all the major questions that

need to be addressed so that the Monitoring Team can complete analyses revolve around potential changes to the scavenger removal rate. The discussion was reorganized to focus on these questions. The key questions are:

- 1. Should the Monitoring Team use an Altamont-based scavenger removal rate?**
- 2. What criteria should be used for including carcasses in the adjustment rate calculation?**
- 3. Should the scavenger removal rate data be analyzed using a survival model instead of a regression model?**
- 4. Should a unique adjuster be calculated for feather spots?**

Question 1: Should the Monitoring Team use an Altamont-based scavenger removal rate?

The central question is whether the Monitoring Team should use data from the draft 48-Hour Search Interval Report (M32), the Carcass Removal Memo (M31) and ongoing scavenger removal trials to develop its own scavenger removal rate.

In response to questions, Monitoring Team members clarified that M32 data do not include older carcasses. "Carcasses of unknown age" was unclear terminology, but meant those carcasses found after two searches were conducted.

There are three groups of carcasses found in the Altamont:

1. All fresh
2. Includes fresh and carcasses less than one week (1+2)
3. Includes any carcasses found after the first two searches (1+2+3).

The data used in the graph in M34 have no aging criteria, and carcasses are categorized differently, into whole carcasses, partial carcasses and feather spots.

One SRC member gave a conditional agreement to this question, as the level of confidence at this point is unknown. It is not clear now whether this approach would be more precise or more variable than the estimates used so far. It will be important to see the standard error or confidence interval. If there is insufficient accuracy, this SRC member may not want to use this approach.

SRC members agreed the Monitoring Team should develop its own scavenger removal rate, which could be useful as a model elsewhere. However, because of the concern about precision, the SRC recommended that the Monitoring Team look at variability in the data before applying the method.

The SRC also asked for final graphs that are clear and reliable, are accompanied by a discussion of caveats and limitations, and a discussion of the utility of each method.

SRC members were concerned about including feather spots in which it is not possible to determine the date of death, and asked the Monitoring Team not to use data of unknown age. One SRC member said the searcher detection rate is 76% for whole birds, and feather piles are easier to see than whole birds, so the detection rate would probably be higher.

Question 2: What criteria should be used for including carcasses in the adjustment rate calculation?

One SRC member said another concern is that species have very different curves, and small raptors have very different curves than large raptors do. It will be important not to combine raptors and non-raptors. The sample size is also extremely small, but it would be helpful to see the curves for each species, rather than lumping.

SRC members were concerned that the different types of carcasses result from different types of scavenging by different scavengers. The scavenger removal trial used whole bodies that were placed. Partial carcasses and feather piles were not removed by scavengers. The issue of concern is that whole body decay curves may be inappropriately applied to feather piles, such as burrowing owls.

A Monitoring Team member said there is a problem with the data set with respect to small raptors, as only one intact American kestrel was followed, and there were only a small number of burrowing owls. While it is not a large data set, it is unique, and should be used to the extent possible.

Monitoring Team members said that the curves differ depending on what data are included. Older carcasses result in a different curve than fresh carcasses because the probability of remaining is high after the first few days. A pre-scavenged carcass is less attractive and therefore reduces the rate.

In response to SRC concerns, the Monitoring Team agreed to present graphs of the four raptor species separately, and to make sure that carcasses are not included from the first two searches.

Doug Leslie said the graph in M34, which includes records not in the KB study, is the most interesting. If you apply decay curves with partial carcasses and feather piles, it reduces the number of mortalities, and makes biological sense.

One SRC member supported using two curves, one for whole carcasses, and the second a combination of partial carcasses and feather piles.

Public Comments and Questions

Renee Culver of NextEra said the use of the term "unknown" is unfortunate. It is in the protocol and has been confusing rather than informing. Using feather spots is very important.

Joan Stewart of NextEra said it would also be really helpful if the terms are much more clearly defined.

Monitoring Team members said they will use a clearer term.

Question 3: Should the scavenger removal rate data be analyzed using a survival model instead of a regression model?

Public Comments and Questions

Ed West of BioResource Consultants said the reports are very interesting and agreed with the comments made about raptors versus non-raptors. He suggested running a statistical analysis of raptors versus non-raptors for the series of curves they create.

SRC and Monitoring Team Discussion

SRC member Julie Yee said the Cox Proportional Hazards Model could be used to explore the raptor/non-raptor difference. The model would analyze the scavenger removal rate represented by plotting a function between X for days dead and Y for proportion removed. Her concern is that, although the regression model in M32 produces a similarly plotted function, it inappropriately assumes there to be a set of independent (X, Y) data values measured from independent sampling units. The (X, Y) values are not independent because they are based on a shared set of carcasses. It is more realistic to assume each carcass is an independent sampling unit and therefore more appropriate to use a survival model, such as Cox Proportional Hazards model, which is based on similar assumptions by treating carcasses as independent sampling units.

Doug Leslie said that would make sense, as it would replicate what the Monitoring Team is doing, finding a carcass and looking to see how long it survives.

