STUDY PLAN

Post-Construction Wildlife Studies and Monitoring

Year 2 (2013-2014)

Spring Valley Wind Energy Facility
White Pine County, Nevada

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NATURAL RESOURCES ◆ SCIENTIFIC SOLUTIONS

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1.0 INTRODUCTION

Spring Valley Wind Energy Facility LLC (SVW), a subsidiary of Pattern Renewables Development Company LLC, is operating the Spring Valley Wind Energy Facility (SVWEF) in White Pine County, Nevada. The project is located on 7,673 acres of land managed by the Bureau of Land Management (BLM) in north Spring Valley, approximately 20 miles east of Ely, Nevada (Figure 1). The SVWEF consists of 66 Siemens 2.3 megawatt (MW) wind turbines with a total generating capacity of 151.8 MW. The turbine towers are approximately 80 meters tall and the rotor blades are approximately 101 meters in diameter, for a maximum height of approximately 130.5 meters from turbine base to fully extended blade tip. The SVWEF turbines are arranged along five strings designated as Alpha (A string), Bravo (B string), Charlie string (C string), Delta (D string), and Echo (E string).

In October 2007, SVW applied for a ROW grant from the BLM for Commercial Wind Energy Development Facilities. The BLM - Ely District Office prepared an Environmental Assessment (EA) to determine whether the project would create significant environmental impacts, and the Final EA (BLM 2010) and Finding of No Significant Impact were issued in October 2010. In accordance with BLM Instruction Memorandum No. 2010-156, an Avian and Bat Protection Plan (ABPP) was developed for the project and incorporated as an Appendix to the EA. The ABPP was developed in consultation with the involved agencies and identifies measures that SVW will implement to avoid, minimize, and mitigate project-related impacts to birds and bats.

The EA and associated ABPP identify post-construction monitoring studies and associated protocols for the SVWEF. In January 2011, a lawsuit was filed alleging that the BLM violated the National Environmental Policy Act (NEPA), and the subsequent Settlement Agreement (SA) modified some study protocols. This Study Plan presents detailed protocols for the post-construction monitoring program based upon the studies outlined in the EA and ABPP, as modified by the Settlement Agreement. Where protocols have not been specified in existing document, we have presented protocols that are consistent with current industry standards.

In addition to the formal fatality monitoring described in this Study Plan, the Wildlife Incident Response System (WIRS) outlines a process and directions for facility personnel to report and respond to wildlife incidents that occur within the SVWEF (Appendix A). The WIRS will be implemented during ongoing studies and for the life of the project.

The ABPP promotes implementation of an adaptive management strategy for the SVWEF. The establishment of a Technical Advisory Committee (TAC) was a key component of this strategy. The TAC is responsible for approving the annual Study Plan and providing recommendations for revisions to post-construction monitoring and studies. Therefore, this Study Plan may be revised again in the future in response to modifications recommended by the TAC and approved by the BLM through an adaptive management process.

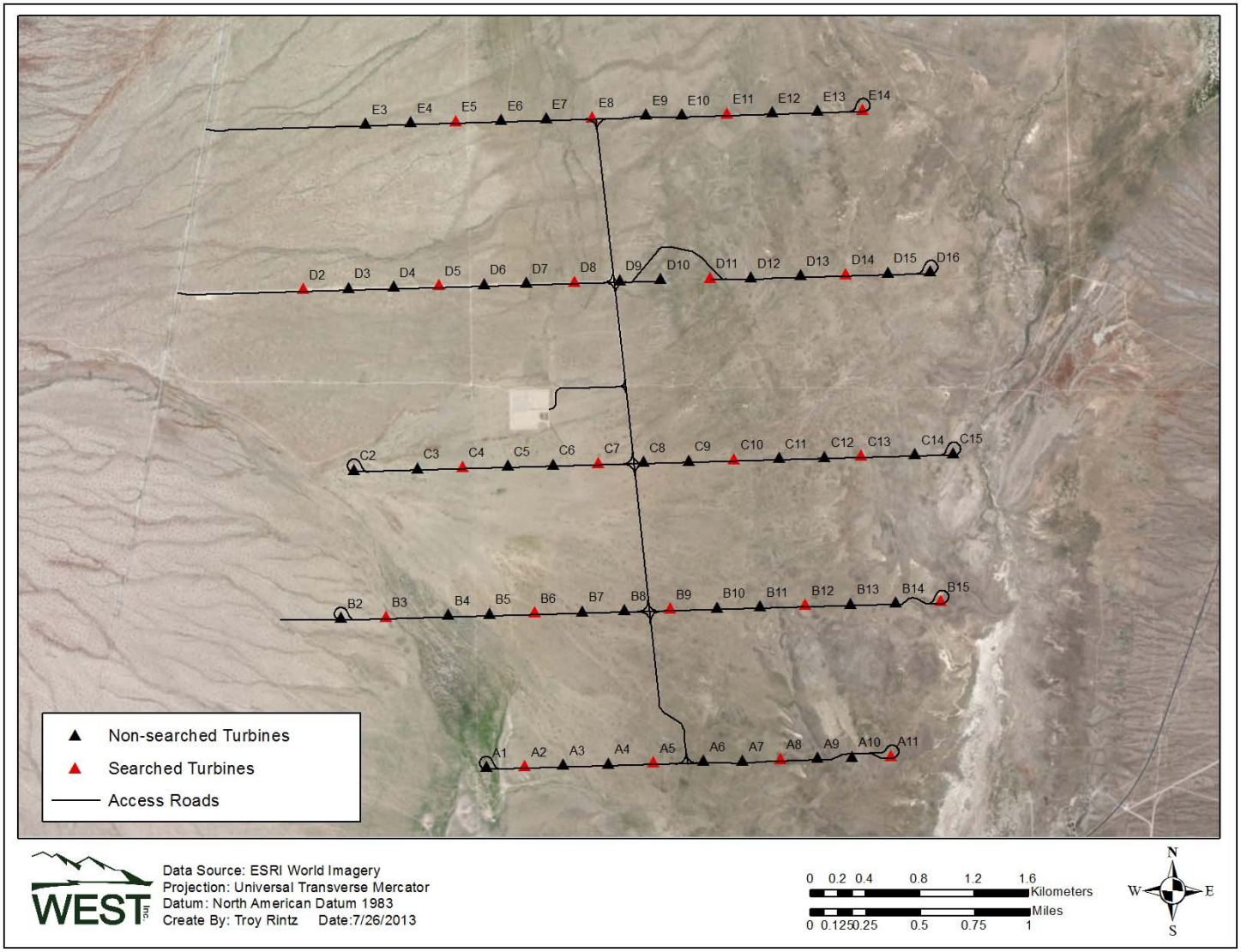

Figure 1. Spring Valley Wind Energy Facility location and turbine layout.

