APPENDIX A

NOTICE TO COMMISSION OF INTENT TO FILE APPLICATION UNDER ALTERNATIVE PERMITTING PROCESS

ODELL
WIND FARM
Cottonwood, Jackson, Martin,
& Watonwan Counties, MN

July 8, 2013

Dr. Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

RE: Notification of Pending Route Permit Application Under Alternative Permitting Process for the Proposed 115 kV Odell Wind Farm Transmission Line and Associated Facilities in Cottonwood, Jackson, and Martin Counties, Minnesota
PUC Docket No. IP__/TL-13-____

Dear Dr. Haar:

Odell Wind Farm, LLC ("Odell"), a Minnesota limited liability company, plans to file a route permit application for a 115 kV high voltage transmission line in Cottonwood, Jackson, and Martin Counties, Minnesota, to interconnect the proposed 200 MW wind farm being developed by Odell.

Since the high voltage transmission line is between 100 and 200 kilovolts, the transmission line and associated facilities are eligible for the alternative permitting process, as provided under Minnesota Rules, part 7850.2800, subpart 1(C). As required by Minnesota Rules, part 7850.2800, subpart 2, Odell is hereby notifying the Public Utilities Commission of its intent to submit a route permit application for the above-mentioned project under the alternative permitting procedures of Minnesota Rules, parts 7850.2800 to 7850.3900.

Odell anticipates filing the route permit application sometime in third quarter 2013.

Please contact me if you have any questions.

Sincerely,

Patrick Smith
Director Environmental Planning

CKB:6836317

AFFIDAVIT OF SERVICE BY MAIL

In the Matter of Odell Wind Farm LLC's Route Permit Application for a 115 kV Transmission Line and Associated Facilities in Cottonwood, Jackson, and Martin Counties

MPUC Docket No. IP__/TL-13-____

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

Shari K. Buster, of the City of Minneapolis, County of Hennepin, in the State of Minnesota, being duly sworn, says that on the 8th day of July, 2013, she e-filed with the Minnesota Public Utilities Commission the following:

1. **Notice of Route Permit Application Under Alternative Review Process; and**

2. **Affidavit of Service.**

A copy has also been served in accordance with the attached service list of record.

Shari K. Buster

Subscribed and sworn to before me
on July 8, 2013.

Notary Public

VIRGINA E. RAHN
NOTARY PUBLIC-MINNESOTA
My Commission Expires Jan. 31, 2015

Julia Anderson
Assistant Attorney General
1400 Bremer Tower
445 Minnesota Street
St. Paul, MN 55101-2131

Burl W. Haar
MN Public Utilties Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

Sharon Ferguson
MN Department of Commerce
85 7th Place East, Suite 500
St. Paul, MN 55101-2198

Curt Nelson
OAG-RUD
900 BRM
Tower 445 Minnesota Street
St. Paul, MN 55101-2130

APPENDIX B

AGENCY CORRESPONDENCE

ODELL WIND FARM
Cottonwood, Jackson, Martin, & Watonwan Counties, MN

May 24, 2013

Mr. Bob Patton
Ag Marketing and Development Division
625 Robert Street North
Saint Paul, MN 55155

RE: Odell Wind Farm and Transmission Line in Southwest Minnesota

Dear Mr. Bob Patton:

Odell Wind Farm, LLC (Odell Wind Farm), a wholly owned subsidiary of Geronimo Wind Energy, LLC, is gathering information and requesting agency comments for a proposed wind energy project and transmission line in Cottonwood, Jackson, Martin, and Watonwan Counties, Minnesota. The proposed project will be up to 200 MW.

Odell Wind Farm intends to submit a Site Permit Application for a Large Wind Energy Conversion System and a Route Permit Application for a High Voltage Transmission Line to the Minnesota Public Utilities Commission (PUC). The Odell Wind Farm will include wind turbines and associated facilities, including gravel access roads, an underground collector system, two substations, meteorological monitoring stations, an operations and maintenance facility, and a 115 kV transmission line.

Turbine locations, access roads and electrical connections have not been finalized at this time. Table 1 provides the sections of land Odell Wind Farm is evaluating for siting the wind energy project.

Table 1 –Sections within the Odell Wind Farm Project Boundary

County Name	Township Name	Township	Range	Sections
Cottonwood	Lakeside	105N	35W	22, 23, 24, 25, 26, 35, 36
Cottonwood	Mountain Lake	105N	34W	12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36
Jackson	Christiana	104N	35W	1, 2, 12
Jackson	Kimball	104N	34W	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 16, 17, 18, 19, 20, 21
Martin	Cedar	104N	33W	4, 5, 6, 7, 8, 9, 16, 17
Watonwan	Odin	105N	33W	7, 18

Similarly, the transmission line route is not yet finalized. Table 2 identifies the land in the transmission route evaluation area, which is the area currently being considered for the transmission route and possible alternative routes.

Table 2 –Sections Included in the Transmission Route Evaluation Area*

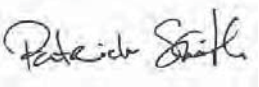
County Name	Township Name	Township	Range	Sections
Cottonwood	Mountain Lake	105N	34W	32, 33, 34, 35, 36
Jackson	Kimball	104N	34W	1, 2, 3, 4, 5
Martin	Cedar	104N	33W	4, 5, 6, 7, 8, 9, 16, 17
*The Sections in Table 2 are also included in Table 1 because the prospective transmission routes are located within the current Odell Wind Farm boundary.				

To facilitate your review, we have enclosed a map of Odell Wind Farm's location and project boundary. The transmission route evaluation area is also indicated on the map.

We welcome any comments the Ag Marketing and Development Division may have at this time or throughout the permit application process. Any comments provided will be incorporated into the PUC review process for the Odell Wind Farm.

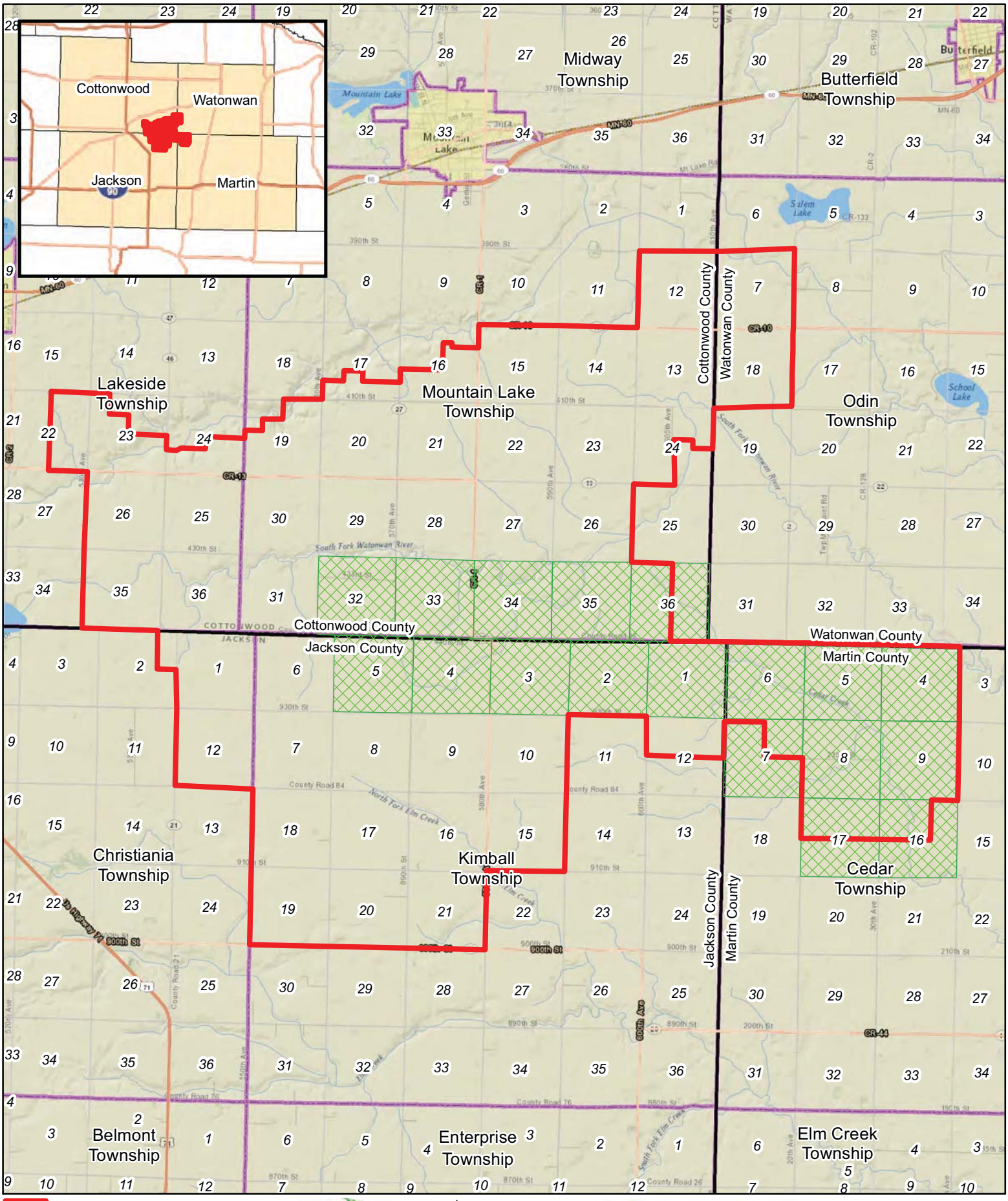
If you require further information or have questions regarding this matter, please contact me at 952-988-9000 or at Patrick@geronimoenergy.com

Sincerely,



Patrick Smith
Director of Environmental Planning

Enclosures:
Odell Wind Farm Project Location Map



Odell Footprint
Route Evaluation Area
County
County Subdivisions

GERONIMO ENERGY

0 0.75 1.5 3
Miles

ODELL WIND FARM
Cottonwood, Jackson, Martin, & Watonwan Counties, MN

Project Location Map

Document Path: O:\GIS\GISData\Projects\Odell Wind Farm\Projects\OD_ProjectLocationMap_05232013_CJ.mxd

cjjenson Date: 5/24/2013

Swenson, Kristen

From: Heather L. Wayne
Sent: Friday, March 29, 2013 9:29 AM
To: Heather L. Wayne
Subject: FW: Proposed Odell wind facility - teleconference discussion regarding field methods

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From: Heather C. Kieweg [mailto:heather.kieweg@appliedeco.com]
Sent: Thursday, March 28, 2013 8:10 PM
To: Rheude, Margaret
Cc: Patrick Smith; Heather L. Wayne; Kim Chapman
Subject: RE: Proposed Odell wind facility - teleconference discussion regarding field methods

Thank you. That will be very helpful information. To my knowledge there haven't been any letters received from either Rich Davis or your office regarding this project.

Heather Kieweg
Applied Ecological Services
Office: 952-447-1919
Cell: 651-428-8253

From: Rheude, Margaret [mailto:margaret_rheude@fws.gov]
Sent: Thursday, March 28, 2013 4:34 PM
To: Heather C. Kieweg
Subject: Re: Proposed Odell wind facility - teleconference discussion regarding field methods

HI Heather,
yes, I will be providing comments to you regarding eagles, T&E species, and other FWS-owned land interests. I will be getting back to you next week. As I am taking over the wind review projects from Rich Davis, I am still playing a bit of catch-up. Can you tell me if you have received any letters from him or our office with initial recommendations for your wind facility?
Thanks,
Mags

On Thu, Mar 28, 2013 at 12:58 PM, Heather C. Kieweg <heather.kieweg@appliedeco.com> wrote:

Hello Mags,

We understand your need to streamline project communications given your work load, although we want to make sure to share information and obtain input as appropriate. One of the issues we would have discussed with you at this point is Bald Eagle use of the project area. We would appreciate any information that you have about eagles within 10 miles of the project area. Please see the attached data request and shapefile containing a 10 mile buffer of the proposed site boundary. Thank you.

Heather Kieweg

Applied Ecological Services

Office: 952-447-1919

Cell: 651-428-8253

From: Rheude, Margaret [mailto:margaret_rheude@fws.gov]
Sent: Monday, March 25, 2013 3:36 PM
To: Heather C. Kieweg
Cc: kevin.mixon@state.mn.us; Richard_Davis@fws.gov; Kim Chapman; Patrick Smith
Subject: Re: Proposed Odell wind facility - teleconference discussion regarding field methods

Dear all,

I wanted to give you an update on the current status of FWS involvement in review of wind energy projects in Minnesota. Our current wind biologist, Rich Davis, will no longer be with the Service as of April 1, 2013. With Rich Davis leaving, I will be taking over his responsibilities for wind project review. A result of the federal government sequester has been that the FWS is having to review more projects with less staff, and our office has determined that for the time being, I will have a smaller role in state wind project review than Rich Davis.

In the coming weeks, I will be putting together a general package for wind developers of recommendations the FWS has for wind developers. This package will likely include general bird and bat conservation recommendations, as well as identify events that will trigger greater involvement by the FWS. These triggers, I anticipate, will include eagle issues, some bat issues (such as Northern Long-ear), T&E issues, and some post-construction fatality monitoring issues, such as migratory bird carcass collection permits. If there are additional issues that the DNR and DOC are not able to resolve, I will be able to provide some additional limited review.

Please continue to include me on emails so that I can keep tabs on various projects, and I will let you know when I am able to attend planning meetings and provide comment.

If you are able to identify specific "trigger" issues at this time, please send me that specific information for review. Otherwise, the Service will be providing you with general recommendations regarding your proposed wind facility.

Thank you,

Mags

--
Mags Rheude

US Fish and Wildlife Service

Twin Cities Field Office

4101 American Blvd E

Bloomington MN 55425

612-725-3548 x2202

margaret_rheude@fws.gov

On Thu, Mar 21, 2013 at 3:08 PM, Heather C. Kieweg <heather.kieweg@appliedeco.com> wrote:

Hello,

We're working with Geronimo on a proposed wind facility in southwestern Minnesota known as Odell. We're hoping to begin avian field surveys in the next few weeks, and we'd like to have a discussion with you about potential issues at the site and proposed survey methods. Ideally I'd like to schedule a teleconference next week. We would share the site location, and information on the proposed surveys.

Are there times next week that would work for a teleconference? Thank you.

Heather Kieweg

Staff Ecologist

Applied Ecological Services, Inc.

21938 Mushtown Road

Prior Lake, MN 55372

Office: 952-447-1919 ext. 3#

Cell: 651-428-8253

heather.kieweg@appliedeco.com

www.appliedeco.com

www.restorationnurseries.com

--
Mags Rheude

US Fish and Wildlife Service

Twin Cities Field Office

4101 American Blvd E

Bloomington MN 55425

612-725-3548 x2202

margaret_rheude@fws.gov

--
Mags Rheude
US Fish and Wildlife Service
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4101 American Blvd E
Bloomington MN 55425
612-725-3548 x2202
margaret_rheude@fws.gov

APPLIED ECOLOGICAL SERVICES, INC.

21938 MUSHTOWN ROAD, PRIOR LAKE, MN 55372
PHONE: (952)447-1919 FAX: (952)447-1920
email: info.mn@appliedeco.com

Bringing the science of ecology to all land use decisions

March 28, 2013

Margaret Rheude
United States Fish and Wildlife Service
Twin Cities Field Office
4101 American Blvd E
Bloomington MN 55425

Subject: Odell (12-0974) – Eagle Nest Data Request

Dear Margaret Rheude,

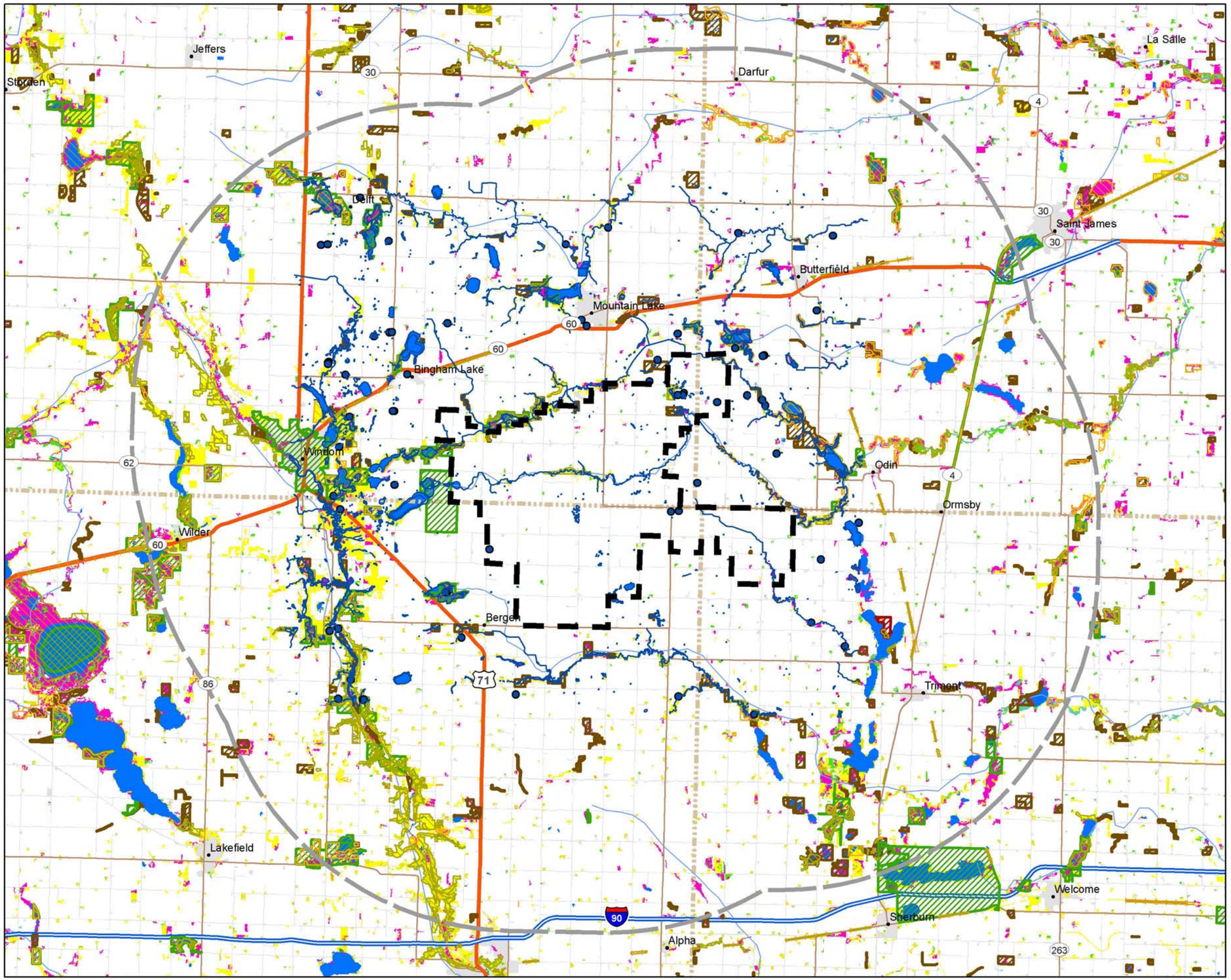
I am requesting nest data for eagles within 10 miles of a proposed wind energy development in Cottonwood, Jackson, Watonwan and Martin counties. We understand that your records of eagle nests are not complete, but would appreciate any information on known nests in this area. Attached you will find a map showing the proposed project location buffered by 10 miles and associated land covers. We would also appreciate any other information you might have on important eagle areas within the 10 mile buffer area. I am sending a GIS shapefile of the request area.

Please contact me if you have any questions. Thank you for your assistance, and we look forward to your review findings.

Sincerely,

Heather Kieweg

Heather Kieweg
heather.kieweg@appliedeco.com
(651) 428-8253



Odell Wind Farm
Eagle Data Request

- Site Boundary
- Odell 10 mile buffer
- Protected Natural Areas
- Railroad Prairie
- Cty. Biological Survey - Native Plant Community
- Cty. Biological Survey - Sites of Biological Sig.
- NWI Wetlands
- RIM Easement
- County Land
- Snowmobile Trails

Land Cover:

- Open Water
- Developed
- Barren Land
- Upland Broadleaf Forest
- Upland Coniferous Forest
- Upland Mixed Forest
- Upland Shrub-Scrub
- Grassland
- Cropland
- Forested Wetland
- Emergent Wetland

Data Sources:
ESRI Street Map
2001 National Landcover Database USDA/NRCS
MNDNR - CBS, MNDNR Ownership, NWI
AES Job Number: 12-0974
Date: 3/28/2013
File Name: Odell_EagleDataRequest_20130328.mxd

APPLIED ECOLOGICAL SERVICES
21938 Mushtown Road
Prior Lake, MN 55372
952-447-1919
www.appliedeco.com

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Miles

N

From: Patrick Smith
To: Heather C. Kieweg; Rheude, Margaret; Kim Chapman; Heather L. Wayne; Jordan B. Burmeister
Subject: RE: Odell - Bald Eagles
Date: Monday, May 13, 2013 10:27:52 AM

Mags,

Thanks for taking the time for our conversation today, the link to the map I mentioned is here: http://mn.gov/commerce/energyfacilities/documents/turb_summary_0710_2012.pdf

Best Regards,

Patrick

Patrick Smith

Director of Env. Planning

Phone: 952-988-9000

Cell: 651-308-9823

Fax: 952-988-9001

Email: patrick@geronimoenergy.com

Geronimo Energy

7650 Edinborough Way, Suite 725

Edina MN 55435

-----Original Appointment-----
From: Heather C. Kieweg [mailto:heather.kieweg@appliedeco.com]
Sent: Friday, May 10, 2013 8:21 AM
To: Heather C. Kieweg; Patrick Smith; Rheude, Margaret; Kim Chapman; Heather L. Wayne; Jordan B. Burmeister
Subject: Odell - Bald Eagles
When: Monday, May 13, 2013 9:30 AM-10:00 AM (UTC-06:00) Central Time (US & Canada).
Where: MN Conference Call Line 1-888-387-8686 ID Num: 764-016-5674#

When: Monday, May 13, 2013 9:30 AM-10:00 AM (UTC-06:00) Central Time (US & Canada).

