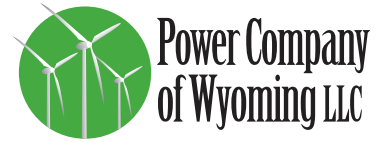


Chokecherry and Sierra Madre Wind Energy Project

Intensive Avian Protection Planning



Avian Protection Summary

- In 2010, PCW initiated a collaborative process with BLM, USFWS, and Wyoming Game and Fish Department to identify a process that would be followed to develop an APP and ECP for the wind project.
- In April 2011, the Service informed BLM that developing an APP for the Project is an appropriate option to avoid and minimize potential take of eagles, migratory birds and bats.
- The comprehensive survey protocols developed for the wind project far exceed the recommendations made in the Draft Eagle Guidance, WGFD's *Wildlife Protection Recommendations for Wind Energy Development in Wyoming*, and the BLM Rawlins Field Office *Wildlife Survey Protocols for Wind Energy Development*.
- A combination of avian radar, raptor count stations, standard grid sampling, and point count surveys will be used to better identify areas of high avian use across the wind project area, with emphasis on large raptors including golden eagles.
- Avian radar has been identified by BLM and USFWS as a desired method to map areas of high avian use.
- Data collected as part of the survey efforts will be analyzed to quantify avian use across the project area.
- Avian use information will inform final project design and will identify areas where Advanced Conservation Practices and Best Management Practices might be implemented to avoid, minimize and mitigate impacts.

Project Background

Power Company of Wyoming LLC is developing the Chokecherry and Sierra Madre Wind Energy Project, a 1,000-turbine wind farm to be located south of Rawlins in Carbon County, Wyoming. The proposed project will be situated on about 100,000 acres of the 320,000-acre Overland Trail Cattle Company ranch. Planned to generate 2,000-3,000 megawatts of clean energy, the project will ensure a reliable, cost-effective supply of renewable electricity that's unmatched in the west. The wind project will generate hundreds of good jobs and hundreds of millions of dollars in tax revenue, providing local, state and national benefits for decades. It also supports the strategy set out in BLM's FPEIS on Wind Energy Development "of extracting the maximum potential wind energy from a given site [which] will minimize the overall environmental impacts."

Because the proposed wind power project spans an approximately 50/50 combination of private land and federal land managed by Bureau of Land Management, the project is being reviewed in an Environmental Impact Statement. In July 2008, the BLM Rawlins Field Office published a Notice of Intent to prepare an EIS to analyze the environmental consequences of the project. In July 2011, BLM published the Draft EIS..

From June 2008 through June 2009, avian use data were collected across the project area to support BLM's EIS process. Data were collected using standard point count methods at 19 locations during the survey period. These data are sufficient for EIS-level analysis to provide estimates of avian use as well as to provide initial estimates of the frequency of each species at rotor-swept heights.

However, PCW has continued to move forward with advanced avian monitoring programs to gather even more data, as outlined in detail below.

Protocol Development Timeline

In July 2010, BLM issued Instructional Memorandum 2010-156, which required the development of a project-specific Avian Protection Plan (APP) for renewable energy projects with the potential to impact golden eagles or their habitats. IM 2010-156 requires the concurrence of the U.S. Fish and Wildlife Service that measures identified in the APP are sufficient to avoid or minimize take of golden eagles that would result from a project.

In April 2011, the Service informed BLM that developing an APP for the wind project is an appropriate option to avoid and minimize potential take of eagles, migratory birds and bats. In January 2011, the Service issued Draft Eagle Conservation Plan Guidance for wind energy projects. The Draft Eagle Guidance provides recommended survey protocols to determine risk to eagles and guidelines for developing Eagle Conservation Plan (ECPs).