2.0 TECHNICAL ADVISORY COMMITTEE

The TAC, an advisory committee consisting of resource specialists from the BLM, USFWS, and NDOW, was established for the SVWEF and is responsible for oversight of the post-construction monitoring program. The TAC reviewed and approved the first year Study Plan, upon which this year 2 Study Plan is based. The TAC will also review this year 2 study plan and provide approval of its implementation. The TAC is also responsible for reviewing annual reports and interim data submittals as well as recommending modifications to study protocols to the BLM Authorized Officer based upon an adaptive management framework. The TAC will provide recommendations to the BLM Authorized Officer on protocol changes and the need to implement measures to monitor and/or mitigate impacts to avian and bat species and their habitats related to operations. The TAC will be disbanded when the BLM Authorized Officer determines that it is no longer useful.

The BLM designated a TAC Lead whose duties include organizing and moderating TAC meetings, reviewing bi-weekly mortality data, disseminating information and reports to other TAC members, and documenting mitigation recommendations for the SVWEF. A Memorandum of Agreement (MOA) was signed by each TAC member to ensure participation and identify guiding principles, duties, and responsibilities of the TAC.

The TAC held its first meeting on May 22, 2012 to develop and approve the charter and review the draft year-1 study plan. The TAC is scheduled to meet annually to discuss study results and plans for future studies. Attendance at TAC meetings is by invitation only. If invited by the TAC, WEST staff will attend meetings in a technical capacity to review study protocols and results. The TAC met to review Year 1 study results and discuss the Year 2 study plan on January 15, 2014. This Year 2 Study Plan has been prepared based on the discussions at that January 15 TAC meeting.

3.0 POST-CONSTRUCTION STUDIES AND MONITORING - YEAR 2

3.1 Mortality Surveys

Objectives

The ABPP requires bird and bat Mortality Surveys during the first three years of operations. The Settlement Agreement added Mortality Surveys 1) for bats only in August and September of Year 4 and 2) for birds and bats in Years 5, 7, 10, and every fifth year after. The ABPP also states that the TAC can recommend reduced survey efforts during subsequent surveys based on the initial three years of survey data, so long as at least two quarters are monitored in each survey year. The TAC may also require more extensive monitoring. As required by the ABPP, in the event of a golden eagle fatality the 44 “non-search” turbines will be searched during the survey period in which the eagle fatality occurred.

The primary objective of the Mortality Surveys is to develop estimates of annual avian and bat fatality rates at the SVWEF. This section describes the four primary components of Mortality Surveys: (1) standardized carcass searches, (2) searcher efficiency trials, (3) scavenger removal trials, and (4) data analyses and reporting.

There are three scenarios under which casualties may be found at the SVWEF: (1) within search plots during the standardized carcass searches, (2) within search plots while searchers are on site but not conducting a standardized search, and (3) by project personnel during other activities such as turbine maintenance. The reporting and handling methods for casualties found by project personnel are presented in the WIRS (Appendix A). All casualties found by study personnel will be recorded in accordance with the methods described below, and will be analyzed under the assumptions that the fatality was caused by the SVWEF.

Study Design

Standardized Carcass Searches

In accordance with the ABPP, each year of Mortality Surveys will consist of standardized carcass searches at one-third (22) of the turbines every other week for an entire year (Table 1). Turbines for the year-long Mortality Surveys were chosen using a systematic sample with a random start. First, turbines were listed from left to right on the first string on the map (starting with E3), right to left on the second string on the map, left to right on the third string on the map, and so forth until all 66 turbines were listed. A single random sample was generated from the numbers 1 to 66 using program R to obtain a random start value of 55. Starting with the 55th turbine on the list, every third turbine was selected for monitoring. This process yielded the following 22 turbines for the year-long Mortality Surveys (Figure 1 and Table 2). This set of 22 turbines was used in Year 1 and will be used again throughout Year 2 studies.

Table 1. Standardized carcass searches by season for Year 1 mortality surveys

Season	Dates	# bi-weekly search periods/ total turbine searches
Spring migration	March 16 – May 15	4/88
Summer	May 16 – August 15	7/154
Fall migration	August 16 – October 31	5/110
Winter	November 1 – March 15	10/220
Total		**26/572**

Table 2. Turbines selected for Year 1 mortality surveys

String A	String B	String C	String D	String E
A2	B3	C4	D2	E5
A5	B6	C7	D5	E8
A8	B9	C10	D8	E11
A11	B12	C13	D11	E14
–	B15	–	D14	–

In accordance with the ABPP, standardized carcass searches will be conducted within 126 x 126 meter plots centered on the turbine. Trained field technicians will systematically search each plot for avian and bat fatalities by walking parallel transects spaced approximately 6 meters apart and scan both sides of the transect for carcasses. Figure 2 illustrates a typical search plot and transects. For the purposes of Mortality Surveys, the condition of carcasses found by searchers will be classified according to the following criteria:

- **Intact** - a carcass that is completely intact, is not badly decomposed, and shows no sign of being fed upon by a predator or scavenger
- **Scavenged** – an entire carcass that shows signs of scavenging or is heavily infested by insects, or portion(s) of a carcass in one location (e.g., wings)
- **Feather Spot** - 10 or more feathers (or two or more primary feathers) at one location indicating predation or scavenging

