Oregon
Tina Kotek, Governor

OREGON DEPARTMENT OF ENERGY

550 Capitol St. NE
Salem, OR 97301
Phone: 503-378-4040
Toll Free: 1-800-221-8035
FAX: 503-373-7806
www.oregon.gov/energy

To: Oregon Energy Facility Siting Council

From: Sarah Esterson, Senior Policy Advisor

Date: August 17, 2023

Subject: Leaning Juniper IIB Wind Power Facility – Annual Monitoring for Wildlife Monitoring and Mitigation Plan (Condition 87)

Attachments: Amended Wildlife Monitoring and Mitigation Plan (November 6, 2015)
Annual Wildlife Monitoring Report (2022)

Purpose

The Oregon Department of Energy (Department) prepared this staff report for the Energy Facility Siting Council to summarize the results of ongoing wildlife monitoring and results at Leaning Juniper IIB Wind Power Facility. The Department is required to make available the actual results and allow for public comment. This staff report supports both Council and the public's understanding of the results and of their opportunity to review and comment.

Wildlife Monitoring and Mitigation Plan Overview

Leaning Juniper IIA Wind Power Facility is a wind energy generation facility consisting of 43 wind turbines, with a peak generating capacity of 90.3 megawatts (MW). The facility is located in Gilliam County. The Council issued a site certificate for the facility in 2007.

Condition 87 of the site certificate states that, "The certificate shall conduct wildlife monitoring as described in the Wildlife Monitoring and Mitigation Plan (WMMP) that is incorporated in the Final Order on Amendment #2 for LJF as Attachment D and as amended from time to time."

The WMMP requires that the certificate holder implement short- and long-term wildlife monitoring during facility operation. Short-term wildlife monitoring requirements included a 2-year post construction Bird and Bat Fatality Monitoring Program and a Grassland Bird Study; these wildlife monitoring activities were completed in 2012-13. On-going long-term wildlife monitoring requirements include:

- Washington Ground Squirrel Surveys (Every 3-years for operational life of facility; 2014, 2017, 2020, etc.)

- Long-Term Raptor Nesting and Burrowing Owl Surveys (Every 5-years for operational life of facility; 2015, 2020, 2025, etc.)
- Wildlife Monitoring and Reporting System (Ongoing)

Washington Ground Squirrel Surveys

The WMMP establishes that the certificate holder conduct long-term monitoring for areas of previous use by Washington Ground Squirrel (WGS). Washington ground squirrel monitoring occurs every 3 years after project operation and surveys were completed in 2014, 2017 and 2021.[1] In 2017 and 2021, not activity was detected.

Summary of Survey Results within 9 Areas of Previous Use

2014	2017	2021	2024	2027
Area 6 showed signs of occupancy	No activity detected	No activity detected	TBD	TBD

Long Term Raptor Nesting Surveys

The objectives of long-term raptor nest monitoring are to determine the size of breeding populations of raptor species in the vicinity of the facility, with a focus on Swainson's hawk, golden eagle, ferruginous hawk and burrowing owl; and, to determine whether facility operations have resulted in a reduction in nest use or nest success on local populations of these species. Results of the long-term raptor nest monitoring are presented in Table 1a below.

Table 1a. Results of 2011, 2015, 2020, and 2021 raptor nest surveys at the Leaning Juniper IIA Wind Project, Gilliam County, Oregon. Results provided at two spatial scales: 0.5 miles (mi) and 2.0 mi from permit boundary.

	2011		2015		2020		2021	
Species	Within 0.5 mi	Within 2 mi	Within 0.5 mi	Within 2 mi	Within 0.5 mi	Within 2 mi	Within 0.5 mi	Within 2 mi
Golden eagle	0	0	0	0	0	0	0	0
Ferruginous hawk	0	0	0	0	0	0	0	0
Swainson's hawk	7	22	7	15	5	15	5	19
Red-tailed hawk	7	18	4	10	2	14	7	18
Burrowing owl	0	0	0	0	-	-	0	0
Peregrine falcon	0	0	0	0	0	1	0	1
Prairie falcon	1	2	0	0	0	0	0	1
Great horned owl	2	4	0	0	1	2	1	3
Barn Owl	0	0	0	0	0	0	0	1
Total Active Raptor Nests	**14**	**46**	**11**	**25**	**8**	**32**	**13**	**43**
Common raven	1	7	10	15	13	41	16	46
Inactive nest	3	8	1	10	8	29	6	24
Total Nests	**18**	**61**	**22**	**50**	**29**	**102**	**35**	**113**

[1] Surveys did not occur in 2020 due to survey disruptions related to COVID-19 travel restrictions in the spring of 2020.

As presented above, during the 2021 aerial raptor nest survey, 113 total nest sites were recorded, 43 of which were active raptor nests including Swainson's hawk.

Across the 11-year study period (2011 to 2021), the overall number of active raptor nests declined from 46 to 43 nests. Swainson's hawk nest use declined from 22 to 19 nests; prairie falcon and great horned owl each saw a decline of one nest. The number of inactive nests also increased over the study period, from eight to 29 nests.

Wildlife Monitoring and Reporting System
Monitoring requirements for this facility include the ongoing Wildlife Monitoring and Reporting System, a program for responding to and handling avian and bat casualties found by personnel at the site during routine maintenance operations. The certificate holder is obligated to notify USFWS and ODFW in the event that any federal or state endangered or threatened species are killed or injured onsite. During operation in 2022, no wildlife fatalities or injuries were recorded by operations staff.

Public Comments on Wildlife Monitoring Results
Section 5 of the WMMP, Data Reporting, establishes an opportunity for the public to review and comment on monitoring results. Specifically, the WMMP states, "The public will have an opportunity to receive information about monitoring results and to offer comment. Within 30 days after receiving the annual report of monitoring results, the Department will make the report available to the public on its website and will specify a time in which the public may submit comments to the Department."

The Department received the annual monitoring results for the facility on April 24, 2023. In accordance with the terms of the WMMP, the Department provides a copy of the 2022 monitoring results for the Leaning Juniper IIA Wind Power Facility to the Council for review (attached) and posted a copy to the Department's project website at: http://www.oregon.gov/energy/facilities-safety/facilities/Pages/LJA.aspx and has established 60-day timeframe to accept public comments.

Comments are due within 60-days of posting, or **October 13, 2023 at 5:00 p.m.** and may be submitted to Sarah Esterson at sarah.esterson@energy.oregon.gov

Attachments: Wildlife Monitoring and Mitigation Plan (November 6, 2015)
Annual Wildlife Monitoring Report (2021)

Wildlife Monitoring and Mitigation Plan (November 6, 2015)

Leaning Juniper IIA and IIB Wind Projects: Ongoing Wildlife Monitoring and Mitigation Plan

[NOVEMBER 6, 2015]

This Ongoing Wildlife Monitoring and Mitigation Plan (the Plan) describes wildlife monitoring that the certificate holders shall conduct during operation of the Leaning Juniper IIA and IIB Wind Power Facilities.[1] The ongoing monitoring objectives are to determine whether the facility causes significant fatalities of birds and bats and to determine whether the facility results in a loss of habitat quality.

Following Amendment 2 of the original Leaning Juniper II Wind Power Facility site certificate, the single facility was divided into two separate facilities, with LJIIA and LJIIB each receiving its own site certificate. However, the site certificate holders agreed to share mitigation and environmental responsibilities. Therefore, the requirements for the facility as a whole, including both LJIIA and LJIIB, remain in this Wildlife Monitoring and Mitigation Plan (WMMP) and each individual site certificate holder remains bound by its terms.

Collectively, LJIIA and LJIIB ('the Facilities' or 'LJIIA/B') consists of 117 wind turbines, four non-guyed meteorological (met) towers and other related or supporting facilities as described in the site certificate. The permanent facility components occupy approximately 111 acres, of which up to 52 acres is Category 5 wildlife habitat or better, based on the Oregon Department of Fish and Wildlife (ODFW) standards (OAR 635-415-0025).[2]

Each certificate holder shall use experienced personnel to implement the ongoing monitoring required under this plan and properly trained personnel to conduct the monitoring, subject to approval by the Oregon Department of Energy (Department) as to professional qualifications. For all components of this plan except the Wildlife Monitoring and Reporting System (WMRS), each certificate holder shall hire an independent third party (not employees of the certificate holder) to perform monitoring tasks.

The Wildlife Monitoring and Mitigation Plan for the Facilities originally included the following components:

1) Fatality monitoring program including: (completed, Downes et al. 2013)
    a) Removal trials
    b) Searcher efficiency trials
    c) Fatality search protocol
    d) Statistical analysis
2) Raptor nesting surveys (ongoing)
3) Washington ground squirrel surveys (ongoing)
4) Grassland bird study (completed, Downes and Gritski 2014)

[1] This plan is incorporated by reference in the site certificate for the LJF 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 holders.

[2] A more complete description of the habitat areas affected by the Facilities, LJIIA and LJIIB, is provided in the Final Order on Amendment #1, Section IV.4(b), which expanded the site boundary to include LJIIB.

5) Wildlife Monitoring and Reporting System (ongoing)

Since the original Wildlife Monitoring and Mitigation Plan was adopted on November 20, 2009 (and updated in June 21, 2013), the requirements of (1) and (4) and the initial requirements of (2), (3), (5), and (6) above have been completed, as reflected and described in this Plan. This Plan reflects the ongoing, long-term monitoring and mitigation requirements for raptor nesting surveys (Section 2), Washington ground squirrel surveys (Section 3), and the Wildlife Monitoring and Reporting System (Sections 5 and 6). Section 8, Literature Cited, was added to provide references and sources for completed requirements of the Plan.

Based on the results of the monitoring programs, mitigation of significant impacts may be required. The selection of the mitigation actions should allow for flexibility in creating appropriate responses to monitoring results that cannot be known in advance. If the Department determines that mitigation is needed, the certificate holders shall propose appropriate mitigation actions to the Department and shall carry out mitigation actions approved by the Department, subject to review by the Oregon Energy Facility Council (Council).

1. Fatality Monitoring

The certificate holders conducted two years of post-construction fatality monitoring following substantial completion or commercial operations date (COD) of the Facilities reflecting operating impacts on wildlife. The results of the post-construction fatality monitoring are presented in Downes et al. (2013).

2. Raptor Nest Surveys

The objectives of raptor nest surveys are: (1) to estimate the size of the local breeding populations of raptor species that nest on the ground or aboveground in trees or other aboveground nest locations in the vicinity of the facility; and (2) to determine whether operation of the facility results in a reduction of nesting activity or nesting success in the local populations of the following raptor species: Swainson's hawk, golden eagle, ferruginous hawk and burrowing owl. For each phase of LJIIA/B, the certificate holder conducted the first year of post-construction raptor nest surveys in 2011 (Downes et al. 2012), the first raptor nesting season after construction of that phase was completed. The second year of surveys was done in 2015 with results presented in Gerhardt and Kronner (2015). Hereafter, the certificate holders shall conduct long-term raptor nest surveys as described below and summarized in Section 2(d). The certificate holder will share the data with state and federal biologists

(a) Survey Protocol

- *For Raptor Species that Nest Aboveground*

During long-term survey years, each certificate holder shall use aerial and ground surveys to evaluate nest success by gathering data on active nests, on nests with young and on young fledged.. Each certificate holder will conduct aerial surveys to determine nest occupancy in late May or early June within the site and a 2-mile buffer around the site (as identified in Downes et al., 2012, Leaning Juniper II Wildlife Monitoring Report for 2011–2012). Two helicopter visits to each nest may be required to determine *occupancy*. These surveys may be coordinated with adjacent wind facilities. All nests discovered during pre-construction surveys and any nests discovered during post-construction surveys, whether active or inactive, will be given identification numbers. Nest locations will be recorded on U.S. Geological Survey 7.5-minute

quadrangle maps. Global positioning system coordinates will be recorded for each nest. Locations of inactive nests will be recorded because they could become occupied during future years. For occupied nests, the certificate holder shall determine nesting *success* by a minimum of one ground visit to determine species, number of young and young fledged. "Nesting success" means that the young have successfully fledged (reach advanced stage of development, the young are capable of independent movements). Nests that cannot be monitored due to the landowner denying aerial or ground access will be checked from a distance where feasible.

