



**DATE:** December 16, 2020

**TO:** John Kuba, ConnectGen LLC

**FROM:** Karl Kosciuch, WEST, Inc.

**RE:** 2020 Golden Eagle and Raptor Nest Survey Report, Rail Tie, WY

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### **Introduction**

ConnectGen, LLC (ConnectGen) is developing the proposed Rail Tie Wind Project (Rail Tie, Project) in Albany County, Wyoming. Western Ecosystems Technology, Inc. (WEST) is under contract to provide biological support for the development of the Project, including aerial surveys for golden eagle (*Aquila chrysaetos*) and non-eagle raptor nests within the Project area and a surrounding 6-mile (mi; 9.6 kilometer [km]) buffer for eagles (Survey Area), and 1-mi (1.6 km) buffer for non-eagle raptors. Aerial surveys began in mid-March, 2020; a second visit was completed in mid-May, 2020. This memorandum summarizes the methodology and results of the 2020 golden eagle and raptor nest surveys at Rail Tie.

### **Survey Area**

The Survey Area included the Project area and a surrounding 6-mi buffer, including portions of Albany and Laramie counties, Wyoming and Larimer County, Colorado (Figure 1). The survey buffer was reduced from 10-mi in 2019 to 6-mi in 2020 based the mean internest distance for all active nests identified during the 2019 and discussions with the U.S. Fish and Wildlife Service (USFWS). The Survey Area is bounded by the Laramie Mountains to the east and the Arapaho Roosevelt National Forest to the south. The Survey Area consists primarily of grassland and lodgepole/ponderosa pine habitat. The Survey Area included a number of rock outcroppings or mountains with large cliffs, all of which offer potentially suitable nesting habitat for golden eagles and other raptors. Much of the Survey Area is privately owned and actively managed for livestock grazing; non-private lands in the area include portions of the Arapaho Roosevelt National Forest, the Pole Mountain area of the Medicine Bow National Forest.

On April 22, 2020, the USFWS released revised eagle nest survey guidance that reduced the nest survey buffer from 10-mi to 2-mi (USFWS 2020). As the first round of eagle nest surveys for the Project had been conducted using a 6-mi, no change was implemented in the survey methods for data continuity despite the reduction in buffer size under the new guidance.