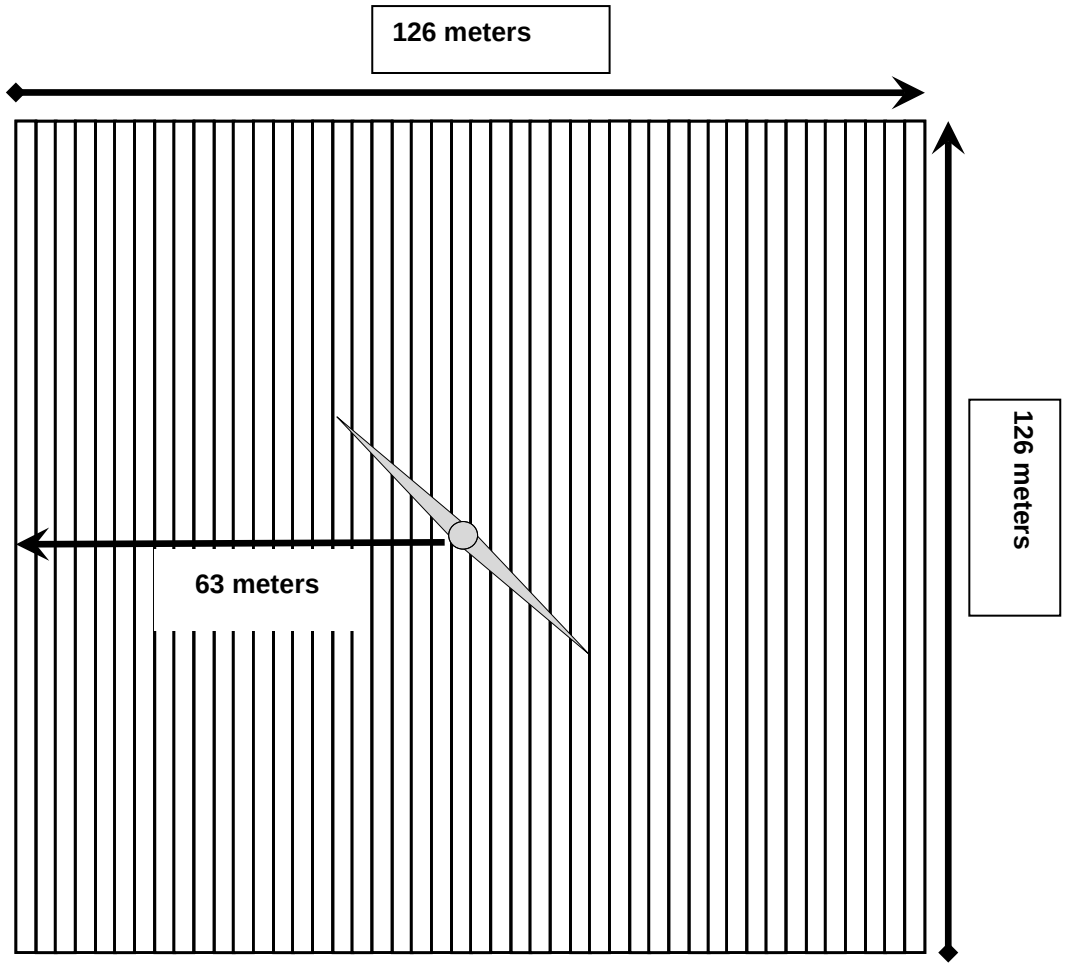

Figure 2. Schematic of turbine search plot and transects

All bird and bat carcasses found during the standardized searches will be labeled with a unique number, bagged, and stored in a freezer at the SVWEF O&M building. A data sheet will be completed for each carcass to record species, sex and age (when possible), date and time collected, location (GPS coordinates), carcass condition, habitat type, cause of death, and any comments. All casualties will be photographed in the field and the location will be plotted on a detailed topographic map that shows the location of the carcass in relation to the nearest turbine and other facilities (e.g., overhead power lines). A copy of the data sheet will accompany each carcass at all times.

Casualties found by searchers outside the formal search plot will be treated in accordance with the protocol described above. These casualties will be classified as incidental discoveries and documented in the manner described above. Casualties found by maintenance personnel and others not conducting the formal searches are documented in accordance with the procedures outlined in the WIRS (Appendix A).

Searcher Efficiency Trials

Searcher efficiency trials will be conducted to develop estimates of the proportion of casualties which are not detected by searchers (searcher detection bias). Searcher efficiency trials will be conducted throughout the year to encompass variable field conditions that may affect surveyor carcass detection.

Each trial will consist of placing approximately 20 carcasses divided among two size classes (small and large) in search plots. Carcasses utilized for searcher efficiency trials will consist of birds and bats found during standardized carcass searches at SVWEF and/or non-native or commercially-available species. Large birds will be represented by species such as mallard (*Anas platyrhynchos*) and ring-necked pheasant (*Phasianus colchicus*), while small birds include species such as house sparrow (*Passer domesticus*) and Coturnix quail (*Coturnix* spp.). Small brown birds (e.g., house sparrows) may be used in lieu of bat carcasses, if necessary.

Searcher efficiency trials will be conducted simultaneously with fatality searches. Trial carcasses will be randomly placed within turbine search plots by a field biologist prior to a scheduled carcass search. Searchers will not be told when or where trials are being conducted to minimize potential bias. Each trial carcass will be discreetly marked to distinguish it from an actual fatality. Carcasses will be dropped from waist height and allowed to land in a variety of postures. Searchers will record the location of each trial carcass found during standardized carcass searches. Immediately following completion of the search, all carcasses not found by searchers will be relocated to determine the number of carcasses that remained available for detection but were not found.

Searcher efficiency trial data will be analyzed to develop estimates of detection bias by (1) carcass size, (2) season, and (3) habitat type (if necessary). The resulting data will be utilized to adjust annual estimates of bird and bat fatality rates for searcher detection bias

Carcass Removal Trials

The objective of carcass removal trails is to estimate the average length of time a carcass remains in the search plot (is not removed scavengers) and is available for detection by searchers. Carcass removal trials will be initiated when carcass search studies begin, and will be conducted throughout the year to incorporate the effects of varying field conditions and scavenger densities. For each trial, approximately 10 large bird carcasses and 10 small bird carcasses will be discreetly marked and placed in the field. Bat carcasses will also be used during the summer and fall seasons (if available). Small brown birds (e.g., house sparrows) may be used to in lieu of bat carcasses, if necessary. All trial carcasses will be handled with disposable gloves to minimize human scent on the carcasses.

In accordance with the ABPP, field technicians will monitor the trial birds on days 1, 2, 3, 4, 5, 6, 7, 14, 21, 28, and 40. This schedule may vary slightly depending on weather. At the end of trial period, all evidence of remaining trial carcasses will be removed. Carcass removal trial data will be analyzed to develop separate estimates for large birds, small birds, and bats, and the results of will be used to adjust annual fatality estimates of bird and bat fatality rates for removal bias.

Data Analyses and Reporting

Adjusted annual fatality estimates will be developed for all birds, all bats, small birds, large birds, and raptors. These estimates will be based upon the number of carcasses found during standardized carcass searches as adjusted for searcher efficiency and carcass removal biases. Adjusted fatality estimates will be calculated by season, and an annual estimate will be developed by summing the values across seasons, if warranted based on bias trial data. If bias trial data does not differ across seasons, data will be pooled and an annual fatality estimate calculated. The final estimates of *m* and associated standard errors and 90% confidence intervals (CI) will be calculated using bootstrapping (Manly 1997). The reported estimates will be the mathematical means of 1,000 bootstrap estimates. The standard deviation of the bootstrap estimates is the estimated standard error, and the lower 5th and upper 95th percentiles of the 1,000 bootstrap estimates are estimates of the lower limit and upper limit of 90% confidence intervals.