For Burrowing Owls The certificate holders monitored burrowing owl nests in 2011 and in 2015 (Downes et al. 2012, Gerhardt and Kronner 2015). Hereafter, each certificate holder will survey burrowing owl nest sites discovered during pre- and post-construction surveys (as identified in Downes et al., 2012, Leaning Juniper II Wildlife Monitoring Report for 2011–2012) as a part of the long-term raptor nest monitoring program described above and in Section 2(d). Any nests discovered during future post-construction surveys, whether active or showing signs of intermittent use by the species will be given identification numbers and monitored. Nest locations will be recorded on U.S. Geological Survey 7.5-minute quadrangle maps. Global positioning system coordinates will be recorded for each nest site. Coordinates for ancillary burrows used by one nesting pair or a group of nesting pairs will also be recorded. Locations of inactive nests will be recorded because they could become occupied during future years.

(b) Analysis

For each phase of the facility, the certificate holders analyzed the raptor nesting data collected after two survey years to determine whether a reduction in either nesting success or nest use has occurred in the vicinity of the facility (see Gerhardt and Kronner 2015).. The number of nests and raptor species composition demonstrated natural variation within the typical range of the various species, between 2011 and 2015. The Swainson's hawk nesting density continued to be high for a landscape dominated by natural habitats. Much of this variability can be attributed to natural conditions associated with precipitation levels, available prey base (voles, ground squirrels, and invertebrates), and interspecies (common raven) competition.

(c) Mitigation

The certificate holders shall propose mitigation for the affected species in consultation with the Department and ODFW and shall implement mitigation as approved by the Council (see Section 2(d)).

(d) Long-term Raptor Nest Monitoring and Mitigation Plan

In addition to the two years of post-construction raptor nest surveys described in Section 2(a), each certificate holder shall conduct long-term raptor nest surveys at five-year intervals for the life of the facility.[3] The certificate holders shall conduct the first long-term raptor nest survey in 2020. In conducting long-term surveys, the certificate holders shall follow the same survey protocols as described above in Section 2(a) and in Gerhardt and Kronner (2015) unless the certificate holders propose an alternative protocol that is approved by the Department. In developing an alternative protocol, the certificate holders shall consult with ODFW.

[3] As used in this plan, "life of the facility" means continuously until the facility site is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

Each certificate holder shall analyze the raptor nesting data collected after each year of long-term raptor nest surveys to determine whether a reduction in either nesting success or nest use has occurred in the vicinity of the facility. If the analysis indicates a reduction in nesting success or nest use by Swainson's hawks, golden eagles, ferruginous hawks or burrowing owls within the facility site or within 2 miles of the facility site, then the certificate holders shall propose appropriate mitigation for the affected species as described in Section 2(a) and shall implement mitigation as approved by the Council. At a minimum, if the analysis shows that any raptors of these species have abandoned a nest territory within the facility site or within ½ mile of the facility site or has not fledged any young over the two survey years within that same area, the certificate holders shall assume the abandonment or unsuccessful fledging is due to operation of the facility unless another cause can be demonstrated convincingly.

Any reduction in nesting success or nest use could be due to operation of the facility, operation of another wind facility in the vicinity or some other cause, including changes in land use patterns after construction of the facility. The certificate holders shall attribute the reduction to operation of LJIIA/B if the wind turbine closest to the affected nest site is an LJIIA/B turbine unless the certificate holder demonstrates, and the Department agrees, that the reduction was due to a different cause.

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

3. Washington Ground Squirrel Surveys

For the LJIIA/B area, the certificate holders conducted surveys in 2011, the year following construction , and 2014 to collect data on Washington ground squirrel (WGS) activity within the lease boundary (Downes et al. 2012, 2014). A qualified professional biologist monitored the WGS sites in the facility identified during the pre-construction surveys (2005 through 2007) and the buffer area within 500 feet in all directions from the identified WGS sites in suitable habitat. The sites include the historic areas at LJIIA/B (as identified in Downes et al. 2012). Overall, WGS are active in the area but have shifted areas of occupancy from pre-construction boundaries.

Hereafter, the certificate holders shall conduct long-term WGS use surveys at LJII-A/B) every three years for the life of the facility (2017, 2020, 2023...). Post-construction WGS monitoring for the LJIIA/B areas will assess the status (occurrence) and use (extent) of colonies. Surveyors will conduct standard recording protocols (level of use, notes on natal sites and physical extent of the sites) during meandering pedestrian (40-60 m spacing) surveys of the identified sites and suitable habitat within 500 ft. buffer twice between late March and late May, during the active WGS periods. The biologist will also record incidental observations (including mapping and dates of observation) during other survey activities on the facility sites. These observations shall also include current land use and any land use or project-caused conditions (erosion, declines in vegetation quality) that may adversely affect WGS sites. This monitoring will be consistent with the Incidental Take Permit (ITP) application for LJIIA as set forth in Attachment E of the Final Order on the Application. These surveys may be coordinated

with adjacent wind facilities to enhance data collection and analysis of WGS activity in the area.

4. Grassland Bird Study

The grassland bird study was a 2-year, post-construction evaluation of grassland bird use in the Facility area. Parts of the Facility occupy native habitat suitable for various ground-nesting bird species that nest in grassland or open low shrub habitat. The objective of the post-construction grassland bird study is to determine if there are noticeable changes in the presence and overall use by special status grassland bird species compared to pre-construction data collected in 2006.

(a) Study Area

The study areas were located within the LJIIA/B area and covered approximately 1,362 acres.[4] The study areas were selected because they are somewhat removed from human activity (except low traffic use on facility access roads and one county road) and contain a large area of grassland/shrub-steppe habitat (mapped as habitat sub-type "SSB") that is not proposed to be altered during project construction or operations.

(b) Survey Protocol

The certificate holders conducted the first year of post-construction grassland surveys in 2011, the first spring following the beginning of commercial operation of the facility (Downes et al. 2012). The certificate holders conducted a second year of grassland surveys in 2014. Findings of the grassland bird study were presented Downes and Gritski (2014).

(c) Data Analysis and Reporting

After the first survey year (2011), the certificate holders submitted a preliminary summary report to the Department (Downes et al. 2012). After the second survey year (2014), the certificate holders submitted a more comprehensive final report (Downes and Gritski 2014). Overall, no noticeable change in presence and overall use by special status grassland birds was observed when compared to pre-construction findings.

5. Wildlife Monitoring and Reporting System

The Wildlife Monitoring and Reporting System (WMRS) is an on-going monitoring program to report avian and bat casualties found by maintenance personnel during operation of the facility. It consists of weekly Environmental Coordinator (EC) Inspections of selected turbines conducted during both spring and fall migration seasons, monthly SPCC Turbine Checks of every turbine, and Incidental Observations with discovery of bird and bat carcasses and injured wildlife incidental to operations and maintenance. The certificate holders' maintenance personnel will be trained in the methods needed to carry out this program.

All avian and bat carcasses discovered by the certificate holders' maintenance personnel will be reported to the on-site EC for same day data recording (species, location, date, conditions) and for photo documentation. This information will be processed within WRMS and reviewed by the certificate holders biologists for confirmation of information and identification. If the carcass is suspected to be an eagle or a state or federally- listed endangered or threatened

species, the certificate holders will contact ODFW and US Fish and Wildlife Service (USFWS) to report and coordinate collection. The certificate holder will secure the carcass (e.g., cover with a container) until, if appropriate, collection is completed. The certificate holders will not handle or transport any bat or bat carcass without a state or federal scientific collection or special use permit (SPUT).

6. Data Reporting

Each certificate holder will report wildlife monitoring data and analysis to the Department. Monitoring data include fatality monitoring program data; raptor nest survey data; WGS survey data, incidental observation, and assessment reports; grassland bird study data; and WMRS (specifically eagles or state and federally-listed endangered or threatened species) data. The certificate holders may include the reporting of wildlife monitoring data and analysis in the annual report required under OAR 345-026-0080 or submit this information as a separate document at the same time the annual report is submitted. In addition, the certificate holder shall provide to the Department any data or record generated in carrying out this monitoring plan upon request by the Department.

The certificate holders shall notify USFWS and ODFW immediately if any federal or state endangered or threatened species are killed or injured on the facility site.

The public will have an opportunity to receive information about monitoring results and to offer comment. Within 30 days after receiving the final versions of reports that are required under this plan, the Department will make the reports available to the public on its website and will specify a time in which the public may submit comments to the Department.[5]

7. Amendment of the Plan

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

8. Literature Cited (Documents cited are available on the Oregon Department of Energy web site)

Downes, S., B. Gritski, B. Anderson, and S. Zielin. 2012. Leaning Juniper II Wind Power Facility Wildlife Monitoring Study Annual Report, March 2011—July 2012. Prepared for Leaning Juniper II, LLC, Portland, Oregon. Prepared by Northwest Wildlife Consultants, Inc. dated October 23, 2012.

Downes, S., B. Gritski, and S. Woods. 2013. Leaning Juniper II Wind Power Facility Wildlife Fatality Monitoring Study January 2011-July 2013. Prepared for Iberdrola Renewables, Portland, Oregon. Prepared by Northwest Wildlife Consultants, Inc., Pendleton, Oregon dated November 27,2013.

[5] The certificate holders may establish a Technical Advisor Committee (TAC) but are not required to do so. If the certificate holders establish a TAC, the TAC may offer comments to the Council about the results of the monitoring required under this plan.

Annual Wildlife Monitoring Report (2022)

Monitoring Report – Condition 21 (b)(v)

Wildlife

As outlined in the Wildlife Monitoring and Mitigation Plan ("WMMP"), LJII completed avian and bat fatality monitoring from 2011 to 2013. Washington ground squirrel monitoring occurs every 3 years after project operation and surveys were completed in 2014 and 2017. Burrowing owl surveys are required every 5 years and the initial survey occurred in 2015. Washington ground squirrel and burrowing owl surveys planned for 2020were completed in the spring of 2021 (See 2021 Annual Report for details). Raptor nest monitoring was completed in 2011 and 2015. ODFW conducted Raptor nest surveys of the area in 2020 and 2021 and shared that data. In 2022, a report summarizing the ODFW raptor data in relation to Leaning Juniper II A and IIB was completed. The next Washington ground squirrel surveys will occur in 2023, and the next raptor nest and burrowing owl surveys will occur in 2025.

Wildlife Monitoring and Reporting System

During operation in 2022, no wildlife fatalities or injuries were recorded by operations staff.

Revegetation

Conditions for revegetation monitoring in 2015. No revegetation monitoring was required, nor was any conducted in 2022.

Habitat Mitigation

LJII holds the legal rights for a 92-acre Habitat Mitigation Area ("HMA"). This HMA covers the facility's impacts for both LJII A and LJII B and the habitat impacts from the final as-built facilities.

In 2015, ODFW and ODOE concurred that the trajectory of vegetation in the HMA was improving following the institution of grazing restrictions. Therefore, the monitoring methods were amended at that time to consist of 1) continuing monitoring of wildfire activity, 2) assessing general vegetation conditions within the HMA using photo-monitoring points and a meandering pedestrian survey of the HMA, 3) documenting noxious weed populations and 4) providing recommendations for weed control. This change was documented in the 2015 HMA monitoring report.

2022

HMA photo-monitoring was conducted in May 2022. Monitoring results indicated that the HMA continues to exhibit increases in cover and diversity in the shrub-steppe and bunchgrass communities. See enclosed 2022 HMA monitoring report.