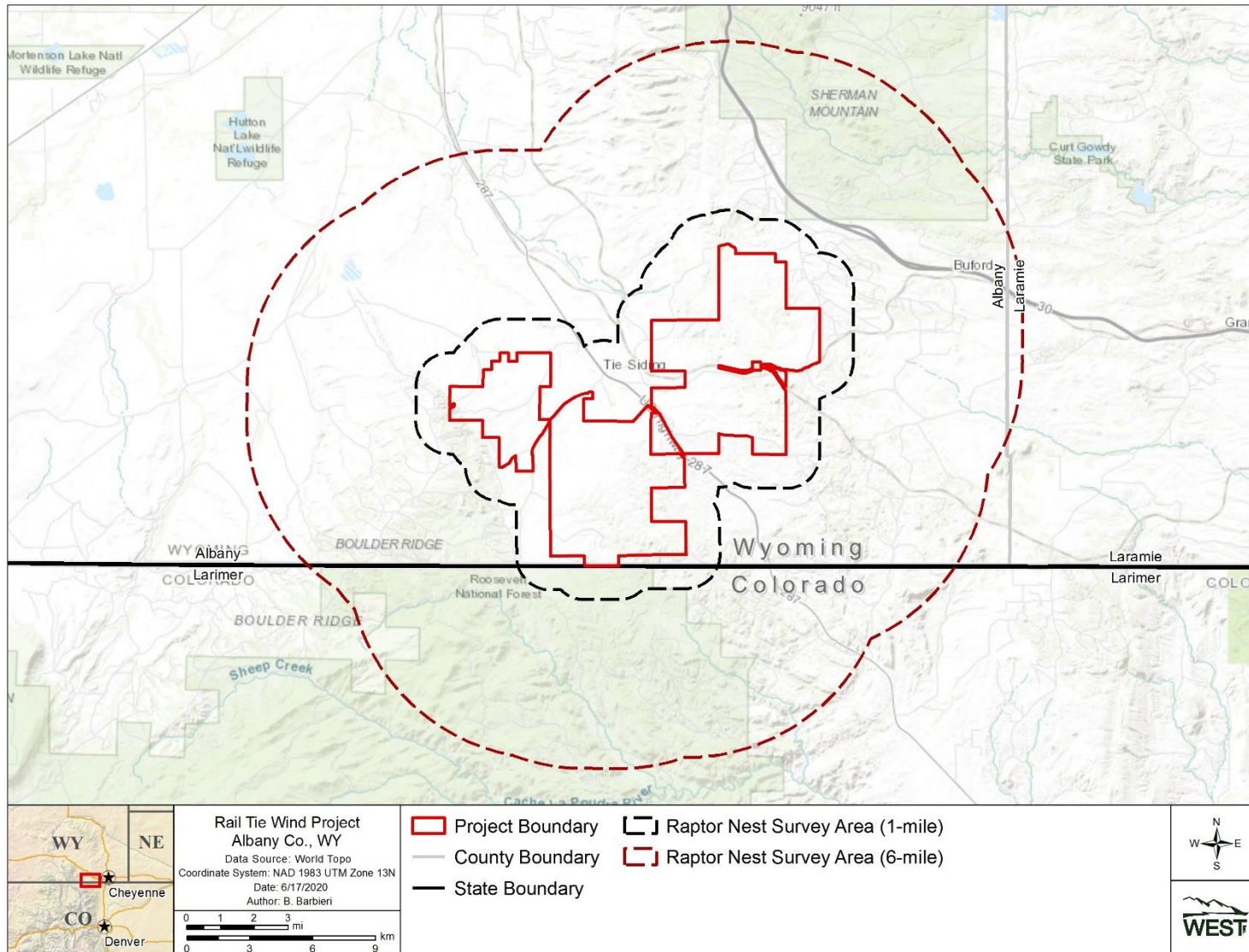


Figure 1. Overview of 2020 Rail Tie Wind Project golden eagle and non-eagle raptor nest Survey Area including 1-mile and 6-mile buffers.

## Aerial Survey Methods

The USFWS recommends conducting two rounds of double-observer (i.e., a primary and secondary observer) aerial nest surveys at a proposed wind energy facility at least 30 days apart (USFWS 2013), with the initial survey scheduled to coincide with the primary nest establishment time period for golden eagles in a particular region. Nesting chronology of golden eagles varies depending on region (e.g., latitude) and yearly site-specific seasonality (e.g., winter storm activity); in Wyoming, golden eagles may begin to establish territories as early as January and February with nest-building, egg-laying, and requisite incubation activity commencing thereafter (e.g., March into April; Pagel et al. 2010). The initial survey was conducted on 15 and 16 March, 2020 during a time period that overlapped the primary territory establishment period of golden eagles in the area, while the follow-up survey was performed on 10 May, 2020 when both resident and non-resident (i.e., migratory) raptor species were actively engaged in reproductive activities (e.g., nest building, incubating, brooding), and when golden eagles engaged in ongoing nesting activities would be reliably on or around nests. The initial effort was also timed to minimize disturbance to golden eagles on active nests prior to critical life history stages such as incubating and brooding; golden eagles observed in the Survey Area were establishing territories and building nests in early March.

The Survey Area was determined based on a Project boundary provided by ConnectGen, with 1-mi and 6-mi Project buffers established in a Geographic Information System (GIS). The focus of the surveys was to record nests that may be used by raptors, including potential eagle and other raptor nests within the Project area and 1-mi buffer and potential eagle nests within the 6-mi buffer. If non-eagle raptor nests were detected incidentally while searching for eagle nests within the 6-mile buffer, they were recorded to facilitate an accurate count of raptor nests for use during follow up surveys and to document nests that could potentially be used by eagles or built up by eagles. The survey utilized an intuitive controlled survey method during the first survey (Figure 2). This intuitive controlled survey focused on areas with the highest potential to support target species; in this case, golden eagles and other raptors. These key habitat features included cliffs, rock outcrops, and large trees. The second survey focused on nest checks and searches of suitable habitat (Figure 3). The focus of the 6-mi Project buffer nest search was on eagles.

