

2019 Eagle and Raptor Nest Survey Report

Tatanka Ridge Wind Project Deuel County, South Dakota



Prepared for:

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June 6, 2019



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REPORT REFERENCE

Cossette, A. S., C. Foo, and J. Rieland. 2019. 2019 Eagle and Raptor Nest Survey Report, Tatanka Ridge Wind Project, Deuel County, South Dakota. Prepared for Tatanka Ridge Wind, LLC, Portland, Oregon. Prepared by Western EcoSystems Technology, Inc. (WEST), Golden Valley, Minnesota. June 6, 2019. 11 pp. + appendices.

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NOTES ON UNITS

Imperial units are used throughout this document. Conversions to metric units are provided below.

Unit Conversions

Imperial	Metric
1 foot	0.3048 meter
3.28 feet	1 meter
1 mile	1.61 kilometers
0.621 mile	1 kilometer
1 acre	0.40 hectare
2.47 acres	1 hectare

Common Conversions

Imperial	Metric
0.12 mile	200 meters
0.5 mile	800 meters
10 miles	16.1 kilometers

INTRODUCTION

Tatanka Ridge Wind, LLC (Tatanka Ridge Wind), a wholly owned subsidiary of Avangrid Renewables, LLC, has proposed development of the Tatanka Ridge Wind Project (Project) in Deuel County, South Dakota (Figure 1). At Tatanka Ridge Wind's request, Western EcoSystems Technology, Inc. (WEST) conducted an aerial raptor nest survey to record the location and status of bald eagle (*Haliaeetus leucocephalus*) and other raptor nests in and near the Project. The aerial survey was conducted in accordance with the guidance provided in the US Fish and Wildlife Service (USFWS) *Eagle Conservation Plan Guidance* (ECPG; USFWS 2013) and the USFWS *Interim Golden Eagle Technical Guidance* (Pagel et al. 2010). This report provides results of the eagle and raptor nest survey conducted in April 2019.

In January of 2019, the Project boundary was modified and shifted to the northwest. The 2019 aerial nest survey served as both a second year check of eagle nests that were documented within 10 miles of the 2018 Project boundary during the 2018 aerial nest survey, and to document raptor and eagle nests within the associated survey buffers of the updated 2019 Project boundary. The 2019 survey area also overlapped with areas surveyed for the Bitter Root Wind Energy Project aerial nest surveys in 2016 and 2017 (Simon et al. 2017; WEST 2017a) and the Coyote Ridge Wind Project aerial nest survey in 2017 (WEST 2017b).

SURVEY AREA

The Project boundary encompasses an area of approximately 27,850 acres (44 square miles) located approximately 6 miles west of the South Dakota/Minnesota border, and directly north of the town of Toronto, South Dakota (Figure 1). The survey area for all raptor stick nests consisted of a 1-mile buffer of the Project boundary. The survey area for bald eagle nests consisted of a focused 2-mile buffer of the Project boundary as well as areas within 10 miles of the Project boundary that were not included in the 2018 aerial raptor nest survey (Kreger and Rieland 2018). Observers checked the nest status for all nests documented during the 2018 raptor nest survey that were consistent in size and shape with eagle nests.

The majority of the survey area consists of cultivated agricultural fields and some pastureland, with limited potential substrates for bald eagle and other raptor nests. Wooded habitat within the Project boundary is mainly in the form of relatively small woodlots associated with rural homesteads and shelterbelts. Wooded areas associated with larger lakes located outside of the Project and within the 10-mile buffer may provide more suitable nesting substrate than that found within the Project boundary.