Where: MN Conference Call Line 1-888-387-8686 ID Num: 764-016-5674#

Note: The GMT offset above does not reflect daylight saving time adjustments.

~~*~*~*~*~*~*~*~*~*

Hello,

I believe that this time will work for everyone to begin a discussion of risk to Bald Eagles at the Odell site. Thank you.

-Heather Kieweg

Swenson, Kristen

From: Rheude, Margaret <margaret_rheude@fws.gov>
Sent: Thursday, May 16, 2013 4:55 PM
To: Patrick Smith; cc: Heather C. Kieweg; Kim Chapman; Heather L. Wayne; Jordan B. Burmeister
Subject: Odell Wind Farm Eagle Recommendations
Attachments: Appendix C ECP 2013.pdf

*This original email got bounced back - I think it was too big, so I'll try to break it up into smaller pieces

Hi everyone,
*this email is mainly concerning eagles

as a quick follow-up to our meeting - I was able to pull up the shapefile of the project, as well as the 10-mile buffer area. I only saw one eagle nest within the 10-mile buffer, and none within the project boundary. The nest that I found in my database search is the same one that you have. However, this does not guarantee that there are no eagle nests within either the project area or the 10-mile buffer - the DNR database has not been updated since 2007. I would recommend conducting yearly nest surveys in the spring of each year (before leaf-on) to look for newly built nests (within the 2-mile buffer zone). The updated eagle conservation plan guidance is out, and can be found:
http://www.fws.gov/windenergy/PDF/Eagle%20Conservation%20Plan%20Guidance-Module%201.pdf

There is in-depth information on pre-construction surveys found in Appendix C. I have pulled that out for you, and attached it here. Please note that it recommends using 800m point counts, at least 1 hour in duration, that eagle minutes and eagles are counted, and that there be a differentiation between flying and perched eagles. I have included a spreadsheet with an example of how data might be collected. The columns in green are data that the FWS needs in order to run the collision risk model. The columns in pink are suggestions of additional data you can collect if it suits your needs. For instance, some developers like to record eagle minutes within, below, and above the rotor swept zone. For the FWS model, however, we are looking at whether eagles are at or below 200m, or above 200m. Some wind developers also note additional information, such as the presence of livestock or carcasses that might influence eagle numbers. I would recommend also conducting observer trials to ensure they can accurately determine 200m flight height, as well as 800m radius observation. Do you know how much eagle data you are going to collect? 1 or 2 years?

In our phone call you asked about the recommended frequency of eagle surveys. The FWS recommends eagle surveys at least once a month in each location, with an increase in surveys during the times of the year when eagle activity is likely to increase - for instance - spring/fall migration, or when chicks fledge, or if there appears to be a wintering population of eagles near the site. As discussed, I do think it would be possible to drop a few of the monthly surveys during times where eagle behavior is likely to be the same - ie: April eagle activity is likely similar to May eagle activity - the same could be true for August-September eagle activity. However, I want to state in order to get the most robust dataset - monthly surveys are preferable. In order to help you with your decision of how many surveys to conduct, I would recommend looking at known patterns of eagle activity year-round for your site - using sources such as winter-point count surveys from the Eagle Center in Wabasha, migration patterns observed from Hawk mountain in Duluth, etc. Note that weather patterns (which can vary from year to year) may change predicted eagle behavior. If you do decide to drop some of the monthly eagle surveys, I would be happy to look at your proposed schedule of surveys and give you feedback.

Please find also attached some examples of recording eagle flight patterns, as well as eagle abundance data, and example of eagle "hot-spots" - places that may attract bald eagles.

I will be working on an additional follow-up response concerning T&E species, as well as FWS-interest lands.
Thanks, I'll be in touch soon.

--
Mags Rheude
US Fish and Wildlife Service
Twin Cities Field Office
4101 American Blvd E

Swenson, Kristen

From: Rheude, Margaret <margaret_rheude@fws.gov>
Sent: Thursday, May 16, 2013 5:03 PM
To: Patrick Smith; cc: Heather C. Kieweg; Kim Chapman; Heather L. Wayne; Jordan B. Burmeister
Subject: Odell eagle email 4
Attachments: Eagle Hot Spots_example.pdf

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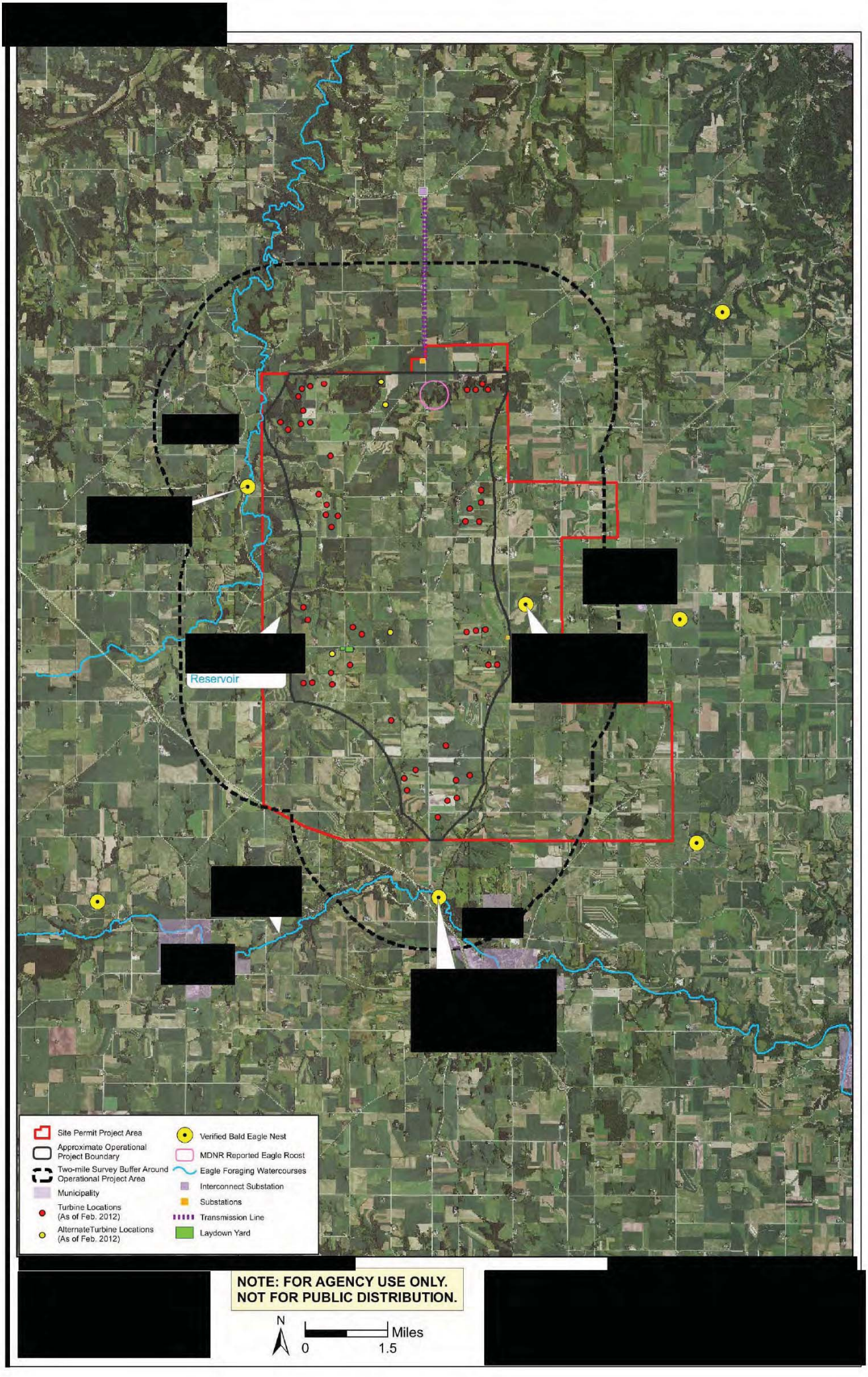
Mags Rheude
US Fish and Wildlife Service
Twin Cities Field Office
4101 American Blvd E
Bloomington MN 55425
612-725-3548 x2202
margaret_rheude@fws.gov


[redacted]
[redacted]
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Reservoir
[redacted]
[redacted]
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[redacted]
Site Permit Project Area
Approximate Operational Project Boundary
Two-mile Survey Buffer Around Operational Project Area
Municipality
Turbine Locations (As of Feb. 2012)
AlternateTurbine Locations (As of Feb. 2012)
Verified Bald Eagle Nest
MDNR Reported Eagle Roost
Eagle Foraging Watercourses
Interconnect Substation
Substations
Transmission Line
Laydown Yard
[redacted]
NOTE: FOR AGENCY USE ONLY.
NOT FOR PUBLIC DISTRIBUTION.
N
0
1.5
Miles
[redacted]

Swenson, Kristen

From: Rheude, Margaret <margaret_rheude@fws.gov>
Sent: Thursday, May 16, 2013 4:57 PM
To: Patrick Smith; cc: Heather C. Kieweg; Kim Chapman; Heather L. Wayne; Jordan B. Burmeister
Subject: Odell Wind Farm eagles Email 2
Attachments: Flight path examples.pdf; Sample abundance data_Redacted.pdf; Sample data collection.xlsx; Sample flight path data_Redacted.pdf; Walker et al 2005 GEs before-after windfarm.pdf

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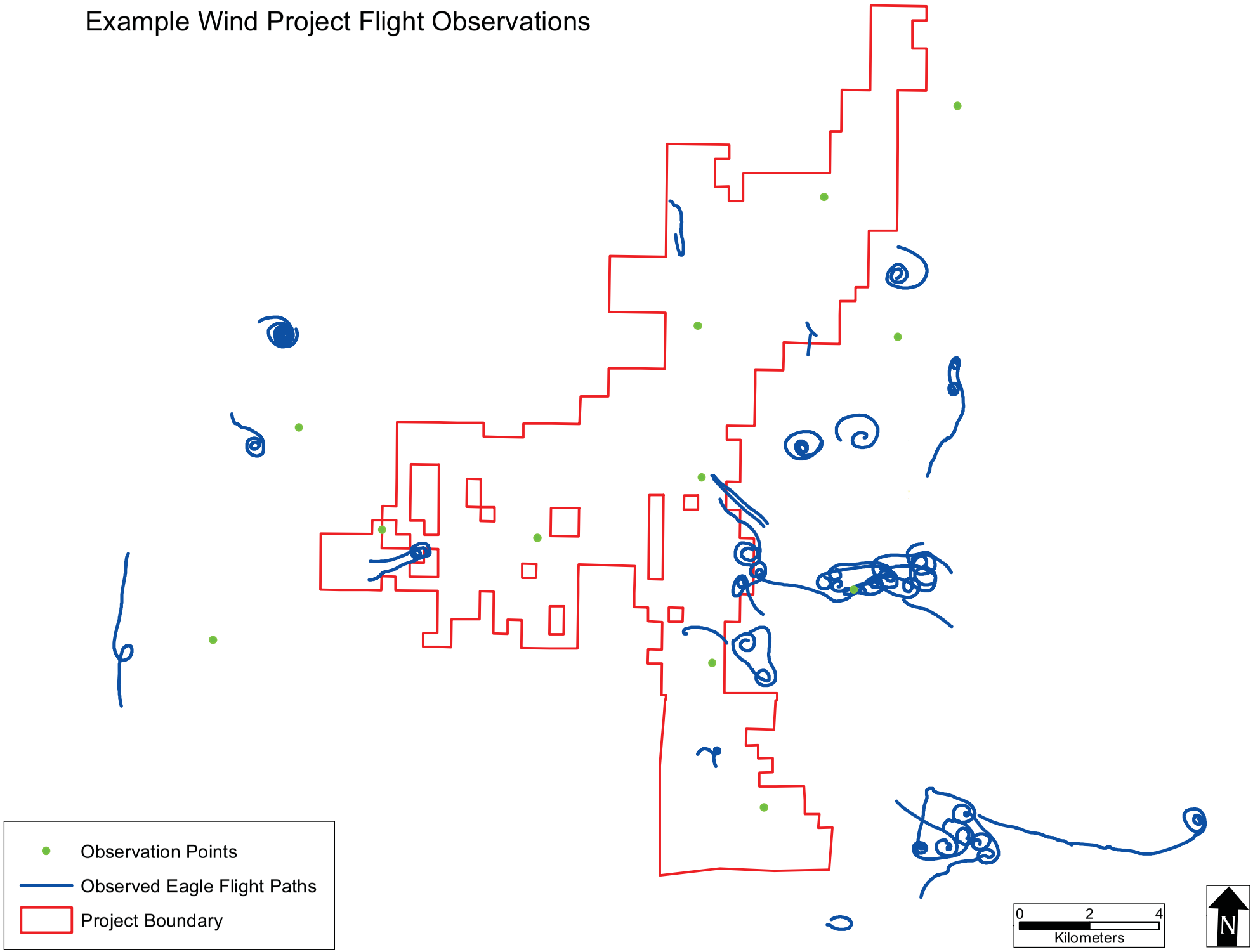
Mags Rheude
US Fish and Wildlife Service
Twin Cities Field Office
4101 American Blvd E
Bloomington MN 55425
612-725-3548 x2202
margaret_rheude@fws.gov

Example Wind Project Flight Observations



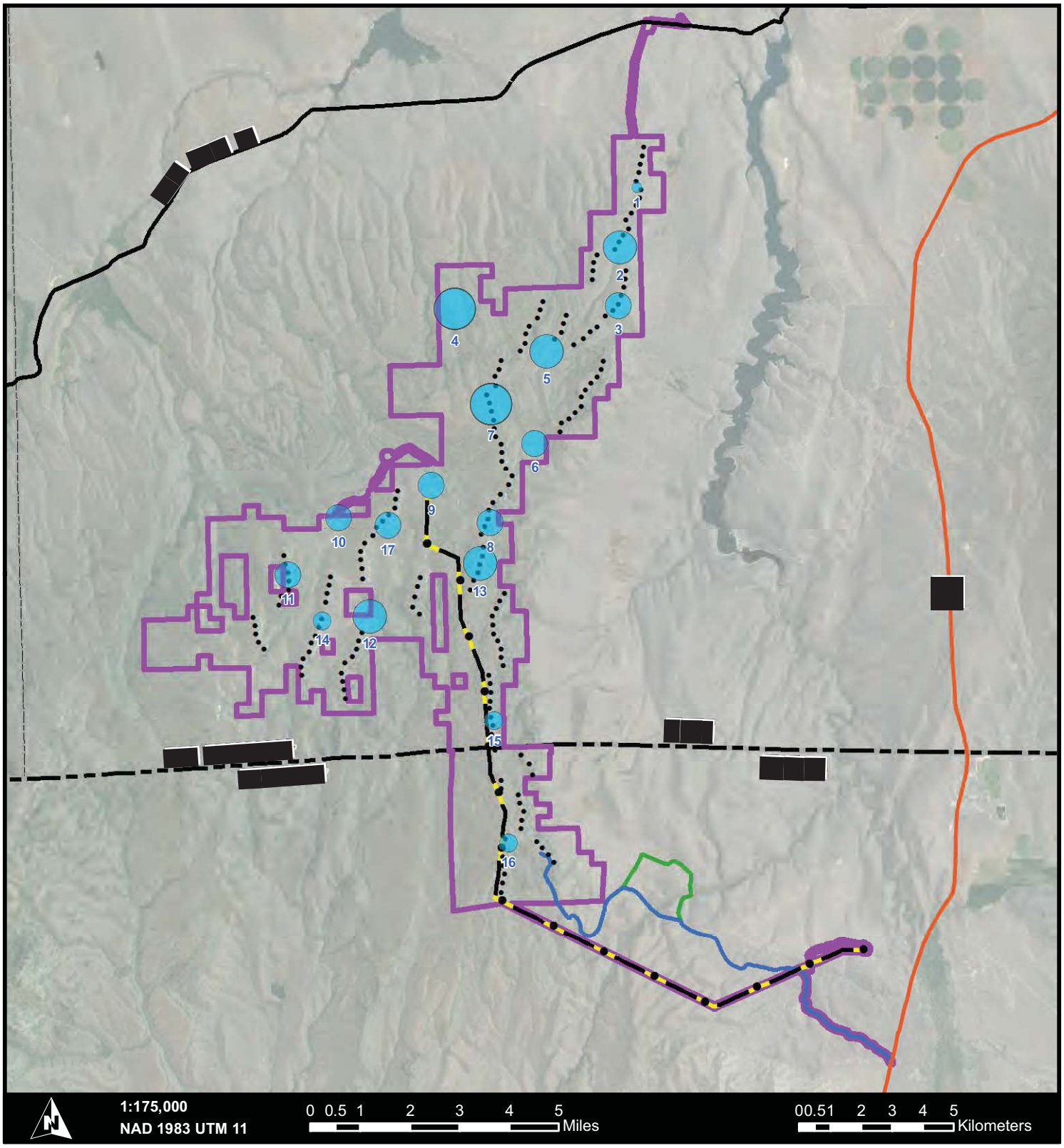


Figure 6

[redacted]

Raptor Use By Survey Point During 2008 Fixed-Point Surveys

[redacted]

Project Area
State Boundary
County Boundary
Wind Turbine Generator
Proposed Transmission Line (345kV)
Southern Haul Option 1
Southern Haul Option 2
Federal Highway
Local Road

Raptor Use
0.01 - 0.25
0.26 - 0.50
0.51 - .075
0.76 - 1.00
> 1.00

[redacted]

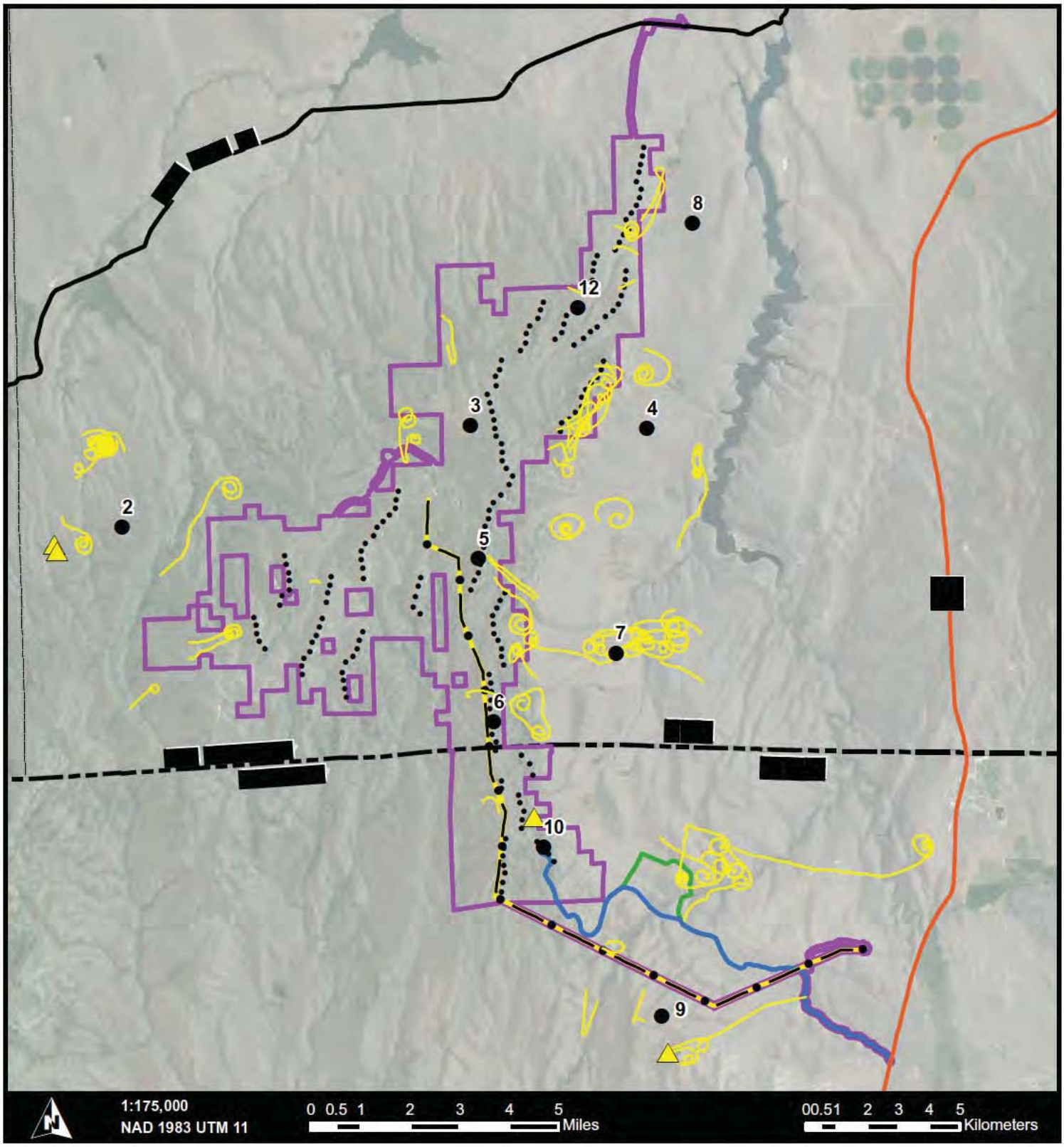


Figure 20

Golden Eagle [redacted]ht Paths and Perch Locations from 2011 Field [redacted]servations

- Project Area
- State Boundary
- County Boundary
- Golden Eagle Observation Point
- Golden Eagle Observation - Perched
- Golden Eagle Observation - Flying
- Wind Turbine Generator
- Southern Haul Option 1
- Southern Haul Option 2
- Proposed Transmission Line (345kV)
- Federal Highway
- Local Road

Resident Golden Eagle ranging behaviour before and after construction of a windfarm in Argyll

D WALKER, M MCGRADY, A MCCLUSKIE, M MADDERS & D R A MCLEOD

Resident Golden Eagle ranging behaviour was monitored over 776 observation hours before and after construction of a windfarm in Argyll, western Scotland between 1997 and 2004. Overall size of the eagle range that was potentially affected by the windfarm (for male, female and both eagles) was similar before and after construction. Eagles appeared to change their ranging to avoid the windfarm site. Once built the windfarm was over flown mostly when other eagles intruded on the territory. An area of plantation forestry was felled with the aim of mitigating the potential loss of foraging habitat to the windfarm, and drawing eagles away from the windfarm thereby reducing collision risk. Eagles were seen in the tree cleared area 3 times more often after felling than before felling, and the shift in ranging was away from the windfarm and in the direction of the felled area. These findings are from a single pair and should be used cautiously when applied to other, similar, situations. However, they are an important first step in understanding the likely effects of windfarms on eagles.