During surveys, the helicopter was positioned to allow thorough visual inspection of all appropriate habitat features. In general, the helicopter remained within a zone 100-feet (ft; 30.5 m) to 500-ft (152.4 m) above ground level at a relative air speed of approximately 50 miles per hour (mph; 80.5 kilometers per hour [kph]). When nests were located, the helicopter reduced speed and adjusted flight track to allow for a clear view of the nest for documentation and photographing. For each nest found, a GPS location was recorded, a photograph was taken, and nest attribute data were collected (Table 1). If there were multiple nests at a location, one representative GPS point was recorded and the number of nests at the location was noted. Photos of eagle nests are contained in Appendix A. If no birds were associated with a nest it is classified as unknown species. Unknown species nests are further classified as 'raptor' if the nest was likely built by a raptor species and 'large stick nest' if the size and structure are characteristic of an eagle.

Nest status was categorized using definitions originally proposed by Postupalsky (1974) and largely followed today (ECPG 2013). Nests were classified as occupied if any of the following were observed at the nest structure: (1) an adult in an incubating position; (2) eggs; (3) nestlings or fledglings; (4) presence of an adult (sometimes sub-adults); (5) a newly constructed or refurbished stick nest in the area where territorial behavior of a raptor had been observed earlier in the breeding season; or (6) a recently repaired nest with fresh sticks (clean breaks) or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath. Occupied nests were further classified as active if an egg or eggs were laid. Nests were classified as inactive if no eggs or chicks were present. Nests not meeting the above criteria for "Occupied" during at least two consecutive surveys were classified as "Unoccupied."

## Results

Thirteen golden eagle nests were documented during surveys (Table 1; Figure 4). Of the thirteen nest locations, two had multiple nests at a location including nest 35 (five nests) and 48 (two nests); however, these are considered a single nest for the purposes of this report. Of the 13 golden eagle nests, six were occupied-active during at least one visit and seven were occupied-inactive during both visits. Of the six occupied-active golden eagle nests, two contained one chick ranging from one week to two weeks old, two contained adults in an incubating or brooding position and the number of eggs or chicks could not be determined, and two had adults in an incubating position during the round 1 survey but the nests were empty during the round two survey.

One 4-week old chick was observed in the one occupied active bald eagle nest (Table 1).

Other nests that were documented as occupied-active during at least one survey included one Canada goose, two common raven, one red-tailed hawk, and one great horned owl (Table 2; Figure 5).