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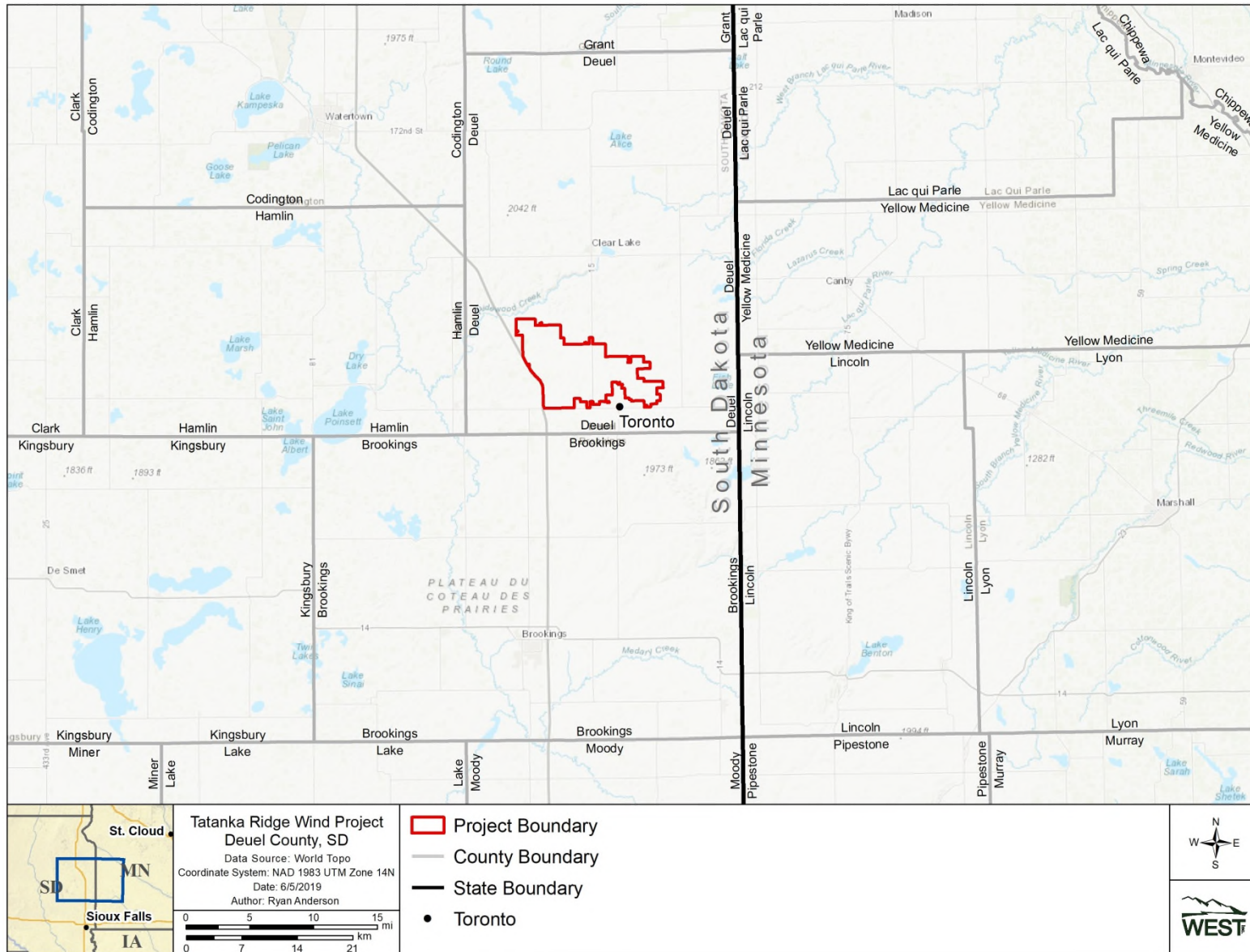


Figure 1. Location of the Tatanka Ridge Wind Project, Deuel County, South Dakota.

METHODS

Aerial Raptor Nest Survey

The aerial survey was conducted from a helicopter in early April (April 2 – 3, 2019), a period before leaf out when raptors and eagles would be actively tending to a nest or incubating eggs. The aerial survey was conducted in accordance with the guidance provided in the ECPG (USFWS 2013) and the USFWS *Interim Golden Eagle Technical Guidance* (Pagel et al. 2010). An experienced raptor biologist and a skilled helicopter pilot conducted the survey. Raptors were defined for this survey as kites, accipiters, buteos, harriers, eagles, falcons, and owls (Buehler 2000). The main focus of the survey was to identify bald eagle and raptor nests and to determine nest activity. Surveyors focused on locating eyries (large, stick nest structures) in suitable eagle nesting substrate (e.g., trees, transmission lines) within and around the Project. Pre-flight planning included the creation of field maps and mobile Geographic Information System files, and review of relevant background information, such as previously recorded nest locations, topographic maps, and aerial photographs.

