



Stantec

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Subject: Kittitas Valley Wind Power Project Fall 2012 Post-Construction Monitoring Update

Dear Jon,

Post-construction monitoring during the second year of operation of the Kittitas Valley Wind Power Project (KVWPP, the project area) in Kittitas County, Washington, is underway. Bird and bat fatality searches are being conducted at all 48 turbines during the 2012-2013 survey year. During fall 2012, individual turbines were searched on an average interval of 14 days. Additional monitoring effort during the 2012-2013 study period included incidental wildlife reporting.

Data presented in this report are preliminary. Minor changes may occur after final data review.

Wildfires

On August 13, 2012, the Taylor Bridge Wildfire ignited approximately 5 miles northwest of the project area. The fire swept through the project area on the night of August 13, burning vegetation within 43 of the 48 search plots. Most of the search plots were partly, rather than completely burned. Overall, an estimated 40% of the study area was burned. Heavy smoke remained in the air for 1 week following the fire.

A lightning storm on September 8, 2012 ignited several wildfires approximately 9 miles northeast of the project area, including the Table Mountain Complex and Wenatchee Complex fires. These fires continued to burn for 1 month and smoke, heavy at times, remained in the project area. The survey schedule was altered on days when air quality was at unhealthy levels.

Fatality Surveys

From August 13, 2012 to October 17, 2012, there were 240 turbine searches or 5 searches at each of the 48 turbines at KVWPP. All searches scheduled during the fall survey period were completed. One searcher efficiency trial and 2 carcass removal trials were completed during the fall survey period, as scheduled. Because the Taylor Bridge fire occurred on day 2 of the fall

survey season, all searcher efficiency and carcass removal trails were conducted after the fire burned through the project area.

During fall 2012 surveys, there were 64 total (search and incidental) fatalities found: 13 bat and 51 birds, Table 1. Of the 64 total fatalities, 58 were found during standardized searches and 6 were found incidentally. All incidental fatalities were birds. Bat fatalities that were identifiable to species consisted of hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), and big brown bat (*Eptesicus fuscus*). Bird fatalities that were identifiable to species consisted of red-tailed hawk (*Buteo jamaicensis*), vesper sparrow (*Pooecetes gramineus*), red-breasted nuthatch (*Sitta canadensis*), horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), spotted towhee (*Pipilo maculatus*), olive-sided flycatcher (*Contopus cooperi*), grey partridge (*Perdix perdix*), California quail (*Callipepla californica*), golden-crowned kinglet (*Regulus satrapa*), and ruby-crowned kinglet (*Regulus calendula*). The olive-sided flycatcher is listed by the U.S. Fish and Wildlife Service as a species of concern. Of the other birds and bats identifiable to species, none were federally or state listed as threatened or endangered.

During fall 2011, there were 31 bird fatalities found during standardized searches, compared to 45 bird fatalities found during standardized searches in fall 2012. For this preliminary analysis, we assumed that all fatalities found were the result of collision with wind turbines.

Table 1. Bat and bird fatalities found at Kittitas Valley Wind Power Project during the fall 2012 survey season.

Date	Season	Survey type	Turbine #	Species
8/13/2012	Fall	Search	E1	red-tailed hawk
8/15/2012	Fall	Incidental ^a	H7	vesper sparrow
8/16/2012	Fall	Search ^a	A3	red-breasted nuthatch
8/16/2012	Fall	Search ^{ab}	A4	unknown passerine
8/17/2012	Fall	Search ^{ab}	C5	unknown avian (small)
8/17/2012	Fall	Search ^a	C6	unknown avian (small)
8/17/2012	Fall	Search ^a	C6	unknown avian (large)
8/17/2012	Fall	Search ^a	C6	hoary bat
8/18/2012	Fall	Search ^a	C7	silver-haired bat
8/21/2012	Fall	Search ^a	I5	hoary bat
8/22/2012	Fall	Search ^a	I9	hoary bat
8/22/2012	Fall	Search ^a	H8	horned lark
8/23/2012	Fall	Search ^a	H1	hoary bat
8/23/2012	Fall	Incidental ^a	H2	western meadowlark
8/23/2012	Fall	Search ^a	H2	unknown passerine



Date	Season	Survey type	Turbine #	Species
8/23/2012	Fall	Search ^{ab}	H2	unknown passerine
8/27/2012	Fall	Search ^a	I10	big brown bat
8/27/2012	Fall	Incidental ^a	I11	spotted towhee
8/28/2012	Fall	Search	A3	spotted towhee
8/28/2012	Fall	Search	A4	unknown avian (large)
8/28/2012	Fall	Search	A4	unknown avian (small)
8/28/2012	Fall	Search	A4	unknown passerine
8/28/2012	Fall	Search	A4	olive-sided flycatcher
8/28/2012	Fall	Search	A1	unknown passerine
8/28/2012	Fall	Search	A1	hoary bat
8/28/2012	Fall	Search	A1	unknown avian (small)
8/29/2012	Fall	Search	C1	grey partridge
8/29/2012	Fall	Search	C2	hoary bat
8/29/2012	Fall	Search	C4	unknown avian (small)
8/29/2012	Fall	Search	C4	California quail
8/29/2012	Fall	Search	C5	unknown avian (small)
8/30/2012	Fall	Search	B6	grey partridge
9/5/2012	Fall	Search	H10	hoary bat
9/5/2012	Fall	Search	H8	unknown passerine
9/5/2012	Fall	Search	H7	horned lark
9/5/2012	Fall	Incidental	H5	grey partridge
9/6/2012	Fall	Search	H2	hoary bat
9/10/2012	Fall	Search	A2	hoary bat
9/10/2012	Fall	Search	E2	red-breasted nuthatch
9/10/2012	Fall	Incidental	I3	horned lark
9/11/2012	Fall	Search	C6	red-breasted nuthatch
9/11/2012	Fall	Search	C8	hoary bat
9/12/2012	Fall	Search	B4	golden-crowned kinglet
9/22/2012	Fall	Search	G3	unknown passerine
9/22/2012	Fall	Search	I2	horned lark
9/25/2012	Fall	Search	E2	grey partridge
9/25/2012	Fall	Search	E2	red-breasted nuthatch
9/25/2012	Fall	Search	C2	unknown avian (small)
9/25/2012	Fall	Search	C2	unknown kinglet



