

Summary | October 10, 2007

Altamont Scientific Review Committee

Developed by the Center for Collaborative Policy

Not Yet Edited & Approved by the SRC

Question and Answer Session between Settling Parties and the Altamont SRC

The Scientific Review Committee held an afternoon meeting in Oakland to answer questions from Settling Parties on the SRC's recommendation for a 4-month winter shutdown recommendation, and on its statistical analysis of raptor mortality. The following is a summary of questions and answers, grouped by subject.

Mortality Data and Trends

Settling Party Question: What are the raw and adjusted numbers for mortality now for the four focal species? If we are on a journey of 100 miles, we need to know if we are on mile 1, 2, etc.

Smallwood:

It's too early to know. The target is a three-year inter-annual average estimate of mortality, like the baseline. Julie Yee's work is a starting point. There are some problems: one problem is it's over a 1.5 year span, two seasons twice. Also it's based on different assumptions and different filters than the baseline. Based on my experience, it does not look like any change in mortality is likely.

Yee:

The numbers are in a database -- they can be queried. The monitoring team has just taken over the data from WEST Inc. I did formulate my own estimated annual mortality. Those estimates are somewhere between 1,100 and 1,270. It's very rough -- the data I used was in the process of being corrected. A lot of these were minor corrections that only affected a few records. But I believe there will be some changes. Even though it was 19 months worth of data, it was annualized. It was calculated as daily rates, and then converted into yearly rates.

Settling Party Question: Does it include seasons "counted" twice?

Yee:

The rates were estimated separately by season. So winter is not overrepresented in the annual rate.

Settling Party Question: Do we know how many turbines were removed or relocated during that time? Could that affect mortality?

Monitoring Team:

The Monitoring Team is now keeping track of the turbines' functionality, but was not before. If a company removed or turned it off, the team wouldn't have known.

Smallwood:

That was a problem with the first study, upon which the baseline is based.

Settling Party Question: Were the same numbers of turbines monitored during the 19 months?

Yee:

Earlier this year the number of turbines monitored was increased to 2,500. Data is measured by turbine and analyzed by turbine. The increase in turbines shouldn't introduce any bias.

Settling Party Question: Could you compare the 1,100 figure with the 1,300 baseline?

Yee:

I would hesitate to compare it because there are some differences in the assumptions of the estimate. The short answer is no.

Settling Party Question: What are the differences?

Smallwood:

The 1,300 was an upper end of an uncertainty range; Julie Yee's estimate is not. The Smallwood and Thelander (2004) estimate ranged 880 to 1,300. The Settling Parties chose the 1,300.

Settling Party comment:

The 880 was without certain scaling factors.

Smallwood:

I used judgment. I felt 880-1,300 was a good, defensible range.

Settling Party comment:

The Settling Parties chose it because, as written, the number using scaling factors was 1,300. If wrong about that, the parties would like to go over that document with you.

Facilitator:

Should this an item for follow-up?

Smallwood:

I'm not using the 1300 number anymore. Smallwood and Thelander (2004) were criticized in review for coming to the upper end of the range instead of a point estimate. There was a rush to get the report out, and it's qualified in the report. Since then, I have produced different estimates, and the point estimate is pretty close to what Julie Yee came up with, 1170 or 1150 or something like that, with uncertainty around it. That includes all raptors, but most of them are the focal species.

Yee:

My estimate is different, there's no issue with the lower/upper bounds. It is not biased. I didn't provide just the upper bound, just the lower bound, I provided what I thought was the actual value. The difference is it includes all the fatalities. Shawn's excluded fatalities that were clearly not related to turbines. Mine includes background mortality. So that number will go down. But I did not account for searcher detection error. Once calculated, it will go up some.

Settling Party Question: Did you use scavenger efficiency factors?

Yee:

I used a scavenger efficiency number that was in one of Shawn Smallwood's reports. (P44, Smallwood: Effects of Monitoring Duration and Inter-Annual Variability on Precision of Wind-Turbine Causes mortality Estimates in the Altamont Pass Wind Resource Area, California (7/26/07))

Settling Party Question: I thought that there would be a determined rather than an estimated scavenger factor.

Smallwood:

It will never be a determined number -- it will always be an estimate.

Yee:

It's not a number, it's an equation. It's a function of the number of days since that fatality occurred.