Immediately following IM 2010-156 and before the USFWS Draft Eagle Guidance was issued, PCW initiated a collaborative process with the BLM, USFWS, and Wyoming Game and Fish Department to identify a process that would be followed to develop an APP and ECP for the wind project. During this collaborative process, it was determined that additional data were needed to better identify concentrated avian use areas, particularly for golden eagles.

As a result, PCW, in coordination with the agencies, developed an intensive one-year survey to identify any high-use areas that might occur in the vicinity of the project. The comprehensive survey protocols developed for the project far exceed the recommendations made in the Draft Eagle Guidance, WGFD's *Wildlife Protection Recommendations for Wind Energy Development in Wyoming*, and the BLM Rawlins Field Office *Wildlife Survey Protocols for Wind Energy Development*.

Monitoring Approach, Tools and Techniques

A comprehensive avian monitoring approach utilizing avian radar technology is being used to better identify areas of high avian use, with emphasis on large raptors including golden eagles. Avian radar technology has been identified by BLM and USFWS as a desired method to map areas of high avian use. The sampling design follows recommendations made by USFWS, BLM and WGFD by combining radar surveys with standard point count and breeding bird methodologies, raptor nest monitoring, avian use surveys and prey base evaluations. The radar technology will also enable better identification of bat use areas and relative densities of bats. The following sections describe the six major elements of the avian survey protocols.

1. Avian Radar System

A DeTect Merlin Avian Radar System is being used to map avian use across the wind project area and was installed on the Overland Trail Cattle Company Ranch in March 2011.

Radar systems work by transmitting a radio beam and listening for the echoes of that beam as it is reflected off of various surfaces. By calculating the time between the transmission and reflection of the radio waves and the relative strength of the reflection, radar systems can determine the distance a target is from the transmission source and the relative size and sometimes shape of the target. Two different types of radar bands (X-band and S-band) are typically used for avian radar systems.

Current configuration of the radar allows for detection of large targets (raptor sized birds and flocks) out to approximately 6 miles from the radar unit. This enables continuous monitoring of avian activity within 113 square miles of that location. Smaller targets are detected out to approximately 3 miles. The vertical radar detects flight paths up to 2 miles above the unit. The radar unit will be deployed at four locations providing around-the-clock avian use data for 450 square miles of the wind project and adjacent areas.

Radar validation surveys are being conducted at minimum once a week to develop an avian target database.

The Merlin radar system allows PCW's biologist team to actively tag known targets with the correct species identification. The avian target database will be post-processed to train the system to identify targets based on target shape and speed. In total, approximately 60 target variables (e.g., perimeter, area, height, width, orientation) will be used to allow the radar system to identify targets at the species level independent from operator verification.

Figures 1 and 2 at the end of this document illustrate the types of data being collected by the avian radar system and how those data will be used to better define avian use patterns in the project area. Through a combination of training the radar system and applying appropriate data filters, avian use patterns of eagles and other species of interest can be identified, and appropriate measures can be taken to avoid, minimize and mitigate potential impacts to those species.

About the Merlin Radar

- A trailer-mounted system with a 200-watt horizontal solid-state S-band radar with Doppler processing and a 25-kilowatt vertical X-band open array radar.
- All-weather operator cabin houses five computer systems needed to operate the Merlin radar system and store target data. Two computers operate the horizontal S-band radar, two computers operate the vertical X-band radar, and 1 computer writes data to a Sequel server at a rate of about 40 megabytes per hour. A keyboard-screen-mouse system is integrated into all computers to operate each computer system and monitor avian activity onsite.
- Remote access also allows 24-hour access to the Merlin radar.
- The system is powered by two diesel generators that switch out every 10 days and provide a continuous power source. An uninterruptible power supply provides backup battery power in the event of generator failure.



2. Avian Use Surveys

Day-long avian use surveys are being conducted at 15 locations. Avian use data are being used to validate radar survey results and to document avian use in areas that are not surveyed directly by the radar system. The species, age, location, height and behavior of each bird observed are recorded, and the use patterns exhibited by that bird are recorded on 1:24,000 topographic maps. The detailed location and behavior data collected at these points is easily integrated with the radar survey data to enable precise determination of avian use.