An appropriate choice of formula for estimating the probability that a carcass is available to be detected and is detected by observers will be made based on the average carcass removal time relative to the search interval. If the average removal time is shorter than the search interval, the Shoenfeld (2004) estimator will be used to calculate this probability. If the average removal time is longer than the search interval, then both the Shoenfeld and the Huso (2010) estimator may be used and the results compared in accordance with industry recommendations (NWCC 2011). If differences exist between the two estimates, possible causes for the differences will be investigated.

A summary report will be prepared that includes the study methods and protocols, study results, statistical analyses, and adjusted annual fatality estimates on a "per MW" and "per turbine" basis.

Disposition of Carcasses

Carcasses found during the study will be stored in a freezer at the SVWEF O&M building with the associated data sheet. The final disposition of carcasses will be in accordance with the requirements of the USFWS Special Purpose Permit and NDOW Scientific Collection Permit, as well as the species' legal status. Intact bird and bat carcasses may be use for searcher efficiency and carcass removal trials. Bird and bat carcasses not suitable for trials will be buried unless otherwise directed. SVW will notify the USFWS and NDOW of any casualties involving eagles or federal/state threatened or endangered species in accordance with permit stipulations (Section 4.3).

3.2 AnaBat Acoustic Surveys

Objectives

The primary objectives of the AnaBat Acoustic Surveys include (1) collecting data on seasonal patterns of bat activity within the SVWEF and (2) evaluating correlations between bat activity levels and bat mortality documented through the Mortality Surveys. The data collected through the AnaBat Acoustic Surveys will also supplement information collected by the on-site radar

systems. The ABPP requires that AnaBat Acoustic Surveys be conducted throughout post-construction studies to help correlate bat activity levels with mortality events. Given this objective, it is assumed that AnaBat Acoustic Surveys will be conducted in the same years as Mortality Surveys (Years 1, 2, 3, 4, 5, 7, 10, and every 5th year thereafter).

Field Methods

The AnaBat Acoustic Surveys will utilize Anabat™ II bat detectors (Titley Scientific™, Australia) coupled with Zero Crossing Analysis Interface Modules (ZCAIM; Titley Scientific™, Australia). An array of three AnaBat microphones will be installed on the permanent MET tower (Figure 3) at heights of approximately 10 m (32 feet), 30 m (98 feet), and 60 m (197 feet). The units are set to a sensitivity level of six to reduce interference from "non-bat" sources of ultrasonic noise (e.g., insects, raindrops, etc.). Microphone sensitivities are calibrated using a BatChirp ultrasonic emitter to ensure similar detection ranges for all three detectors.

Anabat detectors are placed inside weather-tight containers to minimize the potential for water damage. Anabat microphones are mounted on the MET tower. The microphones are encased in a Bat-Hat weatherproof housing (EME Systems, Berkeley, California). AnaBat units are programmed to record acoustic data nightly from 30 minutes before sunset to 30 minutes after sunrise. Bat calls are recorded on a large-capacity memory card in each of the Anabat units, and data cards are downloaded weekly or bi-weekly throughout the survey period.

The AnaBat Acoustic Surveys are conducted between March 1 and October 31, which represents the general period of bat activity in the project area and encompasses the fall migration period for the Mexican free-tailed bat (Sherwin 2009).

Data Analysis and Reporting

At the conclusion of each survey season, AnaBat acoustic data will be analyzed. The standard metric for measuring bat activity is the number of bat passes per detector-night. A bat pass is defined as a continuous series of two or more call notes produced by an individual bat with no pauses of more than one second between call notes (Hayes 1997, White and Gehrt 2001, Gannon et al. 2003). Bat activity at SVWEF will be quantified by counting number of bat passes which do not represent numbers of individuals but rather indices of bat activity. The number of bat passes will be determined by downloading the data files to a computer and tallying the number of echolocation passes recorded and the total number of passes was corrected for effort by dividing by the number of detector-nights. The number of bat passes will be determined by an experienced bat acoustic analyst using Analook. Activity rates will be analyzed to evaluate seasonal tends or patterns and periods of peak activity.

Bat activity will also be analyzed utilizing an acoustic activity index (AI), which is the number of minutes of activity per night by each species. The IA value is obtained by taking the sum of 1-minute time increments for which a species was detected and dividing by the number of sampling nights (Miller 2001). The resulting value is then multiplied by a factor of 100 so that values consist of whole numbers (IA = minutes of activity/nights of recording*100). The IA will be rounded to the nearest whole number.

The AnaBat acoustic data will also be evaluated in an effort to determine bat species. Bat passes will be sorted by their minimum frequency into two groups based on their minimum frequency that correspond roughly to species groups of interest. For example, most species of *Myotis* bats echolocate at frequencies greater than 30 kHz (HF), whereas other species such as the big brown bat, silver-haired bat, and hoary bat typically emit echolocation calls below 30 kHz. An experienced bat acoustic analyst will qualitatively identify echolocation calls through visual comparison of echolocation call metrics (e.g., minimum frequency, slope, duration) to reference calls of known bats (Yates and Muzika 2006). To establish which species may have produced passes in each category, a list of species expected to occur in the study area will be compiled from range maps.

WEST will analyze the data for Year-2 AnaBat surveys and include the information in the annual report. The analysis of AnaBat acoustic data will assess correlations between bat activity documented by AnaBat surveys and radar systems, and bat fatalities documented through curtailment studies and mortality surveys. These data may be used to refine the timing of turbine curtailment in an effort to maximize the effectiveness of such efforts. The ABPP calls for analysis of bat data every 6 months; however, since the AnaBat surveys will be conducted for 8 months each year (March 1 through October 31), only one analysis will be done and the information will be included in the annual report.

3.3 Raptor Nest Surveys

Objectives

The ABPP requires that Raptor Nest Surveys be conducted for the first three years following construction and every fifth year after that. The primary objective of the Raptor Nest Surveys is to determine activity status and monitor annual productivity of all raptor nests within the SVWEF and 1-mile buffer and all golden eagle nests within 10 miles of the project area. The data acquired through these surveys will be utilized to determine the (1) locations of seasonal buffers, (2) need for additional mitigation to reduce impacts to raptor nesting, and (3) effectiveness of mitigation measures.

