ENVIRONMENTAL & STATISTICAL CONSULTANTS

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September 3, 2019

To: Mr. John Ford, Director
County of Humboldt Planning and Building Department
3015 H Street
Eureka, California 95501
jford@co.humboldt.ca.us

Subject: Humboldt Wind Energy Project Draft Environmental Impact Report (DEIR) SCH No. 201872076 – Operational Impacts to Eagles

Dear Mr. Ford:

This document was prepared by Western EcoSystems Technology, Inc. (WEST), on behalf of Humboldt Wind, LLC (Humboldt Wind), in response to information requested by AECOM on known operational impact to eagles at wind energy facilities and how these data relate to eagle use levels recorded at the Humboldt Wind Energy Project (the Project).

During eagle use survey conducted by Stantec (2018b) at the Project from October 2017 through October 2018, a total of seven golden eagle observations and four bald eagle observations were recorded during 129.75 hours of survey. This equates to a use estimate of 0.054 golden eagles per 800-m plot per hour and 0.031 bald eagles per 800-m survey plot per survey hour (Stantec 2018b). While golden eagle observations were spread across several seasons (one in fall, one in spring, and five in summer), all bald eagle observations were recorded in spring. A second year of eagle use surveys, per Eagle Conservation Plan Guidance (ECPG; USFWS 2019) recommendations, is currently underway at the Project using similar survey methods and survey effort. During the Year 2 eagle surveys conducted to date (November 2018 through August 2019), no golden eagle or bald eagle observations have been recorded, suggesting even lower eagle use of the Project in Year 2 than observed in Year 1.

In addition to the eagle use surveys conducted in 2017-2018, Stantec (2018a) also conducted weekly 30-minute large bird surveys at the same 13 plots surveyed for eagles, and during the same time period (i.e. October 2017-October 2018). During 253 hours of large bird surveys, no golden eagle observations were recorded and only two bald eagle observations were recorded, further suggesting very low use of the Project by both eagle species.

To help put these site-specific data into context, information on eagle use collected at the Project was compared with mean golden eagle use at western wind energy facilities and the number of golden eagle fatalities found at those same facilities (Table 1, adapted from Bay et al. 2016). To allow for comparison with eagle use estimates from other wind energy facilities in the western US,

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eagle use at the Project was recalculated for a 20-min survey period by dividing the 60-min use estimate by three. This resulted in a use estimate of 0.018 golden eagles/20 min which falls near the middle of eagle use estimates at 26 other western wind energy facilities with corresponding eagle fatality data. At the majority of facilities (17 of 26 facilities), no golden eagle fatalities have been documented; however, it should be noted that formal post-construction monitoring was not conducted at seven of these facilities (Table 1). Eight of the 12 golden eagle fatalities documented at these facilities were found at the six facilities with the highest recorded eagle use, which ranged from 0.265 to 0.360 eagles/20-min survey (Table 1). While these results do suggest potential correlation between eagle use and eagle fatalities, the eagle fatality data presented represent raw fatality counts rather than an eagle fatality rate and do not take into account the size of the project or the number of turbines searched, nor have the data been corrected for searcher detection or carcass persistence.

Table 1. Mean golden eagle use (observations/800-m plot/20-min survey) and number of golden eagle fatalities at 26 facilities with publicly available wind energy reports that had eagle use and fatality data collected. Table adapted from Bay et al. (2016).

Project (state)	Mean Use[a]	Survey Effort (hours)[b]	# Fatalities[c]	Study Length (months)[d]
Campbell Hills (WY)	0.360	135.0	0 (1 incidental)	12
High Winds (CA)	0.297	329.0	1 (1 incidental)	24
Elkhorn (OR)	0.270	91.7	2	24
Diablo Winds (CA)	0.268	80.0	1 (1 incidental	24
Foote Creek Rim Phase I (WY)	0.265	1,290.0	0	36
Foote Creek Rim Phases II and III (WY)	0.265	1,290.0	1	18
Vasco (CA)	0.120	16	0	1
Tuolumne (WA)	0.078	22.0	0	0
Shiloh I (CA)	0.051	103.5	1	36
Wild Horse (WA)	0.050	89.5	0	12
Combine Hills (OR)	0.031	113.5	1	24
Kittitas Valley (WA)	0.026	96.0	0	0
Leaning Juniper (OR)	0.024	97.7	0	24
Alta Oak Creek Mojave: Alta I (CA)	0.020	110.0	1	36
Stateline (OR and WA)	0.020	122.7	0	30
Shiloh II (CA)	0.019	103.5	0	12
Dry Lake (AZ)	0.016	139.5	0	0
Vansycle (OR)	0.010	247.5	0	12
Vantage (WA)	0.010	94.4	0	0
Wessington Springs (SD)	0.010	60.0	0	0
Wind Flats (WA)	0.010	94.7	0	0
Alta Oak Creek Mojave: Alta II-V (CA)	0.007	88.0	(1 incidental)	36
Hopkins Ridge (WA)	0.007	126.0	0	24
White Creek (WA)	0.004	86.7	0	0
Klondike (OR)	0.003	26	0	12
Nine Canyon (WA)	0.003	99.5	0	12

[a] Annual average number golden eagles/800-m plot/20-min survey.
[b] Effort (survey hours) for point surveys.
[c] Raw fatality count found during scheduled carcass searches (# fatalities found incidentally) during study length.
[d] Length in months of post-construction monitoring.

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More recently, since the release of the ECPG (USFWS 2013), eagle risk assessments at wind energy facilities have relied on the metric of exposure minutes to characterize eagle use of a site. The USFWS (2013) Bayesian collision risk modeling framework is then used to predict impacts to golden eagles based on the relationship between eagle exposure, collision rate, and fatalities. An eagle exposure minute is defined as the number of minutes an eagle is observed in flight within the risk cylinder, or an area within 800 m of the survey point and up to 223 m (maximum rotor-swept height plus 25 m) above ground level during the 60-min survey period. The exposure minute data are then used in the collision risk model to calculate an exposure rate which is the expected number of exposure events (eagle exposure minutes) per survey hour per square kilometer. The prior distribution presented in the ECPG for exposure rate was derived from a range of projects under USFWS review and the projects from Whitfield (2009). The prior distribution is intended to model exposure rates for any wind energy facility. Eagle exposure and fatality rates from the four facilities in Whitfield (2009) which were used to develop the prior distribution for exposure rate in the collision risk model are presented below in Table 2.

Table 2. Golden eagle exposure rates and fatality rates at the four projects used in the US Fish and Wildlife collision risk model (USFWS 2013, Whitfield 2009)

Facility	Exposure Rate (eagle minutes/hr*km^2)	Fatality Rate (eagle fatalities/year)
Altamont (CA)	6.67	67.00
Tehachapi Pass (CA)	0.02	0.46
San Gorgonio (CA)	0.04	0.74
Foote Creek Rim (WY)	0.09	0.43

During the 2017-2018 eagle use surveys at the Project, 17 golden eagle exposure minutes and 10 bald eagle exposure minutes were recorded (Stantec 2018a). This translates to an exposure rate of 0.068 minutes/hour*km^2 for golden eagles and 0.042 for bald eagles. This exposure rate for golden eagles at the Project falls between the estimated exposure rates for San Gorgonio and Foote Creek Rim and is dramatically lower than the estimated exposure rate for Altamont (Table 2). While eagle exposure minute data consistent with the ECPG are now routinely collected at wind energy facilities, corresponding eagle fatality rates are generally not available.

Literature Cited

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