ENVIRONMENTAL & STATISTICAL CONSULTANTS

2725 NW Walnut Boulevard, Corvallis, Oregon 97333
Phone: 541-230-1790 ◆ www.west-inc.com ◆ Fax: 307-637-6981

TECHNICAL MEMORANDUM

DATE: October 12, 2022

TO: Amy Parsons and Brant Ivey, Avangrid Renewables

FROM: Andrea Chatfield and Julia Fields, Western EcoSystems Technology, Inc.

RE: Raptor Nest Analysis for the Leaning Juniper II Wind Project, Gilliam County, Oregon

INTRODUCTION

Leaning Juniper Wind Power II, LLC (Certificate Holder), a subsidiary of Avangrid Renewables LLC, developed the Leaning Juniper II Wind Project (LJII or Project) in Gilliam County, Oregon, with commercial operations beginning in June 2011. Consistent with measure 2(a) in the Project's Wildlife Monitoring and Mitigation Plan (WMMP), amended November 6, 2015 (LJWPII 2015), the Certificate Holder conducted two years of post-construction raptor nest surveys at the Project in 2011 and 2015. Additionally, measure 2(d) of the WMMP calls for long-term raptor nest surveys to be conducted at five-year intervals for the life of the Project. The objectives of the raptor nest monitoring are to determine the size of breeding populations of raptor species in the vicinity of the Project, with a focus on Swainson's hawk (*Buteo swainsoni*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*B. regalis*), and burrowing owl (*Athene cunicularia*), and to determine whether operation of the Project results in a reduction of nest use or nest success in local populations of these species. As a result of the COVID 19 pandemic in the spring of 2020, the first year of long-term monitoring for Leaning Juniper II was impacted due to uncertainties around field crew deployment and overall travel safety. The Certificate Holder subsequently coordinated with Oregon Department of Fish and Wildlife (ODFW) on their planned Upper Columbia Basin raptor and raven nest monitoring effort (Watson et. al 2021). Therefore the initial round of long-term raptor nest monitoring was completed at the Project in 2020 using ODFW data and supplemented in 2021 by ODFW data and data collected by the Certificate Holder (Jansen and Parrot 2021).

In 2022, the Certificate Holder contracted Western EcoSystems Technology, Inc. (WEST) to conduct an analysis of the raptor nesting data collected at the Project to date to determine whether a reduction in nest use by raptors has occurred in the vicinity of the Project post-construction. WEST relied on previous data collected by the Certificate Holder in 2011 and 2015 (Downes et al. 2012, Gerhardt and Kronner 2015), by ODFW and Washington Department of Fish and Wildlife

(WDFW) in 2020 and 2021 (Watson et al. 2021), and by WEST in 2021 (Jansen and Parrot 2021). This memorandum summarizes characteristics of the Survey Area and survey methodology, and compares results of the 2011, 2015, 2020, and 2021 raptor nest surveys conducted at the Project.

SURVEY AREA

The Project is located 1.5 miles (mi; 2.4 kilometers [km]) south of Arlington in Gilliam County, Oregon, and consists of 117 wind turbines (Figure 1), three non-guyed meteorological towers, and other supporting facilities. The Project comprises two areas, Leaning Juniper IIA (LJIIA) and IIB (LJIIB; Figure 1). LJIIA has 43 Suzlon S88 2.1-megawatt (MW) turbines for an installed capacity of 90.3 MW, and LJIIB has 74 GE 1.5sle 1.5-MW turbines for an installed capacity of 111 MW. Combined, the Project has an installed capacity of 201.3 MW.

The raptor nest Survey Areas consisted of a 2.0-mi (3.2-km) buffer of the LJIIA and LJIIB permit boundaries (Figure 1). The Survey Areas are located in the Columbia Plateau Ecoregion, characterized by tablelands of moderate to high relief, and irregular plains with open hills (Thorson et al. 2003). General vegetation communities present within the Survey Areas include agricultural, shrub-steppe, native perennial grassland, non-native annual grassland, and revegetated grassland. Elevations range from approximately 260 to 1,380 feet (80 to 420 meters) above sea level.

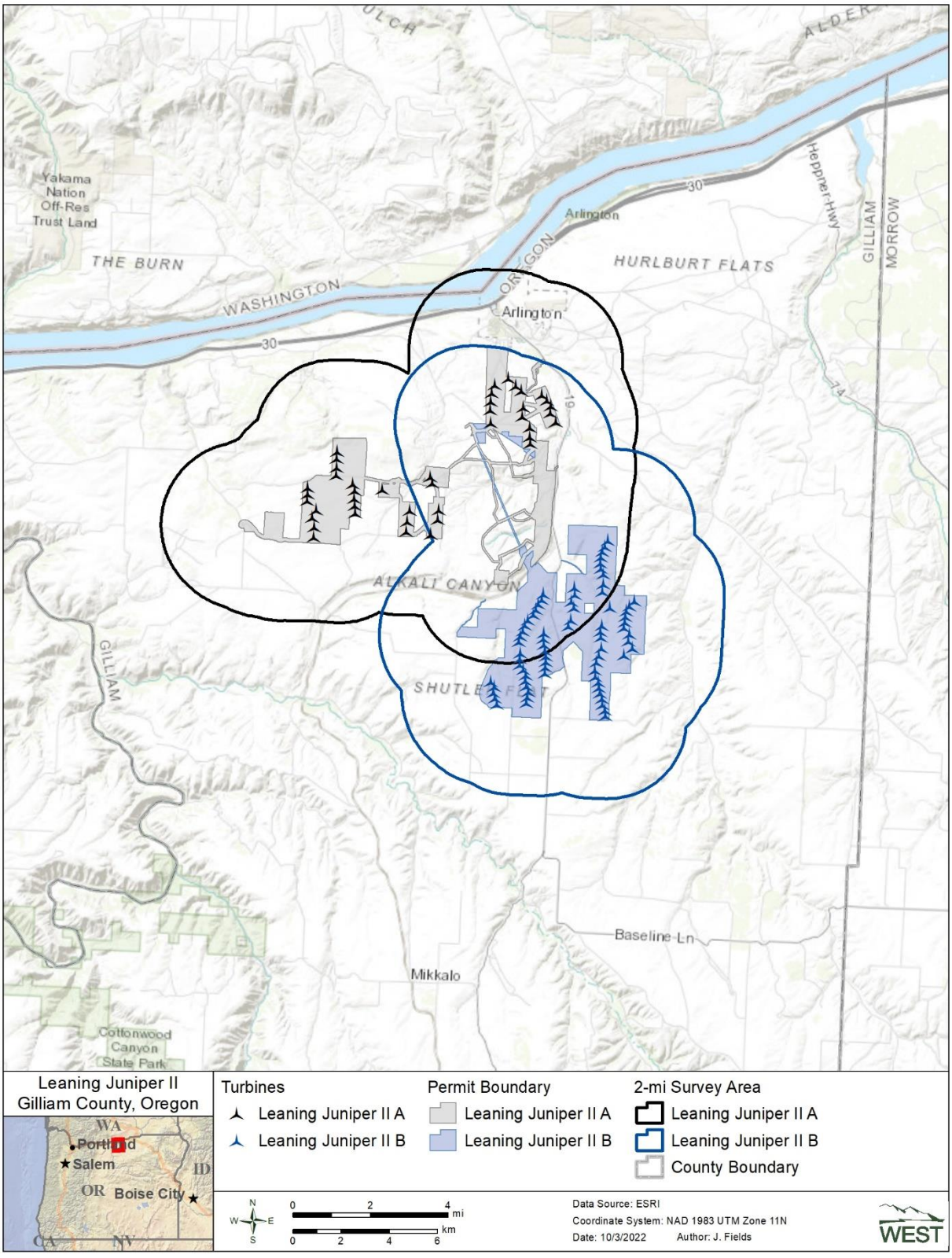

Figure 1. Raptor nest Survey Areas at the Leaning Juniper II Wind Project, Gilliam County, Oregon.

METHODS

Raptor Nest Surveys

Raptor nest surveys consisted of an aerial survey conducted in spring (April 15 – May 15) of each survey year within 2.0 mi of the LJIIA and LJIIB permit boundaries (Figure 1). Surveys were conducted via helicopter and all raptor and common raven (*Corvus corax*) nests were recorded. Nest status was determined using the following definitions:

- Active nest – observed behaviors consistent with a nesting attempt, including nest building/repair, incubation, or presence of eggs or young.

- Inactive nest – no "active" behaviors were observed; presence of adult birds was not sufficient to deem a nest active unless observed in an incubating/brooding posture.

Due to the factors mentioned in the Introduction, follow-up surveys to ascertain the outcome of breeding attempts at active nests were not conducted in all survey years; therefore, changes in nest success during the long-term nest monitoring could not be evaluated. The scope of the 2020 and 2021 nest surveys conducted by WDFW and ODFW was focused on raptor nests observable form aerial observation. As such, the Certificate Holder contracted WEST to conduct a separate ground-based survey in 2021 specifically to monitor the presence and status of historical burrowing owl nests within the Survey Areas (Jansen and Parrot 2021). All six historical burrowing owl burrows identified during pre-construction surveys were visited in June 2021 to assess condition and occupancy.

Analysis of Raptor Nest Data

WEST analyzed raptor nest data collected for the Project in 2011, 2015, 2020, and 2021 to determine whether a reduction in nest use by raptors occurred in the vicinity of the Project during the 11-year period following Project construction. For this analysis, WEST compared the number of active and inactive raptor and raven nests and species composition of nests across the four survey years. Results are reported separately for the two Project areas, LJIIA and LJIIB. WEST assessed changes in raptor nesting for both LJIIA and LJIIB at two spatial scales: within 0.5 mi (0.8 km) of permit boundaries and within the entire 2.0-mi Survey Area for each area.

RESULTS

The number of active and inactive raptor and raven nests by survey year, and for each spatial scale, are presented for LJIIA in Table 1a and for LJIIB in Table 1b. Maps depicting nest locations by survey year (2011, 2015, 2020, and 2021) are included in Figures 2–5.

2011 Surveys

Leaning Juniper IIA

At LJIIA, 61 nests were documented within the Survey Area in 2011, 46 of which were active raptor nests including nests of one focal species, Swainson's hawk (22 nests; Table 1a, Figure 2; Downes et al. 2012).

Leaning Juniper IIB

At LJIIB, 50 nests were documented within the Survey Area in 2011, 41 of which were active raptor nests including nests of three focal species: ferruginous hawk (one nest), Swainson's hawk (20 nests), and burrowing owl (one nest; Table 1b, Figure 2; Downes et al. 2012).

2015 Surveys

Leaning Juniper IIA

At LJIIA, 50 nests were documented within the Survey Area in 2015, 25 of which were active raptor nests including nests of one focal species, Swainson's hawk (15 nests; Table 1a, Figure 3; Gerhardt and Kronner 2015).

Leaning Juniper IIB

At LJIIB, 40 nests were recorded within the Survey Area in 2015, 21 of which were active raptor nests including nests of two focal species: ferruginous hawk (one nest) and Swainson's hawk (13 nests; Table 1b, Figure 3; Gerhardt and Kronner 2015).

2020 Surveys

Leaning Juniper IIA

During the 2020 survey effort at LJIIA, 102 nests were recorded, 32 of which were active raptor nests including nests of one focal species, Swainson's hawk (15 nests; Table 1a, Figure 4; Gerhardt and Kronner 2015).

Leaning Juniper IIB

During the 2020 aerial survey at LJIIB, 85 nests were documented, 34 of which were active raptor nests including nests of two focal species: ferruginous hawk (one nest) and Swainson's hawk (21 nests; Table 1b, Figure 4; Watson et al. 2021).

