SWCA
ENVIRONMENTAL CONSULTANTS

Memorandum

To: Mark Slaughter, Bureau of Land Management

From: Eric Koster, SWCA Environmental Consultants

Date: December 6, 2016

Re: **Proposed Golden Eagle Survey Protocol for Searchlight Wind Energy Project**

Introduction

Crescent Peak Renewables, LLC proposes to construct, operate, and maintain a 175- to 500-megawatt wind generation facility on a portion of approximately 32,531 acres in the Crescent Peak Wind (formerly Greater Searchlight Wind) project area (Figure 1). The Crescent Peak wind energy facility consists of the construction, operation, and decommissioning of wind turbine generators and associated facilities necessary to successfully generate up to 500 MW on four sites constructed in two phases, west of the town of Searchlight in Clark County, Nevada (herein called the Project). The Project would be located mainly on Bureau of Land Management (BLM) lands, and would be administered from the BLM's Las Vegas Field Office. The sites are located in Clark County, Nevada adjacent to the Nevada-California state line; the survey area for eagle and other raptor nests includes San Bernardino County, California.

Pre-construction bird and bat studies are required for wind energy projects on BLM-administered lands in Nevada. These studies must satisfy requirements of BLM's Programmatic Environmental Impact Statement (BLM 2005) for Wind Development which recommends "scientifically rigorous avian and bat use surveys be conducted prior to construction." The U.S. Fish and Wildlife (USFWS) also requests that pre-construction surveys be done in order to evaluate the impacts to sensitive wildlife and their habitat (USFWS 2012 and USFWS 2013). Special emphasis is placed on eagles, for which specific protocols are recommended for adequately examining their use of the project areas (USFWS 2012, USFWS 2013, Pagel 2010). The USFWS Land Based Wind Energy Guidelines (USFWS 2012) recommend that nest searches for eagles be conducted over larger areas than for other raptors and the Eagle Conservation Plan Guidance (ECPG; USFWS 2013) recommends collecting eagle use and behavior data to better understand eagle distribution within a site as well as allow for the quantitative estimation of risk to eagles from a proposed project, which in turn informs an eagle fatality model. The ECPG also recommends using a project's half mean inter-nest distance for eagle nests to help designate which risk category a proposed project would fall under when considering the likelihood a project would take an eagle. The BLM's Instruction Memorandum on the Bald and Golden Eagle Protection Act – Golden Eagle National Environmental Policy Act and Avian Protection Plan Guidance for Renewable Energy (BLM 2010) also calls for the consideration of eagle breeding territories and nests during National Environmental Policy Act (NEPA) analysis for renewable energy projects.