Introduction

In the UK in 2004, 253 MW of new, wind generated electricity was added to the national grid, 5 times the annual amount in the 1990s and double the 2003 figure. In Scotland, 11 schemes are under construction and due to come on line by the end of 2005. Many more developments are being planned in Scotland, and 70% of onshore schemes being considered for planning approval in the UK are located there (British Wind Energy Association 2004). Prospecting for new, commercially viable sites continues.

Scotland holds virtually all breeding pairs of Golden Eagles *Aquila chrysaetos* in the United Kingdom. Windfarms located within the range of Golden Eagles can cause eagle deaths due to collisions (Hunt 2002), and it has been thought that eagles may alter their ranging behaviour to avoid turbines, thus rendering the habitat within the windfarm area unavailable to foraging eagles. In Scotland these possible impacts have led to the adoption of a cautious approach to the siting of windfarms with regards to the location of territorial eagles.

A 46 turbine windfarm, the Beinn an Tuirc windfarm, was constructed during 2001 within an occupied eagle territory in Argyll. In addition, another windfarm, the Deucheran Hills windfarm, was built in 2001 (9 turbines) about 6.4 km to the north of the Beinn an Tuirc site, and is more peripheral to the home range of the eagles. To mitigate the potential habitat loss resulting from the Beinn an Turic windfarm, a habitat management plan was implemented that included forest clearance and management of existing Heather (*Calluna vulgaris*) moorland to increase the abundance of potential eagle prey (eg Willow Ptarmigan *Lagopus lagopus scoticus* and Black Grouse *Tetrao tetrix*). The creation of new areas of foraging habitat away from the windfarm was also thought likely to reduce the risk of eagle collisions with the turbines. An on going programme of eagle monitoring was

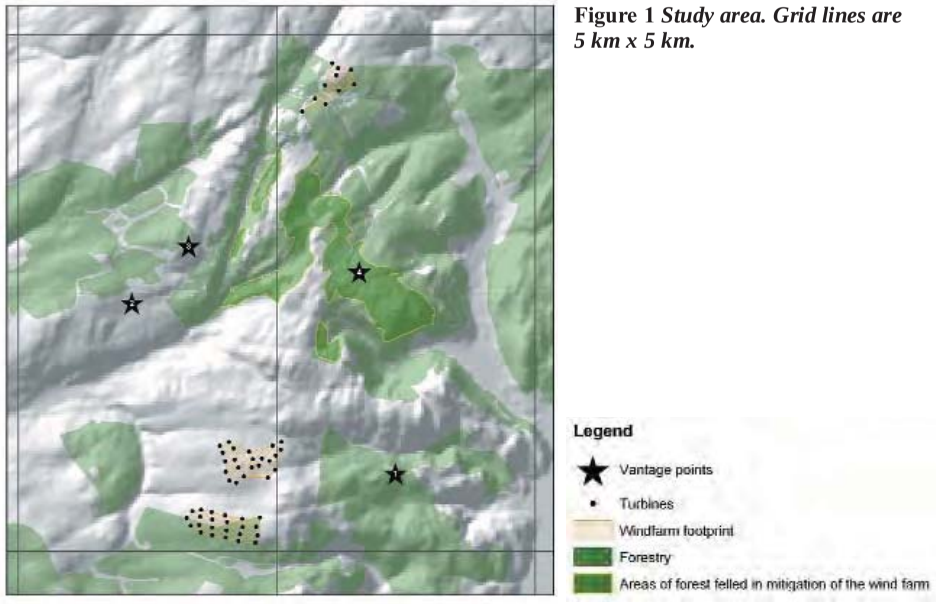


Figure 1 ***Study area. Grid lines are 5 km x 5 km.***

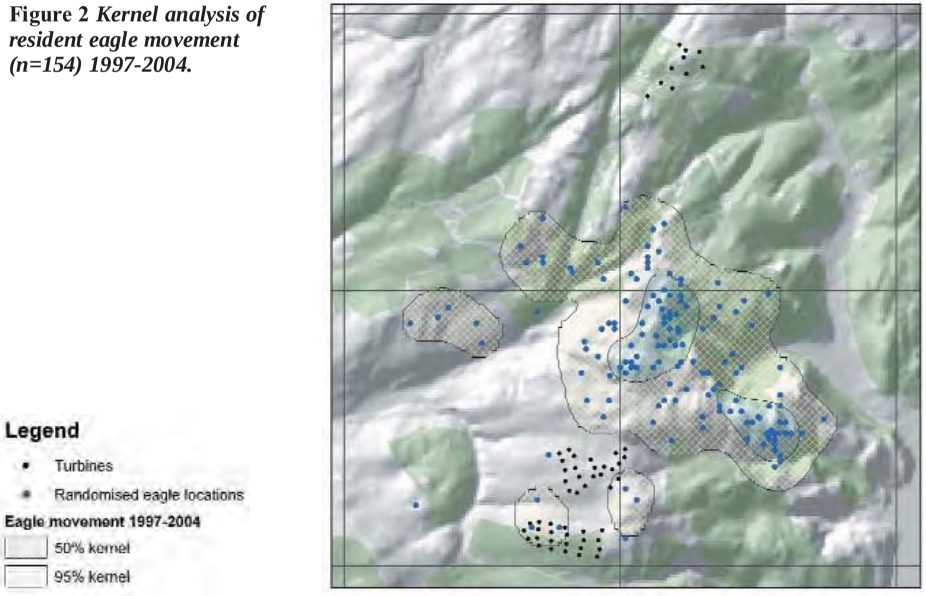


Figure 2 ***Kernel analysis of resident eagle movement (n=154) 1997-2004.***

undertaken from 1997 to assess effects of the Beinn an Tuirc windfarm and the habitat management plan on Golden Eagle ranging and breeding performance.

The Golden Eagle is a species of medium conservation concern in Britain (Gibbons *et al* 1996). In Argyll habitat changes that adversely influence foraging potential (eg upland afforestation and overgrazing of Heather areas) have affected territories adjacent to the one studied by us (Watson *et al* 1987). In spite of the similar loss of much land to plantation forest within the estimated eagle home range that includes the Beinn an Tuirc windfarm, there remains an extensive area of open land with modest populations of important prey species such as Willow Ptarmigan. Because of this the home range continues to be potentially viable for breeding eagles.

Study area

The Beinn an Tuirc windfarm (255 ha) and eagle monitoring area (ca 57 km^2) straddle the main ridge (Figure 1), which is generally below 300m above sea level, though there are peaks of ca 450m. The eastern slopes of this ridge, to a distance of about 3 km, are characterized by deeply cut valleys, with rock outcrops that provide a number of suitable eagle nest sites. To the west of the main ridge for a distance of about 8 km the terrain is gentler, characterized by wide, rounded ridges and shallow incised stream courses that run to the sea. This east west pattern extends both north and south of the study area.

Landcover within the monitoring area includes commercial forestry blocks, mostly Sitka Spruce *Picea sitchensis* of varying age, and open hill, dominated by grass and Heather; open areas include both grazed and ungrazed habitats, which are mostly acidic grasslands with some areas of shrub heath and areas of blanket bog on the higher slopes. Between October 1999 and June 2001 an area of forest (ca 280 ha) was felled to the north east of the main open area as part of the habitat management plan. Eagle monitoring focused on an area of ca 34 km^2 of open hill, which is bounded on the north and south by forest, but also includes ca 7 km^2 of open ridges within forest blocks to the north.

The diversity of natural fauna is limited, and a number of species, such as Mountain Hare *Lepus timidus* and Golden Plover *Pluvialis apricaria*, no longer occur locally as breeders. Mammals include small numbers of Rabbits *Oryctolagus cuniculus* around the fringe of the monitoring area, occasional Brown Hares *Lepus europaeus* towards its western edge, Sika *Cervus nippon* and Roe *Capreolus capreolus* Deer in the plantations and Foxes *Vulpes vulpes*. The birds are typical of upland areas in western Scotland (Ratcliffe 1990). Birds breeding on or using the area include diurnal and nocturnal raptors, Red-throated Divers *Gavia stellata*, small numbers of Mallard *Anas platyrhynchos*, Eurasian Teal *A. crecca* and Mew Gulls *Larus canus*. The forest avifauna is dominated by passerines such as European Robin *Erithacus rubecula* and Chaffinch *Fringella coelebs*, and corvids *Corvus* spp. Black Grouse are present in 3 to 4 areas of the younger plantations, but also occur on the open hill. The open hill holds a scattered population of Willow Ptarmigan, which are mostly associated with areas of Heather moorland. Small numbers of Common Snipe *Gallinago gallinago* and Eurasian Curlew *Numenius arquata* occur in grass dominated wet flushes.

The Beinn an Tuirc windfarm contains 46 – 660kW turbines that are divided evenly into 2 groups (north and south); within these groups the turbines are > 150 m apart. At its narrowest point the gap between the north and south areas is about 670 m. The Beinn an Tuirc windfarm itself is located in the central southern section of the main block of open area with plantation forestry bordering its southern edge. Some plantation forestry (ca 50 ha) was removed to accommodate the southern section of the windfarm.

Human activity in the study area prior to windfarm construction mostly comprised shepherding on the open hill, deer stalking within the forests and ecological project survey work throughout the area. Forest operations, eg felling and planting, are ongoing, but the location, timing and extent of these are controlled, especially during the breeding season, to lessen potential impact on the eagles. Since construction, regular maintenance of the wind turbines has been added to the list of human activities in the area. Human visitor pressure on the open hill by hill walkers, both before and after construction, was very limited and mostly associated with accessing the highest summit.

Methods

Observations of eagle movements were made from 4 vantage points (VP). From these we monitored range occupancy, habitat use and foraging effort by the individual eagles, and collected information on eagle behaviour. Two VPs have been in use since 1997, a third was added in 1998 and a fourth in 1999. The Beinn an Tuirc windfarm area and main open area have been monitored since 1997; the addition of the last 2 VPs allowed us a better view of an area of forestry felled in mitigation of the windfarm. Collectively, the area viewed from the VPs comprises the eagle monitoring area, and VPs are located around the perimeter of this area so that the greatest continuous panorama is under observation, while reducing any potential influence of observer presence on eagle behaviour.

Observations were made 8 times per year (twice per quarter) from each VP between November 1997 and April 2004 except during March to December 2001, when fieldwork was curtailed by Foot and Mouth Disease access restrictions. Within each quarter all 4 VPs were visited; the order of visits was arbitrary. Weather could affect the area viewed from any particular VP and the duration of any particular watch period. Observation periods were chosen to avoid periods of continuous heavy rain, snow or dense fog, and ideally were 4 hours in length. Where possible, watches affected by poor weather conditions were extended to achieve 4 hours of observation time. While weather conditions could affect VP visibility they did not influence choice of VP, and all VPs were visited in a variety of conditions. While most watches tended to cover the middle of the daylight period, observations occurred at all times of the day. A total of 392 hrs of observation were made before construction, 68 during construction and 316 hrs after construction.

A single, experienced observer (DW) made all observations. The viewing area was kept under continuous observation for the full watch period by above skyline scanning without optical aids, binocular scanning of all areas and regular telescopic checks of known and potential perches. In so doing bias in observer effort towards specific locations within the viewing field was minimized.

When an eagle was seen, the time of first contact was recorded to the nearest second, and the bird's flight path was plotted on a paper map. Simple flights were synchronously plotted in the field, prolonged flights were plotted in sections that were drawn synchronously or nearly so, and fast or short flights were plotted immediately after they occurred. Final plotting of more complex flight lines was completed as soon as was possible after the watch period. In this way a complete activity log of eagle behaviour and location was kept for each VP session. An estimation of altitude above the ground (in range

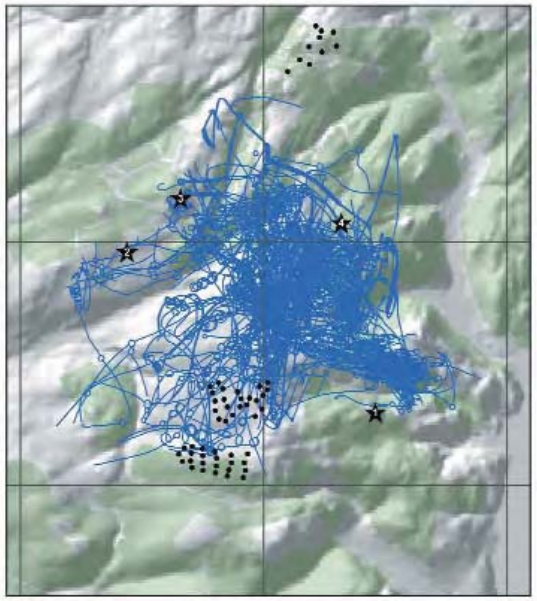
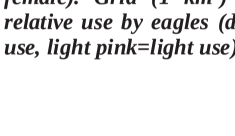
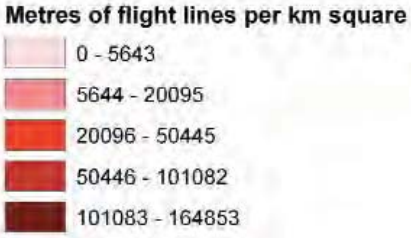
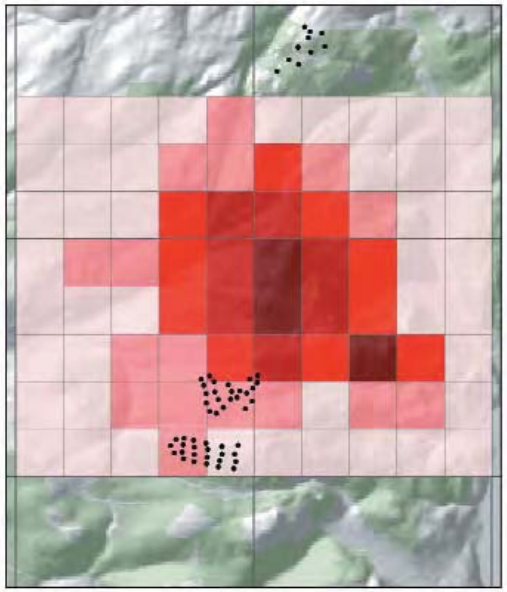


Figure 3 ***Flight lines (left, n=811) of resident Golden Eagles (male and female). Grid (1 km^2) colour shows relative use by eagles (dark red=heavy use, light pink=light use).***







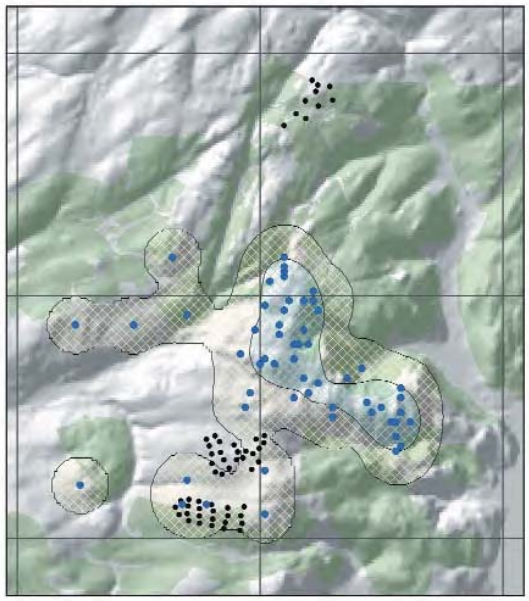
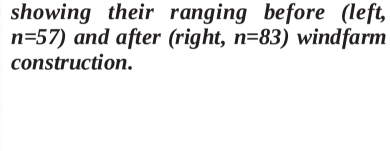
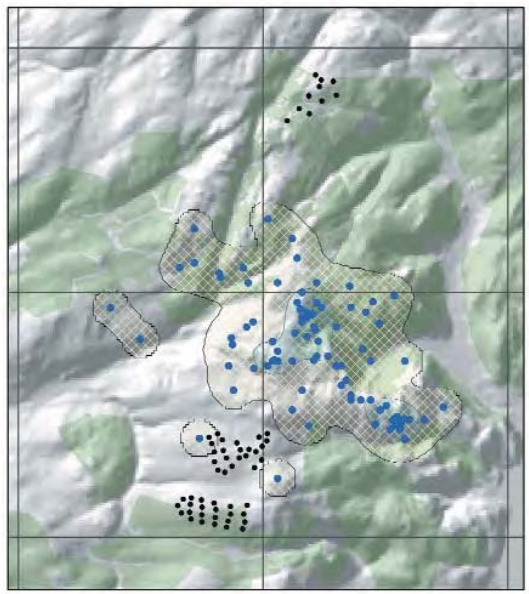


Figure 4 ***Kernel analysis of ranging of resident eagles (male and female) showing their ranging before (left, n=57) and after (right, n=83) windfarm construction.***





bands of <5m, 5-20m, 21-60m & >60m) and activity (hunting, transitional flights, species interaction, display, height gain and directional flights) were noted to the nearest second, as was the time when the bird either landed or flew from view. Factors that might influence eagle behaviour (eg human activity, presence of intruding eagles) were also noted. Even when more than one eagle was visible, all flights were followed, timed and plotted. No flights were excluded from the recording process and no assumptions were made about the route or activity of birds when they were intermittently lost from view.

Analyses of eagle ranging data

Two analytical approaches were taken, one based on generating a representative set of eagle locations and one that used a grid overlaid on eagle flight lines to calculate an index of use of km^2 areas by eagles. These were used to create maps that show location, extent and concentration of use by eagles. Data on eagle ranging and habitat were entered into a Geographical Information System (GIS, ArcView 3.3 and ArcGIS, ESRI, Redlands, CA, USA), where analyses and map making were undertaken using the Animal Movement (ver 2.0) extension (Hooge and Eichenlaub 1997).

Point analysis. We framed the area in which eagles were observed by mapping the maximum extent convex polygon, the vertices of which were the most outlying of observations of eagles. The maximum extent convex polygon probably overestimates the actual range, so we also used a randomised selection of points along mapped flight lines to generate a 'representative' set of eagle locations that could be analysed. Points along plotted flight lines were selected in a way that promoted randomness and independence, while enhancing sample size. To do this we randomly selected a single point along the flight lines for each 4 hour observation bout, then selected the sequence of points before and after that random point that were separated from that point and from each other by at least 45 minutes. Observations of radiotagged, territory holding eagles in western Scotland suggested that they can fly from one end of their range to the other in < 15 minutes (McGrady unpublished data), so the 45 minute limit we set is a conservative estimate of the time needed to achieve independence between points. These randomly selected eagle locations were then used to produce maps of area use for the resident male eagle, for the resident female eagle, and for the eagles as a pair. Two representations of eagle range use were employed that used randomised point data: the minimum convex polygon (MCP) (Mohr 1947) and an adaptive kernel analysis set at 95 and 50% levels (Worton 1989). The MCP maps extent of the random location's distribution and kernel analyses map likely use of areas by eagles based on the distribution of eagle locations over time. The 50% kernel predicts the centrally located area where eagles concentrate 50% of their time, and is used by us as a nominal "core area".

One to 6 observations of intruding eagles were made per year. These are not included in our analyses, but provide useful context for interpreting behaviour of the resident eagles.

Grid analysis. The study area was overlaid with a grid that corresponded to the Ordnance Survey one km grid. We then measured the total length of flight lines recorded from our direct observations that occurred in each square. Total length of flight lines per grid square was then mapped and used as a measure of eagle use.

We made comparisons of ranging before (prior to August 2000) and after (after January 2002) windfarm construction for the male, the female and the pair using the kernel analyses and the flight line information. By way of these comparisons we assessed the effect of the Beinn an Tuirc windfarm and the effects of the associated tree felling and habitat management. Because data are from eagles within a single range, and likely to be the same individuals, robust statistical analyses could not be undertaken.

Results

A total of 776 observation hours were logged over 194 watches. Prior to construction 98 watches were made, during construction 17 watches, and after construction 79 watches. No eagles were seen during 60 of the watches.

Golden eagle occupancy and breeding

The home range was occupied throughout the study period, apparently by the same 2 adult eagles. The eagles used a different nest in each year until 2003 when that of 1998 was reused. The eagles laid 2 eggs each year except 2003, when a single egg was laid. A single juvenile was fledged in 1997. During the study period, productivity was 0.125 young per breeding attempt.