2021 Surveys

Leaning Juniper IIA

During the 2021 aerial survey, 113 nests were recorded within the LJIIA Survey Area, 43 of which were active raptor nests including nests of one focal species, Swainson's hawk (19 nests; Table 1a, Figure 5; Watson et al. 2021). An additional ground-based survey was conducted in June 2021 specifically for burrowing owls, during which all five historical burrowing owl nest burrows documented during pre-construction surveys at LJIIA were visited (WEST 2021). One of the five

historical nest burrows was still present; however, it showed no signs of use by burrowing owl (WEST 2021).

Leaning Juniper IIB

During the 2021 aerial survey, 99 total nests were recorded within the LJIIB Survey Area, 47 of which were active raptor nests including nests of two focal species: ferruginous hawk (one nest) and Swainson's hawk (25 nests; Table 1b, Figure 5; Watson et al. 2021). During the 2021 ground-based survey, the single historical burrowing owl burrow documented during pre-construction surveys at LJIIB was visited; however, the burrow location is within an actively managed wheat field and no longer exists (WEST 2021).

Table 1a. Results of 2011, 2015, 2020, and 2021 raptor nest surveys at the Leaning Juniper IIA Wind Project, Gilliam County, Oregon. Results provided at two spatial scales: 0.5 miles (mi) and 2.0 mi from permit boundary.

	2011		2015		2020		2021	
Species	**Within 0.5 mi**	**Within 2 mi**	**Within 0.5 mi**	**Within 2 mi**	**Within 0.5 mi**	**Within 2 mi**	**Within 0.5 mi**	**Within 2 mi**
Golden eagle	0	0	0	0	0	0	0	0
Ferruginous hawk	0	0	0	0	0	0	0	0
Swainson's hawk	7	22	7	15	5	15	5	19
Red-tailed hawk	7	18	4	10	2	14	7	18
Burrowing owl	0	0	0	0	-	-	0	0
Peregrine falcon	0	0	0	0	0	1	0	1
Prairie falcon	1	2	0	0	0	0	0	1
Great horned owl	2	4	0	0	1	2	1	3
Barn Owl	0	0	0	0	0	0	0	1
Total Active Raptor Nests	**14**	**46**	**11**	**25**	**8**	**32**	**13**	**43**
Common raven	1	7	10	15	13	41	16	46
Inactive nest	3	8	1	10	8	29	6	24
Total Nests	**18**	**61**	**22**	**50**	**29**	**102**	**35**	**113**

Table 1b. Results of 2011, 2015, 2020, and 2021 raptor nest surveys at the Leaning Juniper IIB Wind Project, Gilliam County, Oregon. Results provided at two spatial scales: 0.5 miles (mi) and 2.0 mi from permit boundary.

	2011		2015		2020		2021	
Species	**Within 0.5 mi**	**Within 2 mi**	**Within 0.5 mi**	**Within 2 mi**	**Within 0.5 mi**	**Within 2 mi**	**Within 0.5 mi**	**Within 2 mi**
Golden eagle	0	0	0	0	0	0	0	0
Ferruginous hawk	1	1	1	1	1	1	1	1
Swainson's hawk	9	20	7	14	7	21	8	25
Red-tailed hawk	6	14	4	6	3	7	5	15
Burrowing owl	0	1	0	0	-	-	0	0
Peregrine falcon	0	0	0	0	0	0	0	0
Prairie falcon	0	2	0	0	0	0	0	0
Great horned owl	2	3	0	0	1	5	2	6
Barn owl	0	0	0	0	0	0	0	0
Total Active Raptor Nests	**18**	**41**	**12**	**21**	**12**	**34**	**16**	**47**
Common raven	2	7	6	13	7	23	10	33
Inactive nest	1	2	4	6	7	28	5	19
Total Nests	**21**	**50**	**22**	**40**	**26**	**85**	**31**	**99**

Comparison of Nest Use Across Years

Leaning Juniper IIA

Across survey years, six raptor species were documented nesting within the LJIIA Survey Area (2.0-mi buffer of permit boundary): Swainson's hawk, red-tailed hawk (*B. jamaicensis*), peregrine falcon (*Falco peregrinus*), prairie falcon (*F. mexicanus*), great horned owl (*Bubo virginianus*) and barn owl (*Tyto alba*; Table 1a, Figures 2–5). In general, the lowest level of raptor nesting was observed in 2015, with raptor nest use appearing to rebound in 2020 and 2021 to levels near or above that documented in 2011 (Table 1a). Across the 11-year study period (2011 to 2021), Swainson's hawk nest use declined from 22 nests in 2011 to 19 nests in 2021, while prairie falcon and great horned owl each saw a decline of one nest, red-tailed hawk nest use remained the same, and peregrine falcon and barn owl nests increased by one (Table 1a, Figures 2-5). Alternatively, common raven nests increased substantially within the Survey Area, with a greater than 6-fold increase in active nests documented over the 11-year study period (Table 1a, Figures 2–5). The number of inactive nests also increased over the study period, from a low of eight in 2011 to a high of 29 in 2020 (Table 1a), although the species (e.g., raptor or raven) associated with the nest is unknown. Within 0.5 mi of the permit boundary, Swainson's hawk, prairie falcon, and great horned owl saw a small decrease in nesting (1-2 nests each), while red-tailed hawk nest use was the same in 2011 and 2021 (Table 1a, Figures 2-5).

Leaning Juniper IIB

Across survey years, six raptor species were documented nesting within the LJIIB Survey Area: ferruginous hawk, Swainson's hawk, burrowing owl, red-tailed hawk, prairie falcon, and great horned owl (Table 1b, Figures 2–5). With the exception of burrowing owl and prairie falcon, all raptor species saw either stable or increasing nest use over the study period. The single

ferruginous hawk nest documented in 2011 remained active during all four survey years, while the number of Swainson's hawk, red-tailed hawk nests, and great horned owl nests all increased by two to five nests each (Table 1b, Figures 2–5). A single burrowing owl nest and two prairie falcon nests were documented within the Survey Area in 2011; however, no nesting by either species was observed in 2015, 2020, or 2021 (Table 1b). Similar to LJIIA, common raven nests increased substantially within the Survey Area (from seven to 33), and inactive nests within the Survey Area also increased (from two to 17; Table 1b, Figures 2–5). Within 0.5 mi of the permit boundary, the number and species composition of raptor nests remained relatively constant, with the number of nests for individual species not varying by more than one nest between 2011 and 2021 (Table 1b, Figures 2–5).

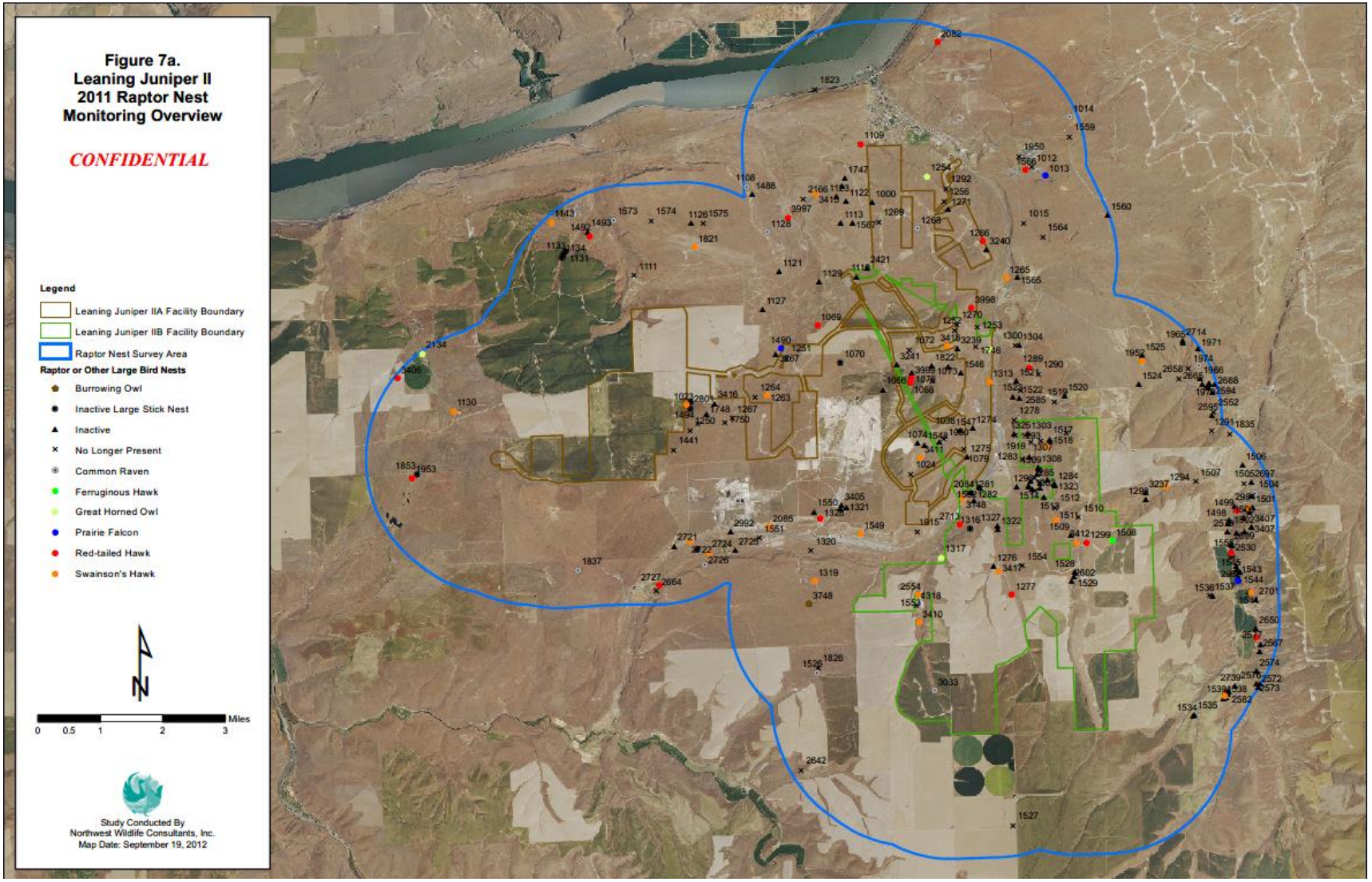

Figure 2. Location of raptor nests documented during 2011 raptor nest surveys at the Leaning Juniper II Wind Project, Gilliam County, Oregon. Figure from Downes et al. 2012.

