

Klondike III Wind Project: Wildlife Monitoring and Mitigation Plan

[NOVEMBER 16, 2007]

1 This plan describes wildlife monitoring that the certificate holder shall conduct during
2 operation of the Klondike III Wind Project (KWP).¹ The monitoring objectives are to determine
3 whether the facility causes significant fatalities of birds and bats and to determine whether the
4 facility results in a loss of habitat quality. The KWP facility consists of up to 208 wind turbines,
5 three non-guyed meteorological towers and other related or supporting facilities as described in
6 the site certificate. The certificate holder completed construction of 124 turbines authorized
7 under the Second Amended Site Certificate in October 2007.

8 The certificate holder shall use experienced personnel to manage the monitoring required
9 under this plan and properly trained personnel to conduct the monitoring, subject to approval by
10 the Oregon Department of Energy (Department) as to professional qualifications. For all
11 components of this plan except PPM Energy’s Klondike III Wind Project Wildlife Reporting and
12 Handling System, the certificate holder shall hire an independent third party (not employees of
13 the certificate holder) to perform monitoring tasks.

14 The Wildlife Monitoring and Mitigation Plan for the Klondike III Wind Project has the
15 following components:

- 16 1) Fatality monitoring program including:
 - 17 a) Removal trials
 - 18 b) Searcher efficiency trials
 - 19 c) Fatality search protocol
 - 20 d) Statistical analysis
- 21 2) Raptor nesting surveys
- 22 3) Avian use surveys
- 23 4) PPM Energy’s Klondike III Wind Project Wildlife Reporting and Handling
24 System

25 Following is a discussion of the components of the monitoring plan, statistical analysis
26 methods for fatality data, data reporting and potential mitigation.

27 The selection of the mitigation actions that the certificate holder may be required to
28 implement under this plan should allow for flexibility in creating appropriate responses to
29 monitoring results that cannot be known in advance. If the Department determines that
30 mitigation is needed, the certificate holder shall propose appropriate mitigation actions to the
31 Department and shall carry out mitigation actions approved by the Department, subject to review
32 by the Oregon Energy Facility Council (Council).

¹ This plan is incorporated by reference in the site certificate for the KWP and must be understood in that context. It is not a “stand-alone” document. This plan does not contain all mitigation required of the certificate holder.

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1. Fatality Monitoring

(a) Definitions and Methods

Seasons

This plan uses the following dates for defining seasons:

Season	Dates
Spring Migration	March 16 to May 15
Summer/Breeding	May 16 to August 15
Fall Migration	August 16 to October 31
Winter	November 1 to March 15

Search Plots

The certificate holder shall conduct fatality monitoring within search plots. The certificate holder, in consultation with the Oregon Department of Fish and Wildlife (ODFW), shall select search plots based on a systematic sampling design that ensures that the selected search plots are representative of the habitat conditions in different parts of the site. Each search plot will contain one turbine. Search plots will be square or circular. Circular search plots will be centered on the turbine location and will have a radius equal to the maximum blade tip height of the turbine contained within the plot. "Maximum blade tip height" is the turbine hub-height plus one-half the rotor diameter. Square search plots will be of sufficient size to contain a circular search plot as described above. The certificate holder shall provide maps of the search plots to the Department before beginning fatality monitoring at the facility. The certificate holder shall use the same search plots for each search conducted during a monitoring year.

Scheduling

In each monitoring year, the certificate holder shall conduct fatality monitoring searches at the rates of frequency shown below. Over the course of one monitoring year, the certificate holder would conduct 16 searches, as follows:

Season	Frequency
Spring Migration	2 searches per month (4 searches)
Summer/Breeding	1 search per month (3 searches)
Fall Migration	2 searches per month (5 searches)
Winter	1 search per month (4 searches)

For the 124 turbines built as of October 2007, the certificate holder shall conduct fatality monitoring for two years (32 searches), beginning November 1, 2007. For turbines built after October 2007 (up to 84 turbines), the certificate holder shall conduct fatality monitoring for two years (32 searches) beginning one month after the start of commercial operation of those turbines.

Sample Size

The sample size for fatality monitoring is the number of turbines searched per monitoring year for each phase of construction. Phase 1 consists of turbines built as of October 2007; Phase 2 consists of turbines built after October 2007. During each monitoring year, the certificate

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1 holder shall search a minimum of one-third of the total number of turbines that are built in the
2 applicable phase.

