

**NOTES | 3/18/2008****Altamont Pass Wind Resource Area Scientific Review Committee  
Conference Call**

Prepared by the Center for Collaborative Policy  
Reviewed by the SRC

**Action Items & Meeting Follow-Up**

Party	Due Date	Action
S. Smallwood	4/10/08	Provide list of bat mortality literature, with 2-3 most critical papers highlighted, for SRC members and website
J. Estep	done	Draft outline on burrowing owl study proposal
J. Yee	4/23/08	Review literature on adaptive sampling for burrowing owl study purposes

**Agenda Items**

- Set Dates for Statistics Call and April Meeting(s)
- Proposed Burrowing Owl Study Design

**Dates for Statistics Call and April Meeting**

Related Materials: [P81 SRC Meeting Plan in 2008](#)

The SRC set the following meeting dates:

- ❖ Statistics Conference Call, March 26, 10:00 am-12:00 pm
- ❖ In-Person Meeting in Oakland, April 23-24
  - Day 1, April 23, 10:00 am-6:00 pm
  - Day 2, April 24, 8:30-11:30 am

**April Agenda Items**

- Burrowing Owl Study: Recommendation to Conduct Study and Rationale
- Bats Literature Review & Initial Conversation
- Scavenger Removal Trials (including bats)
- Additional potential studies

**Other Potential Topics of Interest**

- Budget issues
- EIR process

To prepare for the April meeting, SRC member Shawn Smallwood agreed to provide references for the two or three most critical studies on bats for the April meeting. In addition, the SRC in April will consider suggestions for additional research on searcher detection rates for small birds and bats, scavenger removal rates, background mortality surveys, and a special behavior study of kestrels.

**Proposed Burrowing Owl Study Design**

After reviewing Monitoring Team data showing high burrowing owl mortality estimates at its February 2008 meeting, the SRC again agreed to develop a recommendation that Alameda County conduct a focused burrowing owl behavior study to gather information on causes of burrowing owl fatalities. The SRC agreed that the first step in developing this recommendation

would be to hold an initial conversation during a March 18 conference call to identify questions the study should address.

## **Discussion**

SRC members began by discussing the need for such a study. Points mentioned included:

- Reported data show higher burrowing owl mortality than would be expected given what is known about burrowing distribution and abundance in the APWRA. This raised questions about adjustment factors used in the mortality equation, populations in the APWRA, and the specific mechanisms that might contribute to burrowing owl mortality.
- The causes of burrowing owl mortality are unclear due to the lack of whole carcasses that can be examined, resulting in questions regarding other possible sources of mortality, such as predation.
- Feather piles might be inflating mortality, possibly by being double counted.
- Some data show relatively high burrowing owl mortality associated with winter or with shutdown. The final Monitoring Team report might shed light on this.
- A difference in daytime and nighttime mortality might exist.
- There is a significant data gap about burrowing owl populations, including nesting and wintering populations.
- Are there seasonal or annual long-range movements to and from or across the Altamont Pass?
- Burrowing owls have been observed becoming active near the ridgelines around sunset. Systematic observation, including with night vision equipment or telemetry, might provide information on how they are using ridgelines, foraging habits, and whether they are using ridges with and without turbines.

## **Potential Study Goals**

SRC members then identified purposes of the study. Discussion included:

- To identify causes of burrowing owl mortality, directly and indirectly
- To identify how burrowing owls are dying
- To gain information on time of day of fatalities and on activities that might increase risk
- To learn about any risky behavior on the part of burrowing owls
- To gain information about the relationship, directly and indirectly, between mortality and wind power, including whether turbine shutdown increases predation
- To improve the estimate of burrowing owl mortality as it relates to the Settlement Agreement

From this, SRC members identified a three-pronged focus for the study:

### **1. Abundance and Distribution**

- To provide information for evaluating mortality numbers in relation to abundance
- An explanation of spatial variation in population abundance could help to develop strategies for repowering in low-population areas. If populations or clusters of owls shift locations periodically, burrowing owls will likely move to the same types of places.
- The study could identify three tiers: 1) high population; 2) no burrowing owls; and 3) intermediate populations. There could be three parallel tiers related to mortality: 1) areas of high mortality; 2) areas of no mortality; and 3) areas of intermediate mortality.

### **2. Behavioral Study**

- Related to whether wind turbines influence mortality

- Do burrowing owls regularly engage in behaviors (e.g., foraging, defensive, courtship, etc.) that put them at risk of collision with turbines?
- How burrowing owls are being predated and by what species
- Separate data sets – breeders, hatchlings, etc.

### 3) Mortality

- Extent of mortality
- Relation to wind farms and wind farm activities

### Abundance Discussion

The following methods were discussed:

- **Stable isotopes analysis** can be used to analyze feathers collected by Monitoring Team to determine where they are coming from. Feathers have been surrendered to California Department of Fish & Game (DFG), but will now be kept for potential analysis.
- **Night vision equipment vs. telemetry** – Jack Barclay said several studies using telemetry, show higher burrowing owl mortality, evidence of changed behavior, and an attenuated signal when the birds go underground. He mentioned published studies by Rosenberg and Jennifer Gervais. Shawn Smallwood was familiar with other studies where a problem was not documented and asked if evidence is more than anecdotal. Some SRC members were concerned that telemetry could change the mortality pattern and would be challenging with the numbers of birds involved.
- **Census or sampling** – Because of high variation in abundance and distribution, a random sample could miss a majority of burrowing owls. Options discussed included a systematic sample, with random sampling of two to three categories; a stratified sample; or adaptive sampling, in which there is more sampling done in areas where burrowing owls are found. Julie Yee said she will review literature on adaptive sampling.
- **How to detect burrowing owls, including capture or observation.** Jack Barclay said he did mark-resighting using computers at the San Jose Airport with more than 1000 nestlings, and it was very labor-intensive. He estimates that calculating a survival estimate would take three years for the Altamont. There are a lot of survival estimates in the literature. Barclay said that in the Altamont, burrowing owls are not habituated to humans on foot so tagging would be difficult.