The portion of the survey within the Project boundary and 1-mile buffer documented potential raptor nests, including bald eagle nests, while the survey out to the 2-mile buffer and the areas within 10 miles of the Project that were not previously surveyed focused only on identifying potential bald eagle nests. All nests consistent in size and shape with eagle nests that were documented in the 2018 raptor nest survey were checked for nest status in 2019. The survey was conducted at the greatest possible distance at which the species could be identified, to minimize disturbances, with distances varying depending upon nest location and wind conditions.

In general, potential bald eagle nest habitat was surveyed by flying meandering transects between 0.25–1.0 mile apart, flying at speeds of approximately 50 miles per hour when actively scanning for nests. The survey was conducted between 11:00 hours and 19:15 hours.

The survey track was recorded using a handheld Global Positioning System (GPS) unit to ensure that areas were adequately covered. The helicopter was positioned to allow a thorough visual inspection of the habitat, and in particular, to provide a view of the tops of the tallest dominant trees, where bald eagles generally prefer to nest (Buehler 2000). The locations of potential raptor and eagle nests were recorded using a handheld GPS. This included all confirmed and potential nests regardless of their activity status.

To determine the status of a nest, the biologist evaluated behavior of adults on or near the nest, and presence of eggs, young, whitewash, or fresh building materials. Attempts were made to identify the species of raptor associated with each active nest. Raptor species, nest type, nest status, nest condition, and nest substrate were recorded at each nest location to the extent possible.

Terminology

Included below are descriptions of terms used during the documentation of nests (see Results section).

Nest ID – A unique nest identification number was assigned for each nest documented.

Species – A species was assigned to each nest when possible. When a nest could not be identified to species it was classified as an unidentified raptor nest. Nests documented as unidentified raptor species were defined as any stick nest not having an occupant associated with it at the time of the survey. Unidentified raptor species nests, including old/abandoned nests or nests that could be suitable for raptors, were documented in order to populate a nest database to ensure future surveys include all potentially suitable nest sites. Nests documented as belonging to an unidentified raptor species that appeared consistent in size and shape with bald eagle nests were further classified as potential alternate nest sites for bald eagles.

Nest Condition – Nest condition was categorized as good, fair, or poor. Although the determination of nest condition can be subjective and may vary between observers, it gives a general sense of when a nest or nest site was last used. Nests in good condition were excellently maintained with well-defined bowls, no sagging, and were either suitable for immediate use or currently in use. Nests in fair condition had fairly well-defined bowls, minor sagging, and appeared to require some repair or maintenance before being suitable for use. Nests in poor condition were sloughing or sagging heavily, and would require effort to restore for successful nesting.

Substrate – Nest substrate was recorded to provide observers with a visual reference to facilitate locating the nest in the future. Substrates could include man-made structures (e.g., power lines, nest platforms, dock hoists), and biological and physical structures (e.g., conifer and deciduous tree species, cliff faces).

Nest Status – 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: (1) an adult was present on the nest in incubating position, (2) an egg or eggs were present, or (3) nestlings were observed. Occupied nests were classified as inactive if adults were not observed in a brooding position and no eggs or chicks were present. Nests not meeting the above criteria for “occupied” were classified as “inactive.”

RESULTS

A total of 36 nests representing three identifiable species were recorded during the 2019 aerial nest survey (Figure 2, Table 1). Seven nests were identified as occupied and active bald eagle nests, one nest was identified as being an occupied inactive bald eagle nest, and one nest was identified as being consistent in size and shape with bald eagle nests (but was occupied during the survey by a great horned owl [*Bubo virginianus*]). A total of 27 raptor nests were observed within 1-mile of the Project during the aerial survey in April 2019 (Figure 3, Table 1). Five of these 27 nests were occupied and active at the time of the survey and the remaining 22 nests observed within 1-mile of the Project during the survey were inactive.