Golden eagle ranging

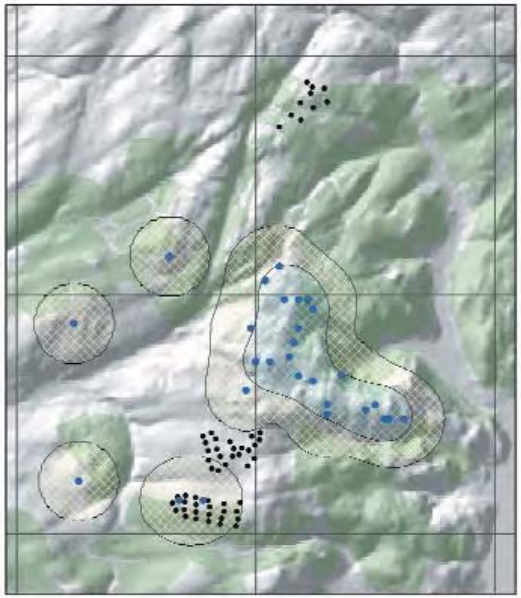
The maximum extent convex polygon in which eagles ranged covered 49.2 km^2; the MCP covered 32.9 km^2 (n= 154). Thirty two percent of the Beinn an Tuirc windfarm was overlaid by maximum extent convex polygon and 28 % was overlaid by the MCP. The 95% kernel of eagle ranging covered 20.5 km^2, and had 2 core areas (50% kernel) that were both outside the Beinn an Tuirc windfarm area and covered a combined area of 2.9 km^2 (Fig 2). The windfarm area was only overlapped by the 50-95% isopleth of kernel analyses of eagle ranging ie it was not included in the core area. Table 1 summarizes the areas of 95% and 50% kernels of eagle home ranging before and after construction and the amount of overlap between eagle ranging maps and the footprint of the Beinn an Tuirc windfarm. Eagle ranging kernels are illustrated in Figures 2-4.

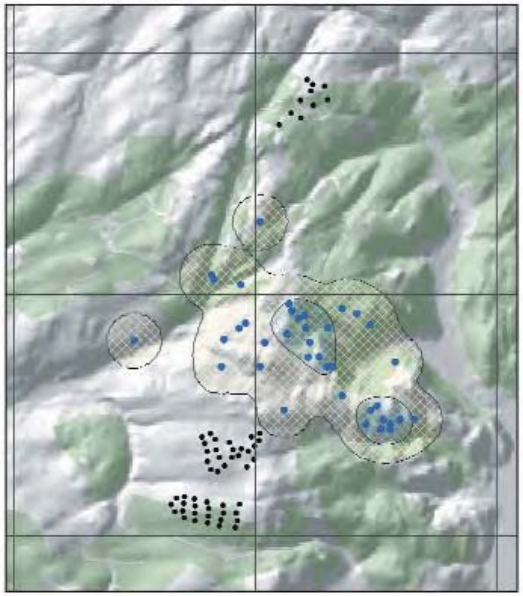
Three randomised locations of eagles (2.56% of all locations) were over the windfarm footprint, two (1.7%) were over turbines, and all of these were prior to construction. Additionally, 3 locations were within 500 m of the windfarm and 2 of these were prior to construction.

Kernel areas for males were similar to those of females (Table 1). Also, for both sexes kernel areas were similar before and after windfarm construction, though the shape and spatial location of the ranges shifted, mostly east and north (Figures 5 and 6) after construction.

Table 1 ***Areas (km^2) within 50% and 95% kernels for eagles during the whole study period and before and after windfarm construction. Values in () are % of eagle range that overlap the windfarm.***

	N	50% area kernel	50-95% kernel	Total 95% kernel
Male 97-04	66	3.0 (0)	17.8 (4.4)	20.8 (3.8)
Male pre construction	27	6.1 (0)	19.3 (6.7)	25.4 (5.1)
Male post construction	37	2.3 (0)	15.0 (0.03)	17.3 (0.03)
Female 97-04	88	4.9 (0)	20.8 (3.7)	25.7 (3.0)
Female pre construction	30	4.7 (0)	20.6 (8.9)	25.3 (7.2)
Female post construction	46	3.8 (0)	19.7 (2.4)	23.5 (2.0)
All birds 97-04	154	3.2 (0)	20.9 (2.7)	24.1 (2.4)
All birds pre construction	57	5.2 (0)	20.7 (9.0)	25.9 (7.2)
All birds post construction	83	6.9 (0)	33.6 (0.5)	40.5 (0.4)





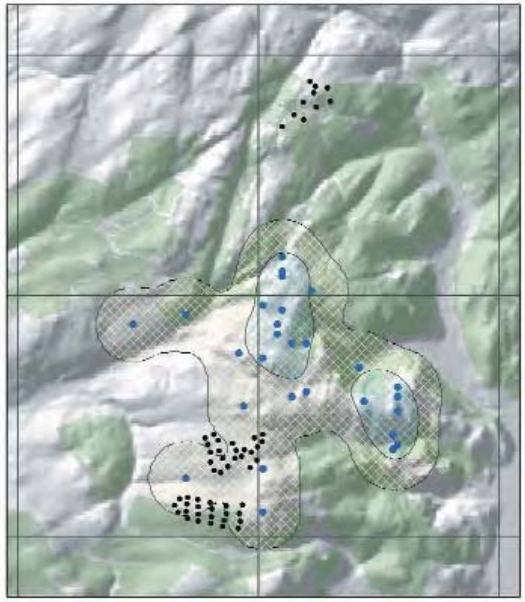
Legend

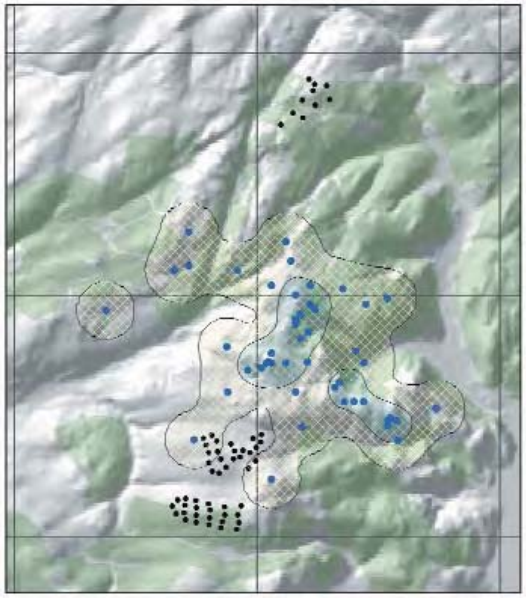
- Turbines
- Randomised eagle locations

Male eagle movement 1997-2004

- 50% Kernel
- 95% Kernel

Figure 5 ***Kernel analysis of ranging of resident male eagle before (left, n=27) and after (right, n=37) windfarm construction.***





Legend

- Turbines
- Randomised eagle locations

Female eagle movement 1997-2004

- 50% Kernel
- 95% Kernel

Figure 6 ***Kernel analysis of ranging of resident female eagles before (left, n=57) and after (right, n=83) windfarm construction.***

A total of 811 flight paths were mapped. Only one eagle flight line was recorded at low to medium altitude (21-60 m) within the Beinn an Tuirc windfarm after construction and this passed between the 2 discrete clusters that comprise the windfarm. In that instance the nearby presence of an intruding eagle was almost certainly a contributing factor. No eagles have been seen within the turbine clusters. Two of 3 instances of eagles over flying the windfarm were when intruding eagles were in the area.

Seventy seven percent of randomised locations were over open landcover types. The percentages of locations over different landcovers suggest the following 'preference' by the eagles: heather moor>treefell>grass hill>forest. Eighty percent of pre construction randomised locations were over open landcover types; the value was 79% for the post construction period.

Regarding the area of forestry that was felled, 21.6% of random locations prior to felling (n=37), 3.1 % of random locations during felling (n=32), and 18.8% of random locations after felling (n=85) were within this area. Eagles flew 0.095 km over the forest area prior to felling per hour of observation and 0.285 km/hr of observation after felling, a three-fold increase in use. Figure 8 utilizes flight line data and shows relative use of different areas overall and proportion of use of each habitat polygon before and after tree felling. Over 70% of total eagle flight line length was over the central open area. Figure 8 illustrates that eagles shifted their ranging to the northeast after trees were felled.

Discussion

Impacts of windfarms on birds can include collisions (See Hunt *et al* 1999 and Hunt 2002) or loss of habitat (eg Leddy *et al* 1999). In this study, resident Golden Eagles appeared to avoid the windfarm within their home range except when responding to intruders south and west of the centre of the territory. Studies exist that show that birds (eg Osborn *et al* 1998) including raptors (Curry and Kerlinger 1998) will try to avoid moving turbines.

Physical accessibility does not seem to be what hinders eagle use of the windfarm. Turbines were separated by relatively large distances, larger than tree spacing in forested areas used by Golden Eagles (Tjernberg 1983), and the eagles we studied were seen hunting Willow Ptarmigan in open patches and rides within forestry smaller than those available within the windfarm (D Walker unpublished data). In combination with the fact that resident eagles continue to forage in areas comparatively close to the windfarm especially toward the centre of the range this suggests that eagles avoid the windfarm as a unit rather than individual turbines. While food densities are comparatively low within the windfarm footprint, current potential prey populations of Willow Ptarmigan, Common Snipe and sheep carrion (S Sheridan and D Walker, unpublished data) and previous use suggest that the eagles would still forage within the windfarm area if turbines were not in place. In particular, eagle foraging might be expected here at times of relatively high grouse availability, July-October, but this has not been recorded since construction. Also, the regular presence within the windfarm of corvids, upon which eagles prey, suggests that eagles may be excluded from the windfarm. Hooded Crows *Corvus corone cornix* are a comparatively common and easily taken prey species but appear to be safe from predation while within the farm. Rotor noise and movement or prey distribution, or any combination of these factors, may be influencing eagle movement. However, we had no impression that the windfarm was avoided less during periods when the turbines were not rotating (D Walker, unpublished data).

The kernel map of eagle ranging suggests that the windfarm may act as a barrier to some areas of the range for the eagles, however VP watches prior to construction did not suggest that the windfarm footprint was along any major transit route for the eagles.

The management plan for this windfarm included activities that potentially would reduce risk of collision by reducing prey availability within the windfarm. In addition, the enhancement of other areas for eagle prey was seen as providing new feeding opportunities for eagles. According to the grid based analysis eagles did appear to more frequently use an area where trees were felled to improve foraging potential. The random point analysis did not show this, though low sample size in the pre felling period could have caused this. Willow Ptarmigan numbers have increased here (S Sheridan unpublished data) since felling, and use of the area by eagles may increase further as prey numbers recover from being limited by blanket forest and their availability increases. This may further reduce the relative attractiveness of the land within and around the windfarm to eagles.

The relative use of different habitats by the eagles to some extent reflects their foraging potential. However, even within particular habitat types there can be variations in quality and prey carrying capacity. Still, so far the findings point to the Golden Eagles at Beinn an Turic being similar to eagles elsewhere and preferring open habitats to closed ones (McGrady 1997, McGrady *et al* 1997). In contrast, eagle use has increased in areas where managed tree felling occurred. The area where trees have been felled in mitigation of open ground lost to the windfarm notwithstanding, tree growth to canopy closure in other areas will restrict use by the eagles. McGrady *et al* (1997) show that eagles avoid areas of closed canopy forestry, probably because prey becomes less available.

Our impression from direct observations of eagles and cursory examination of pellets suggest that the eagles' most important food source is sheep carrion. It also appears that carrion availability varies spatially and temporally. Carrion hot spots are located in wet flushes on the eastern sloping open ground and the windfarm area, but there was no evidence of use of carrion within the windfarm area by eagles since construction. Most sheep carcasses are removed from the windfarm area when they are found, but some are not found and these have not been used by eagles (D Walker unpublished data). Carrion availability within the windfarm area has probably declined since construction. Rabbits, Willow Ptarmigan and Hooded Crows are the main live prey species we have recorded. This prey list is similar to that recorded for eagles elsewhere in western Scotland (Watson *et al* 1993).

Increased human activity can influence eagle behaviour (including breeding and foraging behaviours) and productivity (Watson 1997), and in general, eagles tend to avoid human activity. We have no data to suggest that increased visitor pressure has caused the eagles to change their ranging behaviour. Indeed, eagles did not go into the windfarm even when no people were there. However, we were unable to monitor eagle ranging at the site during construction when human activity was greatest because of access restrictions due to Foot and Mouth Disease. The windfarm is regularly visited by turbine technicians, shepherds and eagle project and other fieldworkers. None of these activities seem likely to cause reduced eagle use because they tend to be localised and relatively infrequent. It is possible that eagles are influenced more by human activity in artificial habitats (eg windfarms or newly felled forestry) than in natural habitats, but we know of no data to support this.

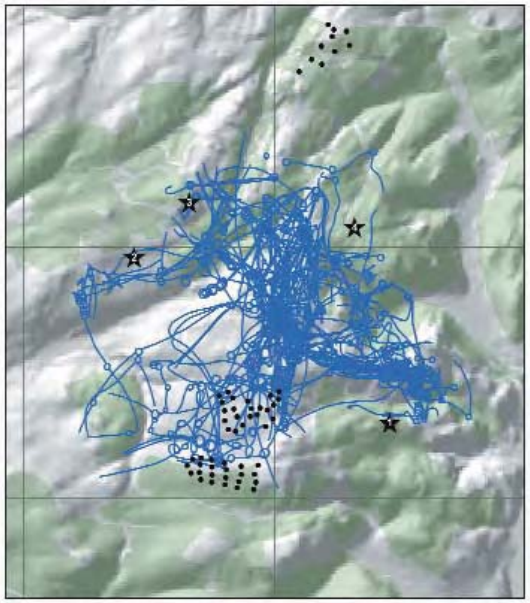
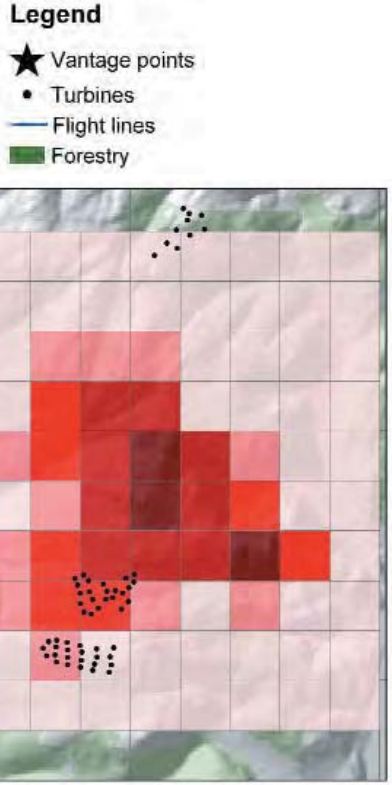


Figure 7a ***Flight paths (left), and grid of relative use of km squares (right) by Golden Eagles (male and female) before windfarm construction at Beinn an Tuirc.***



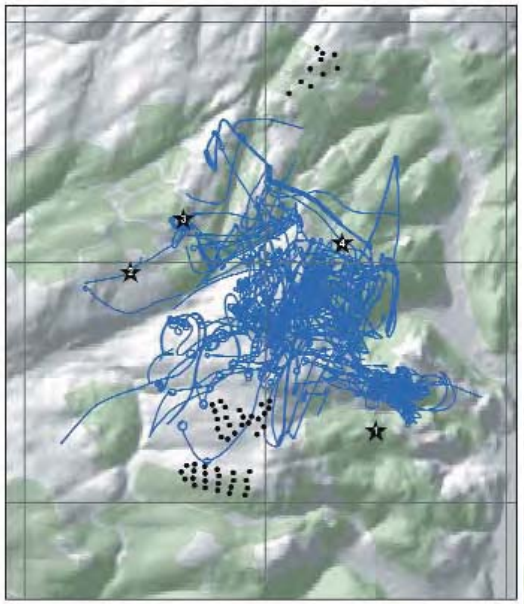
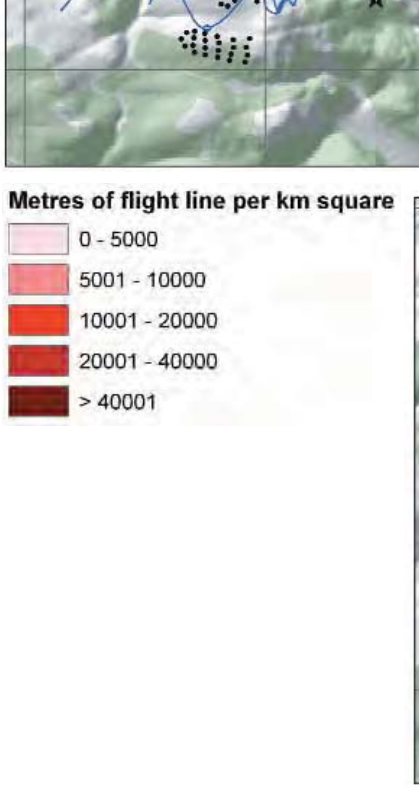


Figure 7b ***Flight paths (left), and grid of relative use of km squares (right) by Golden Eagles (male and female) after windfarm construction at Beinn an Tuirc.***



Intruding eagles were mostly recorded outside the breeding season over the main area of open ground and the tree felled area (D Walker unpublished data). When detected, the resident pair routinely intercepted intruding birds, even when they were towards the fringe of their range, with interactions usually consisting of the resident pursuing the intruder, sometimes with apparently aggressive approaches. In general locations away from the territory centre were associated with territorial defence behaviour, especially by the male (eg Figure 5, western edge of left map), and these added greatly to the size of the range that we mapped.

Different methods used to map animal movements have different advantages and shortcomings (Kenward 1987). We present different mapped representations of the same data to partially overcome this problem. Also, although these data are from a single pair, the number of observations (811 flight lines) is large, is spread over different seasons over 7 years, and this lessens the impact of the shortcomings of the range mapping methods.

Golden Eagle occupancy has not changed during the study period. Overall productivity of this range is 0.44 young per attempt (n=28, M Gregory, unpublished data), compared to an Argyll mean of 0.66 (1992, 96, 99-2004, Argyll Raptor Study Group, unpublished annual report 2004) and a Scottish mean of 0.52 (Watson 1997). Although productivity during the project was only 0.14 young per attempt, there is no evidence that links this low reproductive rate to windfarm construction or operation activities. Declines of this magnitude have been recorded in other ranges in Scotland where no windfarm, or indeed other change, has occurred, though we know of no published information that illustrates this. Rather, it seems that this home range has been relatively unproductive in recent years (only one chick since 1988), and this may be a result of the range viability already being challenged by the expansion of forest (Watson *et al* 1987) and the impoverishment of the flora and fauna that has occurred (Thompson *et al* 1995). We have verified the presence of the adult territorial eagles every 2 weeks, and no eagles, territorial or non territorial, are known to have been killed by colliding with the turbines. There is no indication that the resident eagles have become accustomed to the windfarm area and are more likely to use it as time passes. It remains likely that any fledglings reared at the site, intruders, or new 'naïve' replacement breeders are at greatest risk of collision.

Because tree clearance roughly coincided with the construction of the windfarm, it is difficult to say to what extent eagles responded to the clearance rather than the windfarm. However, the avoidance of the windfarm since construction suggests that the existence of relatively open areas within the windfarm is not sufficient motivation to attract eagles for foraging. Further, if the shift to the north east is a result of windfarm avoidance, then it suggests the eagles, at least at Beinn an Tuirc, 'prefer' recently felled forest areas to the windfarm.

Interestingly, though there was an overall shift to the northeast, there was no real shift in the location of the core areas. These remained in the open area that has never been under forestry to the northeast of the windfarm between blocks of forestry. This result is likely influenced by the location of the nest sites, but supports the idea that these areas are particularly important. If this relative inflexibility in location of the core area is a feature of eagles elsewhere identifying the core area and protecting it may be particularly important. Guidance by Watson *et al* (1987) and modelling of eagle ranging (McGrady *et al* 1997, McLeod *et al* 2003a, 2003b) have established nominal core areas for eagles, but these are criticised as being too simplistic, and are a point of contention between developers, conservation organizations and government agencies. More data are needed to clarify the impact of windfarms on eagles, and it would be useful if data collected at windfarm sites elsewhere in Scotland were made available for collective analyses.

Acknowledgements

The authors would like to thank Mike Gregory and the Argyll Raptor Study Group for use of data on eagle productivity. Scottish Power funded data collection. Saya Sheridan provided information on habitat and prey within the windfarm management area. Steph Carey-Miller of Natural Research (Projects) provided GIS support. The Central Kintyre Management Group has provided a forum for interesting discussions on windfarms and their effects on eagles, and encouraged us to publish the results.

References

British Wind Energy Association 2004. www.britishwindenergy.co.uk. Visited 3 Dec 2004.

Curry R C & Kerlinger P 1998. Avian mitigation plan: Kenetech model wind turbines, Altamont Pass WRA, California. Proceedings of National Avian-Wind Power Planning Meeting III. San Diego, CA, USA.

Gibbons D W, Reid J B & Chapman R A (eds.) 1993. *The new atlas of breeding birds in Britain and Ireland: 1988-1991*. T & AD Poyser. London.

Hooge P N & Eichenlaub B 1997. Animal movement extension to Arcview. ver. 1.1. Alaska Science Center - Biological Science Office, U.S. Geological Survey, Anchorage, AK, USA.

Hunt W G, Jackman R E, Hunt T L, Driscoll D E & Culp L 1999. A population study of Golden Eagles in the Altamont Pass wind resource area 1994-1997. Report to National Renewable Energy Laboratory, Subcontract XAT-6-16459-01. Predatory Bird Research Group, University of California, Santa Cruz.

Hunt G 2002. Golden Eagles in a perilous landscape: predicting the effects of mitigation for wind turbine blade- strike mortality. California Energy Commission. Predatory Bird Research Group, University of California, Santa Cruz. Contract No. 500-97-4033.

Kenward R 1987. *Wildlife radio tagging*. Academic Press. London.

Leddy K L, Higgins K F & Naugle D E 1999. Effects of wind turbines on upland nesting birds in conservation reserve program grasslands. *Wilson Bulletin* 11: 100-104.

McGrady M J 1997. Golden eagle. *BWP Update* 1(2): 99-114.

McGrady M J, McLeod D M, Petty S M, Grant J R & Bainbridge I P 1997. Eagles and forestry. Forestry Commission Research Information Note. No. 292. HMSO. London.

McLeod D R A, Whitfield D P, Fielding A H, Haworth P & McGrady M J 2003a. Predicting home range use by Golden Eagles *Aquila chrysaetos* in western Scotland. *Avian Science* 2: 183-198.

McLeod D R A, Whitfield D P & McGrady M J 2003b. Improving prediction of Golden Eagle (*Aquila chrysaetos*) ranging in western Scotland using GIS and terrain modelling. *Journal of Raptor Research* 36(1 Supplement): 70-77.