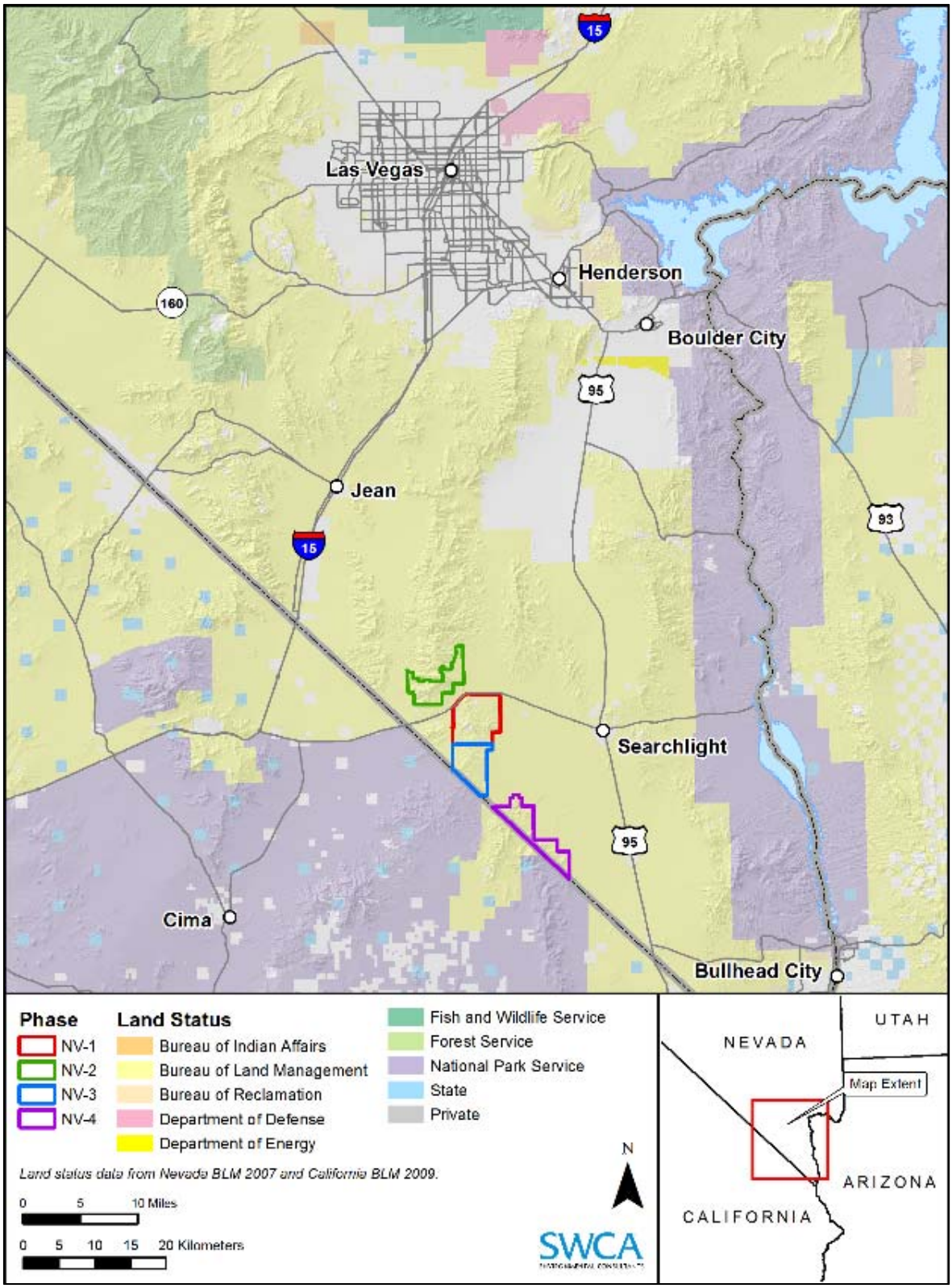

Figure 1. Project Location

SWCA Environmental Consultants (SWCA) has developed a pre-construction avian and bat study plan as a modified/updated version of an approved plan from 2011 and internal draft plan from January 2016. The 2011 version was based on available guidance and field study recommendations from the BLM-NV and BLM-CA, Nevada Department of Wildlife (NDOW), the National Park Service (NPS), USFWS, and past experience with wind energy projects throughout the southwest U.S. The 2016 version incorporated new USFWS guidelines (USFWS 2012 and USFWS 2013) and neighboring state agency guidance (e.g., Arizona Game and Fish Department 2012). On January 15, 2016, SWCA met with BLM and NDOW to discuss plans for additional raptor nest surveys within and adjacent to the Project. During that meeting NDOW discussed the need for coordination with the NDOW Game Division biologists to address the bighorn sheep lambing concerns while still collecting relevant golden eagle nest occupancy data. On November 15, 2016, BLM provided SWCA with NDOW's proposed golden eagle nest survey protocol, which attempts to balance the need for golden eagle nest occupancy data and potential harassment of bighorn sheep during the lambing season. This document includes a synopsis of that protocol, as we understand it, as well as recommendations for improving/modifying the protocol that balance efficiency with accurate, useful data collection.

Synopsis of Methods

For the 2017 golden eagle nesting season, NDOW proposes a two- or three-visit survey methodology; an aerial golden eagle nest inventory of the project area and appropriate golden eagle nesting habitat within a 10-mile buffer of the project area, ground visits to all golden eagle or potential golden eagle nests where occupancy could not be confirmed during the aerial visit, and lastly a final survey of all golden eagle nests determined to be active during the 2017 nesting season to record nest success and productivity.

The first visit would entail a comprehensive inventory of known and potentially overlooked golden eagle nests via an aerial survey in late December. This would require surveying approximately 32,044 acres (130-km^2) within the four project sites (designated Sites NV-1, NV-2, NV-3, and NV-4) and an additional 114,513 acres (463 km^2) of potential golden eagle nesting habitat within a 10-mile buffer of the project area within Nevada. If the same protocol were to be used in California, this would require an additional 67,138 acres (272 km^2) of potential golden eagle nesting habitat within that state. During the 2011 raptor nest survey, experienced raptor biologists recorded 67 golden eagle nests (26 in California, 41 in Nevada) and 40 possible golden eagle nests (26 in California, 14 in Nevada) within the 10-mile buffer (Figure 2). While this data would be used to relocate and check occupancy of these known nests, NDOW has proposed that "the entire area will need to be inventoried for the 2017 breeding season to account for changes over time and possible missed nests." We expect a complete resurvey of this area would require five or six helicopter survey days.