Bald Eagle Nests, and Nests Consistent in Size and Shape with Bald Eagle Nests

A total of nine nests were identified as being consistent in size and shape with bald eagle nests during the 2019 aerial survey. Seven occupied and active bald eagle nests and one occupied inactive bald eagle nest were documented within 10 miles of the Project boundary (Figure 2); in addition, one occupied active great horned owl nest was identified 7.8 miles northeast of the Project boundary (Nest 1621); this nest was recorded in 2018 as an inactive bald eagle nest. The closest bald eagle nests to the Project were Nest 2207 and Nest 1619, which were both documented 5.4 miles southeast of the Project boundary; Nest 2207 was occupied and active whereas Nest 1619 was occupied and inactive in 2019. The other six nests were located between 6.3 and 11.4 miles from the Project boundary. Nest 1744, which was 11.4 miles from the current Project boundary, was recorded as an occupied and inactive bald eagle nest in 2018. The following discussion provides additional information on the bald eagle nests observed during the survey.

Nest 2207 – This nest was located 5.4 miles southeast of the Project boundary. This nest was documented by WEST as an occupied and active bald eagle nest in 2018 (Kreger and Rieland 2018). During the 2019 survey, the nest was in good condition. No adult bald eagles were present on the nest, but two eggs were observed in the nest and the nest appeared to have been recently tended at the time of the survey in April. The nest was therefore classified as an occupied active bald eagle nest in 2019 (Appendix A, Photograph A-1).

Nest 1619 – This nest was located 5.4 miles southeast of the Project boundary, approximately 0.73 mile from Nest 2207. This nest was documented by WEST as an active bald eagle nest in 2017 (WEST 2017a), and as an occupied inactive bald eagle nest in 2018 (Kreger and Rieland 2018). During the 2019 survey, the nest was in good condition. Two adult eagles were observed perched on the nest and the nest appeared to have been recently tended; however, no eggs, chicks, or signs of incubating or brooding were observed. The nest was therefore classified as an occupied and inactive bald eagle nest in 2019 (Appendix A, Photograph A-2). It is possible that the two eagles observed at this nest were actively nesting at nearby Nest 2207.

Table 1. Raptor nest ID, species, distance from Project, status, condition, location, and substrate documented during the April 2019 survey for the Tatanka Ridge Wind Project, Deuel County, South Dakota.

Species ¹	Distance from Project (miles) ²	Status at Time of Survey	Nest ID	Condition	Latitude	Longitude	Substrate ³
BAEA	5.4	occupied active	2207	good	-96.4980	44.5247	DT
BAEA	5.4	occupied inactive	1619	good	-96.5089	44.5177	DT
BAEA	6.3	occupied active	1618	good	-96.4439	44.6053	DT
BAEA	6.9	occupied active	1620	good	-96.4715	44.6742	DT
BAEA	7.7	occupied active	14384	good	-96.9308	44.5769	DT
BAEA	9.4	occupied active	2195	good	-96.6911	44.7993	DT
BAEA	9.8	occupied active	14383	good	-96.9985	44.6273	DT
BAEA	11.4	occupied active	1744	good	-96.3485	44.5515	DT
GHOW ⁴	7.8	occupied active	1621	good	-96.4561	44.6819	DT
GHOW	0.0	occupied active	2200	good	-96.7210	44.6043	DT
RTHA	0.0	occupied active	14387	good	-96.7712	44.6146	DT
RTHA	0.0	occupied active	2194	good	-96.6379	44.6235	DT
RTHA	<0.1	occupied active	2189	good	-96.6151	44.5797	DT
UNRA	0.0	occupied active	2198	good	-96.7086	44.6144	DT
UNRA	0.0	inactive	2184	good	-96.7420	44.5927	DT
UNRA	0.0	inactive	2193	fair	-96.6853	44.6116	DT
UNRA	0.0	inactive	2199	poor	-96.7198	44.6046	DT
UNRA	0.0	inactive	2201	good	-96.7328	44.6021	DT
UNRA	0.0	inactive	2202	fair	-96.7430	44.6260	DT
UNRA	0.0	inactive	2203	fair	-96.7415	44.5931	DT
UNRA	0.0	inactive	2204	good	-96.6900	44.5818	DT
UNRA	0.0	inactive	14385	good	-96.8038	44.6609	DT
UNRA	0.0	inactive	14386	good	-96.7806	44.6251	DT
UNRA	0.0	inactive	14388	good	-96.7707	44.6310	DT
UNRA	0.0	inactive	14389	good	-96.7737	44.6588	DT
UNRA	0.0	inactive	14390	good	-96.7559	44.5926	DT
UNRA	0.0	inactive	14391	good	-96.7324	44.5870	DT
UNRA	0.0	inactive	14392	good	-96.6865	44.6395	DT
UNRA	0.0	inactive	14393	good	-96.6738	44.5945	DT
UNRA	0.2	inactive	3045	good	-96.5783	44.5896	DT
UNRA	0.3	inactive	14394	good	-96.5992	44.6117	DT
UNRA	0.5	inactive	2186	good	-96.5682	44.5754	DT
UNRA	0.5	inactive	2187	good	-96.5866	44.6099	DT
UNRA	0.5	inactive	3043	good	-96.5843	44.6127	DT
UNRA	0.6	inactive	2196	fair	-96.7069	44.5654	DT
UNRA	0.8	inactive	2197	good	-96.7078	44.5619	DT