Mohr C O 1947. Table of equivalent populations of North American small mammals. *American Midland Naturalist* 37: 223-249.

Newton I. 1979. *Population ecology of raptors*. T & A D Poyser, Berkhamstead.

Ratcliffe D 1990. *Birdlife of mountain and upland*. Cambridge University Press. Cambridge.

Thompson D B A, Hester A J & Usher M B 1995. *Heaths and Moorland: Cultural Landscapes*. HMSO, Edinburgh.

Tjernberg M 1983. Habitat and nest site features of Golden Eagle *Aquila chrysaetos* (L.) in Sweden. *Viltrevy* 12(5): 131-163.

Watson J 1997. *The Golden Eagle*. T & A D Poyser, London.

Watson J, Langslow D R & Rae S R 1987. The impact of land-use changes on Golden Eagles in the Scottish Highlands. *CSD Report No. 720*. Nature Conservancy Council, Peterborough.

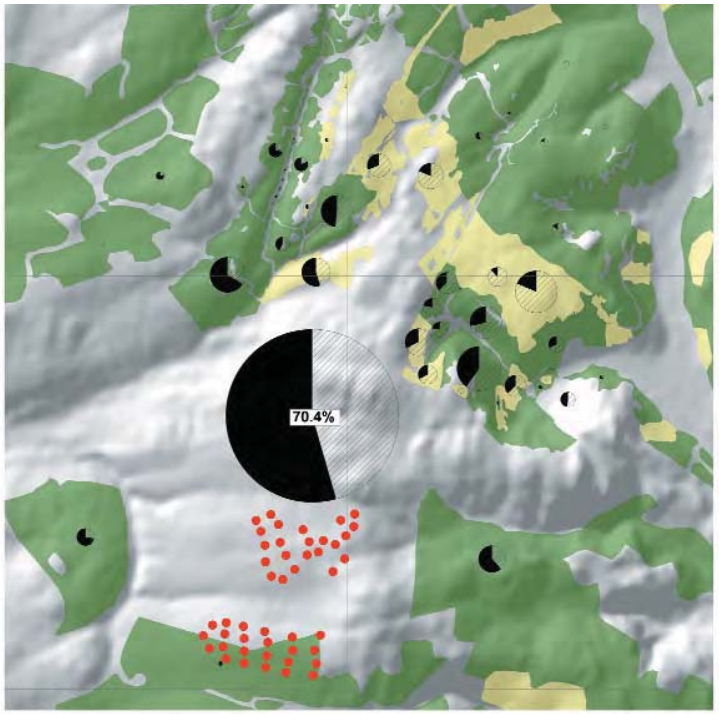


Figure 8 ***Use of habitat by Golden Eagles at Beinn an Tuirc. Size of pie chart shows relative use of habitat polygons for the whole study period, dark portion is percentage use before tree felling, and hatched portion is percentage use after tree felling.***

Watson J, Leitch A F & Rae S R 1993. The diet of Golden Eagles *Aquila chrysaetos* in Scotland. *Ibis* 135:387-393.

Worton B J 1987. Kernel method for estimating the utilization distribution in home range studies. *Ecology* 70: 164-168.

D Walker [1]***, M McGrady*** [1]***, A McCluskie*** [1]***,***
M Madders [1]***, D R A McLeod*** [2]
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[2] ***14 Crailinghall Cottages, Jedburgh TP8 6LU***

M McGrady is the corresponding author

Revised manuscript accepted February 2005

Year	Month	Day	Plot #	Below 200m (min)	Above 200m (min)	Below Rotor (min)	Within Rotor (min)	Above Rotor (min)	Perched (min)	Below + Within Rotor (min)	Total eagle mins	Total eagles (birds)	Survey hours	Livestock?	Carcass
2011	October	3	1	0	0	0	0	0	0	0.0	0.0	0	1	No	No
2011	October	3	2	1	0	0	0	0	1	0.0	0.0	0	1	No	No
2011	October	3	3	0	0	7	3	1	5	10.0	11.0	3	1	No	No
2011	October	3	4	1	2	0	0	0	21	0.0	0.0	0	1	No	No
2011	October	3	5	0	1	0	0	0	1	0.0	0.0	0	1	No	No
2011	October	3	6	23	5	0	0	0	20	0.0	0.0	0	1	No	No
2011	October	12	1	1	2	0	0	0	0	0.0	0.0	0	1	No	No
2011	October	12	2	0	1	9	1	0	0	10.0	10.0	6	1	No	No
2011	October	12	3	2	3	0	0	0	1	0.0	0.0	0	1	No	No
2011	October	12	4	10	2	0	0	0	2	0.0	0.0	0	1	No	No
2011	October	12	5	0	2	0	0	0	1	0.0	0.0	0	1	No	No
2011	October	12	6	0	0	0	0	0	0	0.0	0.0	0	1	No	No

Optional data to include (if it serves project purposes)

Data FWS needs to run FWS collision Risk Model

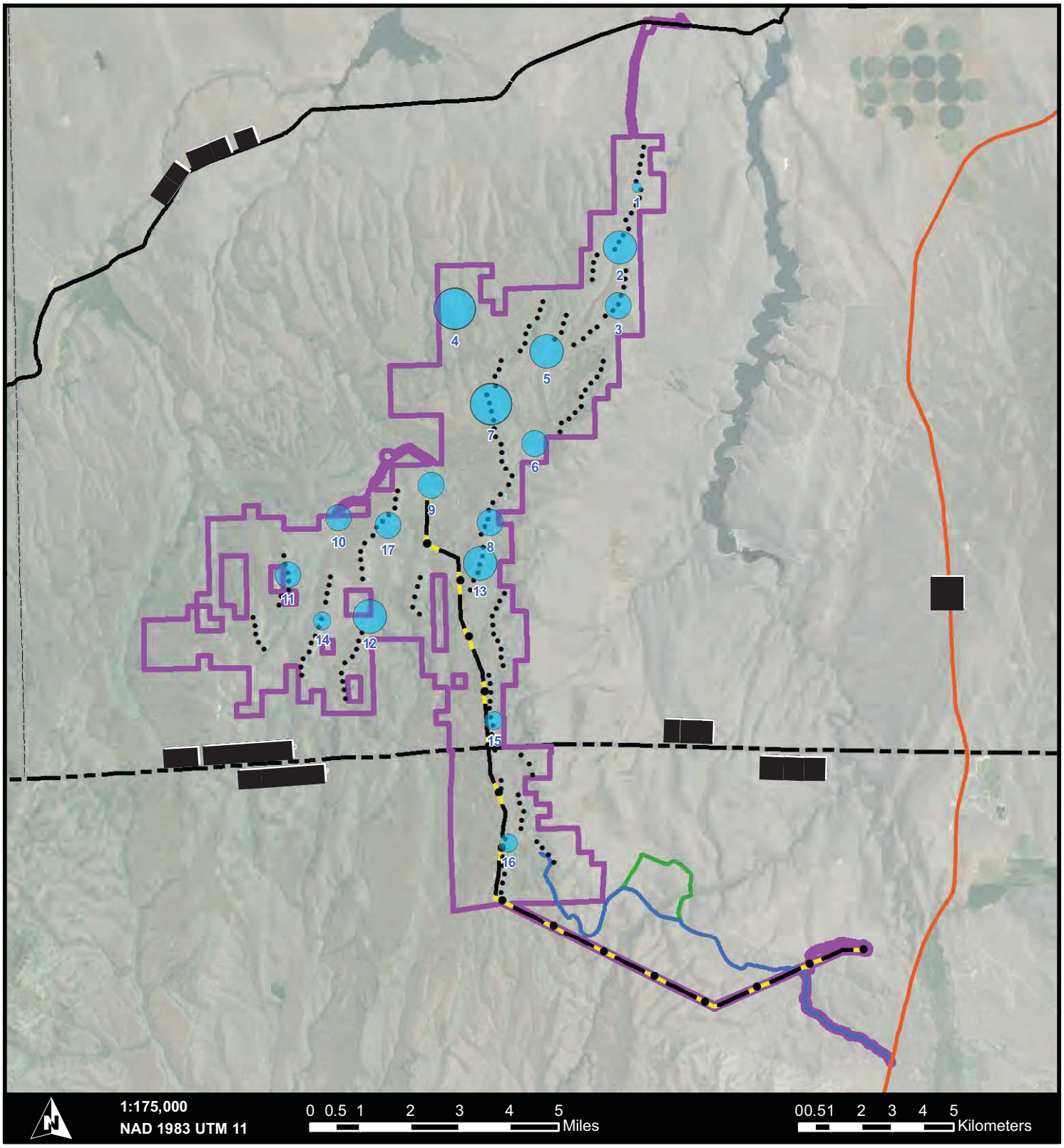


Figure 6

[redacted]

Raptor Use By Survey Point During 2008 Fixed-Point Surveys

[redacted]

Project Area
State Boundary
County Boundary
Wind Turbine Generator
Proposed Transmission Line (345kV)
Southern Haul Option 1
Southern Haul Option 2
Federal Highway
Local Road

Raptor Use
0.01 - 0.25
0.26 - 0.50
0.51 - .075
0.76 - 1.00
> 1.00

[redacted]

Year	Month	Day	Plot #	Below 200m (min)	Above 200m (min)	Below Rotor (min)	Within Rotor (min)	Above Rotor (min)	Perched (min)	Below + Within Rotor (min)	Total eagle mins	Total eagles (birds)	Survey hours	Livestock?	Carcass
2011	October	3	1	0	0	0	0	0	0	0.0	0.0	0	1	No	No
2011	October	3	2	1	0	0	0	0	1	0.0	0.0	0	1	No	No
2011	October	3	3	0	0	7	3	1	5	10.0	11.0	3	1	No	No
2011	October	3	4	1	2	0	0	0	21	0.0	0.0	0	1	No	No
2011	October	3	5	0	1	0	0	0	1	0.0	0.0	0	1	No	No
2011	October	3	6	23	5	0	0	0	20	0.0	0.0	0	1	No	No
2011	October	12	1	1	2	0	0	0	0	0.0	0.0	0	1	No	No
2011	October	12	2	0	1	9	1	0	0	10.0	10.0	6	1	No	No
2011	October	12	3	2	3	0	0	0	1	0.0	0.0	0	1	No	No
2011	October	12	4	10	2	0	0	0	2	0.0	0.0	0	1	No	No
2011	October	12	5	0	2	0	0	0	1	0.0	0.0	0	1	No	No
2011	October	12	6	0	0	0	0	0	0	0.0	0.0	0	1	No	No

Optional data to include (if it serves project purposes)

Data FWS needs to run FWS collision Risk Model

Swenson, Kristen

From: Heather L. Wayne
Sent: Tuesday, June 18, 2013 3:29 PM
To: Margaret_Rheude@fws.gov
Cc: heather.kieweg@appliedeco.com; Jordan B. Burmeister; Patrick Smith
Subject: Meeting Minutes for Odell Wind Farm
Attachments: OdellWindFarm-USFWS-MeetingMinutes05132013_sent06182013.docx

Hi Mags-

Thank you again for your time and input on the Odell Wind Farm.

I've attached a draft of the meeting minutes from our discussion.

Will you please review the minutes and let me know if we missed anything or if you have anything to add?

Thank you.

Have a good week,

Heather Wayne
Associate

Direct: 952.641.4043
www.geronimoenergy.com

Odell Wind Farm and U.S. Fish and Wildlife Service

Meeting Minutes
Bald Eagle Discussion
May 13, 2013
9:30 Telephone Call

Attendees:

U.S. Fish and Wildlife Service ("USFWS")-Margaret Rheude
Applied Ecological Services, Inc. ("AES") –Heather Kieweg
Geronimo Wind Energy, LLC as an agent for Odell Wind Farm, LLC ("Geronimo") – Patrick Smith, Jordan Burmeister, Heather Wayne

General Project Information:

Team Introductions

Project Introduction: Odell Wind Farm ("Odell" or "the project") is being actively developed by Geronimo. It is expected to be up to 200 MW in size. It is located in southwest Minnesota and includes portions of Jackson, Cottonwood, Martin, and Watonwan Counties. It is located near several other constructed wind farms including: Trimont and Elm Creek 1 & 2. The Lakefield Wind Farm is located twenty miles to the southwest of the site. Geronimo began development of the project in 2008, at which point it was called the North Star Wind Farm. According to the current timeline construction will be in 2014 with permitting in 2013.

AES, in conjunction with WSB Associates, is helping Geronimo assess potential environmental impacts from the project.

Eagle Discussion and Environmental Assessments:

The USFWS *Eagle Conservation Plan Guidance Module 1 Land Based Wind Energy Version 2* were released one week previous to this discussion.

A stick nest search and habitat assessment was conducted from the public right-of-way for the project area, a 2-mile buffer of the project area and some areas of higher quality eagle habitat from 2-10 miles from the project. AES located an active eagle nest about 3.5 miles west of the project boundary, along the Des Moines River.

Margaret Rheude is aware of the nest mentioned above. She said that 3.5 miles is a good ways away, but Geronimo should see which way the eagles are moving, or if they are just hanging out near the river. They might be staying west of the project near the Des Moines River.

The USFWS recommends doing eagle surveys with an 800 meter radius and keeping counts of eagles above and below 200 meters in elevation. The USFWS uses 200 meters as the top end of the rotor swept area. They also recommend keeping track of eagle minutes in the radius and getting representative samples during different seasons throughout the year. These recommendations are compatible with AES data collection methods. Margaret Rheude will send sample eagle data and maps in formats that have been useful to the USFWS and are compatible with their collision risk model.

Patrick Smith asked about the threshold for seeking a take permit. Margaret Rheude responded saying that the risk is determined using the USFWS' collision risk model. The models help assess the likelihood of incidental eagle take. A take permit is recommended if the model predicts an eagle take in a thirty year project lifespan. This would be considered a low level of potential take, and would not mean that the project was a high risk project. She also said the take permit is a recommendation, not a requirement. There is some gray area, but if an entity wants to be covered they should seek a permit. Geronimo can also run their model to analyze the potential for eagle take at the site. .She will also check and see if the Odell project is near any USFWS interest lands.

Geronimo has an NHIS information request submitted now. It is pending response.

Margaret Rheude will conduct a desktop analysis of known nests in a ten mile radius, and share any known nest locations. The USFWS maintains an eagle nest database as eagle nest locations are reported to them. The MNDNR no longer updates eagle nest locations. . Margaret Rheude reported that there are not a huge number of eagle nests in the part of the state where Odell is located. The population is growing in the area, but not experiencing as fast of growth as other areas of the state near major rivers like the Minnesota and St. Croix Rivers. She also reported that because of population growth, eagles are moving into less ideal habitat.

Margaret Rheude recommended being aware of potential eagle habitat hotspots (popular fishing areas, refuge dumps, or waterbodies that stay open through the winter). Heather Kieweg commented that the water bodies in the project area usually freeze, and that some bald eagle activity has been observed in and near the site during surveys completed to date.

Heather Kieweg reported that AES is using point counts that are one hour in duration for its raptor surveys. Margaret Rheude agreed this was a good point count length. She commented that the guidelines recommend counts every month, and once there is a year of data to check for pulses in population numbers, because those numbers can help in operational analysis. She said that survey frequency can potentially be decreased to account for time periods when behavior/activity is likely to be similar. Greater survey frequency may be necessary during migratory periods.

Bat Discussion and Other Topics:
Heather Kieweg and/or Patrick Smith said there is very little natural habitat in the site. There is one area with a prairie remnant in the northeast portion of the project that will be avoided.

Patrick will send a link to the statewide turbine map data indicating constructed turbines.

AES has prepared a Tier I and Tier II analysis and there is nothing that really stands out. The two USFWS species listed for the project counties are the Poweshiek Skipperling and Prairie Bush Clover.

Geronimo/AES is conducting full spectrum bat acoustic monitoring at three locations with monitors at two elevations at each location.

The northern long eared bat is a proposed MN candidate species. Margaret Rheude recommended keeping this in mind. Heather Kieweg noted that the site is not forested, although it could be present at the site during migration. Margaret Rheude was not aware of a timeline for making a decision regarding listing, but she would inquire. She was also unsure of if the listing will include the full extent of the species' range.

Margaret Rheude was not currently aware of any other issues for the site, but she will review the site in more detail before providing additional comments. Her comments will include the recommended setbacks from USFWS protected lands. The USFWS' main focus will be eagles, threatened and endangered species, and protected lands. She said the USFWS tries not to duplicate migratory bird work since the MNDNR focuses on those issues.

Patrick Smith said he was not aware of hibernacula in the area (using state database). Margaret Rheude said that it would again be good to see how much bat movement occurs between the project and water resources, or to note if bats stay near the main river without straying too far. Heather Kieweg said the data will be analyzed and reported to the USFWS and other relevant agencies.

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL MINNESOTA 55101-1678

SEP 16 2013

REPLY TO
ATTENTION

Operations
Regulatory (2013-02005-MTS)

Mr. Patrick Smith
Geronimo Wind Energy, LLC
7650 Edinborough Way, Suite 725
Edina, Minnesota 55435

Dear Mr. Smith:

We have received your letter, dated May 24, 2013, requesting agency comments for a proposed wind energy and transmission line project located in portions of Cottonwood, Jackson, Martin and Watonwan Counties, Minnesota.

Based on the limited information provided with you letter, it is unknown whether a Department of the Army (DA) permit would be required for your proposal. Please consider the following information as it may apply to your proposed project.

If the proposal includes activities in navigable waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 10 of the Rivers and Harbors Act of 1899 (Section 10). Section 10 prohibits the construction, excavation, or deposition of materials in, over, or under navigable waters of the United States, or any work that would affect the course, location, condition, or capacity of those waters, unless the work has been authorized by a DA permit.

If the proposal involves a discharge of dredged or fill material into waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 404 of the Clean Water Act (CWA). Waters of the United States include navigable waters, their tributaries, and adjacent wetlands (33 CFR § 328.3). CWA Section 301(a) prohibits discharges of dredged or fill material into waters of the United States, unless the work has been authorized by a DA permit under Section 404. Information about the Corps permitting process can be obtained online at http://www.mvp.usace.army.mil/missions/regulatory.

The Corps' evaluation of a Section 404 permit application involves multiple analyses, including (1) evaluating the proposal's impacts in accordance with the National Environmental Policy Act (NEPA) (33 CFR part 325), (2) determining whether the proposal is contrary to the public interest (33 CFR § 320.4), and (3) in the case of a Section 404 permit, determining whether the proposal complies with the Section 404(b)(1) Guidelines (Guidelines) (40 CFR part 230).

If the proposal requires a Section 404 permit application, the Guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 CFR § 230.10(a)). Time and money spent on the proposal prior to applying for a Section 404 permit cannot be factored into the Corps' decision whether there is a less damaging practicable alternative to the proposal.

If an application for a Corps permit has not yet been submitted, the project proponent may request a pre-application consultation meeting with the Corps to obtain information regarding the data, studies or other information that may be necessary for the permit evaluation process. A pre-application consultation meeting is strongly recommended if the proposal has substantial impacts to waters of the United States, or if it is a large or controversial project.

We encourage continued coordination with us during the design and development for this proposal. For further information or to request a pre-application consultation meeting, please contact Benjamin Cox at (651) 290-5377 or benjamin.r.cox@usace.army.mil.

Sincerely,

Chad Konickson
Chief, Southwest Section

Copies furnished:

Ms. Heather Wayne
Geronimo Wind Energy, LLC
7650 Edinborough Way, Suite 725
Edina, Minnesota 55435

Swenson, Kristen

From: Heather L. Wayne
Sent: Monday, April 15, 2013 4:41 PM
To: kevin.mixon@state.mn.us
Cc: heather.kieweg@appliedeco.com; Patrick Smith
Subject: Minutes from 03-28-2013 Odell Meeting with Geronimo and AES
Attachments: Odell-GWE-AES-DNR-Meeting03282013-V2.docx

Hi Kevin-

Thanks again for your time and input on the Odell Project.
I've attached a draft of the meeting minutes from our discussion.

Let me know if we missed anything or if you have anything to add.

Have a good week, talk to you soon,

Heather Wayne
Associate

Direct: 952.641.4043
www.geronimoenergy.com

Meeting Minutes for March 28, 2013

10:00 AM

Attendees: Kevin Mixon, MNDNR; Heather Wayne, Geronimo Energy; Heather Kieweg, AES

1. Overview of the proposed Odell project – Heather Wayne, Geronimo
    a. LOCATION: The Odell wind farm is a development of Geronimo Energy in southwestern Minnesota (parts of Cottonwood, Jackson, Watonwan, and Martin Counties)
    b. SIZE: The project is planned as a 200 MW project. The footprint has changed and expanded over time.
    c. TIMELINE: The Odell project has been in Geronimo's development portfolio since 2007. It has been a long-term project, but is now being actively marketed. The exact timeline for development is unknown, but the project is likely to enter construction in 2014 or 2015.
2. Overview of the environmental setting and survey work – AES
    a. Environmental setting
        i. Most of the site is agricultural use/row crops
        ii. AES will be visiting the site next week to start field surveys, and will know more about the environmental setting.
        iii. Mr. Mixon identified privately-owned grassland on the northeast portion of the project as an area of interest as well as the Banks and Bennett WMAs (outside the northwest boundary).
        iv. State conservation lands (Banks WMA and Bennett WMA) are present near the northwest and west boundary of the project.
        v. The Des Moines River is to the west of the project. May provide trumpeter swan habitat.
        vi. The project area has limited wetlands.
    b. Endangered, Threatened and Special Concern Species –
        i. Sullivant's Milkweed and Phlox Moth Records nearby
            1. Reported in the grassland in northeast section of the project boundary (inside the grassland mentioned above)
        ii. Henslow's Sparrow
            1. Mr. Mixon remarked that there is a Henslow's Sparrow record (from 2007) within a half mile of the project boundary (near Bennett WMA). The Henslow's Sparrow is a Minnesota state listed endangered species.
            2. When asked about sparrow management, Mr. Mixon said more information about the project regarding sparrows would be helpful (Is there a large enough block of habitat present? Are there Henslow's Sparrows in the project area?) The NHIS database may also provide information on this species as well.
            3. Geronimo plans to conduct grassland habitat surveys as a part of their Tier II assessment, which will provide an inventory of possible sparrow habitat.

iii. Federal species – Poweshiek Skipperling, Prairie Bush Clover
    1. Both species have the potential to occur but DNR did not have any records in the project area
    2. Mr. Mixon deferred this conversation to the USFWS
iv. Bald Eagle
    1. DNR does not comprehensively track bald eagle nests at this time. The USFWS has data, but it may be incomplete.
    2. An older record of a bald eagle nest approximately four miles away from the western boundary (near the Des Moines River).
    3. AES will be surveying for stick nests this spring, starting the week of April 1, 2013.
    4. Geronimo will consult with the USFWS regarding bald eagles.
v. AES will request a NHIS review of Odell next week (week of April 1, 2013).

c. Proposed 2013 survey work (see survey protocol for more comprehensive information)
    i. Avian surveys
        1. Heather Kieweg reported that, while surveys will occur throughout the day, those near the Bennett and Banks WMAs will be focused during the morning and evening hours when waterfowl activity is expected to be greatest.
        2. Site visit – raptor nest search
        3. Flight path mapping will occur during the raptor and large bird surveys
    ii. Bat acoustic monitoring
        1. AES/Geronimo plans to have acoustic monitors out in early May at two or three meteorological tower locations.
        2. Monitors at 3 meters and 55 meters (rotor swept and ground level observations)
        3. Mr. Mixon said the earlier in May the bat monitoring starts, the better. He also mentioned that it's valuable to have someone check the data often in the first couple of weeks for technology reliability reasons.