Smallwood:

The rate of removal decreases over time. We looked at trials across the country and saw the same numbers over and over. You could look at the report on Diablo Winds, 2006. It is cited in P55.

Orloff:

There are more problems with the 1,300 number: the inter-annual fluctuations in raptors.

Settling Party Question: What was the definition of a fatality, and what fatalities were used?

Yee:

I took Wally Erickson's data set, and I didn't make any exclusions. The only controls were that incidental finds were not used. The SRC and I discussed whether to include background mortality. At the time the SRC was looking at shutdown effect. If there is an effect for shutdown, one would see it whether or not there is background mortality. Any differences due to shutdown would occur against background mortality.

Settling Party Question: Is it accurate to say that the half-and-half seasonal shutdown had no effect?

Orloff:

I don't think so. It depends on the species.

Julie Yee shared her latest analysis of the winter shutdown affect, which includes the seasonal effect and annualized information. There is no filtering, but the Poisson analysis does take into consideration time since death. It produces an analysis for the combined three focal species without burrowing owl, and the four focal species.

Winter Shutdown Effects, Julie Yee, M16b 9/20/07

	Shutdown Effect	Annual Mortality 2-Month Shutdown	Annual Mortality 4-Month Shutdown
American Kestrel	-82%	-17%	-35%
Red-tailed Hawk	-32.5%	-6.2%	-14%
Golden Eagle	-69%	-6.5%	-18%
Burrowing Owl	+10%	+2%	+5%
Combined 3	----	-12%	-25%
Combined 4	----	-6%	-13%

Settling Party Question: Did this take into account higher mortality in winter?

Yee:

It does take into account seasonal differences. It weights the species in terms of their abundance.

Settling Party Question: Is this a cumulative estimate that incorporates Tier 1 and 2 removals?

Burger:

They weren't removed at the same time. This is a compliance issue the SRC has discussed.

Smallwood:

It depends on how they were removed. If they were removed more in the north than the south, during the study, it could confound the data. I'm more concerned about the search interval issue (the 43-day average search interval).

Settling Party Question: My concern is that the monitoring be synced with shutdown.

Burger:

This is something the SRC recommended. We're just trying to be able to assign when the mortality occurs for accuracy.

Settling Party Comment:

It's important to sync it; I think we agree with that.

Bird Abundance

Settling Party Question: We had thought there were bird activity studies done each year. How do they compare with the 2004 period?

Combined Answer:

We just received point count data from WEST, Inc., last week. Wally Erickson was to filter the data down to 500 meters to compare it with Shawn's data. The Monitoring Team will have to work very carefully to make the data comparable.

Background Mortality

Settling Party Question: It's of interest to us in arriving at answers to raw count and adjusted count data of focal raptors by species for 2004, 2005, 2006 and 2007.

Smallwood:

If you're interested in background mortality, I would recommend focused searches on parts of the Altamont Pass area where there are no turbines on ridges, like Vasco Caves. I don't know how else to do it without remote sensing.

Settling Party Question: (Seeking information about judgments made regarding background versus turbine-related mortality.)

MT:

A document on the website, Cause of Death Determination (M11, Determination of Cause of Death), will clarify many questions. A turbine-related fatality can be proved in the positive, not in the negative. If a carcass is very fresh, a searcher can see turbine-related injuries. Most of the time, birds are scavenged, leaving behind feather spots or no physical evidence. So to understand background mortality, a background mortality study is necessary.

Orloff:

The winter shutdown study controls for background mortality, because it switches periods so background mortality shouldn't make any difference.

Settling Party Question: The fact that background mortality is mixed in the annual data, how does that affect our confidence of the 1,100 figure?

Smallwood:

The 1,300 figure includes some background mortality.

Settling Party Question: Did any of the different experiments over the years look at baseline mortality, or any studies based on experience?

Smallwood:

I've only come across a high incidence of raptor mortality once, and that was poisoning. I haven't seen mortality in as high rates as I've seen in the Altamont. The problem with using areas in the APWRA for background mortality surveys is that birds injured by turbines could die in the survey area so it's not entirely independent from wind farms.

Settling Party Question: It has to be far away?

Smallwood:

Yes. Then you have a challenging replication problem. If burrowing owls are heavily predated, there may be a problem with background mortality. We may be able to do a background mortality study of them because they don't go very far.

Burrowing Owl Mortality

Settling Party asked for clarification about burrowing owl statistics.