Field Methods

In accordance with the ABPP, the Raptor Nests Surveys will encompass the SVWEF and 1-mile buffer for general raptors, and all historic nests and suitable nesting habitat within a 10-mile buffer for golden eagles. During each year that raptor nest surveys are conducted, an initial aerial (helicopter) survey will be conducted prior to the nesting season (before March 15) to document all nests within the specified buffers. The aerial survey will be conducted by an experienced biologist in accordance with standard raptor and golden eagle nest survey protocols, including surveying all potential nesting habitat, flying low and slow, and conducting surveys on clear days with relatively low wind speeds (<20 MPH). Data sheets will be developed specifically for the raptor nest surveys, and will include date, observer, weather and wind conditions, GPS location, nest condition and activity status, nest substrate, and presence of raptors on the nest or in the general vicinity. A GPS track flight log will be recorded for the

entire survey. The initial Year 2 aerial nest survey will be conducted in March 2014.

All raptor nests and potential golden eagle nests identified during the aerial survey will be monitored once a month during the active nesting season (March 15 to July 30). Monitoring will be conducted from a ground-based vantage point by a qualified field technician. The technician will complete a data sheet for each visit that will record date, time, observer, weather, presence/absence of adults, behavior (e.g., nest preparation, incubation, etc.), presence of eggs or hatchlings, and other observations. Nests at which there is no sign of activity or raptor presence after 3 visits (by end of May) will be classified as inactive and no longer monitored for that year.

Data Analysis and Reporting

An annual report will be prepared that summarizes the results of the raptor nest surveys, including a track flight log. The report will include a summary of the aerial surveys and ground-based monitoring, as well as an assessment of annual productivity by species. An evaluation of nest activity status and distance from the SVWEF will be completed, and reports after the first year will include multi-year trend assessments. Finally, trends in raptor nest activity and productivity will be compared to raptor fatality rates documented at SVWEF.

3.4 Avian Monitoring

Objectives

The ABPP requires that Avian Monitoring be conducted for the first two years of operation using the same methods as pre-construction studies. The ABPP states that "General use point-count data will be collected to provide an accurate comparison between pre- and post-construction use to inform our understanding of avian exposure and probability of mortality as well as behavioral responses to the facility. Raptor count data would be collected to help determine how post-construction use compares to recorded mortality." However, all five general avian use points and three of the four raptor points surveyed during pre-construction studies are located outside the SVWEF, thereby precluding comparison of pre- and post-construction avian use.

An alternative Avian Monitoring study design was developed that will facilitate the assessment of avian behavioral response to the facility as well as correlations between species use and recorded fatalities for raptors and other birds. This study design includes two years of standard point count surveys and transects as described below. Data sheets were specifically developed for the Avian Monitoring surveys.

Field Methods

Fixed-Point Avian Use Surveys

Fixed-point avian use surveys will be conducted at eight points located within and adjacent to the SWVEF (Figure 3). Three fixed points (PCM 1, PCM7, and PCM8) correspond with passerine observation points PS2, PS1, and PS3 that were surveyed during pre-construction studies (SWCA 2009). Fixed-point circular plots will be utilized for both passerine and raptor

surveys following the field methods described by Reynolds et al (1980). The eight avian use points were selected to survey representative habitats and topography while also providing relatively even coverage of the SVWEF. Year-2 avian point counts started in August 2013 and will continue through July 2014.

Each observation point will be surveyed for 30 minutes twice a month (24 times per year). The survey viewsheds will include an 800-meter (m) radius area for large birds and 100-m radius for small birds. All birds observed during each fixed-point survey will be recorded regardless of distance from observer. Due to potential for classification error, observations of large birds beyond 800-m and small birds beyond 100-m of the point will be recorded but excluded from statistical analyses. For this study, large birds will include waterbirds, waterfowl, rails/coots, shorebirds, raptors, owls, vultures, upland game birds, doves/pigeons, and large corvids. Small birds will include passerines (excluding large corvids), swifts/hummingbirds, woodpeckers, and cuckoos. Flight paths for all raptors will be recorded and digitized. In accordance with standard protocol, only observations within the 800-m viewshed will be included for raptor use estimates.

Breeding Bird Transects

A series of ten 800-m long transects (7 project and 3 control) have been established and will continue to be surveyed to document species use within the SVWEF and to obtain information on disturbance and displacement of breeding birds at turbines using a gradient design (Figure 3). Transects are generally oriented perpendicular to the turbine strings, with one end of each transect located at a turbine. Each transect is divided into eight 50-m blocks for data collection and analyses. The seven project area transects have been designed to provide thorough coverage of all major habitat types and the SVWEF project area. The three control transects are located in similar habitats to the project area transects but approximately 1 mile away from the turbine strings.

Surveyors will slowly walk along the 10 transects and record all birds observed or heard within 50 m of either side of the transect line. Surveyors will record the species, behavior, distance from transect line, and the block in which each observation was recorded. Each transect will be surveyed three times during the peak of breeding season (May 1 to June 30). Surveys will be conducted between sunrise and 10:00 a.m. on days when winds are less than 10 mph.