3 As described in the site certificate, the certificate holder may choose to build the KWP
4 using turbine types in two size classes:

- 5 • Small: turbines having a rotor diameter of 82 meters or less
- 6 • Large: turbines having a rotor diameter greater than 82 meters

7 If the final design of the KWP includes both small and large turbines, the certificate
8 holder shall, at a minimum, sample one-third of the total number of turbines in each monitoring
9 year for each phase of construction. Before beginning fatality monitoring, the certificate holder
10 shall consult with an independent expert with experience in statistical analysis of avian fatality
11 data to determine whether it would be possible to sample a sufficient number of the KWP
12 turbines in each size class to allow a statistical comparison of fatality rates for all birds as a
13 group. The certificate holder shall submit the expert's written conclusions to the Department. If
14 sampling of one-third of the total number of all turbines per phase in each monitoring year would
15 provide a sufficient number of turbines in each size class to allow the comparison, the certificate
16 holder will sample the appropriate number of turbines from each class and conduct the analysis.
17 The certificate holder may choose to sample more than one-third of the total number of all
18 turbines in each monitoring year for each phase of construction to allow the comparison.

19 (b) Removal Trials

20 The objective of the removal trials is to estimate the length of time avian and bat
21 carcasses remain in the search area. Carcass removal studies will be conducted during each
22 season in the vicinity of the search plots. Estimates of carcass removal rates will be used to
23 adjust carcass counts for removal bias. "Carcass removal" is the disappearance of a carcass from
24 the search area due to predation, scavenging or other means such as farming activity. Removal
25 rates will be estimated by habitat and season.

26 The certificate holder shall conduct carcass removal trials within each of the seasons
27 defined above during the years in which fatality monitoring occurs. During the first year in
28 which fatality monitoring occurs, the certificate holder shall conduct one removal trial per season
29 (four removal trials per year). For each trial, at least 10 small bird carcasses and at least 10 large bird
30 carcasses will be distributed throughout the project area (approximately 80 trial carcasses per year).

31 Before beginning removal trials for the second year of fatality monitoring, the certificate
32 holder shall report the results of the first year removal trials to the Department and ODFW. In the
33 report, the certificate holder shall analyze whether four removal trials per year, as described
34 above, provides sufficient data to accurately estimate adjustment factors for carcass removal. The
35 number of removal trials for the second year of fatality monitoring may be adjusted up or down,
36 subject to the approval of the Department.

37 The "small bird" size class will use carcasses of house sparrows, starlings, commercially
38 available game bird chicks or legally obtained native birds to simulate passerines. The "large
39 bird" size class will use carcasses of raptors provided by agencies, commercially available adult
40 game birds or cryptically colored chickens to simulate raptors, game birds and waterfowl. If
41 fresh bat carcasses are available, they may also be used.

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1 To avoid confusion with turbine-related fatalities, planted carcasses will not be placed in
2 fatality monitoring search plots. Planted carcasses will be placed in the vicinity of search plots
3 but not so near as to attract scavengers to the search plots. The planted carcasses will be located
4 randomly within the carcass removal trial plots.

5 Carcasses will be placed in a variety of postures to simulate a range of conditions. For
6 example, birds will be: 1) placed in an exposed posture (e.g., thrown over the shoulder), 2)
7 hidden to simulate a crippled bird (e.g., placed beneath a shrub or tuft of grass) and, 3) partially
8 hidden. Trial carcasses will be marked discreetly for recognition by searchers and other
9 personnel. Trial carcasses will be left at the location until the end of the carcass removal trial.

10 It is expected that carcasses will be checked as follows, although actual intervals may
11 vary. Carcasses will be checked for a period of 40 days to determine removal rates. They will be
12 checked approximately every day for the first 4 days, and then on day 7, day 10, day 14, day 20,
13 day 30 and day 40. This schedule may vary depending on weather and coordination with the
14 other survey work. At the end of the 40-day period, the trial carcasses and scattered feathers will
15 be removed.