Date	Season	Survey type	Turbine #	Species
9/26/2012	Fall	Search	C3	unknown bat
9/27/2012	Fall	Search	C6	unknown avian (small)
9/30/2012	Fall	Search	B2	golden-crowned kinglet
9/30/2012	Fall	Search	B3	unknown kinglet
9/30/2012	Fall	Search	B5	grey partridge
9/30/2012	Fall	Search	B6	grey partridge
9/30/2012	Fall	Search	B6	grey partridge
10/5/2012	Fall	Search	H2	unknown avian (small, non-raptor)
10/9/2012	Fall	Search	E2	ruby-crowned kinglet
10/9/2012	Fall	Search	E1	unknown passerine
10/10/2012	Fall	Search	A3	horned lark
10/10/2012	Fall	Incidental	C5	grey partridge
10/10/2012	Fall	Search	C5	unknown passerine
10/11/2012	Fall	Search	C6	unknown passerine
10/11/2012	Fall	Search	B2	unknown passerine

^aFound during the first round of searches after the fire

^bFound in a burned area, during the first round of searches after the fire

Preliminary Estimate of Mortality Rate

Fall 2012 preliminary estimates of mortality were determined only for bird and bat groups. The estimate of mortality for bats at KVVPP during fall 2012 was 0.59 bats per turbine, Table 2. During fall 2012, the estimate of mortality for birds at KVVPP was 1.98 birds per turbine. In fall 2012, bird mortality estimates were approximately 2 times higher than in fall 2011.

In fall 2012, searcher efficiency was 82% for all carcasses (20 medium/large carcasses and 25 small carcasses) and carcass persistence was 12.8 days for all carcasses (20 medium/large carcasses and 20 small carcasses). During the fall 2011, searcher efficiency was 90% and 80% for large and small carcasses, respectively. During the fall 2011, carcass persistence was 32.6 days and 19.5 days for large and small carcasses, respectively.

Higher mortality estimates in fall 2012 were the result of greater numbers of fatalities found during standardized searches and shorter carcass persistence rates. Anecdotal observations of importance included an increase in scavengers (i.e., Common raven [*Corvus corax*]) after the Taylor Bridge fire. After the fire there was significant numbers of rodent carcasses that appeared to be attracting scavengers. Areas beneath project turbines that were re-vegetated (after construction) generally did not burn in the fire, likely due to little to no leaf litter and organic matter accumulations in the reclamation areas. It appears the Taylor Bridge fire

coincided with passerine and bat migration because fatality numbers remained high in the weeks following the fire. Therefore, it was difficult to decipher between fire related and turbine related fatalities. It is highly probable a number of fatalities were the result of the Taylor Bridge fire, especially the 8 bird fatalities that were found during the first “round” (2 weeks) of standardized searches (not incidental) following the fire. Following the Taylor Bridge fire, bird fatalities were found in both burned and non-burned areas of search plots, suggesting that smoke may have been a cause of mortality (e.g., smoke inhalation, reduced visibility caused birds to strike turbines).

We predict that annual mortality estimates at KVVPP will remain within regional averages if we observe similar fatality trends during the remainder of the survey period.

Table 2. Estimate of mortality rates at Kittitas Valley Wind Power Project during the fall 2012 and fall 2011 survey seasons.

Species group	Carcasses found in fall	Mortality estimate for site per fall	95% CI (±) per site per fall	Mortality estimate per turbine per fall	95% CI (±) per turbine per fall	Mortality estimate per MW per fall
FALL 2012						
All birds	45	96	60-142	1.98	1.24-2.95	0.94
All bats	13	29	17-45	0.59	0.34-0.92	0.28
FALL 2011						
All birds	31	48	32 - 69	0.98	0.66 - 1.43	0.46
All bats	6	10	3 - 21	0.21	0.06 - 0.42	0.10

Incidental Wildlife Observations

Six species of raptors were observed incidentally in the project area during fall 2012: Swainson’s hawk (*Buteo swainsoni*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), red-tailed hawk, turkey vulture (*Cathartes aura*), and peregrine falcon (*Falco peregrinus*). Mule deer (*Odocoileus hemionus*) and Roosevelt elk (*Cervus canadensis roosevelti*) were observed in the project area and herd sizes ranged from 1 to 8 individuals. Coyotes (*Canis latrans*) and American badgers (*Taxidea taxus*) were also observed. No species of conservation concern were observed in the project area during fall 2012. There were 2 behavioral responses to project turbines observed: 1 group of Roosevelt elk and 1 group of mule deer were seen resting in the shade of turbines.

Please let us know if you have any questions regarding the fall 2012 preliminary survey results.

Sincerely,



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