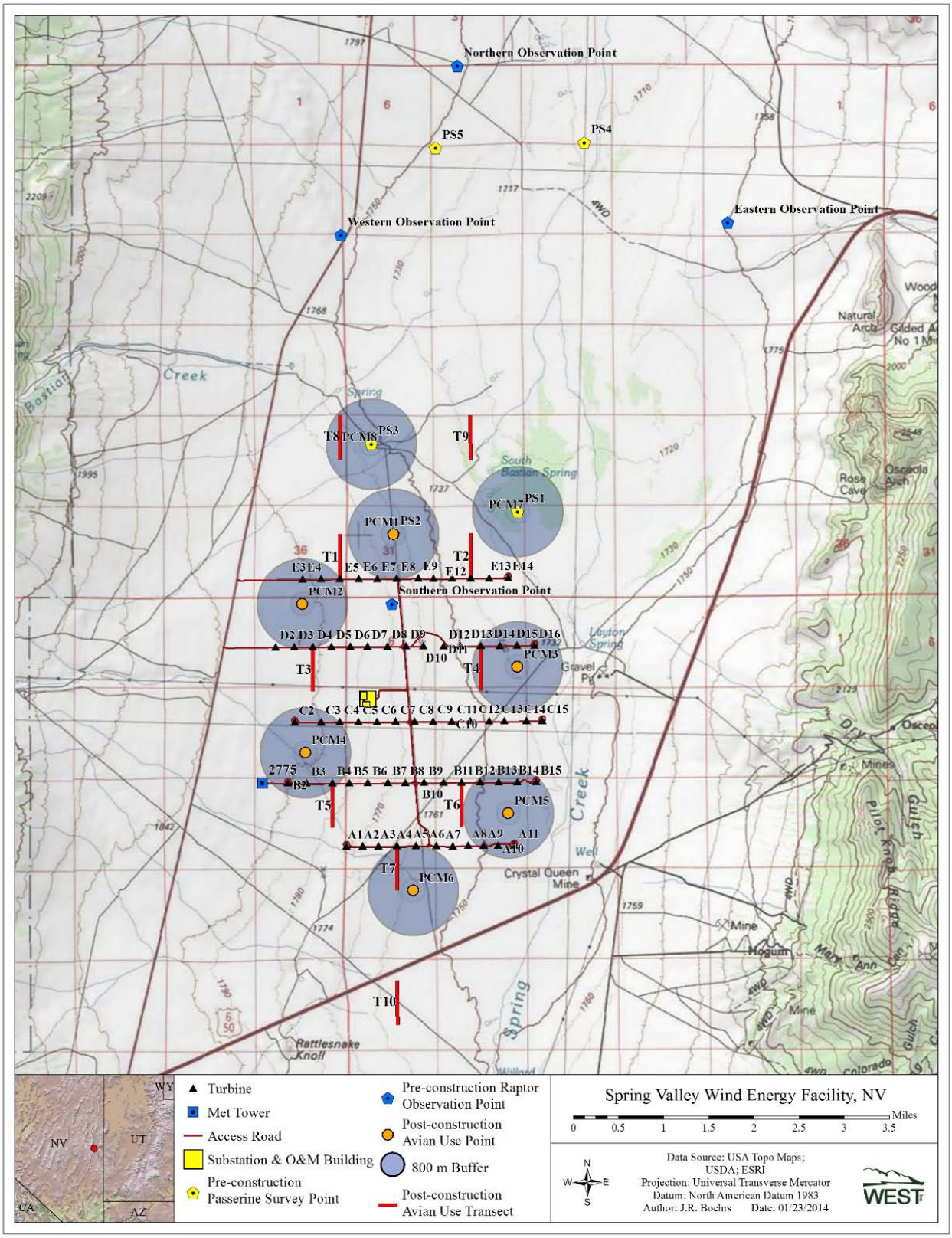

Figure 3. Fixed point and transect locations for avian use surveys at SVWEF

Data Analysis and Reporting for Additional Avian Monitoring

Results of the Avian Monitoring studies will be included in the annual report. The report will include estimates of species richness and diversity, avian use and abundance, spatial use, raptor flight paths, and exposure risk based on data collected during post-construction Avian Monitoring. The report will evaluate spatial and temporal trends in avian use at the SVWEF, and will present a comparison of pre- and post-construction avian use for specific bird species and subgroups (e.g., corvids). Raptor flight paths will be analyzed to assess changes in use and potential behavioral responses to the presence of turbines and/or human activity at the SVWEF.

A gradient analysis (Morrison et al. 2001) will be used to evaluate relationships between bird densities (bird use; number of birds/block/survey/transect) and distance from turbines. Differences in average use per 50-m segment will be compared using two-sample t-tests with 90% confidence intervals. Interpretation of results will focus on trends and patterns using an alpha value of 0.01 (p-value = 0.01).

3.5 Incidental Observations

Field technicians will document wildlife species observed incidentally during the course of conducting field surveys and travelling through the facility. For each incidental observation, technicians will record date, time, species, number of individuals, sex/age class (if identifiable), distance from observer, behavior, and habitat type. Incidental observations will focus on special status species (e.g. pygmy rabbit, long-billed curlew, etc.), big game species, and raptors including eagles. A summary of incidental observations will be included in the annual report.

4.0 REPORTING

4.1 Annual Report

As required by the ABPP, an annual report will be prepared and submitted to the designated TAC Lead during the first quarter of each year. The annual report will summarize the protocols, results of field studies and statistical analyses, and associated conclusions for each of the studies conducted during the previous year.

The TAC Lead will distribute the draft annual report to all TAC members for review and solicit comments from other members. Once all comments have been received, the TAC Lead will prepare a summary of comments and suggested revisions to SVW. SVW will revise the report in response to TAC comments, and will submit a final annual report to the TAC Lead within 2 weeks of receipt of the comment letter.

4.2 Interim Data Submittals

The ABPP requires that copies of all field data sheets and a mortality tracking spreadsheet be submitted to the TAC Lead within one week of completion of each bi-weekly round of Mortality Surveys. The spreadsheet will be used to track the total number of mortalities of each species so that management actions can be implemented immediately should avian or bat mortality levels warrant such actions.

4.3 Special Status Species Reporting

SVW will notify the TAC Lead as soon as possible, but no more than 48 hours after discovery, of any fatality involving a federally Threatened, Endangered, or Candidate species or a bald or golden eagle.

5.0 TENTATIVE STUDY SCHEDULE

Figure 4 presents a general schedule for the post-construction studies based upon requirements identified in the EA, ABPP, and Settlement Agreement.

Commitment	Source[1]	YEAR																																
		Q3/4 2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Curtailment study - conducted from August 1 - September 31 in Year 1	ABPP, pg. 17	■																																
Bird and bat mortality surveys - conducted in Years 1, 2, 3, 5, 7, and 10, and every 5 years thereafter.	ABPP, pg. 19 SA, pg. 3	■	■	■	■		■		■			■					■					■					■						
Fall bat-only mortality surveys - in Year 4	SA, pg.3					■																												
Bat acoustic surveys - conducted throughout the post-construction studies to correlate bat activity with mortality events	ABPP, pg. 21	■	■	■	■	■	■		■			■					■					■					■						
Avian use surveys - conducted during the first two years of operation	ABPP, pg. 21	■	■	■																														
Raptor nest surveys - during the first 3 years and every fifth year after that	EA, pg. 25 DR, pg. 3 ABPP, pg. 21		■	■	■					■					■					■					■					■			
Annual reports - submitted to TAC Lead in the first quarter of each subsequent year	ABPP, pg. 22		■	■	■	■	■	■		■	■		■			■		■			■		■			■		■				■	

Figure 4. General schedule for post-construction monitoring at Spring Valley Wind

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Appendix A. SVW Wildlife Incident Reporting System (WIRS)

SPRING VALLEY WIND
WILDLIFE INCIDENT REPORTING SYSTEM (WIRS)

BACKGROUND AND INTRODUCTION

The US Fish and Wildlife Service (USFWS) requests that casualties of birds protected under the Bald and Golden Eagle Protection Act (BGEPA), the Endangered Species Act (ESA), and the Migratory Bird Treaty Act (MBTA) be reported. Pattern operations personnel will record and report all dead and injured birds and bats found incidentally in the Spring Valley Wind (SVW) project area over the entire life of the project as part of the project operations and monitoring efforts. The purpose of this Wildlife Incident Reporting System (WIRS) is to standardize the actions taken by site personnel in response to wildlife incidents found in the SVW facility boundaries. The WIRS provides direction for site personnel who may encounter a wildlife incident in an effort to fulfill SVW obligations in reporting wildlife incidents.