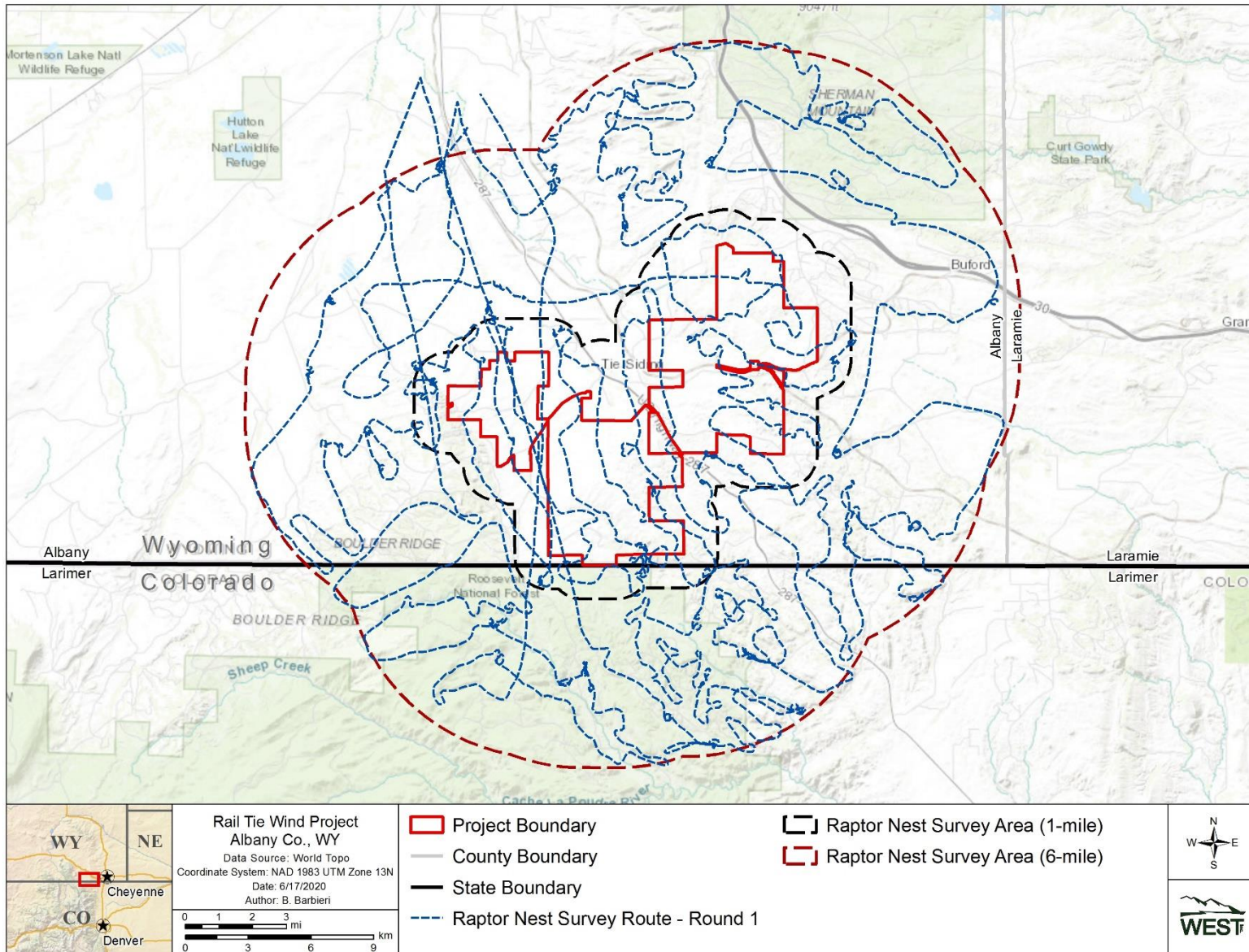


Figure 2. Survey route during round 1 aerial nest surveys at Rail Tie Wind Project, 15 – 16 March 2020.