3. Migratory Bird Surveys

Migratory bird point count surveys are being completed during spring and summer migration periods. Point counts are being completed at 15 locations in close association with the Avian Use Survey points described above. Migratory bird survey data will be correlated with data observed on the avian radar system at the avian use survey points to determine seasonal and daily timing, size and duration of migratory events.

4. Breeding and Resident Bird Surveys

Breeding and resident bird surveys are being completed in late spring and early summer at 16 locations. Surveys are being completed following Rocky Mountain Bird Observatory protocols as well as BLM and USFWS recommendations. Data collected during breeding and resident bird surveys will be correlated with other survey data, including avian radar data, to help identify areas of avian use in the project area.

5. Raptor Nest Surveys and Monitoring

Helicopter-based surveys are being completed across nearly 500 square miles to identify active raptor nests. Specific efforts are being made to ensure that all active eagle nests are being identified and monitored for nest and fledging success. Special attention will be paid to the avian activities surrounding active nests to enable correlation with observed activities and data recorded as part of avian radar and avian use survey efforts.

6. Prey Base Evaluations and Incidental Observations

During other ongoing survey efforts associated with the project, incidental observations of all large raptors and other avian species are being recorded. Incidental observations are also being recorded for all potential raptor prey items, large herds of ungulates, and other unique or unusual observations. These data will be correlated with observed avian use patterns to determine important foraging/scavenging areas as well as to document other areas of high use activity that might be missed as part of other surveying efforts.

Analysis and APP/ECP Development

Data collected as part of the survey efforts described above will be analyzed to quantify avian use across the project area. Avian use information will be used in final project design and to identify areas where Advanced Conservation Practices and Best Management Practices might be implemented to avoid, minimize, and mitigate potential impacts of this nationally important, large-scale clean energy investment.