3. Discussion
    a. Generally Mr. Mixon acknowledged that the survey work as described looked suitable.
        i. Geronimo/AES will be providing more detailed survey protocol information to DNR. DNR will plan to review the information the week of April 1, 2013.
        ii. Mr. Mixon said that he may also visit the site.
    b. He agreed with creating a survey focus around the northwest part of the project.
    c. Mr. Mixon discussed the need to work with the DNR if a public waterway needs to be crossed with a utility, or needs to be crossed temporarily. A license to cross permit or a work in water permit may be needed.
    d. Mr. Mixon said that the DNR has the lands on the edges, but overall he doesn't anticipate any major issues for the Odell project.

From:	Heather L. Wayne
To:	"kevin.mixon@state.mn.us"
Cc:	heather.kieweg@appliedeco.com; Patrick Smith
Subject:	Documents from Odell (Geronimo & AES) meeting with DNR: Email 1 of 2
Date:	Thursday, March 28, 2013 1:16:29 PM
Attachments:	Odell_SiteLocation20130328.jpg BirdPointCountDataSheet_passerine.pdf BirdPointCountDataSheet-raptor_60min.pdf Odell_Agenda_Mtg_2013_03_26.docx Odell_SiteHabitats20130325.jpg Odell_SiteLocation20130326.jpg

---

Hi Kevin-

Thank you again for taking the time to talk with us about the Odell wind energy project today.

I've attached the maps and the agenda that we reviewed at the meeting.
I'm also providing additional documents regarding AES's field protocol.

I will be sending two emails to provide all of the documents (because of the large file sizes).

Have a good day,

Heather Wayne
Associate

Direct: 952.641.4043
Mobile: 612.247.7506
Main: 952.988.9000
1.855.GERONIMO
(1.855.437.6646)

www.geronimowind.com

Corporate Office:
Geronimo Wind Energy
7650 Edinborough Way, Suite 725
Edina, MN 55435

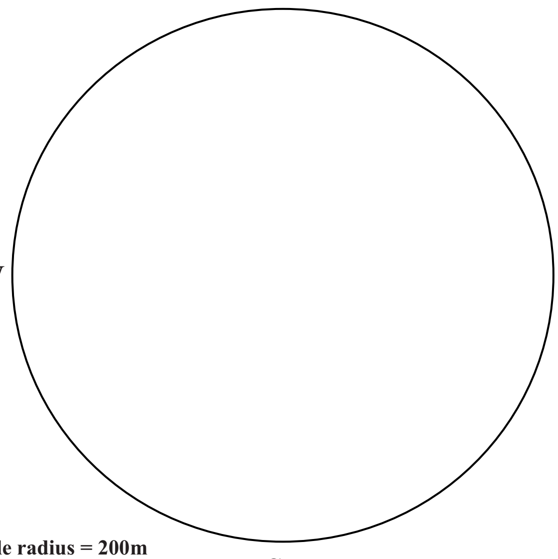
PASSERINE - Bird Point Count Data Sheet

Project Name ____________________ Sample Point ID # & Location (road names) ____________________

Date __________ Start Time (24 hr format) __________ Stop Time __________ X coordinate, Y coordinate ____________________

Observer ______ Wind Spd. ______ Wind Dir. ______ Sky ______ Temp ______ Dominant (>50%) AES Habitat Type ____________________

Other Habitats____



Circle radius = 200m
Point radius = unlimited

Wind	**Sky**	**AES Habitat Type**
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 = 13-18 mph	4 = rain	Upland Shrub-Scrub
5 = 19-24mph	5 = fog	Upland Broadleaf Forest
6 > 24 mph		Upland Coniferous Forest
Behavior		Upland Mixed Forest
H = Heard, not seen		Wetland Forested
P = Perched, on water or on ground		Wetland Shrub-Scrub
F = Flying (flapping)		Wetland Emergent
S = Soaring (updraft)		Open Water
G = Gliding		
K = Kiting		
MI = Multi-bird Interaction (describe)		
O = other (describe)		

Notes:

Alpha Code	**Behav. Code**	**Dir. from Point**	**Dist. from Point (m)**	**Flight Dir.**	**Ht. (m)**	**0-3 min**	**3-5 min**	**5-10 min**	**10-15 min**	**15+ min**	**Notes**

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes

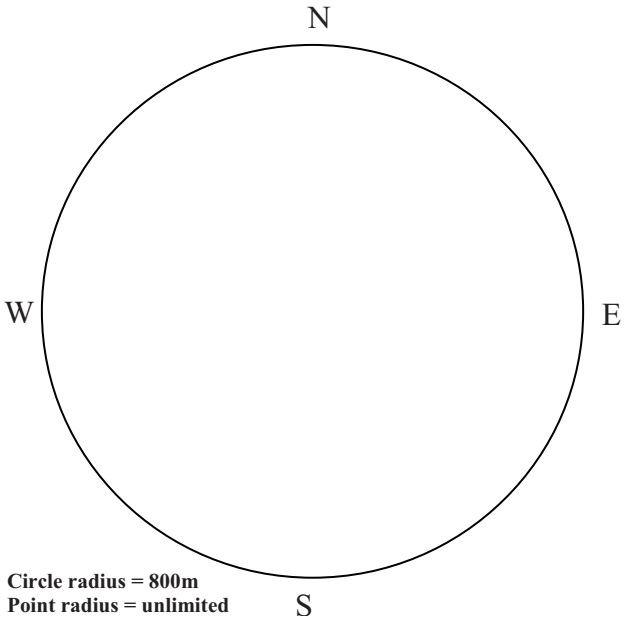
Raptor Large Bird- Bird Point Count Data Sheet

Project Name _____ Sample Point ID # & Name _____

Date _____ Start Time (24 hr format) _____ Stop Time _____ X coordinate, Y coordinate _____

Observer _____ Dominant (>50%) AES Habitat Type _____ Other Habitats _____

Time	Wind Speed	Wind Dir.	Sky	Temp.



Circle radius = 800m
Point radius = unlimited

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 = 13-18 mph	4 = rain	Upland Shrub-Scrub
5 = 19-24mph	5 = fog	Upland Broadleaf Forest
6 > 24 mph		Upland Coniferous Forest
Behavior		Upland Mixed Forest
H = Heard, not seen		Wetland Forested
P = Perched, on water or on ground		Wetland Shrub-Scrub
F = Flying (flapping)		Wetland Emergent
S = Soaring (updraft)		Open Water
G = Gliding		
K = Kiting		
MI = Multi-bird Interaction (describe)		
O = other (describe)		

Notes:

Fl #	Alpha Code	Num. Obs.	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Flight Ht. (m)	Duration (min) in RSA (30-150m)	Start Time	Stop Time	Notes
1											
2											
3											
4											
5											
6											
7											
8											
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Fl #	Alpha Code	Num. Obs.	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Flight Ht. (m)	Duration (min) in RSA (30-150m)	Start Time	Stop Time	Notes
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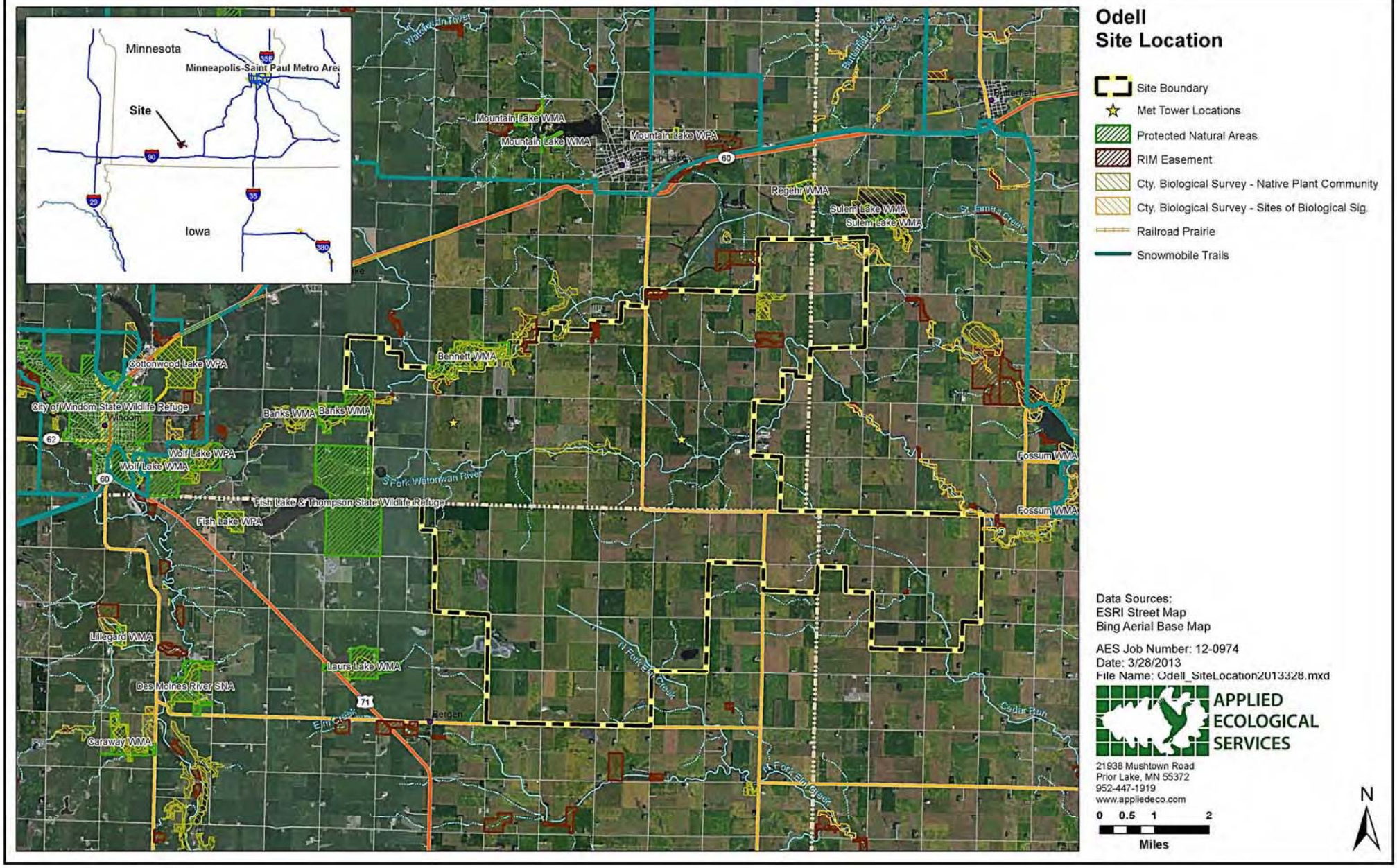
Minnesota
Minneapolis-Saint Paul Metro Area
Site
Iowa
Odell
Site Location
Site Boundary
Met Tower Locations
Protected Natural Areas
RIM Easement
Cty. Biological Survey - Native Plant Community
Cty. Biological Survey - Sites of Biological Sig.
Railroad Prairie
Snowmobile Trails
Mountain Lake WMA
Mountain Lake WPA
Regehr WMA
Sulem Lake WMA
Bennett WMA
Cottonwood Lake WPA
City of Windom State Wildlife Refuge
Banks WMA
Wolf Lake WPA
Wolf Lake WMA
S Fork Watonwan River
Fish Lake & Thompson State Wildlife Refuge
Fish Lake WPA
Fossum WMA
Lilegard WMA
Laura Lake WMA
Des Moines River SNA
Caraway WMA
Bergen
Butterfield
Data Sources:
ESRI Street Map
Bing Aerial Base Map
AES Job Number: 12-0974
Date: 3/28/2013
File Name: Odell_SiteLocation2013328.mxd
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952-447-1919
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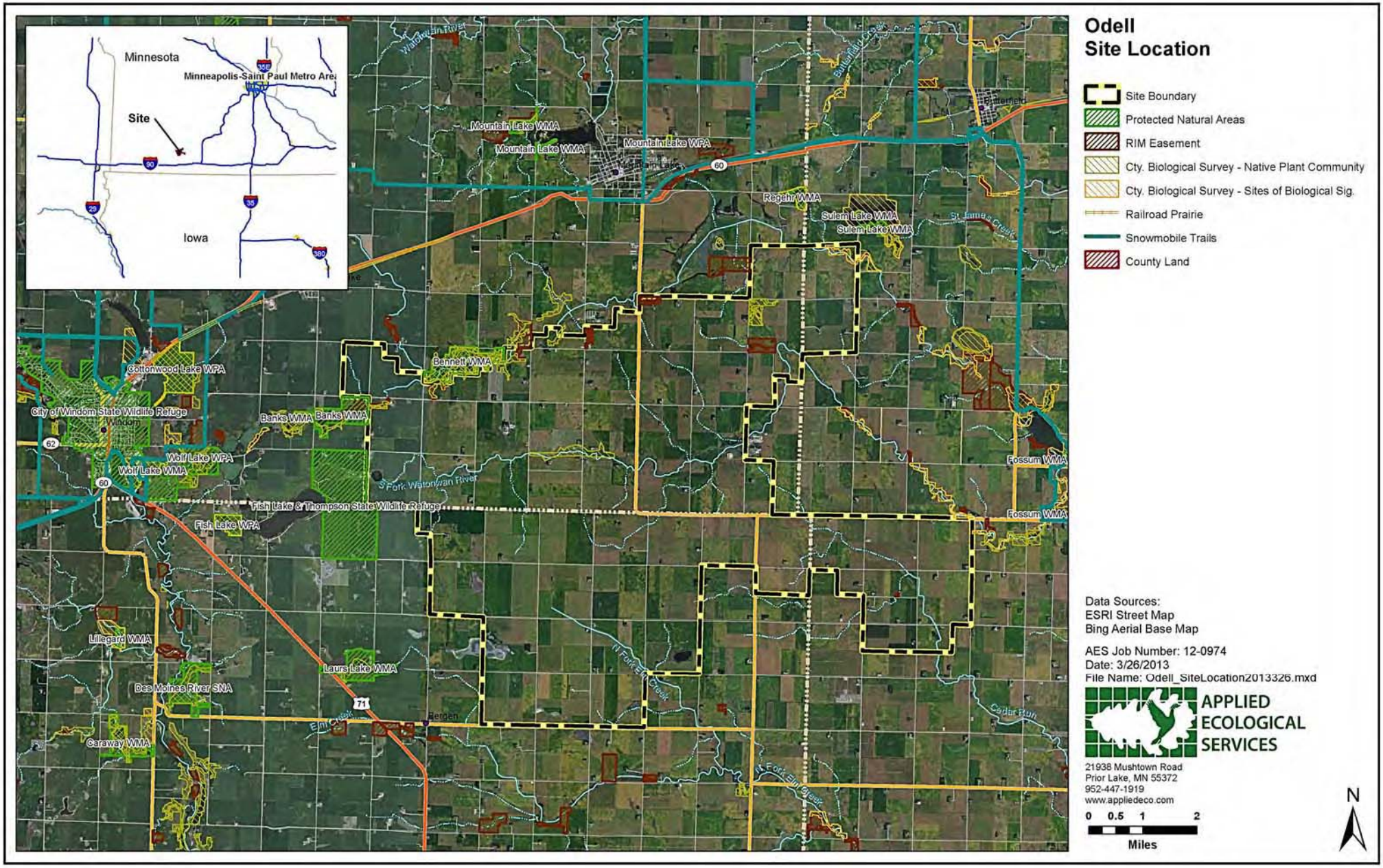
Minnesota
Minneapolis-Saint Paul Metro Area
Site
Iowa
Odell
Site Location
Site Boundary
Protected Natural Areas
RIM Easement
Cty. Biological Survey - Native Plant Community
Cty. Biological Survey - Sites of Biological Sig.
Railroad Prairie
Snowmobile Trails
County Land
Mountain Lake WMA
Mountain Lake WPA
Regehr WMA
Sulem Lake WMA
Bennett WMA
Cottonwood Lake WPA
City of Windom State Wildlife Refuge
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Fish Lake & Thompson State Wildlife Refuge
Fish Lake WPA
Fossum WMA
Lilegard WMA
Laura Lake WMA
Des Moines River SNA
Caraway WMA
Bergen
Elm Creek
Cedar Run
Data Sources:
ESRI Street Map
Bing Aerial Base Map
AES Job Number: 12-0974
Date: 3/26/2013
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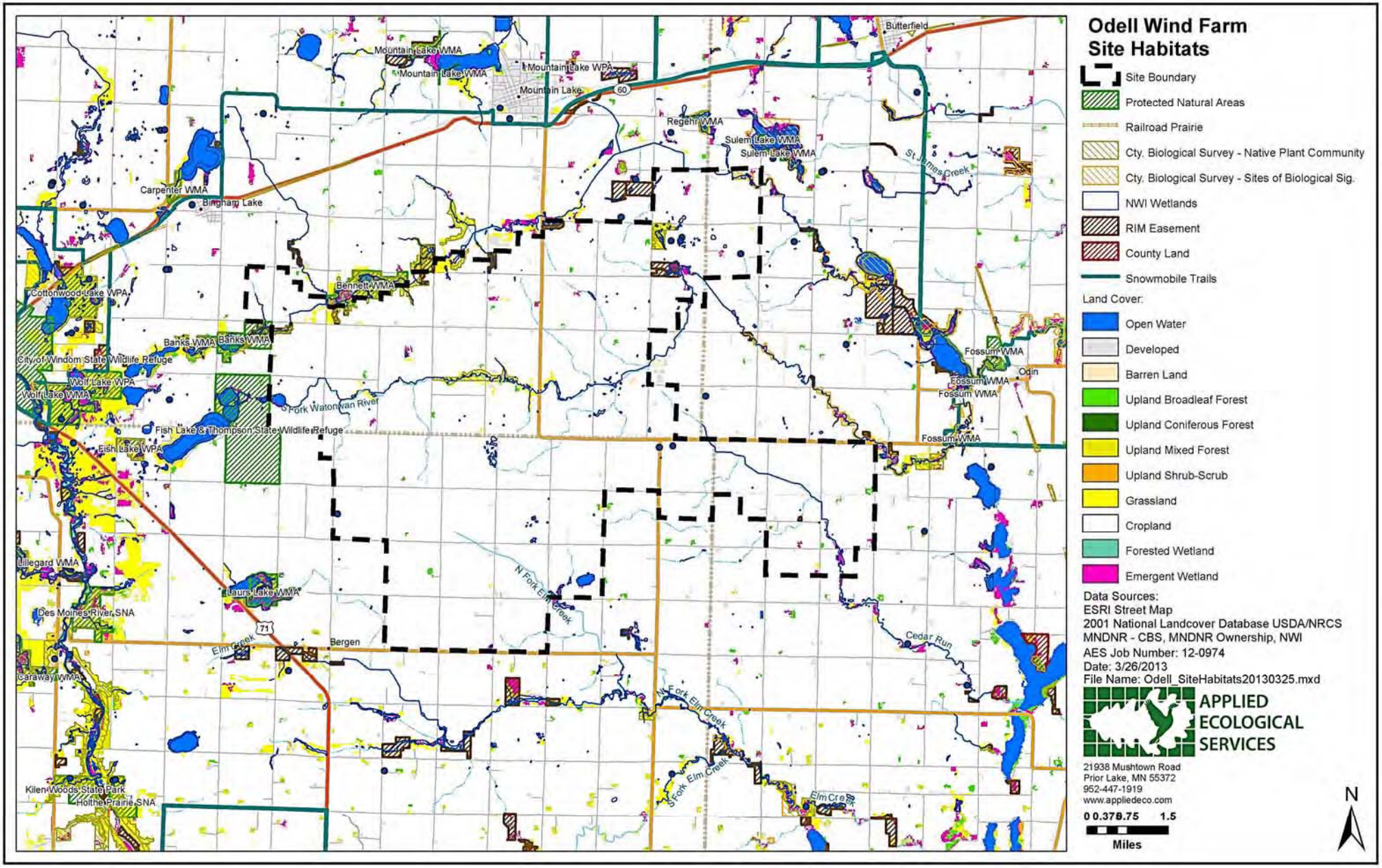
Odell Wind Farm
Site Habitats
Site Boundary
Protected Natural Areas
Railroad Prairie
Cty. Biological Survey - Native Plant Community
Cty. Biological Survey - Sites of Biological Sig.
NWI Wetlands
RIM Easement
County Land
Snowmobile Trails
Land Cover:
Open Water
Developed
Barren Land
Upland Broadleaf Forest
Upland Coniferous Forest
Upland Mixed Forest
Upland Shrub-Scrub
Grassland
Cropland
Forested Wetland
Emergent Wetland
Data Sources:
ESRI Street Map
2001 National Landcover Database USDA/NRCS
MNDNR - CBS, MNDNR Ownership, NWI
AES Job Number: 12-0974
Date: 3/26/2013
File Name: Odell_SiteHabitats20130325.mxd
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www.appliedeco.com
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Miles
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Butterfield
Mountain Lake WMA
Mountain Lake WPA
Mountain Lake
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Regehr WMA
Sulem Lake WMA
Sulem Lake WMA
St James Creek
Carpenter WMA
Bingham Lake
Cottonwood Lake WPA
Bennett WMA
Banks WMA
Banks WMA
City of Windom State Wildlife Refuge
Wolf Lake WPA
Wolf Lake WMA
S Fork Watonwan River
Fish Lake & Thompson State Wildlife Refuge
Fish Lake WPA
Fossum WMA
Odin
Fossum WMA
Fossum WMA
Fossum WMA
Lillegard WMA
Laura Lake WMA
Des Moines River SNA
71
Elm Creek
Bergen
N Fork Elm Creek
Cedar Run
Caraway WMA
N Fork Elm Creek
S Fork Elm Creek
Elm Creek
Kilen Woods State Park
Hoithe Prairie SNA

From:	Heather L. Wayne
To:	"kevin.mixon@state.mn.us"
Cc:	Patrick Smith; heather.kieweg@appliedeco.com
Subject:	Documents from Odell (Geronimo & AES) meeting with DNR: Email 2 of 2
Date:	Thursday, March 28, 2013 1:16:53 PM
Attachments:	Raptor Large Bird Migration - 60min.pdf Odell SpringPass draftpts 20130326.jpg Odell SpringRLB draftpts 20130326.jpg Odell SurveySummary 2013 03 28.docx Passerine Migration & Breeding.pdf

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Hi Kevin-

Here are the rest of the documents.