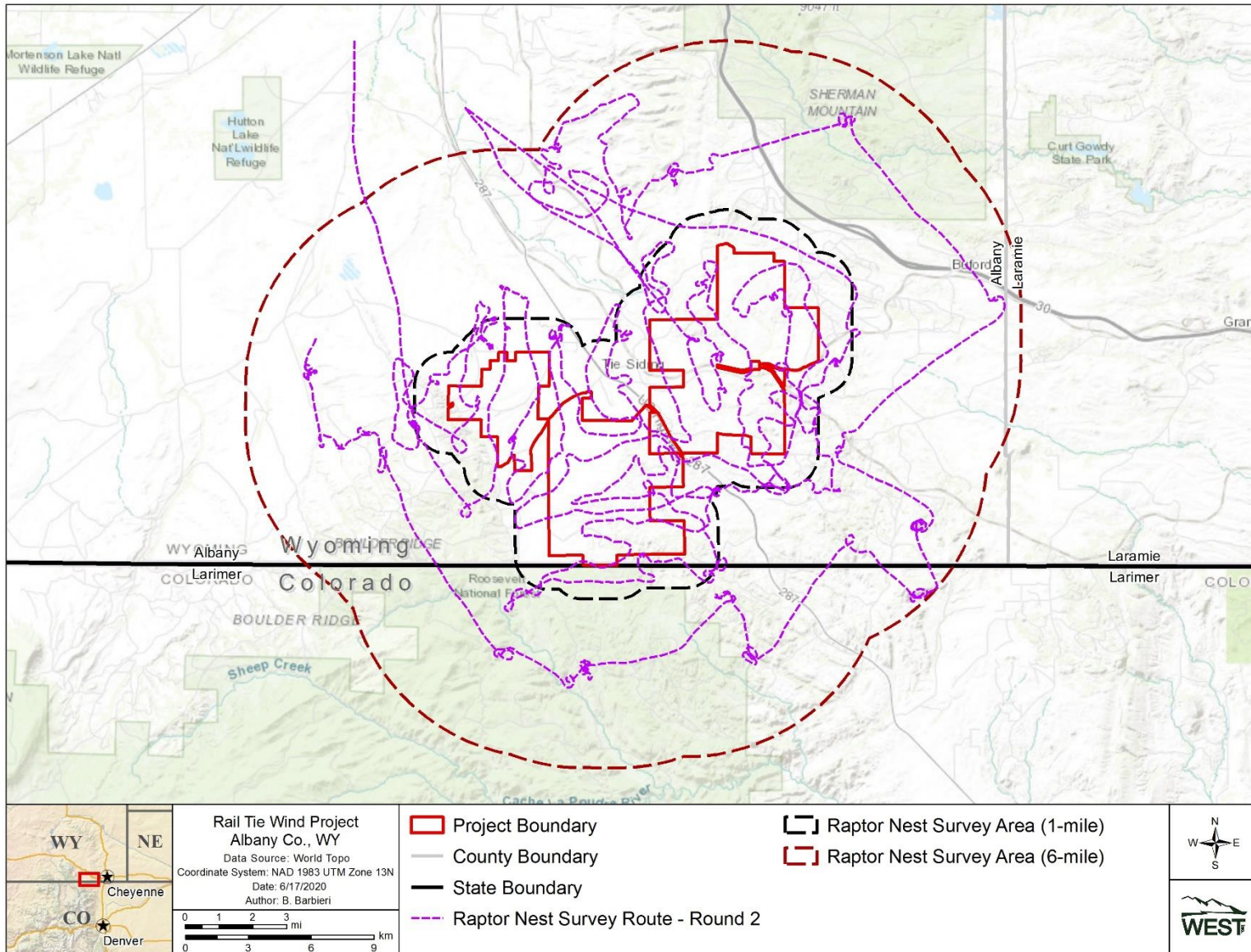


Figure 3. Survey route during round 2 aerial nest surveys at Rail Tie Wind Project, 13 May 2020.