horizontal_heading_2011_05_22_16_Mountain Standard Time

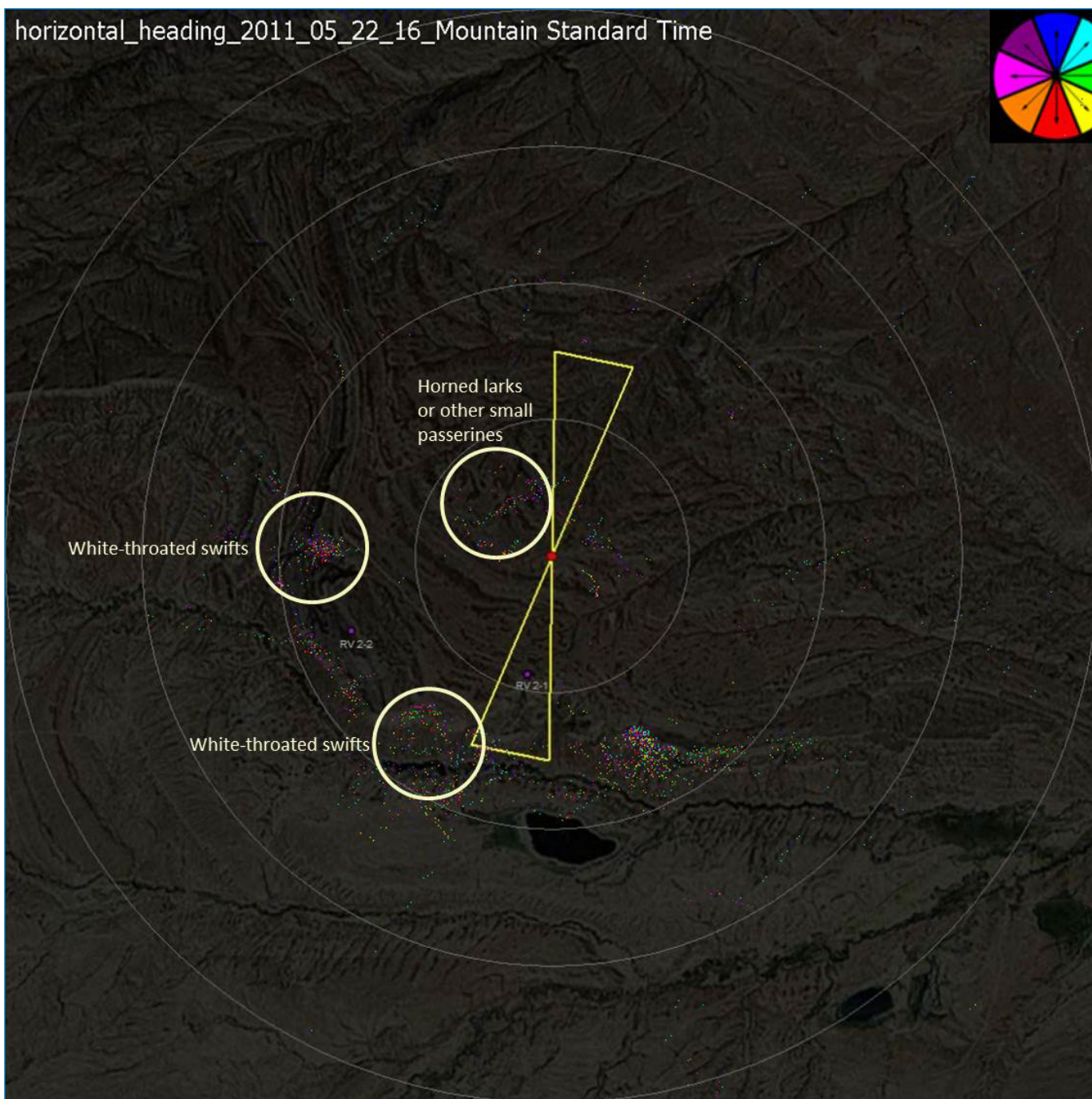


Figure 1: All Targets. This image plots all targets that were recorded in the horizontal radar on May 22, 2011, from 4 p.m. to 5 p.m. MST. Each ring surrounding the radar represents 1 nautical mile (1.15 miles). Scale of the image is 4 nautical miles (4.6 miles) to the edges and about 5.5 nautical miles (6.3 miles) to the corners.

The image indicates a moderate amount of biological activity along the cliff bands south and west of the current radar location. The image also indicates some activity close to the radar location. The activity to the south and west of the radar location falls outside of the current wind development area, while the activity near the radar location falls within the current footprint for wind development. Based on data collected during radar validation surveys, it is known that much of the biological activity south and west of the radar location can be explained by white-throated swifts, a small swallow-like bird that forages and nests along vertical surfaces. It is also known that much of the activity near the radar location is explained by horned larks and other small passerines. Several potential flight paths are evident in the image, but it is impossible to identify areas of activity for large targets (eagles, other raptors, waterfowl, ravens, etc.) without first applying a size filter to the data collected.