16 (c) Searcher Efficiency Trials

17 The objective of searcher efficiency trials is to estimate the percentage of bird and bat
18 fatalities that searchers are able to find. The certificate holder shall conduct searcher efficiency
19 trials on the fatality monitoring search plots in both grassland/shrub-steppe and cultivated
20 agriculture habitat types. Searcher efficiency will be estimated by size class, habitat type and
21 season. A pooled estimate of searcher efficiency will be used to adjust carcass counts for
22 detection bias.

23 The certificate holder shall conduct searcher efficiency trials within each of the seasons
24 defined above during the years in which the fatality monitoring occurs. During each season of
25 the years in which fatality monitoring occurs, the certificate holder shall use approximately 25
26 carcasses for searcher efficiency trials (approximately 100 carcasses per year). The certificate
27 holder shall vary the number of trials per season and the number of carcasses per trial so that the
28 searchers will not know the total number of trial carcasses being used in any trial. The certificate
29 holder shall distribute trial carcasses in varied habitat in rough proportion to the habitat types
30 within the facility site. During each season, both small bird and large bird carcasses will be used
31 in approximately equal numbers. "Small bird" and "large bird" size classes and carcass selection
32 are as described above for the removal trials.

33 Before beginning searcher efficiency trials for the second year of fatality monitoring, the
34 certificate holder shall report the results of the first year efficiency trials to the Department and
35 ODFW. In the report, the certificate holder shall analyze whether the efficiency trials as described
36 above (using approximately 100 carcasses per year) provides sufficient data to accurately estimate
37 adjustment factors for carcass removal. The number of removal trials for the second year of fatality
38 monitoring may be adjusted up or down, subject to the approval of the Department.

39 Personnel conducting searches will not know in advance when trials are conducted; nor
40 will they know the location of the trial carcasses. If suitable trial carcasses are available, trials
41 during the fall season will include several small brown birds to simulate bat carcasses. Legally
42 obtained bat carcasses will be used if available.

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1 On the day of a standardized fatality monitoring search (described below) but before the
2 beginning of the search, efficiency trial carcasses will be placed at random locations within areas
3 to be searched. If scavengers appear attracted by placement of carcasses, the carcasses will be
4 distributed before dawn.

5 Efficiency trials will be spread over the entire season to incorporate effects of varying
6 weather and vegetation growth. Carcasses will be placed in a variety of postures to simulate a
7 range of conditions. For example, birds will be: 1) placed in an exposed posture (thrown over the
8 shoulder), 2) hidden to simulate a crippled bird and 3) partially hidden.

9 Each non-domestic carcass will be discreetly marked so that it can be identified as an
10 efficiency trial carcass after it is found. The number and location of the efficiency trial carcasses
11 found during the carcass search will be recorded. The number of efficiency trial carcasses
12 available for detection during each trial will be determined immediately after the trial by the
13 person responsible for distributing the carcasses.

14 If new searchers are brought into the search team, additional detection trials will be
15 conducted to ensure that detection rates incorporate searcher differences.

16 (d) Coordination with the Biglow Canyon Wind Farm

17 The proposed Biglow Canyon Wind Farm lies to the north of the Klondike III Wind
18 Power Project on similar terrain and habitat. If the Council approves site certificates for both
19 facilities and requires similar wildlife monitoring, coordination of removal trials and searcher
20 efficiency trials would be possible. Subject to the approval of both certificate holders and the
21 Department, the number of trials at each site and the number of trial carcasses used at each site
22 can be reduced by combining the removal data and efficiency data from both projects, if the
23 certificate holder can demonstrate that the calculation of fatality rates would continue to have
24 statistical validity for both facilities and that combining the data would not affect any other
25 requirements of the monitoring plans for either facility.

26 (e) Fatality Monitoring Search Protocol

27 The objective fatality monitoring is to estimate the number of bird and bat fatalities that
28 are attributable to facility operation. The goal of bird and bat fatality monitoring is to obtain a
29 precise estimate of the fatality rate and associated variances. The certificate holder shall conduct
30 fatality monitoring using standardized carcass searches.