The second visit, as proposed by NDOW, would require ground-based surveys (Pagel et al. 2010) to determine occupancy at any golden eagle nest or possible golden eagle nest at which occupancy could not be confirmed during the initial aerial survey. During the 2011 surveys, of the 107 golden eagle or possible golden eagle nests observed, 12 were recorded as occupied. Assuming similar conditions and findings during the 2017 nesting season, we would expect the need to revisit approximately 95 golden eagle and possible golden eagle nests. The ground-based survey protocol, as described by Pagel (et al. 2010), requires a 4-hour survey at each nest or nest cluster. Given that the remote locations of many of these nests would require significant amounts of driving and hiking, it is assumed that only one nest or nest group could be monitored during a single field day. However, in some instances, multiple nests could be monitored from a single observation point, and some nests would be confirmed occupied or unoccupied prior to the end of the 4-hour survey period. Additionally, nests that are confirmed active would negate

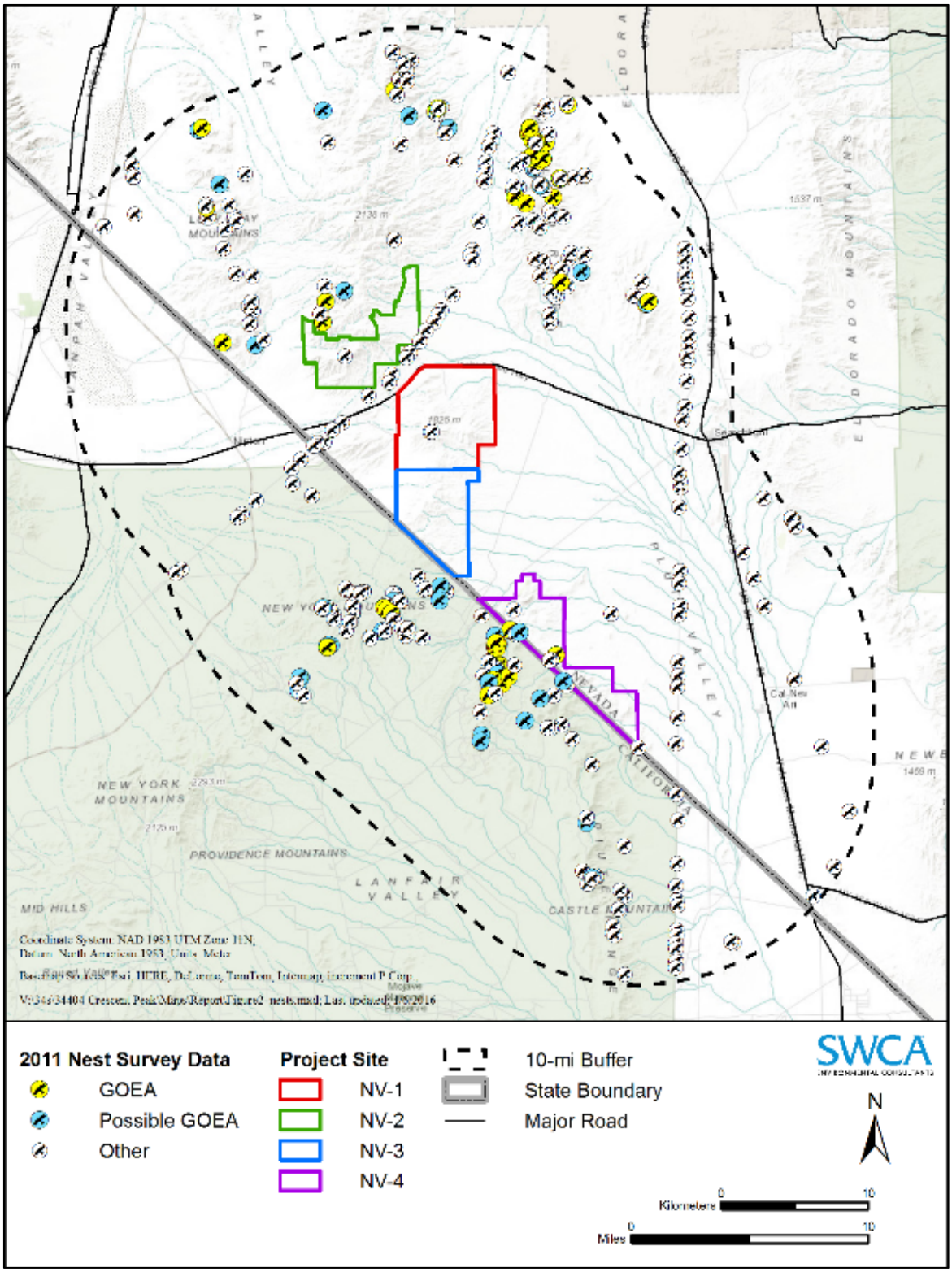

Figure 2. Golden eagle, possible golden eagle, and other raptor/corvid nests recorded during the 2011 10-mile radius survey effort.

the need to monitor other nests within that same active territory. Following the initial aerial survey, SWCA would confirm territory boundaries with BLM and NDOW. These territory boundaries would be used to reduce the number of nests that would require the 4-hour ground-based occupancy survey in cases where an active nest is observed. With these factors in mind, we estimate that approximately 75 golden eagle and possible golden eagle nests would require monitoring as part of the second occupancy survey and these 75 nests could be monitored in 40 field days, or roughly two nests monitored per day.