In addition to this WIRS, SVW is also implementing a post-construction monitoring study to investigate and assess the direct impacts of the development on birds and bats. The monitoring study will include standardized carcass searches and bias trials conducted by qualified field biologists. A detailed fatality monitoring study plan and sampling protocol has been developed for the post-construction monitoring study. Wildlife fatalities or injuries found by project personnel or others will be reported and processed following the protocols described in this document.

SPRING VALLEY WIND WIRS POLICY

This WIRS will be active for the life of the SVW project. All employees and subcontractors of Pattern have a responsibility to comply with all environmental laws and regulations. Most birds are protected by the federal Migratory Bird Treaty Act, and eagles are further protected by the Bald and Golden Eagle Protection Act. Under these federal statutes, it is illegal to harm, harass, kill, or collect birds that may be found in the wind project. A summary of these statutes is presented below. While bats are generally not protected by federal law unless listed as a threatened or endangered species, it is the policy of Pattern to treat bat incidents the same as avian incidents and they are also covered by this WIRS.

It is illegal to collect an injured or dead bird without appropriate federal and state permits. **THE POSSESSION, TRANSFER OR TAMPERING WITH ANY AVIAN OR BAT SPECIES (ALIVE OR DEAD) BY SPRING VALLEY WIND EMPLOYEES OR SUBCONTRACTORS IS STRICTLY PROHIBITED.** The WIRS is designed to provide a means of recording and collecting data regarding avian and bat species found in the wind project to increase the understanding of wind turbine and wildlife interactions. Pattern maintains an ongoing commitment to investigate wildlife incidents involving company facilities and to work cooperatively with federal and state agencies in an effort to minimize the potential for future bird and wildlife fatalities. The objective of this policy is to insure that the best available information about avian and bat incidents found in the wind facility is recorded and the proper authorities are notified. It is the responsibility of Pattern employees, contractors, and subcontractors to report all avian incidents found within the SVW to the Facility Manager as outlined in this WIRS. The Pattern Environmental Lead

shall be the only one to report incidents to agencies, and no other personnel shall report to agencies without prior direct approval from Pattern Environmental Affairs.

APPLICABLE LAWS

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) (16 USC 703-712) is the cornerstone of migratory bird conservation and protection in the United States. The MBTA implements four treaties that provide for international protection of migratory birds. It is a strict liability statute wherein proof of intent is not an element of a "taking" violation. Wording is clear that most actions resulting in a taking or possession (permanent or temporary) of a protected species can be a violation, regardless of intent.

Specifically, the MBTA states: “Unless and except as permitted by regulations...it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess…any migratory bird, any part, nest, or egg of any such bird…(The Act) prohibits the taking, killing possession, transportation, and importation of migratory birds, their eggs, parts, and nests, expect when specifically authorized by the Department of the Interior." The word "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap capture, or collect."

The MBTA protects 836 species of migratory birds (listed in 50 CFR 10.13), including waterfowl, shorebirds, seabirds, wading birds, raptors, and passerines. Generally, the MBTA protects all birds in the U.S. except upland game birds, pigeons, European starlings, and English house sparrows. Nearly all birds found at the SVW project area are protected under the MBTA.

Bald and Golden Eagle Protection Act

In June 1940, Congress signed into law the Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668-688d) which affords additional protection to the bald and golden eagle. Specifically, the BGEPA states: “Whoever, with the United States or any place subject to the jurisdiction thereof, without being permitted to do so as provided…shall knowingly or with wanton disregard for the consequences of his act take, possess, transport…at any time or in any manner, any bald or golden eagle, alive or dead, or any part, nest or egg thereof shall be fined…that the commission of each taking or other act prohibited by this section, with respect to a bald or golden eagle, shall constitute a separate violation of this section." Penalties for violations of the BGEPA are up to $250,000 and/or 2 years imprisonment for a felony (violations are defined as a felony), with fines doubled for organizations. Golden eagles are known to occur in the SVW project area.

Endangered Species Act

In 1973, the Endangered Species Act (ESA) (16 USC 1513-1543) was passed to protect endangered and threatened species and to provide a means to conserve their ecosystems. Under the ESA, Federal agencies are directed to utilize their authorities to conserve listed species, as well as "Candidate" species that may be listed in the near future, and make sure that federal agencies' actions do not jeopardize the continued existence of these species. As with the MBTA and the BGEPA, the ESA as amended prohibits the taking of species listed under the act as threatened or endangered. There are no federally listed species that are known to occur in the SVW project area. The greater sage-grouse, which is known to occur in the project area, is currently classified as a candidate for federal listing.

SVW WILDLIFE INCIDENT REPORTING

The following procedures are to be followed when Pattern personnel or subcontractors discover an avian or bat fatality or injury while on site at SVW. These procedures are intended to be in place for the life of the project and are independent of the post-construction monitoring studies. Prior to the initiation of operations, on-site training will be provided to Pattern personnel and subcontractors regarding the implementation of this WIRS.

When To Use The WIRS - What Constitutes A Reportable Incident?

For the purposes of this reporting system, *incident* is a general term that refers to any bird or bat, or evidence thereof, that is found dead or injured within the wind project. Note that an incident may include an injured animal and does not necessarily refer only to a carcass or fatality.

An intact carcass, carcass parts, bones, scattered feathers, or an injured bird or bat all represent reportable incidents. Pattern personnel and subcontractors shall report all such discoveries even if you are uncertain if the carcass or parts are associated with the SVW facility.

> A ***fatality*** is any find where death occurred, such as a carcass, carcass parts, bones, or feather spot (10 or more feathers).
>
> An ***injury*** or injured animal is any bird or bat with an apparent injury, or that exhibits signs of distress to the point where it cannot move under normal means or does not display normal escape or defense behavior.

Prior to assuming a bird or bat is injured, it should be observed to determine if it cannot or does not display normal behaviors. For example, raptors will occasionally walk on the ground, especially if they have captured a prey item. Raptors also "mantle" or hold their wings out and down to cover a prey item. These types of behaviors may make the wings appear broken or the animal injured. Identification of specific behaviors typical to bird life cycles and distress behaviors will be part of the wildlife education program at SVW. Always exercise caution before approaching an injured bird.