31 The certificate holder shall use a worst-case analysis to resolve any uncertainty in the
32 results and to determine whether the data indicate that additional mitigation should be
33 considered. The Department may require additional, targeted monitoring if the data indicate the
34 potential for significant impacts that cannot be addressed by worst-case analysis and appropriate
35 mitigation. On an annual basis, the certificate holder shall report an estimate of fatalities in seven
36 categories: 1) all birds, 2) small birds, 3) large birds, 4) raptors, 5) grassland birds, 6) nocturnal
37 migrants, 7) State Sensitive Species listed under OAR 635-100-0040 and 8) bats. If there is
38 sufficient sampling of large and small turbines, the certificate holder shall compare the fatality
39 rates in the "all birds" category for each of the turbine size classes. The certificate holder shall
40 calculate fatality rates using the statistical methods described in Sections (a) and (f).

41 The certificate holder shall estimate the number of avian and bat fatalities attributable to
42 operation of the facility based on the number of avian and bat fatalities found at the facility site.

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1 All carcasses located within areas surveyed, regardless of species, will be recorded and, if
2 possible, a cause of death determined based on blind necropsy results. If a different cause of
3 death is not apparent, the fatality will be attributed to facility operation. The total number of
4 avian and bat carcasses will be estimated by adjusting for removal and searcher efficiency bias.

5 Personnel trained in proper search techniques (“the searchers”) will conduct the carcass
6 searches by walking parallel transects within the search plots.² Transects will be initially set at 6
7 meters apart in the area to be searched. A searcher will walk at a rate of approximately 45 to 60
8 meters per minute along each transect searching both sides out to three meters for casualties.
9 Search area and speed may be adjusted by habitat type after evaluation of the first searcher
10 efficiency trial. The searchers will record the condition of each carcass found, using the
11 following condition categories:

- 12 ▪ Intact – a carcass that is completely intact, is not badly decomposed and shows no
13 sign of being fed upon by a predator or scavenger
- 14 ▪ Scavenged – an entire carcass that shows signs of being fed upon by a predator or
15 scavenger, or portions of a carcass in one location (e.g., wings, skeletal remains,
16 legs, pieces of skin, etc.)
- 17 ▪ Feather Spot – 10 or more feathers at one location indicating predation or
18 scavenging or 2 or more primary feathers

19 All carcasses (avian and bat) found during the standardized carcass searches will be
20 photographed, recorded and labeled with a unique number. Each carcass will be bagged and
21 frozen for future reference and possible necropsy. A copy of the data sheet for each carcass will
22 be kept with the carcass at all times. For each carcass found, searchers will record species, sex
23 and age when possible, date and time collected, location, condition (e.g., intact, scavenged,
24 feather spot) and any comments that may indicate cause of death. Searchers will photograph each
25 carcass as found and will map the find on a detailed map of the search area showing the location
26 of the wind turbines and associated facilities. The certificate holder shall coordinate collection of
27 state endangered, threatened or protected species with ODFW. The certificate holder shall
28 coordinate collection of federal endangered, threatened or protected species with the U.S. Fish
29 and Wildlife Service (USFWS). The certificate holder shall obtain appropriate collection permits
30 from ODFW and USFWS.

31 The searchers might discover carcasses incidental to formal carcass searches (e.g., while
32 driving within the project area). For each incidentally discovered carcass, the searcher shall
33 identify, photograph, record data and collect the carcass as would be done for carcasses within
34 the formal search sample during scheduled searches. If the incidentally discovered carcass is
35 found within a formal search plot, the fatality data will be included in the calculation of fatality
36 rates. If the incidentally discovered carcass is found outside a formal search plot, the data will be
37 reported separately. The certificate holder shall coordinate collection of incidentally discovered
38 state endangered, threatened or protected species with ODFW. The certificate holder shall
39 coordinate collection of incidentally discovered federal endangered, threatened or protected
40 species with the USFWS.

² Where search plots are adjacent, the search area may be rectangular.

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1 Any injured native birds found on the facility site will be carefully captured by a trained
2 project biologist or technician and transported to Jean Cypher (wildlife rehabilitator) in The
3 Dalles, the Blue Mountain Wildlife Rehabilitation Center in Pendleton or the Audubon Bird Care
4 Center in Portland in a timely fashion. The certificate holder shall pay costs, if any, charged for
5 time and expenses related to care and rehabilitation of injured native birds found on the site,
6 unless the cause of injury is clearly demonstrated to be unrelated to the facility operations.