¹ BAEA = bald eagle (*Haliaeetus leucocephalus*), RTHA = red-tailed hawk (*Buteo jamaicensis*), GHOW = great horned owl (*Bubo virginianus*), UNRA = unidentified raptor species

² A distance value of 0.0 indicates the nest is located within the Project boundary.

³ DT = deciduous tree

⁴ Nest is consistent in size and shape with a bald eagle nest, but was occupied by a different raptor species

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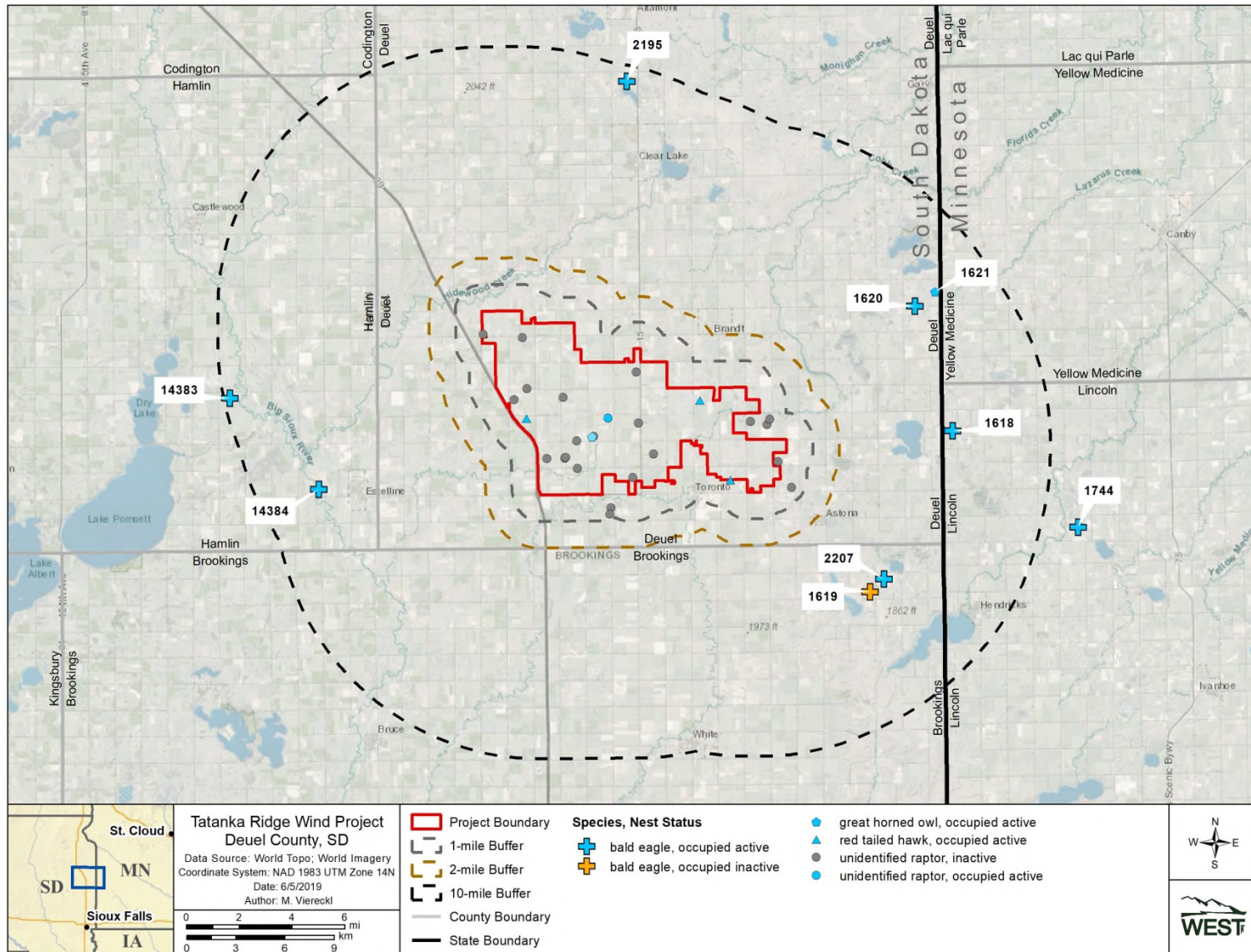