### Other Issues

- **Extrapolating density estimates to the entire Altamont**– Is it necessary to extrapolate density estimates to the entire Altamont? One SRC member favored a broader look at how burrowing owls are using the Altamont Pass area and getting a general idea of the populations.
- Insufficient information exists on wintering populations, including how many are breeders, or owls flying through. There is a pattern of an influx of burrowing owls in winter. One researcher implied a crossover from the valley to the Bay Area.
- Ground squirrel burrows tend to be in the lower half of the slope, and burrowing owls are using ground squirrel burrows at the lower portion of the elevation bands used by squirrels. As for the small sample of 20-plus pairs Shawn Smallwood studied at Vasco Caves, he found nest productivity increased with increasingly higher position on the slope

for those nests that produced any chicks. But, there were also nests on the slope that produced no chicks.

### **Public Comment – Abundance**

Jack Barclay said he has spent several thousand hours doing burrowing owl night-time observation. He said generation three night vision is limited as a search instrument, but is effective if you know where the owl is. Testing around turbine rotor planes might be worthwhile. Thermal imaging would probably yield more observations.

He gave details on his findings. Over two years, from 2006 to 2007, of 10 km<sup>2</sup>, he found high densities of more than five pairs per square kilometer at about 6% of the Altamont. It was not highly variable over those two years, but there was a lot of spatial variation.

Burrowing owls have a very high reproductive potential and a very high mortality rate of 75-80% for juveniles. The adult survival rate is about 60% from one year to the next. That background is important when considering feather piles –high mortality is likely.

Jack Barclay also summarized what he learned in his study over the last two years about distribution of 65 pairs of burrowing owls:

1. They concentrated around margins of basins and drainages.
2. No evidence exists that burrowing owls chose any particular magnetic direction of slope.
3. Degree of slope was in the moderate range, characteristic of the middle of the margins of drainage basins.
4. Occur where many ground squirrel burrow and occasionally not.
5. Range from flat to 22°.

Two statewide surveys on burrowing owl abundance exist, and neither sampled the Altamont. Existing information suggests an uncommonly high density of burrowing owls that has not previously been surveyed.

### **Behavioral Study Discussion**

- Direct observation was favored
- Observation alone might be insufficient. Behavioral patterns may suggest mortality-related factors.
- Seeing predation is difficult for observers so evidence may not be available to attribute to a cause. Telemetry could possibly be used to track the fate of the bird.
- Observing from 4-10 p.m. is possible. Having observers in position before sunset is important since owls won't emerge if a shadow has fallen over the burrow.
- Thermal imaging equipment is expensive. Night vision equipment is more reasonable. Using both is possible: one to view a broader area and the second to pinpoint. Jack Barclay said he has a generation 3 night vision scope.
- As a way to quantify the degree to which wind turbines might contribute to predation of burrowing owls, or overall mortality of burrowing owls, the study team could perform background mortality surveys on ridges where turbines are not located but where they normally would be located elsewhere in the APWRA. Mortality estimated in those areas could be compared to mortality estimated in the search areas around wind turbines. Analyzing carcass distance from turbine row is another possibility.

- Observing burrowing owls on hills with and without turbines is important to provide a control area. Site 300 of the Lawrence Livermore National Laboratory is one possible site. The MT could survey it to see if features are conducive to burrowing owls. Also, Vasco Caves has 20-25 pairs.

**Mortality Discussion**

- Brian Karas of the Monitoring Team said two variables involving feather piles could inflate the mortality estimate. The small bird removal rate is based on an intact carcass, and feather piles have a different profile, perhaps taking up to one year for the evidence of a feather pile to vanish. In addition, for the searcher efficiency rate, feather piles are easier to find.
- Kort Clayton of the Monitoring Team, who performed his Masters thesis research on burrowing owls, said that despite the limits of telemetry, a telemetry study could go far in answering questions about cause-specific mortality. The only confounding issues could be risks to burrowing owls from predators perched on shutdown turbines, which radio tracking wouldn't address.

**Public Comment**

Michael Boyd of CARE said his organization is working to develop a proposal to include this project in the PG&E rate base. The group has consulted with a PUC administrative law judge and the Alameda County Planning Director. The organization needs a ballpark figure on non-recurring research and development charges, such as this study, to estimate the annual budget. They hope to have that information before May.

Brian Karas of the MT said recent data are showing similar patterns in American kestrel mortality to burrowing owl mortality. In response, SRC members said they will need to think about the American kestrel issue and whether a separate study should be completed.

**Wrap Up and Next Steps**

Jim Estep will draft an outline of a study proposal for Burrowing Owls expanding on the subjects discussed during the conference call, for review by other SRC members to develop the proposal sufficiently for the April meeting.

**Participants**

<u><b>SRC</b></u>	<u><b>Identified Members</b></u>	<u><b>Monitoring Team</b></u>	Sandi Rivera, County of Alameda
Joanna Burger	<u><b>of Public</b></u>	Brian Latta	
Jim Estep	Jack Barclay	Brian Karas	
Sue Orloff	Bill Barnes	Kort Clayton	Facilitator Gina Bartlett and Ariel Ambruster, Center for Collaborative Policy
Shawn Smallwood	Mike Boyd		
Julie Yee	Hilary Corrigan		
	Renee Culver		
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