7 (f) Statistical Methods for Fatality Estimates

8 The certificate holder shall estimate the total number of wind facility-related fatalities for
9 each phase of construction based on:

- 10 (1) The observed number of carcasses found during standardized searches during the
11 two monitoring years (for the applicable phase) for which the cause of death is
12 attributed to the facility.³
- 13 (2) Searcher efficiency expressed as the proportion of planted carcasses found by
14 searchers.
- 15 (3) Removal rates expressed as the estimated average probability a carcass is expected
16 to remain in the study area and be available for detection by the searchers during
17 the entire survey period.

18 Definition of Variables

19 The following variables are used in the equations below:

20	c_i	the number of carcasses detected at plot i for the study period of interest (e.g., one
21		year) for which the cause of death is either unknown or is attributed to the facility
22	n	the number of search plots
23	k	the number of turbines searched (includes the turbines centered within each
24		search plot and a proportion of the number of turbines adjacent to search plots to
25		account for the effect of adjacent turbines on the 90-meter search plot buffer area)
26	\bar{c}	the average number of carcasses observed per turbine per year
27	s	the number of carcasses used in removal trials
28	s_c	the number of carcasses in removal trials that remain in the study area after 40
29		days
30	se	standard error (square of the sample variance of the mean)
31	t_i	the time (days) a carcass remains in the study area before it is removed
32	\bar{t}	the average time (days) a carcass remains in the study area before it is removed
33	d	the total number of carcasses placed in searcher efficiency trials
34	p	the estimated proportion of detectable carcasses found by searchers
35	I	the average interval between searches in days

³ If a different cause of death is not apparent, the fatality will be attributed to facility operation.

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- 1 $\hat{\pi}$ the estimated probability that a carcass is both available to be found during a
2 search and is found
- 3 m_t the estimated annual average number of fatalities per turbine per year, adjusted
4 for removal and observer detection bias
- 5 C nameplate energy output of turbine in megawatts (MW)

6 Observed Number of Carcasses

7 The estimated average number of carcasses (\bar{c}) observed per turbine per year is:

8
$$\bar{c} = \frac{\sum_{i=1}^n c_i}{k} . \quad (1)$$

9 Estimation of Carcass Removal

10 Estimates of carcass removal are used to adjust carcass counts for removal bias. Mean carcass
11 removal time (\bar{t}) is the average length of time a carcass remains at the site before it is removed:

12
$$\bar{t} = \frac{\sum_{i=1}^s t_i}{s - s_c} . \quad (2)$$

13 This estimator is the maximum likelihood estimator assuming the removal times follow an
14 exponential distribution and there is right-censoring of data. Any trial carcasses still remaining at
15 40 days are collected, yielding censored observations at 40 days. If all trial carcasses are
16 removed before the end of the trial, then s_c is 0, and \bar{t} is just the arithmetic average of the
17 removal times. Removal rates will be estimated by carcass size (small and large) and season.

18 Estimation of Observer Detection Rates

19 Observer detection rates (i.e., searcher efficiency rates) are expressed as p , the proportion
20 of trial carcasses that are detected by searchers. Observer detection rates will be estimated by
21 carcass size and season.

22 Estimation of Facility-Related Fatality Rates

23 The estimated per turbine annual fatality rate (m_t) is calculated by:

24
$$m_t = \frac{\bar{c}}{\hat{\pi}} , \quad (3)$$

25 where $\hat{\pi}$ includes adjustments for both carcass removal (from scavenging and other means) and
26 observer detection bias assuming that the carcass removal times t_i follow an exponential
27 distribution. Under these assumptions, this detection probability is estimated by:

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$$\hat{\pi} = \frac{\bar{t} \cdot p}{I} \cdot \left[\frac{\exp\left(\frac{I}{t}\right) - 1}{\exp\left(\frac{I}{t}\right) - 1 + p} \right]. \quad (4)$$