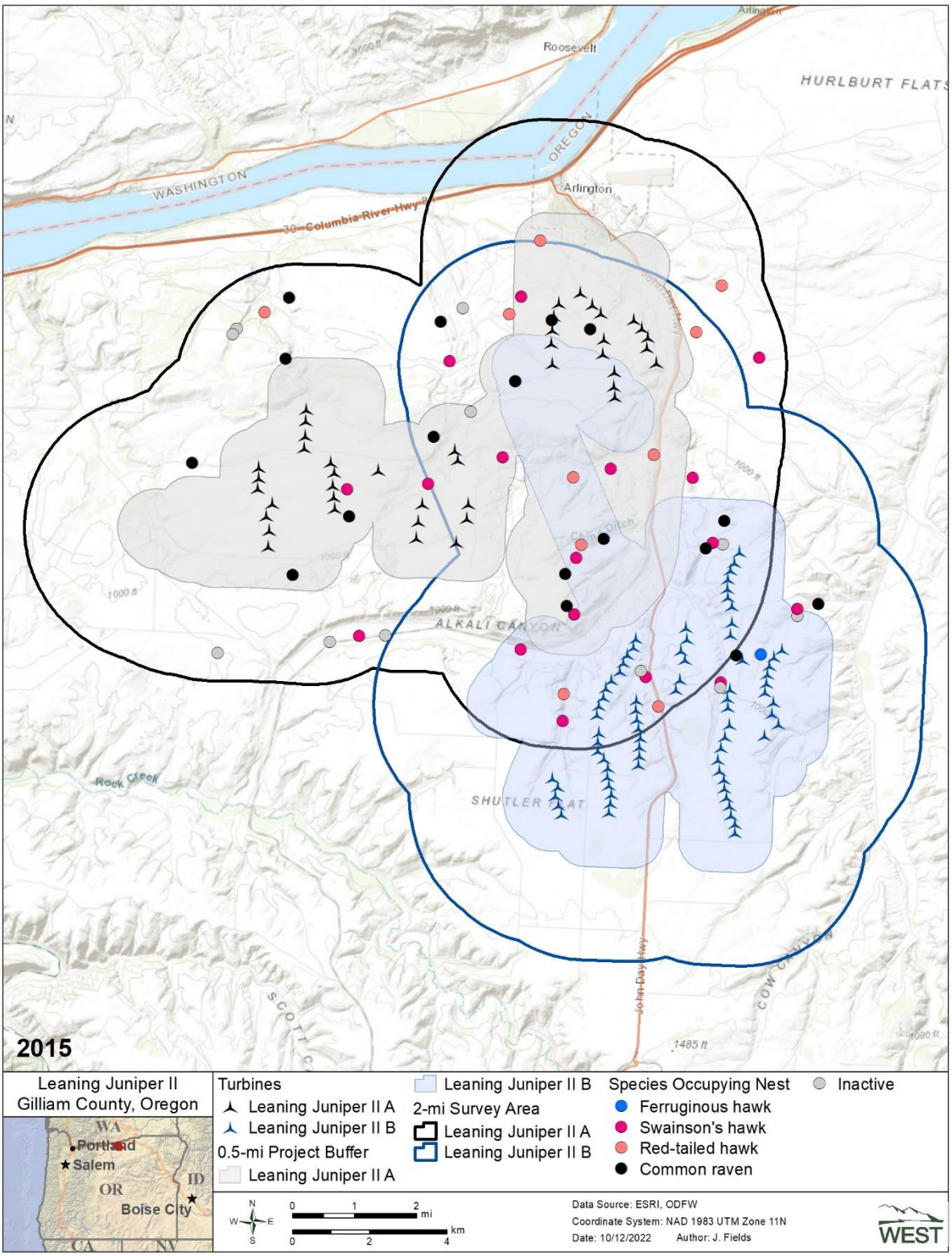

Figure 3. Location of raptor nests documented during 2015 raptor nest surveys at the Leaning Juniper II Wind Project, Gilliam County, Oregon. Data from Gerhardt and Kronner 2015.

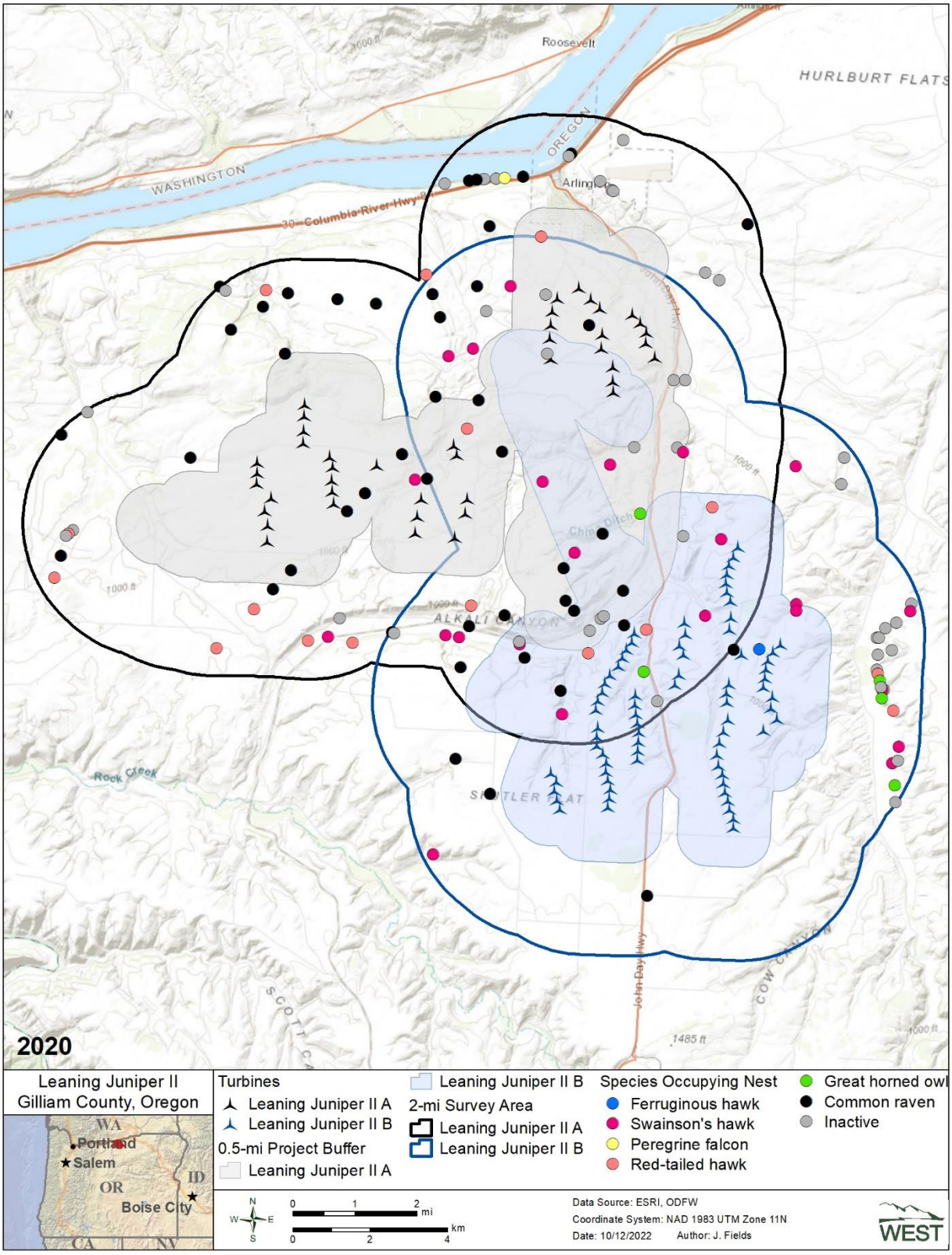

Figure 4. Location of raptor nests documented during 2020 raptor nest surveys at the Leaning Juniper II Wind Project, Gilliam County, Oregon. Data from Watson et al. 2021.

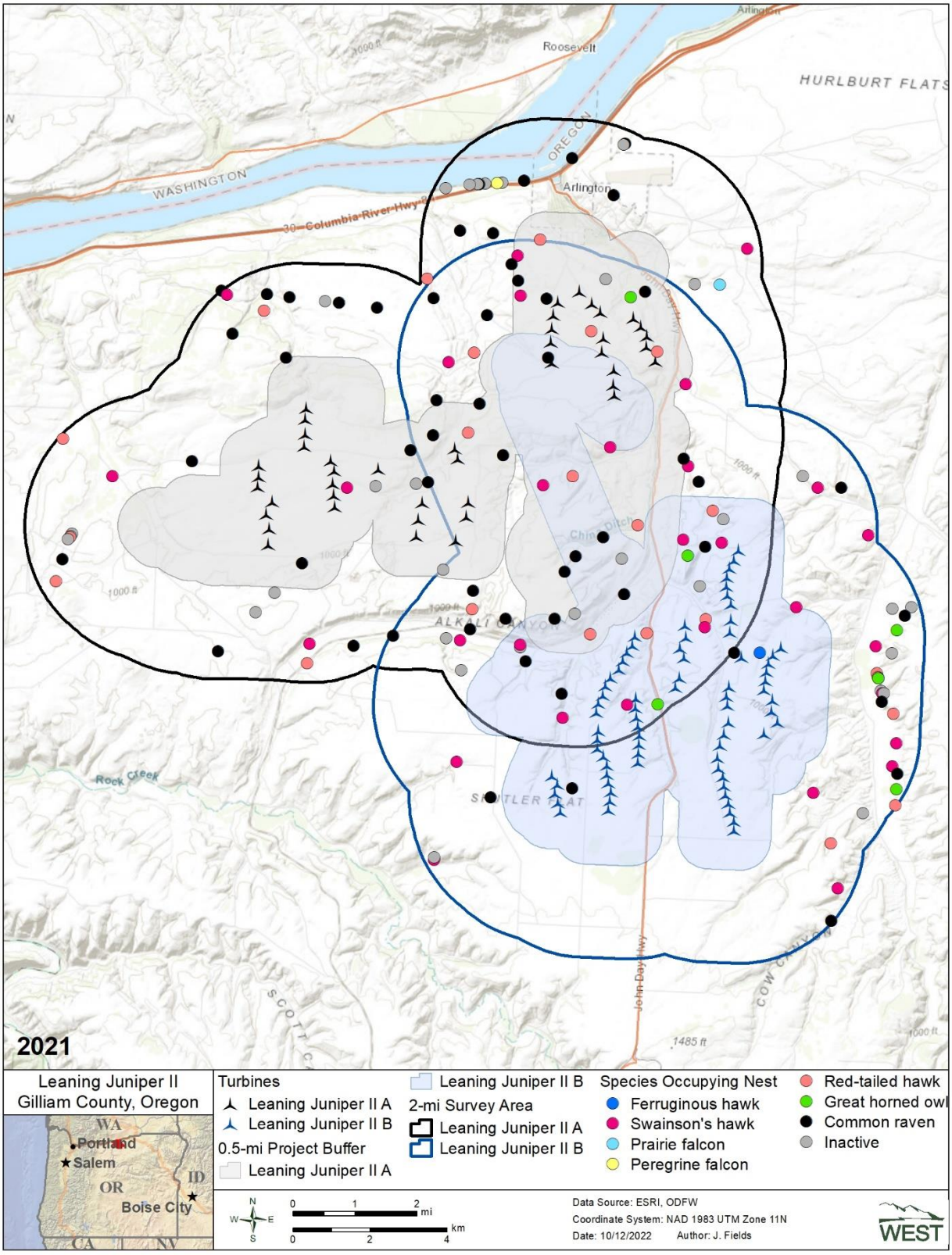

Figure 5. Location of raptor nests documented during 2021 raptor nest surveys at the Leaning Juniper II Wind Project, Gilliam County, Oregon. Data from Watson et al. 2021.

DISCUSSION

At LJIIA, the overall number of active raptor nests declined from 46 nests in 2011 to 43 nests in 2021. In contrast, at LJIIB, the overall number of raptor nests increased over the study period, from 41 nests in 2011 to 47 nests in 2021, primarily due to an increase in Swainson's hawk nests. Of the four focal species identified in the WMMP, three were documented nesting within the Survey Area during the 11-year post-construction study period: ferruginous hawk, burrowing owl, and Swainson's hawk. The single ferruginous hawk nest documented in 2011, located about 330 meters (1,083 feet) from the nearest LJIIB turbine, remained active during all subsequent survey years (Figures 2–5). Alternatively, the single burrowing owl burrow documented in the LJIIB Survey Area in 2011 was inactive during the 2015 and 2021 surveys.