Orloff:

The SRC agreed that one management strategy is unlikely to have a positive effect on all species. For burrowing owls, the SRC is going to have to recommend a different management strategy.

Yee:

M16b, dated 20 September, estimate 18, is a positive number, 0.08. It leans toward an increase in fatalities during non-operation. The standard error is very high. We can't say with any confidence that there is any effect for burrowing owls.

Burger:

It was very clear for the three species, and the SRC doesn't know about the fourth.

Impact on Mortality of Tier Classifications and Removals

Settling Party Question: Shawn did a paper on March 19 – Estimated Effects of Full Winter Shutdown And Removal of Tier I & II Turbines – is that still operational? In it, he estimates a fatality reduction of 9.9% due to removal of Tier 1 and 2 turbines. To the best of my knowledge, Tiers 1 and 2 turbines have been removed or relocated. Do we think there is a 9.9% reduction? Do we have an impact by species?

Smallwood:

I think he's asking if anybody here assessed the reduction that might be achieved by removing turbines. The answer is no, the only work has been with these tier classifications. Tiers are just a tool. They are supposed to be used with judgment. The classification is based on an empirical model, they worked OK, but are far from perfect. I think the SRC and parties can do better using judgment in conjunction with tier classifications. And I don't agree that all Tier 1 and 2 turbines were removed. I can't get confirmation.

Orloff:

A lot of times, the hub is removed but not the tower. It really confounds the data.

Smallwood:

I would suggest it might be quicker and more efficient if the SRC goes out and points out which turbines can be dangerous.

Settling Party Comment:

I'm expressing some openness to that. My experience with parties on different sides, they can never agree on rhetoric, but can agree on the facts.

Facilitator:

Those strategies can be discussed.

Estep:

I agree on the value of identifying turbines in the field. But some interesting data exists already.

Burger:

The SRC would need to have the data with us in the field.

Settling Party Question:

If we remove the turbines, is that a better result than seasonal shutdown?

Smallwood:

Not necessarily – it depends on what the capacity limit is, how much can shut down. And we're going after turbines that are not Tiers 1 and 2 anymore, we've changed the landscape so there's some guesswork involved. But something big needs to be done to get to 50%

Settling Party Question: And that's because they're in a notch, issues of siting?

Smallwood:

Yes.

Settling Party Question:

We assumed after removal of high risk turbines, there would be a change. You're not seeing a change. With a half-and-half season closure, you're not seeing any change in mortality?

Orloff:

It depends on if you're looking at baseline comparisons or the winter shutdown data. If you look at Julie's data, there have been significant decreases in some species: Red-tailed hawk and American kestrel.

Smallwood:

That's winter shutdown effect, not annual mortality.

Settling Party Comment:

We would expect with the crossover shutdown and if all Tier 1 and 2 turbines are removed, one would see some impact. It might be 15%, 20%, or something. If nothing or unsure, one concern is comparability.

Settling Party Question:

What is your overall sense of Tier 1-3 removal?

Smallwood:

My numbers show removing Tiers 1-3 make a significant difference.

Settling Party Question:

In terms of the 50%, I'm trying to determine the relative importance of winter shutdown versus high-risk turbine removal.

Smallwood:

We haven't really talked about it. (He refers to Page 3 of S23 and his estimate of 32% reduction in focal raptor species mortality due to seasonal shutdown.) I'm hearing more in the 25 to 30% range with a 4-month winter shutdown. The other management option on the table is removal of Tier 1-3 turbines.

Yee:

It's good it came up, the comparison to baseline. It's not at a stage yet where the SRC can make that determination. How many miles of that hundred miles, the SRC doesn't know, but it sure doesn't feel like 50%.

Orloff:

Also, it's the job of the monitoring team, not the SRC, to compare to baseline.

Facilitator:

The Monitoring Team was supposed to deliver the report. It was delayed significantly. Julie Yee did a lot of analysis.

Burger:

The problem is that the SRC did not get the data; the data is several months behind.

SRC Recommendation for 4-Month Winter Shutdown

Settling Party Question: It seems like what we proposed in the settlement isn't working, and you're proposing we do the four-month shutdown. Our concern at Audubon is this is the kind of information we needed as a midcourse correction. What you're seeing is no change happening, and this is the way you're recommending to deal with the problem.