Question 4: Should a unique adjuster be calculated for feather spots?

SRC and Monitoring Team Discussion

Doug Leslie said he is proposing using the KB and scavenger removal trial data, to treat feather spots separately, to apply a separate decay curve and a separate scavenger removal rate. He sees a biological justification to separate them, as they would more likely result from predation than from turbines. This has been a particular issue with burrowing owls.

In response to a question about how the cause of death might relate to scavenging rate, a Monitoring Team member said a turbine-related death would usually start out as a whole carcass, while a predation-related death would start out as a partial carcass or a feather spot. How the carcass starts might affect which decay curve to use.

SRC members suggested that the Monitoring Team compute the data in both ways and look at the results to determine whether to combine feather piles and partial carcasses. They suggested that the Monitoring Team not infer a presumption about cause of death.

Monitoring Team members said they will run statistics or analyze the data as SRC members recommended.

One SRC member asked if there is no statistical difference between feather spots and partial carcasses, is there still a value in analyzing them differently?

A Monitoring Team member said it's possible that burrowing owls, which are generally found as feather spots, may be predated at a higher rate than other species. This might warrant treating feather spots separately.

One SRC member was concerned that it is unknown if a feather spot or partial carcass started out as a whole carcass, partial carcass or feather spot. There is a potential that it began as a whole carcass and later transitioned. It would be more appropriate to apply a hybrid of two or three types of carcasses.

Another SRC member and a Monitoring Team member suggested that the whole body decay curve and the equations may already include the transition.

Public Comment

Ed West of BioResource Consultants suggested conducting a temporal sequencing analysis of the curves.

Facilitator Gina Bartlett said he could perhaps pursue the analytical question with the Monitoring Team off-line prior to the next meeting.

Renee Culver of NextEra thanked the group for a very valuable conversation.

Next Steps

- Julie Yee will consider the carcass transition issue and bring a proposal to the August 20 conference call meeting.
- The Monitoring Team will work up the curve data for August 20.

Overview of Analytical Approach to Diablo Winds

The Monitoring Team report on Diablo Winds is due September 8, as it is on the agenda for the in-person meeting. Doug Leslie said the plan is to compare Diablo Winds to the rest of the monitored turbines, using the portion of data collected when both were monitored simultaneously.

Three issues were identified:

- 1. Diablo Winds has a search radius of 75 meters, while other monitored turbines have a search radius of 50 and 60 meters.**
- 2. Diablo Winds turbines do not have a seasonal shutdown, as the other turbines do.**
- 3. Intermixing or close proximity of non-repowered turbines with Diablo Winds turbines**

How would the SRC recommend addressing these issues?

Question 1: Differing Maximum Search Radii

The Monitoring Team does not have a proposal for how to deal with this. The larger maximum search radius was established by WEST, Inc., based on its experience with larger turbines' throwing carcasses farther. There is a 125 meter filter in which monitors include carcasses seen from within the search radius.

SRC members suggested that the Monitoring Team look at the data on the proportion of fatalities inside and outside the search radius. If they are roughly proportional, it would mean that the different radii should not be an issue. The Monitoring Team could look at the decay curves at points moving away from the turbine. There is not a great deal of research on the relationship between the number of carcasses found, search radius and turbine size.

Public Comment

Renee Culver of NextEra said she thought a decision had been made that only fatalities meeting the scavenger removal report protocol of 40 meters would be used.

Monitoring Team members said their understanding was that the SRC recommended that they look at the issue and return to the SRC with an approach. While the KB Report protocol was 40 meters, the protocol in this case was 125 meters.

Question 2: Seasonal Shutdown Differences

There is no Monitoring Team proposal, although one idea is to look at operating times.

SRC members suggested that one objective of this study is to develop a fatality rate for Diablo Winds by itself, so in that case the seasonal shutdown issue would not be relevant. At a minimum, two sets of turbines could be compared, regardless of winter shutdown, and the issue could be caveated in the report.

Question 3: Proximity of old-generation and Diablo Winds turbines

One of the issues in separating the effect of old and new-generation turbines is that they are intermixed, an issue recognized by the SRC.

Public comment

Renee Culver of NextEra said proximity is an issue, if injured birds are included.

The Monitoring Team will look at to what extent this factor might create a bias, and the item will be scheduled for additional discussion.

Next Steps

Bill Warren-Hicks, consultant to NextEra, said his report should be ready by Monday.

The August 20 conference call meeting agenda items include the scavenger removal rate decay curve and settling party questions.

ATTENDEES

SRC

Joanna Burger
Jim Estep
Sue Orloff
Shawn Smallwood
Julie Yee

Consultants

Doug Leslie
Jesse Schwartz
Brian Karas

Identified Public

Renee Culver
Janice Gan
Steve Mullen
Bob Power
Joan Stewart
Bill Warren-Hicks
Ed West

Staff

Sandra Rivera, Alameda County
Gina Bartlett, CCP
Ariel Ambruster, CCP