Under no circumstances are site personnel permitted to handle carcasses or injured animals.

MATERIALS NEEDED TO REPORT AN INCIDENT

1. A copy of this WIRS
2. A Wildlife Incident Report Form (see Attachment 1)
3. Project Personnel Listing and Contact Information
4. Pencil, Pen
5. Camera
6. Flagging

WILDLIFE INCIDENT REPORTING PROCEDURES

The following procedures apply if the incident involves a **Bird or Bat Fatality** or **Injured Bat**:

- **Leave the subject animal in place**. A flag may be used to mark its location so it is easy to find again after the data sheet is completed. It is recommended that any flagging be marked with the date, time, and initials of the recorder. **DO NOT HANDLE THE CARCASS.**
- **Report** the find to the Spring Valley Wind Facility Manager immediately.
- The Facility Manager shall complete or direct facility personnel to complete the following steps:
    - **Photograph** the incident as it was found in the field. Take a minimum of two pictures: a close up shot of the animal as it lays in the field and a broader view of the animal (marked by a flag) with the road, turbines, or other local features in the view. For the close up picture, Place an object (e.g., radio, pocket knife, coin, etc.) next to the carcass for a scale of size.
    - **Report** the find to the Pattern Environmental Lead immediately.
    - **Prepare a Wildlife Incident Report Form.** The form and associated instructions are provided below.

The following procedures apply if the incident involves an **Injured Bird**:

- **Move** to a distance far enough away that it is not visibly disturbed or uneasy due to your presence. **DO NOT ATTEMPT TO CAPTURE OR HANDLE AN INJURED ANIMAL.**
- **Report** the find immediately to the Facility Manager immediately.
- The Facility Manager shall complete the following steps:
    - **Report** the find to the Pattern Environmental Lead immediately.
    - **Contact** a local rehabilitation center (*see contact list below*) for further instructions on handling and transport/pickup of the injured animal.
    - **Prepare a Wildlife Incident Report Form.** The form and instructions for filling out the form are provided below.

*** Any incident involving a federally listed threatened or endangered species, a candidate species, or a bald or golden eagle must be reported to the USFWS and NDOW within 24 hours of identification. These incidents will be reported to the agencies verbally by the Pattern Environmental Lead (*see contact list below)*. No other Pattern personnel or subcontractors will report incidents to the agencies.**

SPRING VALLEY WIND INCIDENTAL WILDLIFE REPORTING FORM

INCIDENT DETAILS

Name of Observer/s:_____ Date: _____ Time: _____

Type of Incident: ☐ Injury ☐ Fatality

Carcass Condition: ☐ Intact Carcass ☐ Partial Carcass ☐ Feathers Only

Age of Remains (days): ☐ 1-2 (fluid filled eyes) ☐ 2-4 (maggots) ☐ 5+ (dried bones/feathers)

Photos Taken: ☐ Yes ☐ No (Take photos of - Birds: beak, legs, feathers, body. Bats: face and ears, tail and feet, body)

Who was notified of incident? (see contact list below)_____

Comments on Carcass Condition or Behavior of Injured Animal:_____

_____

LOCATION

Where Found: ☐ On Access Road ☐ Turbine pad/Under Turbine ☐ Under Power Line ☐ Substation

Nearest Turbine:_____ Distance from Turbine (in feet):_____ Direction to Turbine:____

GPS Coordinates: UTM N:_____ UTM E:_____ DATUM:_____

Comments on Location:_____

IDENTIFICATION

☐ Bird ☐ Bat ☐ Mammal ☐ Other:_____

Species (to best of ability):_____

Description of Color/Markings:_____

Does Animal Resemble a Species of Concern discussed at Training? ☐ Yes ☐ No

Identification Remarks:_____

_____

(Describe details of - Birds: beak size, color, and shape; leg size, color, and shape; feather color; body size. Bats: color of fur and wings; muzzle long or short, tail attached or extending; ear color and shape)

ENVIRONMENTAL CONDITIONS

Weather (Check all that apply): ☐ Clear ☐ Cloudy ☐ Rain ☐ Snow ☐ Fog

Approximate Temperature (F°):_____

Wind: ☐ Calm ☐ Breezy/Gusty ☐ Strong Winds

Habitat where found: ☐ Gravel (access road/turbine pad) ☐ Bare Ground ☐ Grass ☐ Shrub

OTHER NOTES/COMMENTS:_____

_____

CONTACT LIST (Immediately notify one of these individuals of incident)

1. Facility Manager:, 775-237-9060
2. Assistant Facility Manager:, 775-237-9194
3. Environmental Lead:: 713-449-6129

Please submit completed form and incident photos to Environmental Affairs Lead, Rene Braud @ rene.braud@patternenergy.com

SPRING VALLEY WIND CONTACT LIST

- Facility Manager: Jeff Holbrook
  - Office: 775-592-0327 x100
  - Cell: 775-237-9358
  - Email: jeff.holbrook@patternenergy.com

- Assistant Facility Manager: Tom Ashby
  - Office: 775-591-0327 x200
  - Cell: 775-237-9194
  - Email: tom.ashby@patternenergy.com

- Pattern Environmental Lead: Rene Braud
  - Office: 713-308-4233
  - Cell: 713-449-6129
  - Email: rene.braud@patternenergy.com

- WEST Project Manager: Joel Thompson
  - Office: 541-230-1790
  - Cell: 307-214-2799
  - Email: jthompson@west-inc.com

- WEST Lead Field Technician: Pam Bullard
  - Cell: 903-312-9725
  - Email: pam.bullard7@gmail.com

- U.S. Fish and Wildlife Service: Chris Nicolai
  - Office: 775-861-6333
  - Email: Chris_Nicolai@fws.gov

- Nevada Department of Wildlife: Jason Williams
  - Office: 775-289-1655 x23
  - Email: jasonw@ndow.org

- BLM: Nancy Herms
  - Office: 775-289-1868
  - Email: nherms@blm.gov

- Northeast Nevada Wildlife Rehabilitation Center: Jo Dean
  - Address: 556 E Charlwood Ct
    Spring Creek, NV 89815
  - Phone: 775-340-2984
  - Email: DeanLLPJ@frontiernet.net

SPECIES PHOTOGRAPHS

Adult Bald Eagle

Immature Bald Eagle

Adult Golden Eagle

Immature Golden Eagle

Greater sage-grouse (male)

Greater sage-grouse (female)

Pygmy rabbit

Mexican free-tail bat