NDOW also recommends a final aerial survey (likely late May or early June) to determine nest success and productivity at any nest determined to be active during the 2017 nesting season. Assuming there would be no more than 20 occupied nests in the survey area, we expect this final survey could be completed in one survey day via helicopter.

Recommendations

SWCA thanks NDOW for their recommendations on golden eagle nest survey protocol for the Crescent Peak Wind Project. While we generally agree with the proposed protocol, the effort involved with this methodology is substantial. In an effort to efficiently and expeditiously collect data specifically relevant to this project while still limiting disturbance in bighorn sheep lambing areas, we propose the following possible changes in methodology:

- Pagel (et al. 2010) recommends ground surveys as an alternative "when their use is more efficient, or when other circumstances (e.g. bighorn sheep lambing areas) require this method." Acknowledging that ground surveys require ten times as much field time as aerial surveys and are, thus, much less efficient, does NDOW or BLM have data showing that the entire project area and 10-mile buffer are bighorn lambing areas? We propose that portions of the project area and associated buffer be surveyed via aerial surveys during the second visit if bighorn sheep are not known to occur in those areas or it is suspected that an area is not used for lambing and those areas are large enough such that conducting surveys aerially would increase their efficiency. SWCA would work closely with NDOW and BLM to delineate these areas prior to the second survey.

- The ECPG (USFWS 2013) states, "If recent (within the previous 5 years) local data are available on the spacing of eagle nests for the project-area nesting population, those data can be used to determine an appropriate boundary for such surveys." Furthermore, the ECPG states that, when referring to nest monitoring, "the project-area mean inter-nest distance can be used to define a more relevant project-area boundary." While we acknowledge the 2011 data is greater than five years old, we do think that the 2011 data, when combined with data from the initial 2017 aerial survey could yield a dataset from which an enhanced mean inter-nest distance could be generated. The ECPG goes on to say that, "One-half the mean inter-nest distance has been used as a coarse approximation for the territory boundary in a number of raptor studies (e.g., Thorstrom 2001, Wichmann et al. 2003, Soutullo et al. 2006). Eagle pairs at nests within ½ the mean project-area inter-nest distance of the project footprint are potentially susceptible to disturbance take and bladestrike mortality, as these pairs and offspring may use the project footprint." Therefore, we propose using the newly calculated half mean inter-nest distance as a buffer on the project footprint and subsequently using this area as the survey boundary for the ground-based follow-up survey. Based on data from the 2011 aerial surveys, we expect this to place an approximately 3-mile survey buffer on the project area. Additionally, this approach would be conservative as the

inter-nest distance would only diminish with increased observation of occupied nests and remain larger with a limited dataset. Therefore, the early timing of the initial survey, and presumed lack of detection of late season occupancy, would not bias this calculation towards a smaller half mean inter-nest distance but towards a greater one.

Literature Cited

Arizona Game and Fish Department (AGFD). 2012. Guidelines for Reducing Impacts to Wildlife from Wind Energy Development in Arizona. October 15, 2012.

Bureau of Land Management (BLM). 2005. Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-administered Lands in the Western United States. U.S. Department of the Interior. Bureau of Land Management. June 2005.

———. 2010. Bald and Golden Eagle Protection Act – Golden Eagle National Environmental Policy Act and Avian Protection Plan Guidance for Renewable Energy. Instruction Memorandum No. 2010-156. July 9, 2010. Available on the Internet at: https://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2010/IM_2010-156.html

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Bird Management, U.S. Fish and Wildlife Service.

Soutullo, A., V. Urios, M. Ferrer, and S. G. Penarrubia. 2006. Post-fledging behaviour in golden eagles *Aquila chrysaetos*: onset of juvenile dispersal and progressive distancing from the nest. Ibis 148:307-312.

Thorstrom, R. 2001. Nest-site characteristics and breeding density of two sympatric forest-falcons in Guatemala. Ornitologia Neotropical 12:337-343.

United States Fish and Wildlife Service (USFWS). 2012. Land-Based Wind Energy Guidelines. March. Available on the Internet at: http://www.fws.gov/windenergy/

———. 2013. Eagle Conservation Plan Guidance. Module-1 Land-Based Wind Energy. April. Available on the Internet at: http://www.fws.gov/windenergy/eagle_guidance.html

Wichmann, M. C., F. Jeltsch, W. R. J. Dean, K. A. Moloney and C. Wissel. 2003. Implication of climate change for the persistence of raptors in arid savanna. Oikos 102:186–202.