The estimated per MW annual fatality rate (m) is calculated by:

$$m = \frac{m_t}{C}. \quad (5)$$

For each phase of construction, the certificate holder shall calculate fatality estimates for: (1) all birds, (2) small birds, (3) large birds, (4) raptors, (5) grassland birds, (6) nocturnal migrants 7) State Sensitive Species listed under OAR 635-100-0040 and 8) bats. If there is sufficient sampling of large and small turbines, the certificate holder shall compare the fatality rates in the “all birds” category for each of the turbine size classes. The final reported estimates of m , associated standard errors and 90% confidence intervals will be calculated using bootstrapping (Manly 1997). Bootstrapping is a computer simulation technique that is useful for calculating point estimates, variances and confidence intervals for complicated test statistics. For each iteration of the bootstrap, the plots will be sampled with replacement, trial carcasses will be sampled with replacement and \bar{c} , \bar{t} , p , $\hat{\pi}$ and m will be calculated. A total of 5,000 bootstrap iterations will be used. The reported estimates will be the means of the 5,000 bootstrap estimates. The standard deviation of the bootstrap estimates is the estimated standard error. The lower 5th and upper 95th percentiles of the 5000 bootstrap estimates are estimates of the lower limit and upper limit of 90% confidence intervals.

Nocturnal Migrant and Bat Fatalities

Differences in observed nocturnal migrant and bat fatality rates for lit turbines, unlit turbines that are adjacent to lit turbines and unlit turbines that are not adjacent to lit turbines will be compared graphically and statistically.

(g) Mitigation

Mitigation may be appropriate if fatality rates exceed a “threshold of concern.” For the purpose of determining whether a threshold has been exceeded, the certificate holder shall calculate the average annual fatality rates for species groups for each phase of construction after two years of monitoring. Based on current knowledge of the species that are likely to use the habitat in the area of the facility, the following thresholds apply to the Klondike III facility:

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Species Group	Threshold of Concern (fatalities per MW)
Raptors (All eagles, hawks, falcons and owls, including burrowing owls.)	0.09
Raptor species of special concern (Swainson's hawk, ferruginous hawk, peregrine falcon, golden eagle, bald eagle, burrowing owl and any federal threatened or endangered raptor species.)	0.06
Grassland species (All native bird species that rely on grassland habitat and are either resident species, occurring year round, or species that nest in the area, excluding horned lark, burrowing owl and northern harrier.)	0.59
State sensitive avian species listed under OAR 635-100-0040 (Excluding raptors listed above.)	0.2

1 If the data show that a threshold of concern for a species group has been exceeded, the
2 certificate holder shall implement additional mitigation if the Department determines that
3 mitigation is appropriate based on analysis of the data, consultation with ODFW and
4 consideration of any other significant information available at the time. In addition, mitigation
5 may be appropriate if the Department determines that fatality rates for individual avian or bat
6 species (especially State Sensitive Species) are higher than expected and at a level of biological
7 concern. If mitigation is appropriate, the certificate holder, in consultation with the Department
8 and ODFW, shall propose mitigation measures designed to benefit the affected species. The
9 certificate holder shall implement mitigation as approved by the Council. The Department may
10 recommend additional, targeted data collection if the need for mitigation is unclear based on the
11 information available at the time. The certificate holder shall implement such data collection as
12 approved by the Council.

13 Mitigation should be designed to benefit the affected species group. Mitigation may
14 include, but is not limited to, protection of nesting habitat for the affected group of native species
15 through a conservation easement or similar agreement. Tracts of land that are intact and
16 functional for wildlife are preferable to degraded habitat areas. Preference should be given to
17 protection of land that would otherwise be subject to development or use that would diminish the
18 wildlife value of the land. In addition, mitigation measures might include: enhancement of the
19 protected tract by weed removal and control; increasing the diversity of native grasses and forbs;
20 planting sagebrush or other shrubs; constructing and maintaining artificial nest structures for
21 raptors; improving wildfire response; and local research that will aid in understanding more
22 about the species and conservation needs. In considering whether additional mitigation is
23 appropriate for bat fatalities, the Department will take into account the mitigation that the
24 certificate holder has already implemented under Condition 96 of the site certificate (a
25 contribution of \$10,000 per year for three years, beginning in the first year of operation, to fund
26 research toward better understanding wind facility impacts to bats and to develop mitigation
27 solutions).

28 **2. Raptor Nest Surveys**

29 The objectives of raptor nest surveys are to estimate the size of the local breeding
30 populations of tree or other above-ground-nesting raptor species in the vicinity of the facility and
31 to determine whether operation of the facility results in a reduction of nesting activity or nesting

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1 success in the local populations of the following raptor species: Swainson’s hawk, golden eagle
2 and ferruginous hawk.