I will be writing up the meeting minutes and will provide those to you for your comment.

Thank you again,

Heather

APPLIED ECOLOGICAL SERVICES

Odell – Survey Summary

March 28, 2013

Project Size: 60square miles

Proposed Avian Surveys

Survey	Approximate Dates	Number of Points	Length of Count (minutes)
Early April Raptor & Large Bird Migration Survey	April 3 – April 6	30	60
Late April Raptor & Large Bird Migration Survey	April 1 – April 30	30	60
Spring Passerine Migration Survey	May 1 – May 15	25, surveyed twice	10
Breeding Bird Survey	June 1 – June 30	25, surveyed twice	10
Fall Passerine Migration Survey	August 15 – September 15	25, surveyed twice	10
October Raptor & Large Bird Migration Survey	October 1 – October 31	30	60
November Raptor & Large Bird Migration Survey	November 1 – November 30	30	60

Proposed Bat Acoustic Monitoring

- 3 met towers at current project – 1 climbable, 1 with pulley system, one tilt-up
- Ultimately 6 full spectrum monitoring units to be deployed – 3 at 55m and 3 at 3m
- Monitoring dates early May – October 31, 2013; high elevation tilt-up monitor may be deployed later

Midwest/Corporate
P.O. Box 256, 17921 Smith Rd
Brodhead, WI 53520
(608) 897-8641

Great Lakes
120 W Main St
West Dundee, IL 60118
(847) 844-9385

Northwoods
21938 Mushtown Rd
Prior Lake, MN 55372
(952) 447-1919

Great Plains
1271 N 222 Rd
Baldwin City, KS
(785) 594-2245

Atlantic Coast
1100 E Hector St, Suite 398
Conshohocken, PA 19428
(610) 238-9088

Northeast
1899 SR414
Waterloo, NY 13165
(608) 214-2361

Field Protocol for Raptor & Large Bird Migration Point Surveys
Applied Ecological Services
March 26, 2013

Time of Day Limitations

Surveys with an emphasis on raptors and large birds should be conducted between dawn and dusk.

Weather Constraints

Surveys should be conducted during weather that promotes bird activity.

a. Soaring raptors strongly prefer clear skies and favorable winds (southerly in spring, northerly in fall).

b. Powered-flight raptors and large birds can fly in less favorable conditions, but are most active with clear skies and favorable winds.

c. Steady rain, poor visibility or steady strong winds (steady wind over 25mph) are not acceptable. Brief periods of rain, light drizzle and gusts up to 30mph are acceptable if birds remain active.

Point Count Procedure

1. When approaching a sampling point, assess whether a single AES land-cover type covers >50% of the plot. If there is no dominant habitat, move the point location into the intended dominant type for that point.
2. For unlimited radius plots used in raptor/large birds surveys, it is most important to have unobstructed views. Assess visibility and reposition point to increase visibility as necessary., while generally covering the appropriate location.
3. Arrive at point and wait 5 minutes for birds to habituate to the surveyor's presence.
4. While waiting, begin filling in the general point and weather information on the data sheet.
5. If visiting a point for the first time, take a GPS reading. For all GPS readings at sampling points in a project site, use a four letter code made of the first initials of key words (e.g., Big Muddy = BIMU) followed by a unique number for each sampling point. Number sampling points consecutively beginning at 100. On subsequent visits, do not take a GPS reading as it severely complicates data management. Write the coordinates on the data sheet and indicate the location of the point on your field map if it differs from the proposed point on the field map. Write down the nearest street location or other unique location identifier for the point.
6. On the first visit to a point identify the dominant and other significant AES habitat cover types at the site. For each, visually estimate the percent of the habitat within a 800m radius of the point, or within the observable radius if less than 800m. Estimate area visible if less than an 800m circle.
    a. The dominant habitat has >50% cover in the 800m radius area.
    b. Other significant habitats will cover >10% of the 800m radius area.

Habitat Cover Type	Description
Developed	Residential, commercial, industrial, and other developed land, including developed green space (e.g., golf-course, city park).
Cropland	Regularly cultivated land. Includes winter wheat.
Barren Land	Land with sparse to no vegetation (e.g., mines, landfills, construction sites, sparsely vegetated shores).
Grassland	Grass and herbaceous plants cover ≥90% of the ground in uplands.

Upland Shrub-Scrub	Shrubs and scrubby or mature trees cover 10-50% of the ground. Includes brushland and savanna with trees and shrubs.
Upland Broadleaf Forest	Trees cover cover ≥50% of the ground. Broadleaf deciduous trees are ≥90% of the tree cover.
Upland Coniferous Forest	Trees cover ≥50% of the ground. Coniferous (needle-leaved) trees are ≥90% of the tree cover.
Upland Mixed Forest	Trees cover ≥50% of the ground. A mixture of broadleaf and coniferous trees, with each covering <90% of the forest.
Wetland Forested	A wetland or lowland flooded area with 50-100% tree cover.
Wetland Shrub-Scrub	A wetland with 10-50% cover by shrubs, scrubby and mature trees. Includes savanna with trees and shrubs.
Wetland Emergent	A wetland with ≥90% cover of herbaceous plants.
Open Water	Water and sparse to no vegetation cover; rivers, streams, lakes, ponds.

7. On the first visit to a point sketch and label the habitat cover type in the circle on the data sheet. Note the dimensions of the habitat, including distances from the sampling point. Note significant features in the 800m radius area, such as roads, hedgerows, houses, ditches with grass cover, etc. Note limits on visibility.
    a. In the notes section add details on type of crop, percent tree cover, maturity of forest, etc.
8. For Raptor/Large Birds surveys remain at point for 60 min.
9. Use the AOU 4-digit alpha codes for species. A master alpha code list is available from AES.
10. For other data, use the codes provided on the data sheet.
11. For flight height use meters.
12. The notes column in the bird data section is for noting the identifying features of a bird for later identification or for clarification or explanation of data.
13. Map the flight path for raptors, waterfowl and SGCN species. Draw flight path on zoomed in aerial map, not on data sheet. Number flight path with pre-assigned number from datasheet.
14. If a Bald Eagle is observed – add the following information:
    a. Flight path (map on field map)
    b. Time first observed; time last observed
    c. Flight behavior and flight heights during observation period
15. Vary start location for each round of surveys to ensure each point is visited at varying times of day

Protocol for Passerine Migration & Breeding Point Surveys
Applied Ecological Services
March 13, 2012

Scheduling

Dates

Spring migration survey should occur during the peak of the long-distance passerine migration, typically May 1-15 in northern states.

Breeding bird survey should occur during the peak breeding season for birds in the northern temperate zone, typically in June.

Fall migration survey should occur during the peak of the long-distance passerine migration, typically August 21-September 15 in the northern states.

Consult local birding experts and websites to adjust timing of surveys.

Point Selection

1. Acquire recent aerial photo of the site.
2. Map habitat in the project site using AES land-cover (habitat) types:

AES Habitat Cover Type	Description
Developed	Residential, commercial, industrial, and other developed land, including developed green space (e.g., golf-course, city park).
Cropland	Regularly cultivated land. Includes winter wheat.
Barren Land	Land with sparse to no vegetation (e.g., mines, landfills, construction sites, sparsely vegetated shores).
Grassland	Grass and herbaceous plants cover ≥90% of the ground in uplands, includes pasture, hay meadow and fallow field.
Upland Shrub-Scrub	Shrubs and scrubby or mature trees cover 10-50% of the ground. Includes brushland and savanna with trees and shrubs.
Upland Broadleaf Forest	Trees cover cover ≥50% of the ground. Broadleaf deciduous trees are ≥90% of the tree cover.
Upland Coniferous Forest	Trees cover ≥50% of the ground. Coniferous (needle-leaved) trees are ≥90% of the tree cover.
Upland Mixed Forest	Trees cover ≥50% of the ground. A mixture of broadleaf and coniferous trees, with each covering <90% of the forest.
Forested Wetland	A wetland or lowland flooded area with 50-100% tree cover.
Shrub-Scrub Wetland	A wetland with 10-50% cover by shrubs, scrubby and mature trees. Includes savanna with trees and shrubs.
Emergent Wetland	A wetland with ≥90% cover of herbaceous plants.
Open Water	Water and sparse to no vegetation cover; rivers, streams, lakes, ponds.

3. Determine research questions:
    a. Characterization of habitat and bird use of project site.
    b. Identification of sensitive species habitat, bird concentration areas, etc.
    c. Identification of migratory and movement routes.

d. Importance for birds of riparian corridors, habitat patch size, public land, wetlands, etc.

e. Response with distance from a feature (e.g., shoreline, Important Bird Area).

4. With aerial photo and habitat map, identify potential sample points consistent with the number in the proposal budget. Points should have public road access or be on public land. A simple grid of points is not likely to address the research questions.

    a. Distribute points evenly across all habitat types.

    b. Locate sampling points in one dominant (>50% cover) habitat cover type.

    c. Represent the project site with the geographic distribution of points.

    d. Identify alternate points in field if selected points are not appropriate.

    e. Determine other point locations based on the key research questions (e.g., some studies require that points be placed inside/outside riparian zones, at varying distances from a shoreline or IBI, etc.).

    f. Separate points by a minimum of 250m for passerine point counts.

Time of Day Limitations

Spring passerine migration: Dawn to 11am or until a noticeable drop in bird activity; and 5pm to dusk

Breeding bird survey: Dawn to 10am or until a noticeable drop in bird activity; if activity remains high at 10am, continue until 11am or a noticeable drop in bird activity.

Fall passerine migration: Dawn to dusk.

Weather Constraints

Surveys should be conducted during weather that promotes bird activity.

a. Steady rain, poor visibility or steady strong winds (steady wind over 25mph) are not acceptable. Brief periods of rain, light drizzle and gusts up to 30mph are acceptable if birds remain active.

Point Count Procedure

1. When approaching a sampling point, assess whether a single AES land-cover type covers >50% of the plot. If there is no dominant habitat, move the point location into the intended dominant type for that point.
2. Arrive at point and wait 5 minutes for birds to habituate to the surveyor's presence.
3. While waiting, begin filling in the general point and weather information on the data sheet.
4. If visiting a point for the first time, take a GPS reading. For all GPS readings at sampling points in a project site, use a four letter code made of the first initials of key words (e.g., Big Muddy = BIMU) followed by a unique number for each sampling point. Number sampling points consecutively beginning at 100. On subsequent visits, do not take a GPS reading as it severely complicates data management. Write the coordinates on the data sheet and indicate the location of the point on your field map if it differs from the proposed point on the field map. Write down the nearest street location or other unique location identifier for the point.
5. On the first visit to a point identify the dominant and other significant AES habitat cover types at the site. For each, visually estimate the percent of the habitat within a 100m radius of the point, or within the observable radius if less than 100m.

    a. The dominant habitat has >50% cover in the 100m radius area.

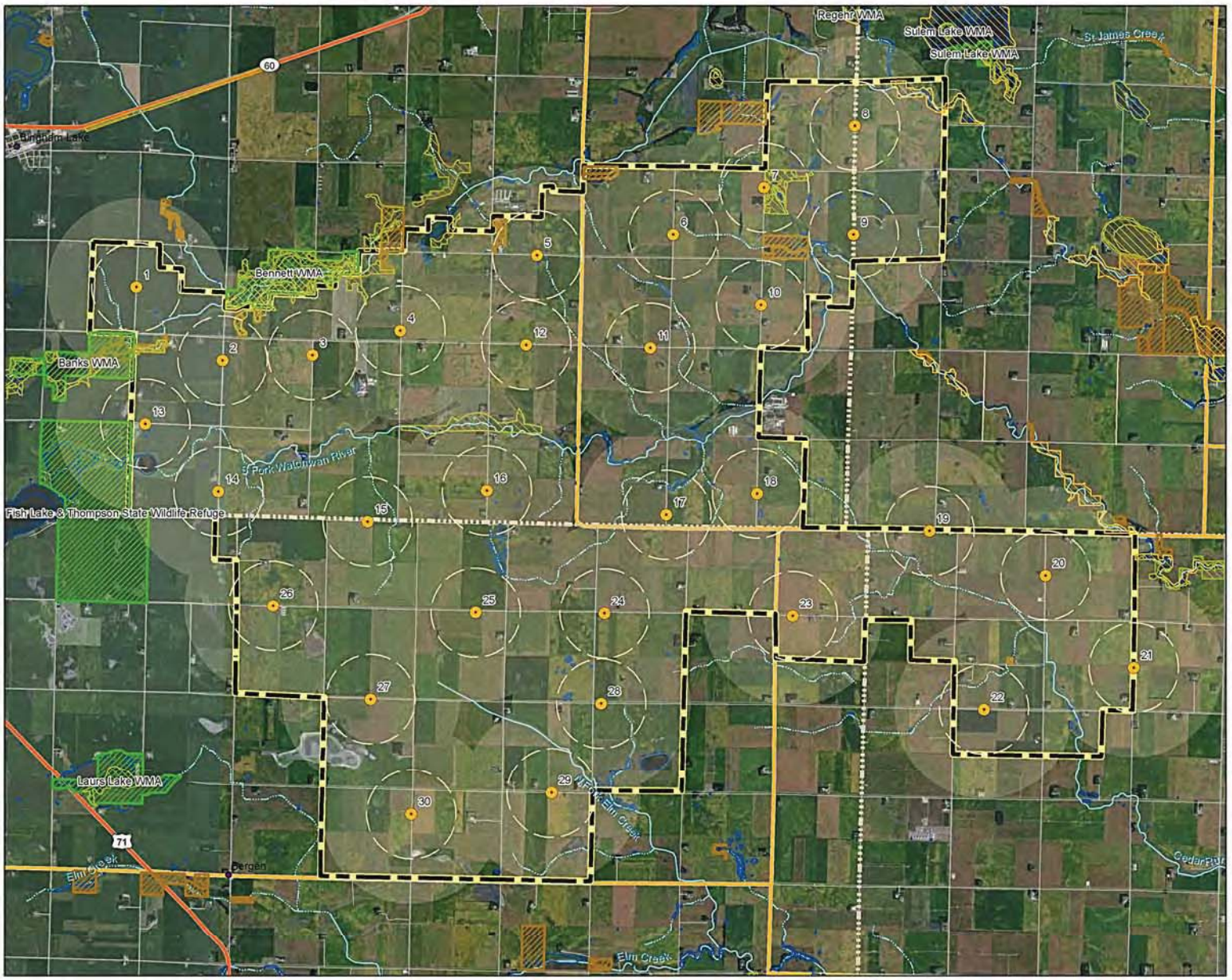
    b. Other significant habitats will cover >10% of the 100m radius area.

6. On the first visit to a point sketch and label the habitat cover type in the circle on the data sheet. Note the dimensions of the habitat, including distances from the sampling point. Note

significant features in the 100m radius area, such as roads, hedgerows, houses, ditches with grass cover, etc.

   a. In the notes section add details on type of crop, percent tree cover, maturity of forest, etc.

7. Record all birds seen and heard at the point in 10 minutes for an unlimited distance from the point. Record one line of data for each species (individual or group at one general location). Note the number of individuals of a species for each observation . For the first 3 minutes record the number of birds observed in the 0-3 column. For the next 2 minutes record the number of birds observed in the 3-5 column. For the last 5 minutes record the number of birds in the 5-10 column. Record a number in the column, not a tally mark.
8. Use the AOU 4-digit alpha codes for species. A master alpha code list is available from AES.
9. For other data, use the codes provided on the data sheet.
10. For flight height use meters.
11. The notes column in the bird data section is for noting the identifying features of a bird for later identification or for clarification or explanation of data.
12. During the breeding season, some states (e.g., Ohio) require that a breeding confirmation level be recorded for each species observed. Use the local breeding confirmation level guidelines.



Odell
Proposed Raptor Large Bird Points

- Site Boundary
- Proposed Raptor Large Bird Points
- 800m point buffer
- 1600m point buffer
- Protected Natural Areas
- RIM Easement
- Cty. Biological Survey - Native Plant Community
- Cty. Biological Survey - Sites of Biological Sig.
- Railroad Prairie
- County Land

Data Sources:
ESRI Street Map
Bing Aerial Base Map

AES Job Number: 12-0974
Date: 3/26/2013
File Name: Odell_SpringRLB_draftpts_2013326.mxd

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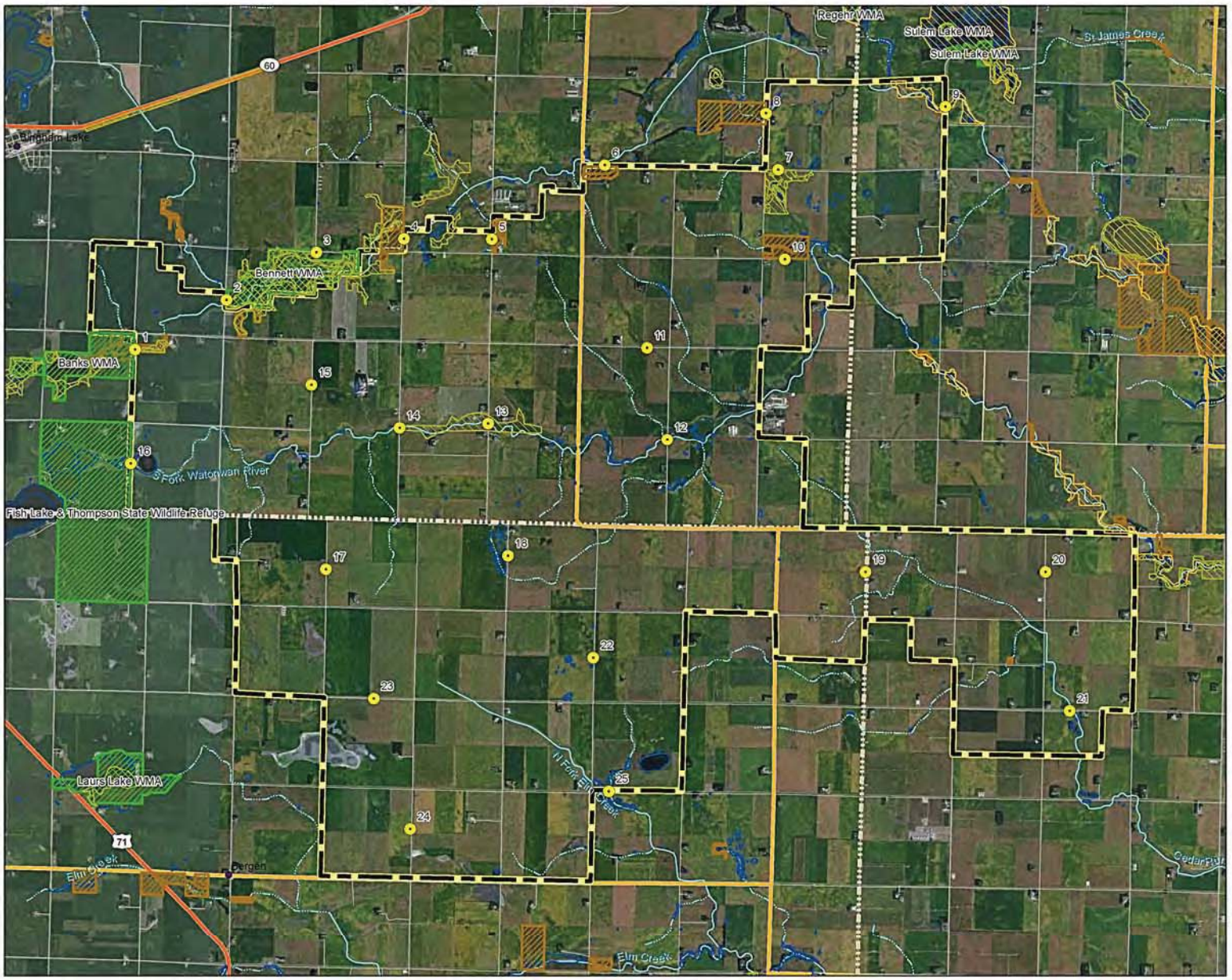

Odell
Proposed Passerine Points

- Site Boundary
- Protected Natural Areas
- RIM Easement
- Cty. Biological Survey - Native Plant Community
- Cty. Biological Survey - Sites of Biological Sig.
- Railroad Prairie
- County Land

Data Sources:
ESRI Street Map
Bing Aerial Base Map

AES Job Number: 12-0974
Date: 3/26/2013
File Name: Odell_SpringPass_draftpts_2013326.mxd

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From: Mixon, Kevin (DNR)
To: Heather L. Wayne
Subject: RE: Documents from Odell (Geronimo & AES) meeting with DNR: Email 2 of 2
Date: Friday, March 29, 2013 9:11:09 AM

Heather:

Thanks for the meeting and the DNR has no further comments on your planned methods. If you have any questions let me know.