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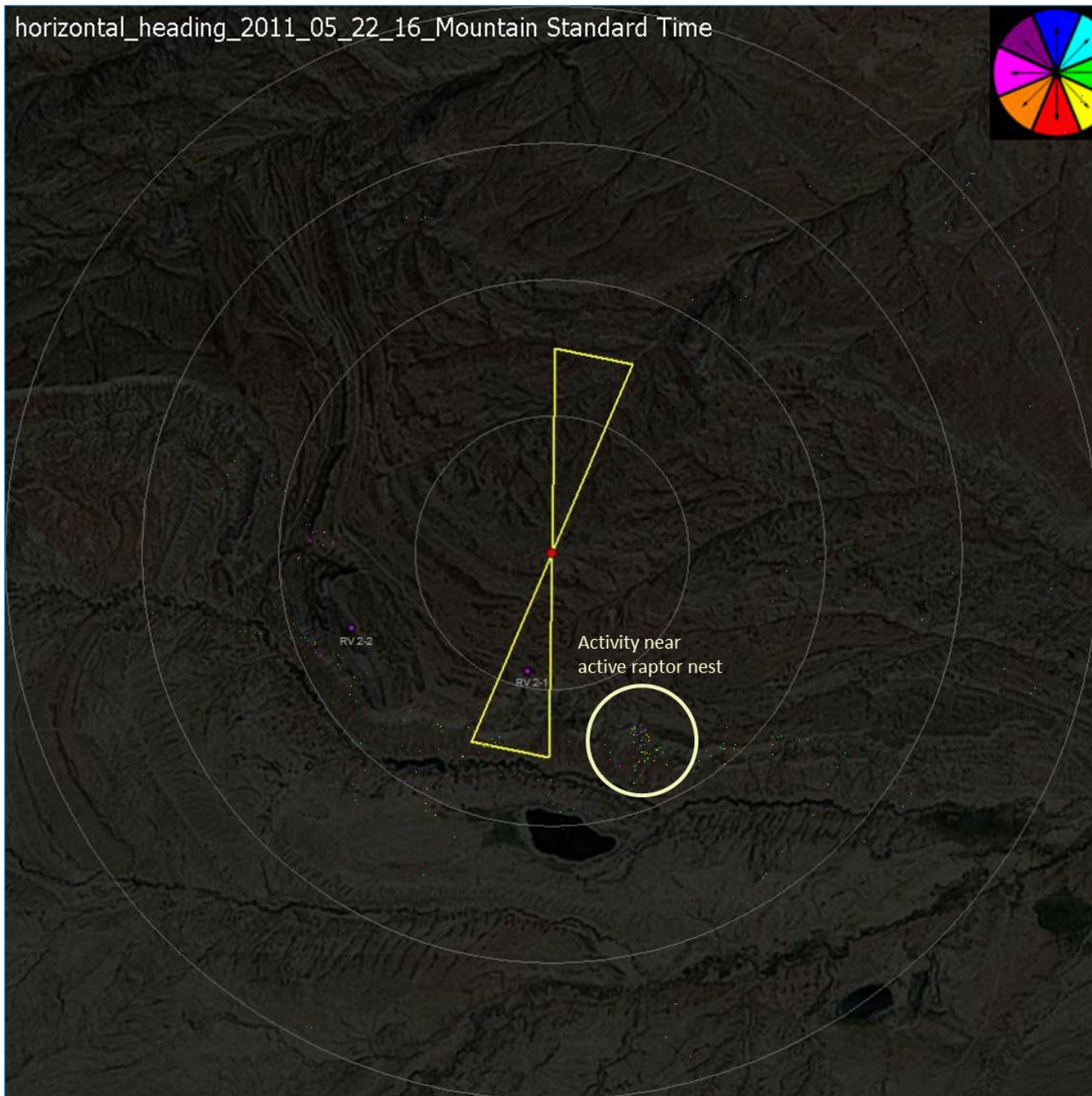


Figure 2: Large Targets. This image plots large targets that were recorded in the horizontal radar on May 22, 2011, from 4 p.m. to 5 p.m. MST. It illustrates the activity level once the large-target size filter was applied.

Targets illustrated in this image are individuals crow-sized and larger or tightly packed flocks of smaller birds. Note that the activity near the radar is no longer present and that the activity along the cliff bands to the south and west of the radar has substantially decreased. Some of the remaining targets south and west of the radar are likely groups of swifts that are reflective enough to be recorded as large targets. Other remaining areas of activity occur near an active nest (see label on image) that was documented during helicopter surveys during spring 2011 as well as a potential track of an eastbound bird to the west of the point labeled RV 2-2.