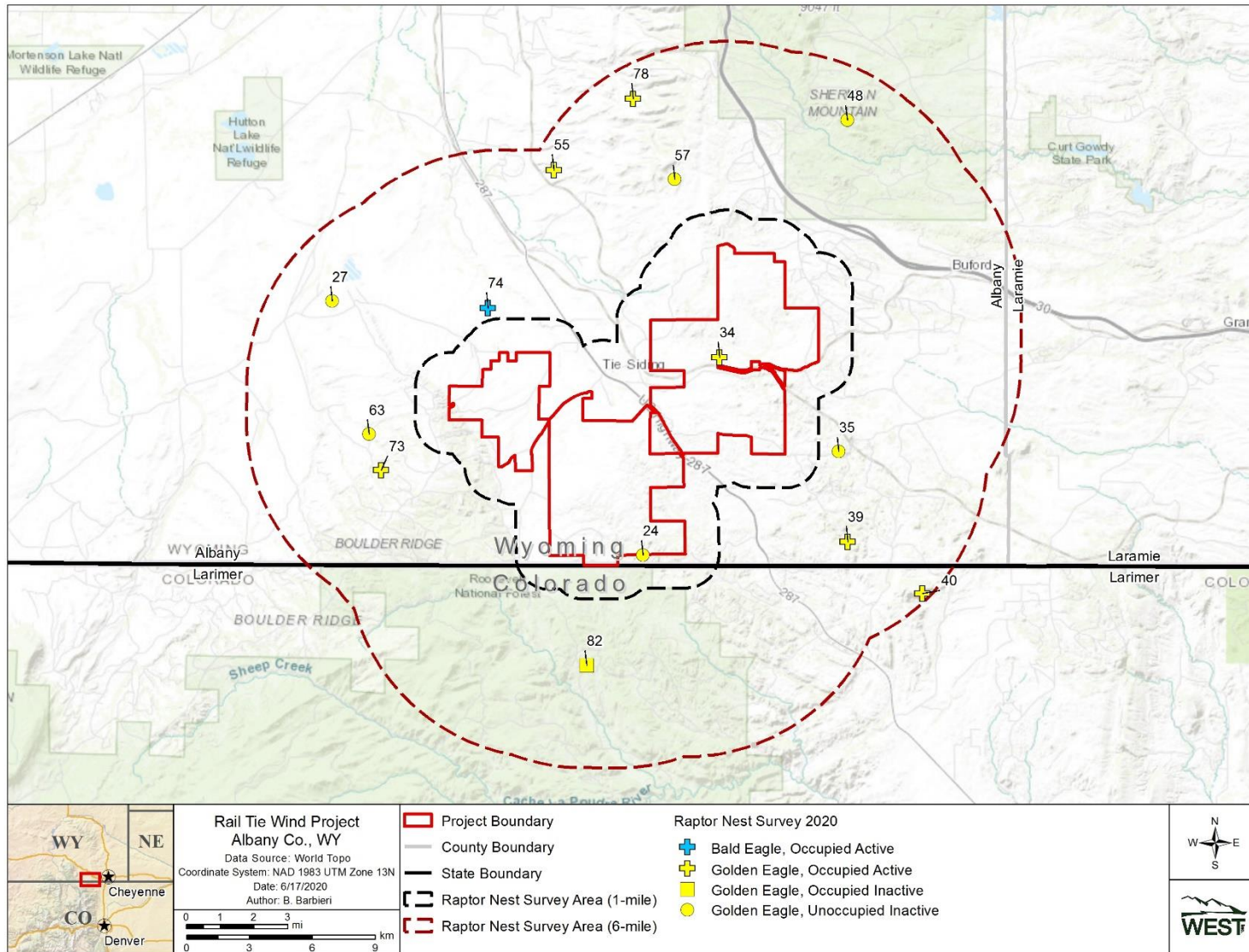


Figure 4. Bald eagle and golden eagle nest locations documented during aerial surveys of Rail Tie, 2020. If a nest was active on one of two visits, the active status is depicted.