Figure 2. Locations of raptor nests within 1-mile and eagle-sized nests within 10 miles of the Tatanka Ridge Wind Project or otherwise checked for nest status during the 2019 aerial nest survey, Deuel County, South Dakota.

Nest 1618 – This nest was located 6.3 miles east of the Project boundary in Lincoln County, Minnesota. This nest was documented by WEST as an active bald eagle nest in 2017 (WEST 2017a), and as an occupied active bald eagle nest in 2018 (Kreger and Rieland 2018). During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest at the time of the survey in April, and the nest appeared to have been recently tended. The nest was therefore classified as an occupied and active bald eagle nest in 2019 (Appendix A, Photograph A-3).

Nest 1620 – This nest was located 6.9 miles northeast of the Project boundary. This nest was documented by WEST as an active eagle nest in 2017 (WEST 2017b), and as an occupied and active eagle nest in 2018 (Kreger and Rieland 2018). During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest at the time of the survey in April, and the nest appeared to have been recently tended. The nest was therefore classified as an occupied and active bald eagle nest in 2019 (Appendix A, Photograph A-4).

Nest 14384 – This nest was located 7.7 miles west of the Project boundary. This nest was located for the first time in 2019 and was in good condition. Two adult bald eagles were observed; one was perched nearby and the other was incubating on the nest at the time of the survey in April. The nest appeared to have been recently tended. The nest was therefore classified as an occupied and active bald eagle nest in 2019 (Appendix A, Photograph A-5).

Nest 2195 – This nest was located 9.4 miles north of the Project boundary. This nest was documented by WEST as an occupied active eagle nest in 2018 (Kreger and Rieland 2018). During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest at the time of the survey in April, and the nest appeared to have been recently tended. The nest was therefore considered an occupied and active bald eagle nest in 2019 (Appendix A, Photograph A-6).

Nest 14383 – This nest was located 9.8 miles west of the Project boundary. This nest was located for the first time in 2019 and was in good condition. An adult bald eagle was observed incubating on the nest at the time of the survey in April, and the nest appeared to have been recently tended. The nest was therefore classified as an occupied and active bald eagle nest in 2019 (Appendix A, Photograph A-7).

Nest 1744 – This nest was located 11.4 miles east of the Project boundary in Lincoln County, Minnesota. This nest was documented by WEST as an active eagle nest in 2017 (WEST 2017a), and as an occupied inactive eagle nest in 2018 (Kreger and Rieland 2018). During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest, and the nest appeared to have been recently tended at the time of the survey in April. The nest was therefore classified as an occupied and active bald eagle nest in 2019 (Appendix A, Photograph A-8).

Nest 1621 – This nest was located 7.8 miles northeast of the Project boundary. This nest was documented by WEST as an active bald eagle nest in 2016 (Simon et al. 2017), as an active great

horned owl nest in 2017 (WEST 2017b), and as an inactive bald eagle nest in 2018 (Kreger and Rieland 2018). During the 2019 survey, the nest was in good condition. No eagles were observed on the nest. An adult great horned owl was observed incubating on the nest, and the nest appeared to have been recently tended. The nest was therefore classified as an occupied active great horned owl nest in 2019; however, based on the previous classifications, this nest is likely an alternate bald eagle nest that has the potential to be occupied by bald eagles in future years (Appendix A, Photograph A-9).