3 (a) Survey Protocol

4 For the species listed above, aerial and ground surveys will be used to gather nest success
5 statistics on active nests, nests with young and young fledged. The certificate holder will share
6 the data with state and federal biologists. The certificate holder will conduct two years of post-
7 construction raptor nest surveys. One year of surveys will be done in 2008. The second year of
8 surveys will be done in 2012.

9 During each monitoring year, the certificate holder will conduct a minimum of one
10 helicopter survey in late May or early June and additional surveys as described in this section.
11 All nests discovered during pre-construction surveys and any nests discovered during post-
12 construction surveys, whether active or inactive, will be given identification numbers. Nest
13 locations will be recorded on U.S. Geological Survey 7.5-minute quadrangle maps. Global
14 positioning system coordinates will be recorded for each nest. Locations of inactive nests will be
15 recorded as they may become occupied during future years.

16 The certificate holder shall conduct the aerial surveys within the Klondike III site and a
17 2-mile buffer around the turbines to determine nest occupancy. Determining nest *occupancy* will
18 likely require two helicopter visits to each nest. For occupied nests, the certificate holder shall
19 determine nesting *success* by a minimum of one ground visit to determine species, number of
20 young and nesting success. “Nesting success” means that the young have successfully fledged
21 (the young are independent of the core nest site). Nests that cannot be monitored due to the
22 landowner denying access will be checked from a distance where feasible.

23 (b) Mitigation

24 The certificate holder shall analyze the raptor nesting data collected after two monitoring
25 years to determine whether a reduction in either nesting success or nest use has occurred in the
26 vicinity of the Klondike III facility. If the analysis indicates a reduction in nesting success by
27 Swainson’s hawk, golden eagle or ferruginous hawk within 2 miles of the facility, then the
28 certificate holder shall propose appropriate mitigation and shall implement mitigation as
29 approved by the Council. At a minimum, if the analysis shows that any of these species has
30 abandoned a nest territory within ½ mile of the facility or has not fledged any young over the
31 two-year period within a ½ mile of the facility, the certificate holder shall assume the
32 abandonment or unsuccessful fledging is the result of the facility unless another cause can be
33 demonstrated convincingly.

34 Given the very low buteo nesting densities in the area, statistical power to detect a
35 relationship between distance from a wind turbine and nesting parameters (e.g., number of
36 fledglings per reproductive pair) will be very low. Therefore, impacts may have to be judged
37 based on trends in the data, results from other wind energy facility monitoring studies and
38 literature on what is known regarding the populations in the region.

39 If the analysis shows that mitigation is appropriate, the certificate holder shall propose
40 mitigation for the affected species in consultation with the Department and ODFW. Mitigation
41 should be designed to benefit the affected species or contribute to overall scientific knowledge
42 and understanding what stimulates nest abandonment. Mitigation may be designed to proceed in

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1 phases over several years. It may include, but is not limited to, additional raptor nest monitoring,
2 protection of natural nest sites from human disturbance or cattle activity (preferably within two
3 miles of the facility) or participation in research projects designed to improve scientific
4 understanding of the needs of the affected species.

5 (c) Long-term Raptor Nest Monitoring and Mitigation Plan

6 In addition to the two years of post-construction raptor nest surveys described in
7 paragraph (a), the certificate holder shall conduct long-term raptor nest surveys at five-year
8 intervals for the life of the facility. The certificate holder shall conduct the first long-term raptor
9 nest survey in 2017. In conducting long-term surveys, the certificate holder shall follow the same
10 survey protocol that is described above in paragraph (a) unless the certificate holder proposes an
11 alternative protocol that is approved by the Department. In developing an alternative protocol,
12 the certificate holder shall consult with ODFW and may collaborate with the certificate holder
13 for any other wind energy facility.

14 The certificate holder shall analyze the long-term survey data as described above in
15 paragraph (b). If the analysis shows that mitigation is appropriate, the certificate holder shall
16 propose mitigation for the affected species in consultation with the Department and ODFW as
17 described in paragraph (b) and shall implement mitigation as approved by the Council. Any
18 reduction in nesting success could be due to operation of the KWP, operation of another wind
19 facility in the vicinity or some other cause. The reduction shall be attributed to the KWP if the
20 wind turbine closest to the affected nest site is a KWP turbine unless the certificate holder
21 demonstrates, and the Department agrees, that the reduction was due to a different cause.