Results for Swainson's hawks were mixed between the two Project areas, with the species showing a slight decline in nest use at LJIIA (22 nests in 2011 to 19 nests in 2021), but increasing at LJIIB (20 nests in 2011 to 25 nests in 2021). Within 0.5 mi of the permit boundaries, Swainson's hawk saw a decline of 1-2 nests at each of LJIIA and LJIIB between 2011 and 2021. At a larger, regional scale, Watson et al. (2021) found significant increases in Swainson's hawk nest at wind energy facilities in the upper Columbia Basin from up to 18 years following facility construction, with regional Swainson's hawk nest numbers more than doubling between pre- and post-construction nest surveys. Similar changes in Swainson's hawk nest use were observed at two reference areas located away from the wind energy facilities (Watson et al. 2021). Specifically for the Leaning Juniper II Project, the number of active Swainson's hawk nests increased between pre-construction (2005 and 2009) and post-construction (2020 and 2021) surveys for both LJIIA and LJIIB (an increase of 0.028 and 0.040 nests/square km, respectively; Watson et al. 2021). Interannual variation in nest use by Swainson's hawk is likely influenced by a combination of factors, including changes in land use and human activity on the landscape (e.g., agricultural practices, wind energy development, residences), competition from other species (e.g., red-tailed hawk and common raven), the availability of nesting substrates, and weather patterns that may affect prey abundance. For example, it's possible that the relatively high number of raptor nests documented in 2011 was influenced by the above average spring precipitation during that year resulting in an abundance of prey (Gerhardt and Kronner 2015). By contrast, spring 2015 was unusually dry and may have contributed to the decrease in raptor nesting activity documented in 2015 (Gerhardt and Kronner 2015). Average and above average precipitation in 2019 and 2020, respectively (National Weather Service 2022), may have contributed to the apparent rebound in raptor nest activity observed at the Project during the 2020 and 2021 surveys.

The remaining focal species identified in the WMMP, golden eagle, was not recorded within the Survey Area. No historical golden eagle nests are known to occur within 2.0 mi of the Project's permit boundary and no golden eagle nests have been documented during pre- or post-construction raptor nest surveys for the Project.

CONCLUSION

The results of this assessment of long-term raptor nesting in the Project vicinity indicate generally stable numbers of active nests for all raptor species over the 11-year post-construction study period, both at the 0.5-mi and 2.0-mi spatial scales. While Swainson's hawks saw a slight decrease in nest use at LJIIA, nesting by this species increased by 25% at LJIIB and Swainson's hawks remain the most common raptor breeding in the Survey Area. Ferruginous hawk nesting has remained low but consistent throughout the study period (one nest during each of the four survey years at LJIIB). No golden eagle nests have been documented within the Survey Area post-construction.

LITERATURE CITED

Downes, S., B. Gritski, B. Anderson, S. Zielin. 2012. Leaning Juniper II Wind Power Facility Wildlife Monitoring Study Annual Report, March 2011—July 2012. Prepared for Leaning Juniper II, LLC, Portland, Oregon. Prepared by Northwest Wildlife Consultants, Inc. October 23, 2012.

Gerhardt, R. and K. Kronner. 2015. Leaning Juniper II Wind Power Facility Raptor Nest Survey. Preapered for Leaning Juniper Wind Power II, LLC. Prepared by Northwest Wildlife Consultants, Inc. September 15, 2015.

Esri. 2022. World Imagery and Aerial Photos (World Topo). ArcGIS Resource Center. Environmental Systems Research Institute (Esri), producers of ArcGIS software, Redlands, California. Accessed September 2022. Available online: https://www.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=10df2279f9684e4a9f6a7f08febac2a9

Jansen E. and J. Parrot. 2021. Final 2021 Burrowing Owl (*Athene cunicuaria*) Survey Report for the Leaning Juniper IIA and IIB Wind Power Facility, Gilliam County, Oregon. Submitted to Avangrid Renewables, LLC. Prepared by Western EcoSystems Technology, Inc. (WEST). August 3, 2021.

Leaning Juniper Wind Power II (LJWPII), LLC. 2015. Leaning Juniper II Wind Project: Wildlife Monitoring and Mitigation Plan. June 11, 2015. Oregon Energy Facility Siting Council of the State of Oregon, Final Order on Amendment #2-Attachment D. Second Amended Site Certificate for the Leaning Juniper II Wind Power Facility.

National Weather Service. 2022. NOWData – National Oceanic and Atmospheric Administration Online Weather Data. Monthly Total Precipiation for Pendleton Area, OR. Accessed October 4, 2022. Available online at: https://www.weather.gov/wrh/Climate?wfo=pdt

North American Datum (NAD). 1983. NAD83 Geodetic Datum.

Thorson, T.D., S.A. Bryce, D.A. Lammers, A.J. Woods, J.M. Omernik, J. Kagan, D.E. Pater, and J.A. Comstock. 2003. Ecoregions of Oregon. (Color poster with map, descriptive text, summary tables, and photographs.) US Geological Survey (USGS) map (map scale 1:1,500,000). USGS, Reston, Virginia. US Environmental Protection Agency (USEPA). Information and downloads available online at: https://archive.epa.gov/wed/ecoregions/web/html/level_iii_iv-2.html#Level_%20III; map and ecoregion descriptions available online at: https://archive.epa.gov/wed/ecoregions/web/html/or_eco.html

US Geological Service (USGS) National Hydrography Dataset (NHD). 2022. USGS NHD Extracts by State. Accessed September 2022. Available online: https://www.usgs.gov/national-hydrography/national-hydrography-dataset; State data available online: https://apps.nationalmap.gov/downloader/#/

Watson, J.W., S.P. Cherry, and G.J. McNassar. 2021. Changes in Populations of Nesting Raptors and Common Ravens in Wind Power Developments in the Upper Columbia Basin up to 18 Years After Construction. Final Report to US Fish and Wildlife Service, Contract No. F19AF00789. Washington Department of Fish and Wildlife, Olympia, Washington and Oregon Department of Fish and Wildlife, Heppner, Oregon.

ENVIRONMENTAL & STATISTICAL CONSULTANTS

2725 NW Walnut Blvd., Corvallis, OR 97330
Phone: 541-230-1790 ◆ www.west-inc.com ◆ Fax: 307-637-6981

DATE: July 30, 2021

TO: Matt Hutchison and Brant Ivey, Avangrid Renewables, LLC

FROM: Erik Jansen and Joshua Parrot, WEST, Inc.

RE: Final 2021 Washington Ground Squirrel (*Urocitellus washingtoni*) Survey Report for the Leaning Juniper IIA and IIB Wind Power Facility, Gilliam County, Oregon.

Introduction

Leaning Juniper Wind Power II, LLC (LJWP), a wholly owned subsidiary of Avangrid Renewables, LLC operates the Leaning Juniper IIA and IIB Wind Power Facility (Project; LJIIA or LJIIB) in Gilliam County, Oregon. Western Ecosystems Technology, Inc. (WEST) was contracted by LJWP to conduct Washington ground squirrel (*Urocitellus washingtoni*; ground squirrel) surveys per conditions in the Wildlife Monitoring and Mitigation Plan (WMMP) that was included in the 2009 Site Certificate, as amended (EFSC 2015). Starting in 2017, the amended WMMP required periodic monitoring of historic Washington ground squirrel colonies every three years for the life of the Project. Monitoring resumed in 2021 after postponed in 2020 due to the health and safety concerns and travel restrictions related to the COVID-19 pandemic. This memorandum describes the survey methodology and associated monitoring results in compliance with Permit Conditions #87 and #88 of the Final Order of the Site Certificate, and WMMP, as amended (LJWP 2009, EFSC 2015).

Status and Natural History

A small rodent endemic to the Columbia Plateau, the Washington ground squirrel is no longer considered a federal candidate for listing, but is a state endangered species[1] in Oregon due to the reduced number of historic sites and distribution within the state (USFWS 2016, ODFW 2021).

Washington ground squirrels have an annual cycle characterized by a relatively short active period when all foraging, social, and reproductive activity takes place (Soto 2012). This period is followed by a longer period of dormancy, when animals live off accumulated fat reserves while hibernating in underground burrows (estivation). In Oregon, adult squirrels begin to emerge from winter hibernation between late January and early February (Sherman 2000). Young emerge from natal burrows as early as mid-March (Sherman 1999). The peak activity period is estimated to occur from the second week of April through the first week of May (Goodman 2003). Some sites may be noticeably active before and after these dates. Site-specific differences in chronology of activity levels do occur even among sites close in proximity (Goodman 2003). Peak activity occurs after the young have emerged. Active sites are most

[1] Oregon Administrative Rule 635-100-0105

obvious at this time because of heightened visual and audio detections, fresh digging, and/or fresh droppings (Goodman 2003). Typically, if the survey is conducted during peak activity periods, vocalizations can be expected if the site is active, although squirrels in small dispersed sites may not always be vocal (Goodman 2003). Estivation is initiated at many sites by early June and accurate site delineation becomes impractical. Soil type is an important component of habitat selection and burrow integrity (Finger et al. 2007). Shrub-steppe habitat over deep silty loam soils, particularly Warden and Sagehill soils, are typically used (Rickart and Yensen 1991, Marr 2001, Morgan 2002, Marr 2004). Surveys at the Montague Wind Facility, adjacent to the Project and the Boardman Bombing Range, located further east, found associations with Warden, Sagehill, Willis and Olex soils and dense sagebrush cover (Greene et al. 2009, Kronner 2009).

Survey Methods

To facilitate the 2021 survey effort, spatial data from previous survey efforts were obtained and mapped (Gritski et al. 2008, Gritski 2010 Downes et al. 2012, Downes and Gritski 2014, Gritski and Kronner 2017).

Ground squirrel surveys consisted of pedestrian transect surveys at historic 'areas of use' and 500 ft (152 m) buffers at nine sites at JLIIA and 10 sites at LJIIB (Survey Area; Gerhardt and Kronner 2017). Overlap of adjacent 500-ft buffers resulted in six areas of use in LJIIA and four areas of use in LJIIB (Figure 1). The term 'area of use' is analogous to a group of burrows that form a colony or site. Consistent with prior monitoring in 2017, biologists determined the current habitat suitability for ground squirrels at each Survey Area and recorded land use activity along with any evidence of Project-related conditions that might increase erosion or result in a decline in vegetation quality, thus adversely affecting a ground squirrel colony or its activity (LJWPII 2009, EFSC 2015). Habitat within areas of use that were converted from shrub-steppe to dryland wheat and classified as unsuitable ground squirrel habitat in 2017 were excluded from 2021 surveys.

The survey protocol followed guidance within the WMMP and methods outlined by Morgan and Nugent (1999) who describe sample techniques in areas where squirrel occupancy is unknown, and Goodman (2003) which is used in areas of known historical sites. Two rounds of surveys were conducted in mid-April and mid-May 2021. In the field, one biologist walked parallel meandering transects spaced approximately 164 ft (50 m) apart. To enhance the likelihood of detection, transects were oriented north-south the first round and east-west the second round. If an active burrow, historic burrow, or sign of squirrel was detected (*see* Active Site, below), the area within a 49-ft (15-m) radius of the point was searched for additional sign. If no sign was detected within the 49-ft radius area, radial transects spaced approximately 49 ft apart from the initial burrow entrance were surveyed to the edge of the Survey Area, marking all burrows detected. The process continued until the outer-most burrows were identified, thus delineating the furthest extent of the area of use. When documentation of all burrows was complete, parallel surveys continued along the same direction as before. Squirrel activity at the burrow followed Finger et al. (2007) and was defined as follows:

- Active Site – Confirmation of ground squirrel activity that includes observation of adults or juveniles, hearing alarm calls or other vocalizations, droppings outside of a freshly

used burrow. Tracks or disturbed soil at burrow entrance, clipped vegetation, fresh droppings, absence of spider webs at the burrow entrance, or intact burrow walls were all signs indicative of freshly used burrows.

- Inactive Site – During both rounds of surveys, transects were completed in the colony and no sign of individuals or evidence of burrows were observed.
- Unconfirmed Site – No ground squirrel activity was confirmed during transect surveys; however, typical ground-squirrel sized burrows occur at the site that ranged between 2.25−2.75 inches (5.7–7.0 centimeters) in diameter.

Surveys were conducted from sunrise until early afternoon, after which time aboveground squirrel activity typically diminishes (Morgan and Nugent 1999). Surveys were postponed if wind gusts exceeded 20 miles per hour (32 km per hour) due to issues with audio detection.