Other Raptors

A total of 28 non-eagle raptor nests were documented during the aerial nest survey, 27 of which were within 1-mile of the Project (Table 1; Figure 2; Figure 3). Nest 1621, as described above, was documented as an occupied active great horned owl nest approximately 7.8 miles northeast of the Project boundary, and was consistent in size and shape with a bald eagle nest. The 27 raptor nests within 1-mile of the Project include the following:

- Occupied and active
 - three red-tailed hawk (*Buteo jamaicensis*) nests
 - one great horned owl nest
 - one unidentified raptor nest
- Inactive nests
 - 22 inactive nests of unidentified raptor species

Nineteen of the 27 raptor nests observed within 1-mile of the Project during the 2019 survey were documented within the Project boundary, including four occupied nests that were reported in good condition. Of the occupied nests, two were active red-tailed hawk nests, one was an active great horned owl nest, and one was an active unidentified raptor nest. The 15 inactive nests within the Project boundary included 11 nests in good condition, three nests in fair condition, and one nest in poor condition.

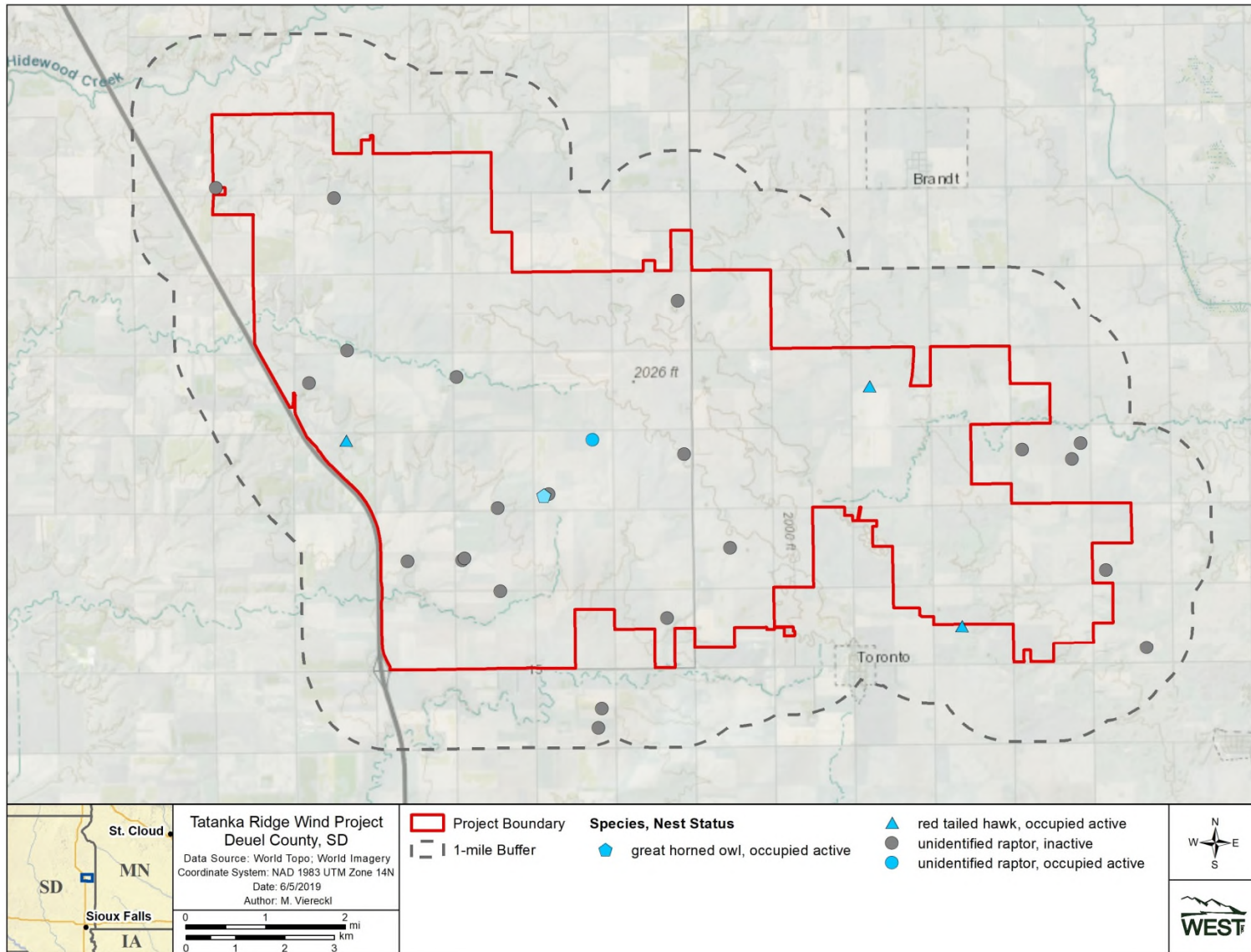


Figure 3. Locations of raptor nests observed within 1-mile of the Tatanka Ridge Wind Project during the 2019 aerial nest survey, Deuel County, South Dakota.

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**Appendix A. Photographs of Bald Eagle Nests and Nests Consistent in Size and Shape
with Bald Eagle Nests Documented during the Aerial Nest Survey at the Tatanka Ridge
Wind Project in April 2019**



Appendix A, Photograph A-1. Nest 2207 was located approximately 5.4 miles southeast of the Project boundary. During the 2019 survey, the nest was in good condition. No adult bald eagles were present on the nest, but two eggs were observed in the nest and the nest appeared to have been recently tended at the time of the survey in April. The nest was therefore classified as an occupied active bald eagle nest in 2019.



Appendix A, Photograph A-2. Nest 1619 was located approximately 5.4 miles southeast of the Project boundary. During the 2019 survey, the nest was in good condition. Two adult bald eagles were observed perched on the nest (prior to the photograph being taken) and the nest appeared to have been recently tended; however, no eggs, chicks, or signs of incubating or brooding were observed. The nest was therefore classified as an occupied and inactive bald eagle nest in 2019. It is possible that the two bald eagles observed at this nest were actively nesting at Nest 2207 nearby.