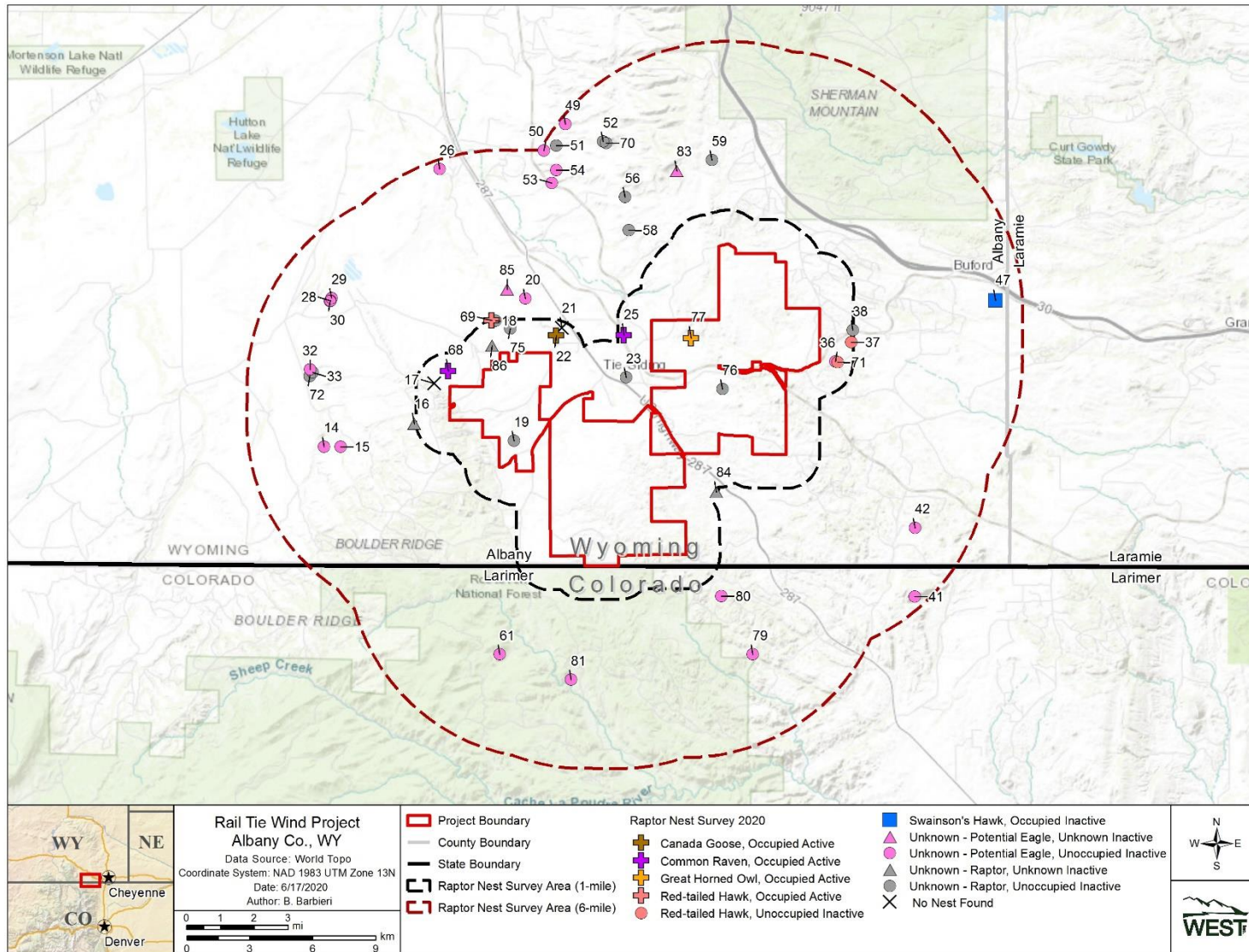


Figure 5. Non-eagle raptor nest locations documented during aerial surveys of Rail Tie, 2020.



**Table 1. Eagle Nests Detected During Nest Surveys for the Rail Tie Wind Project, Albany County, Wyoming.**

Nest ID	Species*	1st Visit	Status	Contents	2nd Visit	Status	Contents	Nest Substrate
24	Golden eagle	3/15/20	Unoccupied Inactive	Empty	5/13/20	Unoccupied Inactive	Empty	Cliff
27	Golden eagle	3/15/20	Unoccupied Inactive	Empty	5/13/20	Unoccupied Inactive	Empty	Cliff
34	Golden eagle	3/15/20	Occupied Active	Incubating	5/13/20	Occupied Active	1 chicks, 2 weeks old	Cliff
35	Golden eagle	3/16/20	Unoccupied Inactive	Empty	5/13/20	Occupied Inactive	Empty	Cliff
39	Golden eagle	3/16/20	Occupied Active	Incubating	5/13/20	Occupied Inactive	Empty	Cliff
40	Golden eagle	3/16/20	Occupied Active	Incubating	5/13/20	Occupied Inactive	Empty	Cliff
48	Golden eagle	3/16/20	Unoccupied Inactive	Empty	5/13/20	Occupied Inactive	Empty	Cliff
55	Golden eagle	3/16/20	Occupied Inactive	Empty	5/13/20	Occupied Active	Brooding	Cliff
57	Golden eagle	3/16/20	Unoccupied Inactive	Empty	5/13/20	Unoccupied Inactive	Empty	Tree
63	Golden eagle	3/15/20	Unoccupied Inactive	Empty	5/13/20	Occupied Inactive	Empty	Cliff
73	Golden eagle	3/15/20	Occupied Inactive	Empty	5/13/20	Occupied Active	Incubating	Tree
74	Bald eagle	3/15/20	Occupied Active	Incubating	5/13/20	Occupied Active	1 chick, 4 weeks old	Cliff
78	Golden eagle	3/16/20	Occupied Active	Incubating	5/13/20	Occupied Active	1 chick, 1 week old	Cliff
82	Golden eagle	3/16/20	Occupied Inactive	Empty	5/13/20	Occupied Inactive	Empty	Cliff