To delineate areas of use, burrow locations were imported into a GIS and each of the burrows was buffered by 15 meters and connected to form a polygon. The area of the polygon was calculated and the level of use at a site was classified according to the density of active burrows as described by Gerhardt and Kronner (2017) and implemented during pre-construction studies:

- Absent = No active burrows detected during either survey round,
- Very Low Use = less than one active burrow per hectare,
- Low Use = 1–5 active burrow(s) per hectare,
- Medium Use = 5–25 active burrows per hectare, or
- High Use = 25 or more active burrows per hectare,
- Very High Use = 250 or more active burrows per hectare.

Results

Biologists conducted two rounds of pedestrian transect surveys within Survey Areas over six days total on April 17−19 and May 17−19, 2021. Habitat suitability for ground squirrels within the 500-ft buffer of the areas of use were similar to 2017 conditions; no additional disturbances that might increase erosion or result in a decline in vegetation quality were noted. Areas with unsuitable land cover (e.g., 13, 14, 15 in LJIIB) that were excluded from 2017 survey were verified as cropland and excluded from 2021 surveys.

Approximately 76 ground squirrel burrows were documented within Survey Area 16-17 at LJIIB (Figure 4). Of the 76 burrows, droppings, tracks, fresh excavation, or calls were heard at 68 burrows (Photos 1-3). Consistent with the approach described by Gerhardt and Kronner (2017), each burrow was buffered by 15 m, resulting in a 2.81 ac (1.14 ha) area of use which is classified as a High area of use (approximately 60 burrows per hectare). Burrows within the area of use are embedded along the berm on either side of a dirt two-track, extending approximately 18 m perpendicular from the two-track at a straight length of 0.28 mi from end to end (Figure 4). The majority of soils within the area of interest consisted of Olex gravelly silt loam followed by Willis silt loam (Natural Resources Conservation Service 2021).

Literature Cited

Downes, S. and B. Gritski. 2014. Leaning Juniper II Wind Power Facility 2014 Wildlife Moni-toring. Prepared for Leaning Juniper II, LLC, Portland, Oregon. Prepared by Northwest Wildlife Consultants, Inc., Pendleton, Oregon.

Downes, S., B. Gritski, B. Anderson and S. Zielin. 2012. Leaning Juniper II Wind Power Fa-cility Wildlife Monitoring Study Annual Report. March 2011–July 2012. Prepared for Iberdrola Renewables, Portland, Oregon. Prepared by Northwest Wildlife Consultants, Inc., Pendleton, Oregon.

Energy Facility Siting Council (EFSC). 2015. Leaning Juniper IIA and IIB Wind Projects: Ongoing Wildlife Monitoring and Mitigation Plan. November 6. Available online: https://www.oregon.gov/energy/facilities-safety/facilities/Pages/LJA.aspx

Finger, R., G. J. Wiles, J. Tabor, and E. Cummins. 2007. Washington ground squirrel surveys in Adams, Douglas, and Grant Counties, Washington, 2004. Washington Department of Fish and Wildlife, Olympia. June.

Gerhardt, R. and K. Kronner. 2017. Leaning Juniper II Wind Power Facility 2017 Washing-ton Ground Squirrel Monitoring. Prepared for Leaning Juniper II, LLC, Portland, Oregon. Prepared by Northwest Wildlife Consultants, Inc., Pendleton, Oregon.

Goodman, S. 2003. 2003 protocol for Washington ground squirrel surveys. Washington Department of Fish and Wildlife. Olympia.

Greene, E. R. G. Anthony, V. Marr, and R. Morgan. 2009. Abundance and Habitat Associations of Washington Ground Squirrels in the Columbian Basin, Oregon. The American Midland Naturalist 162(1), 29-42.

Gritski, B. K. Kronner, and S. Downes. 2008. Leaning Juniper Phase I Wind Power Project, 2006–2008. Wildlife Monitoring Final Report. Prepared for PacifiCorp Energy, Portland, Or-egon. Prepared by Northwest Wildlife Consultants, Inc., Pendleton, Oregon.

Gritski, B. 2010. 2010 Leaning Juniper Washington Ground Squirrel Monitoring of 2005 Sites for ODFW-issued Incidental Take Permit Requirements. Prepared for PacifiCorp En-ergy, Portland, Oregon. Prepared by Northwest Wildlife Consultants, Inc., Pendleton, Oregon.

Kronner, K. 2009. Unpublished field notes for surveys conducted from 2001-2009 in the vicinity of the Montague Wind Facility. Northwest Wildlife Consultants, Goldendale, WA. In Montage Wind Power Facility Application for Site Certificate. Exhibit Q threatened and Endangered Plant and Animal species.

Leaning Juniper Wind Power II (LJWP), LLC. 2009. Leaning Juniper II Wind Project: Wildlife Monitoring and Mitigation Plan. November 20, 2009. Oregon Energy Facility Siting Council of the State of Oregon, Final Order on Amendment #1-Attachment A. First Amended Site Certificate for the Leaning Juniper II Wind Power Facility.

Marr, V. 2001. Effects of 1998 wildfire on Washington ground squirrels and their habitat at Naval Weapons Systems Training Facility, Boardman, Oregon. Unpublished report for Oregon Department of Fish and Wildlife, Heppner, Oregon.

Marr, V. 2004. Washington ground squirrel monitoring. Boardman Conservation Area, 2004. Oregon Department of Fish and Wildlife, Salem, Oregon.

Morgan, R. L. 2002. Status and habitat use of the Washington ground squirrel *Spermophilus washingtoni* on Bureau of Land Management lands, Horn Butte, Oregon in 2001. Oregon Department of Fish and Wildlife, Salem, Oregon.

Morgan, R. L., and M. Nugent. 1999. Status and habitat use of the Washington ground squirrel (*Spermophilus washingtoni*) on State of Oregon Lands, South Boeing, Oregon in 1999. Report to the Oregon Department of Fish and Wildlife.

Multi-Resolution Land Characteristics (MRLC). 2019. National Land Cover Database (NLCD) 2016. Multi-Resolution Land Characteristics (MRLC) Consortium. US Geological Survey (USGS) Earth Resources Observation and Science (EROS) Center, MRLC Project, Sioux Falls, South Dakota. May 10, 2019. Information online: https://www.mrlc.gov/data

Natural Resources Conservation Service. 2021. Web Soil Survey. Available online: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Oregon Department of Fish and Wildlife. 2021. Threatened, Endangered and Candidate Fish and Wildlife Species. Available online: https://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp. Accessed July 17, 2021.

Rickart, E. A. and E. Yensen. 1991. *Spermophilus washingtoni*. Mammalian Species 371:1–5.

Sherman, P. W. 1999. Behavioral ecology of Washington ground squirrels (*Spermophilus washingtoni*). Annual Report of Scientific Permittee. Cornell University, Ithaca, New York.

Sherman, P. W. 2000. Distribution and behavior of Washington ground squirrels (*Spermophilus washingtoni*) in central Washington. Annual Report of Scientific Permittee. (#00-027) Cornell University, Ithaca, New York.

U.S. Fish and Wildlife Service. 2016. Endangered and threatened wildlife and plants; 12-month findings on petitions to list nine species and endangered or threatened species. Federal Register 81:64843–64857.

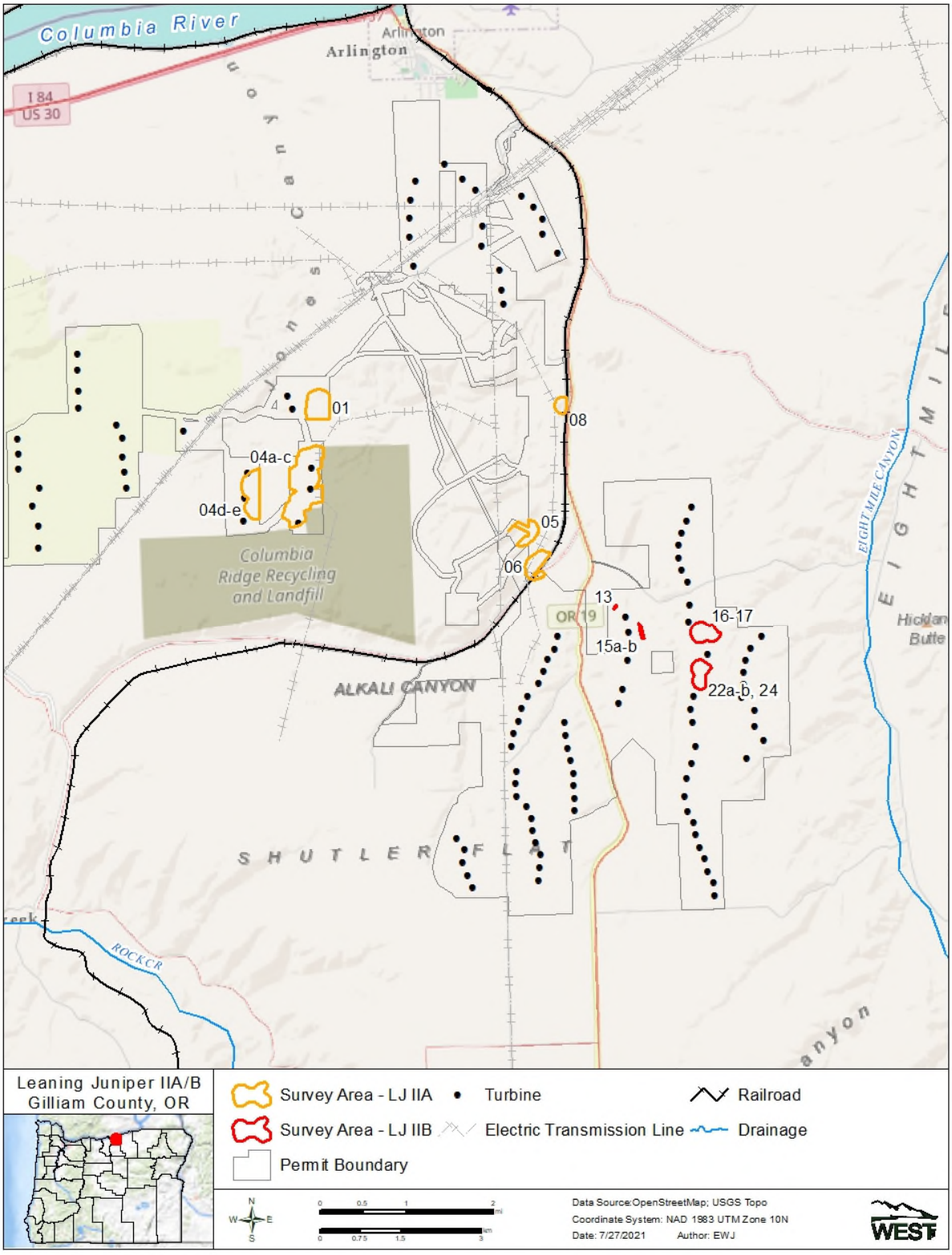

Figure 1. Vicinity map of the Washington ground squirrel Survey Areas at the Leaning Juniper IIA and IIB Wind Power Facility in Gilliam County, Oregon.

