

## Comments on APWRA Monitoring Program Update

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I appreciate receiving a written summary update of the monitoring activities in the Altamont Pass Wind Resource Area (APWRA). Most of the summary looked fine, leaving me with only a few questions and comments that we can discuss at the upcoming SRC meeting.

First, I noticed in the Update that the search order of turbine rows in routine fatality monitoring will be randomized. What is the purpose of randomizing the search order? This is a new practice, and it has not been practiced previously for two good reasons. First, the logistics of driving back and forth across the Altamont Pass to accommodate a random search order will add time and expense to the monitoring effort. Second, turbine rows will vary much more in their search intervals, which will complicate data analysis. Until now, the turbine rows would share nearly the same search interval per rotation. The new approach might vary search intervals from 15 to 45 days per rotation. If there is a reason for randomizing the search order, please provide it at the meeting.

Under Double Surveys on the bottom of page 6, the update reads “*Results [fatality detections] are processed by the Field Supervisor (or Assistant) using a set of data models (Microsoft Excel and web applications) that allow detections to be assigned to single fatality numbers based on cumulative results of all searches.*” This statement seems vague, and it doesn’t answer the question I have been asking since September. How will the data collected in the double survey be analyzed? As I explained in earlier comments on the detailed implementation plan, “I don’t believe Cormack, Jolly, or Seber anticipated the use of capture-recapture estimators on decaying carcasses. I believe they anticipated capture and recapture of live animals, and that these capture attempts would be nearly instantaneous relative to the lifespans of the animals involved. Carcasses, however, quickly change in appearance as they weather and decay. Recapture probabilities will likely change quickly over time, and two weeks should not be regarded as anywhere close to instantaneous with respect to the “lifespan” of the carcass.” I would like to see an example exercise in which the simulated data are analyzed by the monitoring team, and I would like for the monitoring team and SRC to have an opportunity to interpret the results. Without such an exercise, I fear that the double survey approach may generate data that are uninterpretable using a capture-recapture estimator. There may be an alternative way to use the data, such as simply generating another removal curve, but I think it is important to identify alternatives up-front.

The Supervisor Surveys summarized on page 7 also left me confused. How long will found and placed carcasses actually be left in the field? And, why is the Supervisor going to pre-survey and post-survey only 5% of the turbines used in the double survey effort? According to the Update, the double survey effort will involve about 25% of the 1,327 turbines monitored turbines, or about 332 turbines. Five percent of these double surveyed turbines will equal 17 turbines.

Unless the Supervisor is going to place carcasses at all 17 of these turbines, these pre-survey visits seem like they would be a waste of time. Perhaps I missed the point of these surveys.

The post-survey visits would also involve about 17 turbines. Are these 17 turbines where carcasses were detected or placed? Will these post-survey visits yield a sufficient sample size?

Additionally, the turbines selected for the pre-surveys will be randomly selected. Would not a random selection further diminish the likelihood that fatalities will be detected by the Supervisor at the 17 turbines that are pre-surveyed?

Finally, the pre-surveys will be performed a day before the routine monitoring visits, and the post-surveys will be performed a day following the routine monitoring visits. A day is a long time in the removal rates of carcasses, especially during the initial few days following death. As an example, Insignia Environmental placed carcasses for their routine fatality searchers at Buena Vista, and they checked up on the carcasses on the same day as placement but following the routine searches. Of the placed carcasses that were not detected by the search crew, the Supervisors found that 52% were missing by the time the post-survey check was performed. This means that half the placed carcasses had been removed within the same day of placement. This result was repeated in multiple monitoring reports I recently reviewed from across North America. Unless the monitoring team gets more aggressive with the pre- and post-survey checks, I fear that the results may not be very useful.

Missing from the Update were details of how search detection rates will be monitored as carcasses age. I understood from the last SRC conference call that the monitoring team decided not to implement this SRC-recommended element of the monitoring program. I think this is unfortunate because it has been unrealistic to assume that searcher detection at 30-day search intervals should be represented by placed intact carcasses.