Yee:

We didn't feel the 2-month shutdown was going far enough to meet the 50%. We felt obligated to make recommendations. This is one that the SRC thought could probably be effective to get to the 50% shutdown.

Settling Party Question: It's hard for the lawyers to go back and recommend to senior management, if it's only a gut feeling to the SRC.

Burger:

Partly the confusion is resulting from the fact that as scientists, we deal with statistics and probabilities. But the other approach is a weight of evidence approach -- all of the information the SRC has, whether old data from Shawn, or Wally Erickson, Julie Yee - - they are all showing this effect from a 2-month winter shutdown. But they're all showing the effect is not 50%. All the SRC said that the only way to get to the 50% with the techniques available is to go to a 4-month shutdown. It was an overall weight of evidence approach from several lines of evidence, with fairly high significance in some of them.

Other SRC members agreed.

Smallwood:

It will at least double the reduction.

Settling Party Question: The spirit of this November 2009 deadline was that we probably needed three years of data to figure out what's happening there. If the 2-month winter shutdown is skipped in 07-08, how does that affect the overall program?

Burger:

The SRC judgment was that without a four-month shutdown, there is no possibility of getting to 50%. There aren't that many management techniques available.

Public Comment

Nan Leuschel said she represents a land owner who owns a lot of turbines. She wondered if the results could have been affected by the amount of wind. Last year was a windy year.

Shawn Smallwood responded that it could have, but they don't have the data. He thinks analyzing the power output data could have a huge impact on what the SRC would recommend.

She also asked whether it was possible not to require the winter shutdown in areas where there are high burrowing owl populations.

In response, Joanna Burger said the data for burrowing owl data does not have high reliability. The SRC felt strongly that a behavior study would be important, and possibly off-site mitigation, to study and/or reduce burrowing owl mortality. She said she would not change her recommendation because there was a clear positive effect on the other three species. She also said she wouldn't support reducing the recommended 4-month shutdown recommendation to two months for areas with high burrowing owl populations.

Wrap Up & Next Steps

One settling party member said he needed to digest the information from the meeting and may possibly ask for another meeting.

Another settling party said a next step is to have a discussion about compliance monitoring. It also would be important to get information about output and capacity of turbines.

In response to the latter issue, company and County representatives said it has been difficult to coordinate gathering of output information because some information is not on computers, and there are a huge number of data points.

SRC members asked that the Monitoring Team and wind farms develop a system for synchronizing searches with turbine shutdowns for the winter.

Documents Circulated at Meeting

S21_Settlement Parties Questions for the SRC 10-2-07 (4-Month Winter Shutdown)

S22_Audubon Questions for SRC 10-2-07 (4-Month Winter Shutdown)

S23_Smallwood's Answers to Audubon's Queries 10-6-07 (4-Month Winter Shutdown)

S24_ Yee's and Berger's Answers to Settlement Parties 10-10-07 (4-Month Winter Shutdown)

S25_ Estep Responses to Audubon Questions to SRC 10-10-07 (4-Month Winter Shutdown)

Documents Referenced at Meeting

M11_Determination of Cause of Death

M15_Brian Karas, Winter Shutdown Tables, 9/12/2007

M16b_Yee: Analysis on Shutdown Effect Using Poisson Model (9/20/07)

P44_Smallwood: Effects of Monitoring Duration and Inter-Annual Variability on Precision of Wind-Turbine Causes mortality Estimates in the Altamont Pass Wind Resource Area, California, 26 July 2007

S19_Smallwood Estimated Effects of Full Winter Shutdown and Removal of Tier 1 & 2 Turbines (3/19/07)

SRC Meeting Participants

SRC Members

Joanna Burger (by telephone)

Jim Estep

Sue Orloff

Shawn Smallwood

Julie Yee

Staff

Gina Bartlett, Facilitator

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Brian Karas, BRC

Brian Latta, UCSC

Others

(Meeting Sign-in is optional)

Michael Boyd, CARE

Bill Damon, Altamont Winds Inc.

Jim Hopper

Nan Leuschel, Ralph Properties II

John Moorman, enXco

Elizabeth Murdock, Golden Gate Audubon

Eli Saddler, Golden Gate Audubon

Julia Sorensen

Joan Stewart, FPLE and AIC

Jim Walker, enXco

Zach Walton

Peter Weiner

Bill Yeates, Golden Gate Audubon & National Audubon Societies