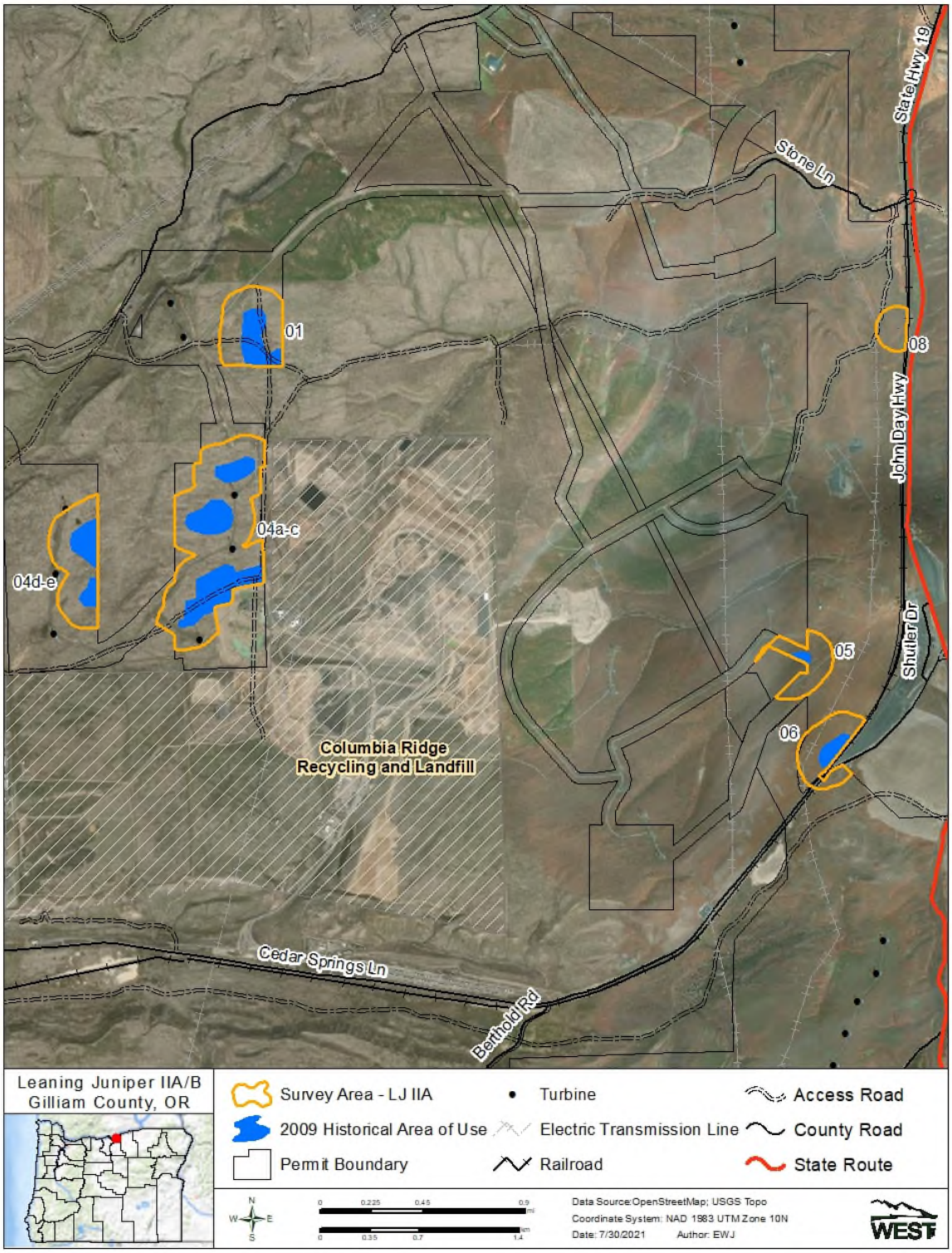

Figure 2. Washington ground squirrel Survey Areas and historical areas of use documented pre-construction at the Leaning Juniper IIA Wind Power Facility in Gilliam County, Oregon.

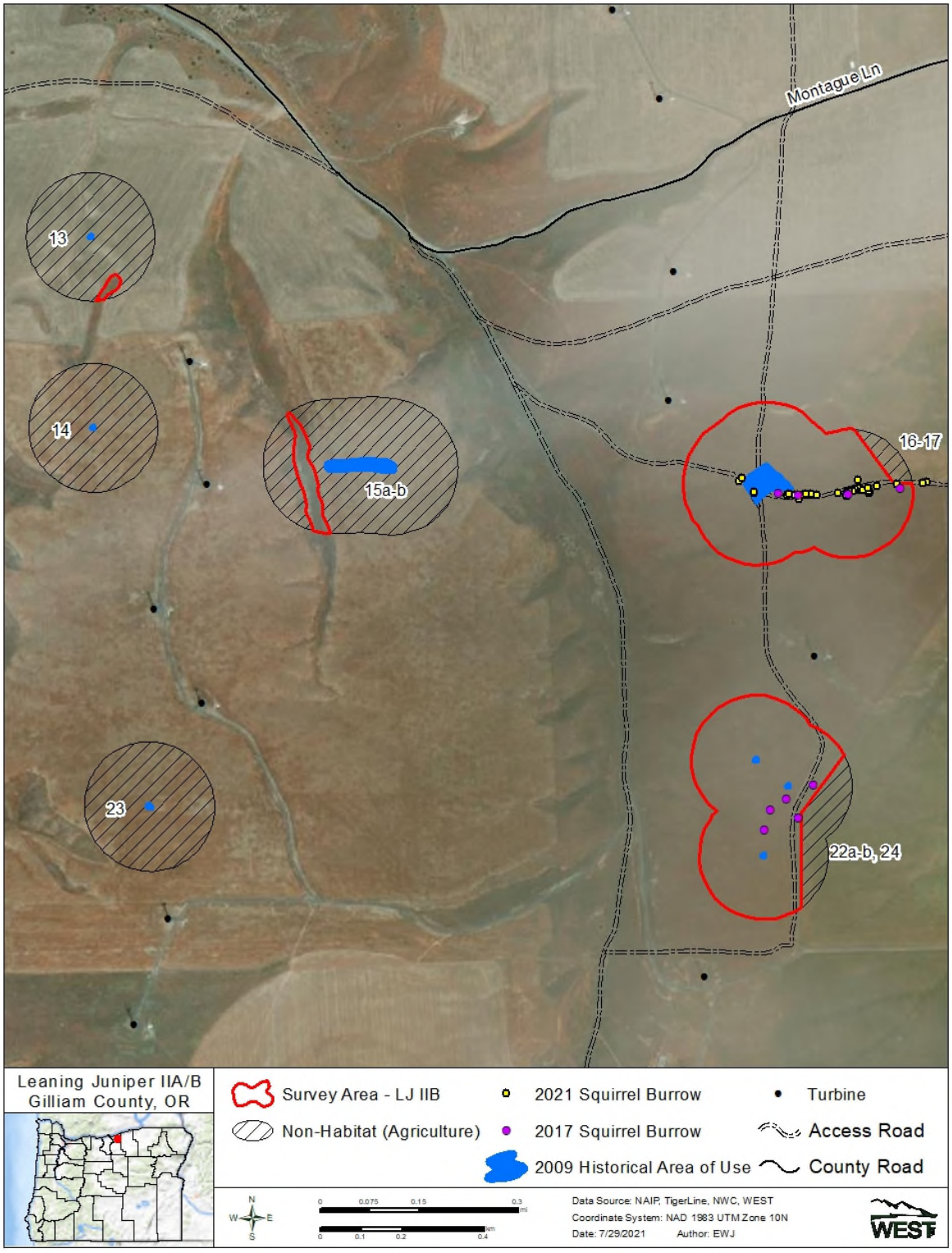

Figure 3. Washington ground squirrel Survey Areas, historical areas of use and contemporary detections at the Leaning Juniper IIB Wind Power Facility in Gilliam County, Oregon.

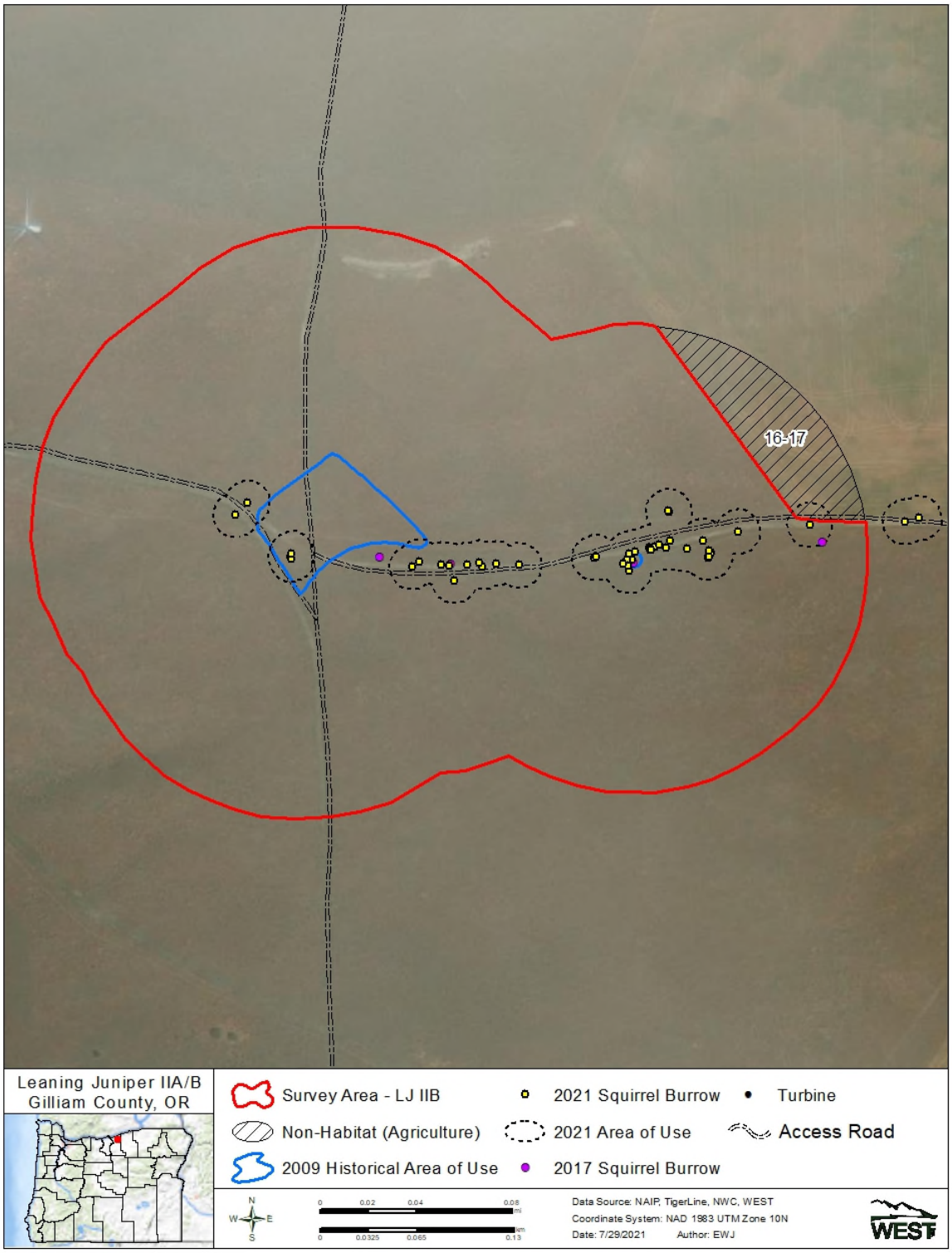

Figure 4. Burrows and corresponding area of use documented in 2021 compared to results from previous surveys at Survey Area 16-17 at the Leaning Juniper IIB Wind Power Facility in Gilliam County, Oregon.

Photo 1. Facing south into the Project from Survey Area 16-17 where the majority of burrows were located at the Leaning Juniper IIB Wind Power Facility in Gilliam County, Oregon.

Photo 2. Facing north into the Project from Survey Area 16-17 where there was comparatively less vegetation cover and ground squirrel burrow at the Leaning Juniper IIB Wind Power Facility in Gilliam County, Oregon.

Photo 3. Active Washington ground squirrel burrow at Survey Area 16-17, Leaning Juniper IIB Wind Power Facility in Gilliam County, Oregon.