22 **3. Avian Use Surveys**

23 During each fatality monitoring search, observers will record birds detected in a ten-
24 minute period at approximately one-third of the turbines within the fatality monitoring sample
25 using standard variable circular plot point count survey methods. The purpose of observing and
26 recording avian use while conducting the fatality monitoring is to identify additional species that
27 may not have been listed in the original baseline survey report. In addition, avian use surveys
28 provide a basis to evaluate, in general terms, whether the species with the highest fatality
29 numbers are also the most common species at the site.

30 **4. PPM Energy's Klondike III Wind Project Wildlife Reporting and Handling System**

31 PPM Energy's Klondike III Wind Project Wildlife Reporting and Handling System
32 (WRHS) is a monitoring program to search for and handle avian and bat casualties found by
33 maintenance personnel during construction and operation of the facility. A similar system is in
34 place for Klondike I and II. Construction and maintenance personnel will be trained in the
35 methods. This monitoring program includes the initial response, the handling and the reporting
36 of bird and bat carcasses discovered incidental to construction and maintenance operations
37 ("incidental finds").

38 All carcasses discovered by maintenance personnel will be photographed and recorded. If
39 maintenance personnel discover incidental finds at turbines that are not within search plots for
40 the fatality monitoring searches, the data will be reported separately from fatality monitoring
41 data. For such incidental finds, the maintenance personnel will notify a project biologist. The
42 project biologist must be a qualified independent professional biologist who is not an employee

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1 of the certificate holder. The project biologist (or the project biologist's experienced wildlife
2 technician) will collect the carcass or will instruct maintenance personnel to have an on-site
3 carcass handling permittee collect the carcass. The certificate holder's on-site carcass handling
4 permittee must be a person who is listed on state and federal scientific or salvage collection
5 permits and who is available to process (collect) the find on the day it is discovered. The find
6 must be processed on the same day as it is discovered.

7 If maintenance personnel discover carcasses within search plots, the data will be included
8 in the calculation of fatality rates. The maintenance personnel will notify a project biologist. The
9 project biologist will collect the carcass or will instruct maintenance personnel to have an on-site
10 carcass handling permittee collect the carcass. As stated above, the on-site permittee must be
11 available to process the find on the day it is discovered. The certificate holder shall coordinate
12 collection of state endangered, threatened or protected species with ODFW. The certificate
13 holder shall coordinate collection of federal endangered, threatened or protected species with the
14 USFWS.

15 5. Data Reporting

16 The certificate holder will report the monitoring data and analysis to the Department.
17 Monitoring data include fatality data, raptor nest survey data, avian use point counts and data on
18 incidental finds by fatality searchers and KWP personnel. The report may be included in the
19 annual report required under OAR 345-026-0080 or may be submitted as a separate document at
20 the same time the annual report is submitted. In addition, the certificate holder shall provide to
21 the Department any data or record generated in carrying out this monitoring plan upon request by
22 the Department.

23 The certificate holder shall notify USFWS and ODFW immediately in the event that any
24 federal or state endangered or threatened species are killed or injured on the facility site.

25 The public will have an opportunity to receive information about monitoring results and
26 to offer comment. Within 30 days after receiving the annual report of monitoring results, the
27 Department will make the report available to the public on its website and will specify a time in
28 which the public may submit comments to the Department.⁴

29 6. Amendment of the Plan

30 This Wildlife Monitoring and Mitigation Plan may be amended from time to time by
31 agreement of the certificate holder and the Council. Such amendments may be made without
32 amendment of the site certificate. The Council authorizes the Department to agree to
33 amendments to this plan and to mitigation actions that may be required under this plan. The
34 Department shall notify the Council of all amendments and mitigation actions, and the Council
35 retains the authority to approve, reject or modify any amendment of this plan or mitigation action
36 agreed to by the Department.

⁴ The certificate holder may establish a Technical Advisor Committee (TAC) but is not required to do so. If the certificate holder establishes a TAC, the TAC may offer comments to the Council about the results of the monitoring required under this plan.