**Table 2. Raptor Nests Detected During Nest Surveys for the Rail Tie Wind Project, Albany County, Wyoming.**

<b>Nest ID</b>	<b>Species*</b>	<b>1st Visit</b>	<b>Status</b>	<b>Contents</b>	<b>2nd Visit</b>	<b>Status</b>	<b>Contents</b>	<b>Nest Substrate</b>
14	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
15	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
16	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
18	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
19	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
20	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
22	Canada Goose	3/15/2020	Inactive	Empty	5/13/2020	Active	4 eggs	Tree
23	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
25	Common Raven	3/15/2020	Inactive	Empty	5/13/2020	Active	Incubating	Tree
26	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
28	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
29	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
30	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
32	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
33	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
36	Unknown - Potential Eagle	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
37	Red-tailed Hawk	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff

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38	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
41	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
42	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
47	Swainson's Hawk	3/16/2020	Inactive	Empty	5/13/2020	Occupied Inactive	Adult at nest	Tree
49	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Rock
50	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
51	Unknown - Raptor	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
52	Unknown - Raptor	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
53	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
54	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
56	Unknown - Raptor	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
58	Unknown - Raptor	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
59	Unknown - Raptor	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
61	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
68	Common Raven	3/15/2020	Inactive	Empty	5/13/2020	Active	Incubating	Rock
69	Red-tailed Hawk	3/15/2020	Inactive	Empty	5/13/2020	Active	Incubating	Tree
70	Unknown - Raptor	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
71	Red-tailed Hawk	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree

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72	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
75	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Tree
76	Unknown - Raptor	3/15/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Rock
77	Great Horned Owl	3/15/2020	Active	Incubating	5/13/2020	Inactive	Empty	Cliff
79	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
80	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
81	Unknown - Potential Eagle	3/16/2020	Inactive	Empty	5/13/2020	Inactive	Empty	Cliff
83	Unknown - Potential Eagle	Not located			5/13/2020	Inactive	Empty	Tree
84	Unknown - Raptor	Not located			5/13/2020	Inactive	Empty	Tree
85	Unknown - Potential Eagle	Not located			5/13/2020	Inactive	Empty	Rock
86	Unknown - Raptor	Not located			5/13/2020	Inactive	Empty	Tree

\*Potential Eagle is consistent with size and structure characteristics of an eagle nest, but could not be confirmed.

## References

- 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.
- Postupalsky, S. 1974. Raptor Reproductive Success: Some Problems with Methods, Criteria, and Terminology. In Management of Raptors, Raptor Research Report No. 2., edited by F.N. Hamerstrom, Jr., B.E. Harrell, and R.R., Olendorf, pp. 21-31. Vermillion, South Dakota: Raptor Research Foundation.
- US Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. US Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. April 2013. Executive Summary and frontmatter + 103 pp. Available online at: <https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf>
- US Fish and Wildlife Service (USFWS). 2020. Updated Eagle Nest Survey Protocol. Available online at: <https://www.fws.gov/birds/management/managed-species/eagle-management.php>

**Appendix A – Eagle nest photo log**



**Nest 24. Occupied-inactive golden eagle nest.**



**Nest 27. Occupied-inactive golden eagle nest.**



**Nest 34. Occupied-active golden eagle nest.**



**Nest 35. Occupied-inactive golden eagle nest.**





**Nest 39. Occupied-active golden eagle nest.**



**Nest 40. Occupied-active golden eagle nest.**



**Nest 48. Occupied-inactive golden eagle nest.**



**Nest 55. Occupied-active golden eagle nest.**



**Nest 57. Occupied-inactive golden eagle nest.**



**Nest 63. Occupied-inactive golden eagle nest.**



**Nest 73. Occupied-active golden eagle nest.**



**Nest 74. Occupied-active bald eagle nest.**



**Nest 78. Occupied-active golden eagle nest.**



**Nest 82. Occupied-inactive golden eagle nest.**