Appendix A, Photograph A-3. Nest 1618 was located approximately 6.3 miles east of the Project boundary in Lincoln County, Minnesota. During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest at the time of the survey in April, and the nest appeared to have been recently tended. The nest was therefore classified as an occupied and active bald eagle nest in 2019.



Appendix A, Photograph A-4. Nest 1620 was located approximately 6.9 miles northeast of the Project boundary. During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest at the time of the survey in April, and the nest appeared to have been recently tended. The nest was therefore classified as an occupied and active bald eagle nest in 2019.



Appendix A, Photograph A-5. Nest 14384 was located approximately 7.7 miles west of the Project boundary. This nest was in good condition. Two adult bald eagles were observed; one was perched nearby and the other was incubating on the nest at the time of the survey in April. The nest appeared to have been recently tended. The nest was therefore classified as an occupied and active bald eagle nest in 2019.



Appendix A, Photograph A-6. Nest 2195 was located approximately 9.4 miles north of the Project boundary. During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest at the time of the survey in April, and the nest appeared to have been recently tended. The nest was therefore considered an occupied and active bald eagle nest in 2019.



Appendix A, Photograph A-7. Nest 14383 was located approximately 9.8 miles west of the Project boundary. During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest at the time of the survey in April, and the nest appeared to have been recently tended. The nest was therefore classified as an occupied and active bald eagle nest in 2019.



Appendix A, Photograph A-8. Nest 1744 was located approximately 11.4 miles east of the Project boundary in Lincoln County, Minnesota. During the 2019 survey, the nest was in good condition. An adult bald eagle was observed incubating on the nest, and the nest appeared to have been recently tended at the time of the survey in April. The nest was therefore classified as an occupied and active bald eagle nest in 2019.



Appendix A, Photograph A-9. Nest 1621 was located approximately 7.8 miles northeast of the Project boundary. During the 2019 survey, the nest was in good condition. No eagles were observed on the nest, but it was consistent in size and shape with a bald eagle nest. An adult great horned owl was observed incubating on the nest, and the nest appeared to have been recently tended. The nest was therefore classified as an occupied active great horned owl nest in 2019.