Good Luck!

Kevin

-----Original Message-----
From: Heather L. Wayne [mailto:HWayne@geronimowind.com]
Sent: Thursday, March 28, 2013 1:17 PM
To: Mixon, Kevin (DNR)
Cc: Patrick Smith; heather.kieweg@appliedeco.com
Subject: Documents from Odell (Geronimo & AES) meeting with DNR: Email 2 of 2

Hi Kevin-

Here are the rest of the documents.

I will be writing up the meeting minutes and will provide those to you for your comment.

Thank you again,

Heather

Swenson, Kristen

From: Heather L. Wayne
Sent: Tuesday, May 07, 2013 11:14 AM
To: kevin.mixon@state.mn.us
Cc: Patrick Smith; Jordan B. Burmeister; 'Margaret_Rheude@fws.gov'
Subject: Odell Wind Farm-Bat Monitoring

Hi Kevin-

I'm writing to update you on Geronimo's bat monitoring activities at our Odell Project.

We talked with you in late March about having two bat monitoring stations, with high and low mics, installed starting this month (May) at our Odell Project.

Upon entering the fields for the bat monitoring equipment install, our field technician realized that the most recent ice/wind storm had torn the bat bracket from the meteorological tower.

We were able to install one monitoring station, both high and low, successfully, but we were not able to install the second one on our scheduled date. We are working on getting the equipment for the second station installed as soon as possible, and expect to have it installed sometime in June at the latest.

This circumstance was unforeseen and has caused us to temporarily depart from our planned methodology. We wanted to confirm with you that the DNR understands what happened, and that we are working on getting the second station up as soon as possible.

Heather Wayne
Associate
Geronimo Energy
Direct: 952.641.4043
www.geronimoenergy.com

Swenson, Kristen

From: Heather L. Wayne
Sent: Tuesday, May 14, 2013 2:39 PM
To: 'Schrenzel, Jamie (DNR)'; Mixon, Kevin (DNR)
Cc: Patrick Smith; Jordan B. Burmeister; Margaret_Rheude@fws.gov; Davis, Richard (COMM)
Subject: RE: Odell Wind Farm-Bat Monitoring

Hi Jamie and Kevin-

Geronimo Energy is actively working on the site permit application for our Odell wind energy project (a 200 MW project in southern Minnesota). We have not yet submitted a site permit application.
We have been coordinating directly with Mr. Mixon regarding the Odell project. We talked with him in March 2013 to review the project and our planned biological survey methods, including bat and avian surveys. Since the bat pulley equipment was torn off the tower in a storm, I wrote the email below to inform the DNR that our data collection will temporarily vary from what we had initially planned.

Jamie, I'd be happy to talk with you and/or send you more information to get you up to speed.

Heather Wayne
Associate
Geronimo Energy
Direct: 952.641.4043
www.geronimoenergy.com

From: Schrenzel, Jamie (DNR) [mailto:jamie.schrenzel@state.mn.us]
Sent: Tuesday, May 14, 2013 2:02 PM
To: Mixon, Kevin (DNR); Heather L. Wayne
Cc: Patrick Smith; Jordan B. Burmeister; Margaret_Rheude@fws.gov; Davis, Richard (COMM)
Subject: RE: Odell Wind Farm-Bat Monitoring

To help with the permit condition question, my records show only DNR early coordination back in 2009 for this project and a Natural Heritage Information System review. It looks like there is an updated NHIS review also underway. I have attached DNR comment letters for reference. For me, a general status update would be helpful to put the discussion below in context.

Thanks,
Jamie

From: Mixon, Kevin (DNR)
Sent: Thursday, May 09, 2013 4:49 PM
To: Heather L. Wayne
Cc: Patrick Smith; Jordan B. Burmeister; Margaret_Rheude@fws.gov; Schrenzel, Jamie (DNR); Davis, Richard (COMM)
Subject: RE: Odell Wind Farm-Bat Monitoring

Heather:

OK these things happen and the key time to get bat data is summer/early fall. My memory is vague…too many projects…on whether the PUC permit required the bat acoustics? If it did then you should be in contact with Rich Davis (Dept. of Commerce, EFP).

Thanks,

Kevin

From: Heather L. Wayne [mailto:HWayne@geronimowind.com]
Sent: Tuesday, May 07, 2013 11:14 AM
To: Mixon, Kevin (DNR)
Cc: Patrick Smith; Jordan B. Burmeister; Margaret_Rheude@fws.gov
Subject: Odell Wind Farm-Bat Monitoring

Hi Kevin-

I'm writing to update you on Geronimo's bat monitoring activities at our Odell Project.

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Heather Wayne
Associate
Geronimo Energy
Direct: 952.641.4043
www.geronimoenergy.com

Minnesota Department of Natural Resources
Division of Ecological and Water Resources, Box 25
500 Lafayette Road
St. Paul, Minnesota 55155-4025
Phone: (651) 259-5109 E-mail: lisa.joyal@state.mn.us

June 24, 2013 **Correspondence # ERDB 20090921-0003**

Ms. Heather Kieweg
Applied Ecological Services, Inc.
21938 Mushtown Road
Prior Lake, MN 55372

RE: Natural Heritage Review of the proposed Odell Wind Farm;
Cottonwood, Jackson, Martin, and Watonwan Counties

Dear Ms. Kieweg,

As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area (for details, see the enclosed database reports; please visit the Rare Species Guide at http://www.dnr.state.mn.us/rsg/index.html for more information on the biology, habitat use, and conservation measures of these rare species). Please note that the following **rare features *may* be adversely affected** by the proposed project:

Ecologically Significant Areas

The proposed project is in the Minnesota River Prairie Ecological Subsection (http://www.dnr.state.mn.us/ecs/index.html). Key habitats, priority conservation areas as identified in Minnesota's State Wildlife Action Plan (http://www.dnr.state.mn.us/cwcs/index.html), in this subsection include prairie, shallow lakes, and nonforested wetlands.

The Minnesota Biological Survey (MBS) has identified several Sites of Biodiversity Significance within the project boundary (see enclosed map). Sites of Biodiversity Significance have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Factors taken into account during the ranking process include the number of rare species documented within the site, the quality of the native plant communities in the site, the size of the site, and the context of the site within the landscape. These particular Sites contain native prairie and state-listed species (see below). **Given the ecological significance of these Sites, the DNR recommends that those rated Moderate or above be considered avoidance areas within the permitting boundary.** Indirect impacts from surface runoff or the spread of invasive species should also be considered during project design and implementation.

- A Site of High Biodiversity Significance is located in T105N R34W Section 13. This Site contains several rare native plant communities including Mesic Prairie, Wet Prairie, Prairie Mixed Cattail Marsh, Seepage Meadow/Carr and Southern Basin Wet Meadow/Carr. This Site also contains known occurrences of Sullivant's milkweed (*Asclepias sullivantii*), a state-listed threatened plant, and the phlox moth (*Schinia indiana*), a state-listed moth of special concern.

- There is a Site of Moderate Biodiversity Significance in T105N R35W Section 26. This Site contains Dry Hill Prairie and a Prairie Wetland Complex.

- There is a Site of Moderate Biodiversity Significance in T105N R35W Section 24 and T105N R34W Section 19. Most of this Site is within the Bennett Wildlife Management Area, but there are portions

within the project boundary. Within the project boundary, the Site contains Dry Hill Prairie, Mesic Prairie, and Prairie Mixed Cattail Marsh. The Henslow's sparrow (*Ammodramus henslowii*), a state-listed endangered bird, was documented in this Site during the 2007 breeding season. The status of this species is proposed to change to threatened when the state list is next revised (likely this year).

- There is a Site of Moderate Biodiversity Significance in T105N R34W Section 17 that contains Dry Hill Prairie.

- There is a Site of Moderate Biodiversity Significance in T105N R34W Sections 28, 29, & 32. It also contains Dry Hill Prairie.

- A Site ranked as Below is located in T105N R33W Section 7. Although Sites ranked as Below do not meet the minimum biodiversity threshold for statewide significance, they may have conservation value at the local level as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or as areas with high potential for restoration of native habitat.

All of the native plant communities mentioned above are rare. The Prairie Mixed Cattail Marsh has a conservation status rank of S1 meaning that it is critically imperiled within Minnesota. The Seepage Meadow/Carr has a rank of S3 indicating that it is vulnerable to extirpation within Minnesota. The remaining native plant communities all have a rank of S2 indicating that they are imperiled in Minnesota.

In the mid-1800's, Minnesota had eighteen million acres of prairie. Less than 1% remains. Given that more than 99% of Minnesota's prairies have been destroyed, and more than one-third of Minnesota's endangered, threatened, and special concern species are now dependent on the remaining small fragments of Minnesota's prairie ecosystem, we feel that all prairie remnants merit protection. We also recommend that turbines and other infrastructure be distant enough from native prairies as to allow for prairie management, such as prescribed burning.

Please note that the wetlands mentioned above may qualify as Rare Natural Communities under the Wetland Conservation Act. Minnesota Rule 8420.0515, Subpart 3 states that a wetland replacement plan for activities that modify a rare natural community must be denied if the local government unit determines that the proposed activities will permanently adversely affect the natural community. If you have any questions regarding this, please contact Doug Norris, DNR Wetlands Program Coordinator, at 651-259-5125 or Doug.Norris@state.mn.us.

State-listed Plants

Sullivant's milkweed (*Asclepias sullivantii*), a state-listed threatened plant, has been documented in wet prairie and wet-mesic prairie within the project boundary. This species is also known to occur in mesic prairie. Minnesota's endangered species law (*Minnesota Statutes*, section 84.0895) and associated rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the taking of threatened or endangered species without a permit. **Please contact me if there will be any disturbance within native prairie.** Given the protected status of this species and the potential for it to still occur within the project boundary, a qualified surveyor (see attached list) will likely need to conduct a survey for this species prior to any disturbance within native prairie. The purpose of the survey would be to reduce the likelihood of an inadvertent taking of a state-protected species and to inform the takings permit process if needed. **Please submit a survey proposal to me before any survey work is initiated**, as the DNR would like the opportunity to provide feedback on surveyor qualifications and survey protocol in order to prevent any potential project delays. Project planning should take into account that the botanical survey needs to be conducted during the appropriate time of the year, which may be limited (the best time to search for Sullivant's milkweed is when it is in flower from June through August, especially mid-July). Please visit the DNR Rare Species Guide at http://www.dnr.state.mn.us/rsg/index.html for more information on the biology, phenology, habitat use, and conservation measures of this rare plant.

Rare Birds

Henslow's Sparrow

As mentioned above, the Henslow's sparrow (*Ammodramus henslowii*), a state-listed endangered bird, was documented just outside the project boundary in the Bennett Wildlife Management Area. Henslow's sparrows use uncultivated grasslands and old fields with stalks for singing perches and with a substantial litter layer. Minnesota's endangered species law (*Minnesota Statutes*, section 84.0895) and associated rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the taking of threatened or endangered species without a permit. **If any construction will occur within potential habitat during the breeding season**, the DNR requests that a qualified surveyor (see enclosed list) conduct a survey for Henslow's sparrows just prior to construction. The purpose of this survey would be to avoid an inadvertent takings of this species (e.g., nest with eggs or nestlings) during construction. **Please submit a survey proposal to me before any survey work is initiated**, as the DNR would like the opportunity to provide feedback on surveyor qualifications and survey protocol in order to prevent any potential project delays.

Other Rare Birds

Please note that the Minnesota Biological Survey has not conducted surveys in this area in over a decade, so data on state-listed species in this area is incomplete. In particular, the Natural Heritage Information System (NHIS) is not current with respect to bald eagle (*Haliaeetus leucocephalus*) nest locations. Bald eagles are a state-listed species of special concern and are proposed to be delisted when the state list is next revised (likely this year). A minimum of 34 Species in Greatest Conservation (SGCN), as identified in Minnesota's State Wildlife Action Plan (http://www.dnr.state.mn.us/cwcs/index.html), are known to occur within the Minnesota River Prairie Subsection. Nineteen of these use the prairie habitats mentioned above. Please note that the NHIS does not track many of the SGCN. It should also be noted that the NHIS does not include records of migrating birds and that the Minnesota River Prairie Subsection is a major migratory corridor. The DNR looks forward to receiving the results of the pre-construction avian surveys and may have additional comments regarding rare birds at that time.

Wind farms can affect birds due to collision mortality, displacement due to disturbance, habitat fragmentation, and habitat loss. Even if collision mortality rates are low, the additional mortality may be significant for rare species. In addition, the results from some studies suggest that grassland birds are deterred from nesting in otherwise appropriate habitat by the presence of tall structures in the vicinity. As such, voluntary setbacks from prairie or other grasslands may be an appropriate measure to minimize disturbance to rare grassland birds.

Given the potential for a state-protected bird to occur and breed in the area and the potential for wind turbines to cause avian fatality, the DNR recommends pre-construction avian surveys. Depending on the pre-construction survey results and whether any turbines are located in prairie or other grassland, post-construction avian fatality monitoring may also be recommended.

Bat Congregation Areas and State-listed Bats

The Natural Heritage Information System (NHIS) tracks bat maternity colonies and bat hibernacula plus some Anabat data, but this information in not current or exhaustive. Although there are no NHIS records for bats in the vicinity of the proposed project, all seven of Minnesota's bats can be found throughout Minnesota. The northern myotis (*Myotis septentrionalis*) and the tricolored bat (*Pipistrellus subflavus*) are both state-listed species of special concern. The big brown bat (*Eptesicus fuscus*) and the little brown bat (*Myotis lucifugus*) are currently proposed to become state-listed species of special concern when the state list is next revised (likely this year). The DNR looks forward to receiving the results of the bat acoustic monitoring and may have additional comments regarding state-listed bats at that time.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

The enclosed results include an Index Report and a Detailed Report of records in the Rare Features Database, the main database of the NHIS. To control the release of specific location information, which might result in the destruction of a rare feature, both reports are copyrighted.

The Index Report provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an environmental review document (e.g., EAW or EIS), municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index report for any other purpose, please contact me to request written permission. **The Detailed Report is for your personal use only as it may include specific location information that is considered nonpublic data under *Minnesota Statutes*, section 84.0872, subd. 2. If you wish to reprint or publish the Detailed Report for any purpose, please contact me to request written permission.**

For environmental review purposes, the Natural Heritage letter and database reports are valid for one year; they are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or if an updated review is needed.

Please note that locations of the gray wolf (*Canis lupus*), state-listed as special concern, and the Canada lynx (*Lynx canadensis*), federally-listed as threatened, are not currently tracked in the NHIS. As such, the Natural Heritage Review does not address these species.

Furthermore, the Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. Additional rare features for which we have no data may be present in the project area, or there may be other natural resource concerns associated with the proposed project. For these concerns, please contact your DNR Regional Environmental Assessment Ecologist (contact information available at http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html). Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,

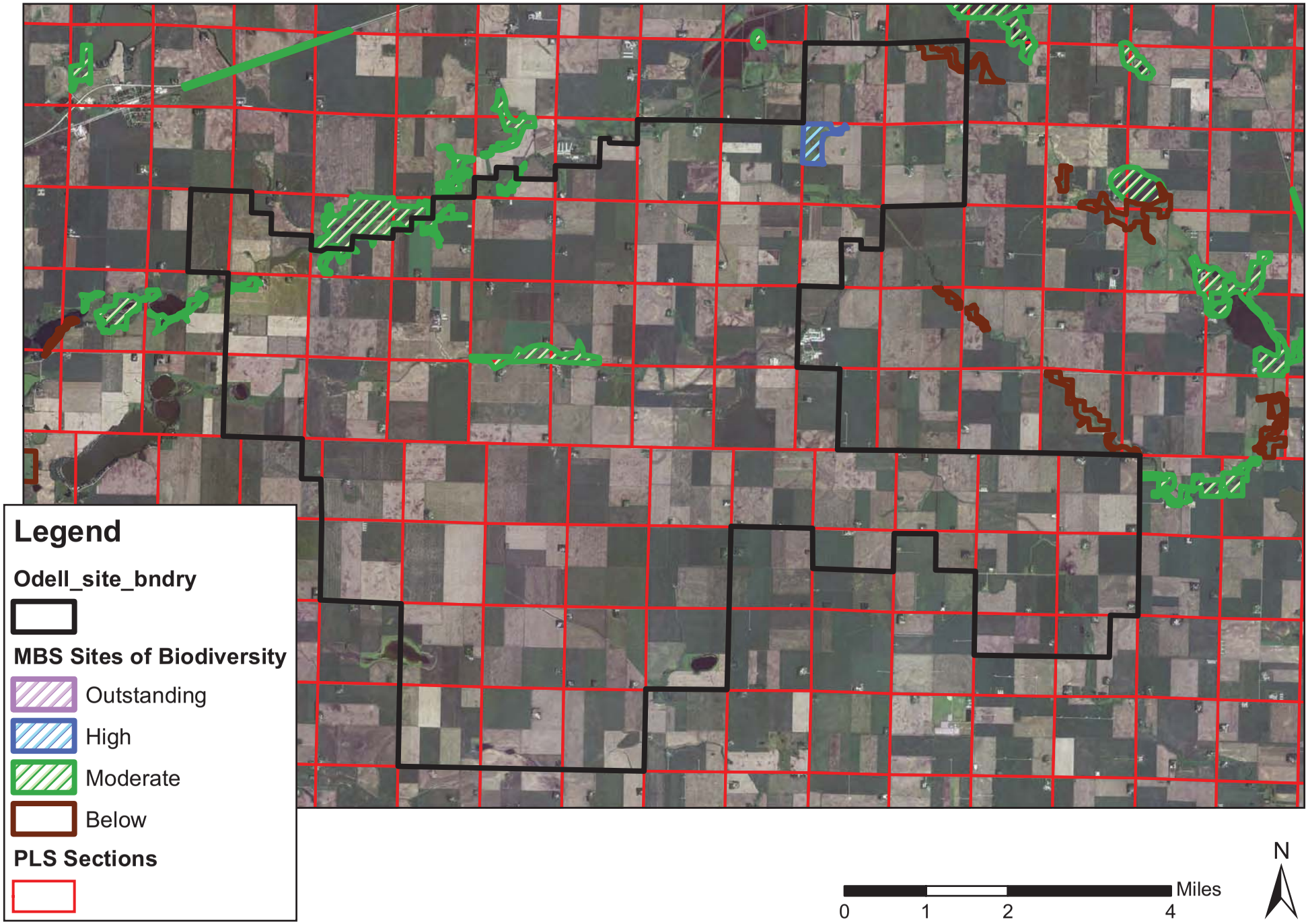
Lisa Joyal

Lisa Joyal
Endangered Species Review Coordinator

enc. Rare Features Database: Index and Detailed Report
Rare Features Database Reports: An Explanation of Fields
Map
DNR List of Surveyors (Animals and Plants)

cc: Kevin Mixon, DNR
Lisa Gelvin-Innvaer, DNR
Jamie Schrenzel, DNR
Doug Norris, DNR
Deborah Pile, DOC
Rich Davis, DOC

Odell Wind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Minnesota Department of Natural Resources

Division of Ecological and Water Resources
Southern Region • 261 Highway 15 South • New Ulm, MN • 56073
Phone: 507-359-6073 Email: kevin.mixon@state.mn.us

June 24, 2013

Mr. Patrick Smith
Odell Wind Farm, LLC
7650 Edinborough Way, Suite 725
Edina, MN 55435

In re: Odell Wind Farm and Transmission Line
Preliminary Review
Cottonwood, Jackson, Martin, and Watonwan Counties, MN

Dear Patrick:

The Minnesota Department of Natural Resources (DNR) appreciates the opportunity to review and comment on the Odell Wind Farm. The DNR participated in a conference call on March 28, 2013 concerning the project and this letter is intended to clarify and supplement the prior discussion.

The Bennett and Banks Wildlife Management Areas (WMA) are adjacent to the current project area. The DNR recommends that no direct impacts occur to these public recreational lands from turbine construction, transmission lines, substations, or road networks associated with the project. It is the DNR's responsibility to seek avoidance, minimization, and mitigation for potential impacts to Minnesota Recreation System Units (Minnesota Statutes, chapter 86A) from turbine construction, transmission lines, substations, or road networks associated with a wind project. The wind resource of State lands is protected from encroachment through the wind access buffer of 5 rotor diameters (prevailing wind direction) and 3 rotor diameters (non-prevailing wind direction) that has been established by the PUC to protect non-participating landowners wind rights.

The DNR is aware that various wildlife surveys are currently being conducted within the project area. The bat acoustic data is of special interest as we have had a few projects with higher bat passes per detector night than would be expected in agriculture dominated landscapes. On first glance, the overall project area would pose a low risk to birds and bats. However, the DNR will need to review the wildlife survey data in order to provide an estimated project risk level. The project risk level is related to the post-construction fatality monitoring methods that would be recommended by the DNR.

The northwest portion of the project area near Bennett and Banks WMA is a higher risk area to wildlife due to the exceptionally high waterfowl use in that area. On April 3, 2013 I observed thousands of ducks, geese, and swans using the wetlands within and adjacent to the WMA. The turbine layout should be designed to avoid placing turbines in the north/northwest portion of the project area. Placing turbines in this area may increase the estimated project risk level to avian species.

Previously the DNR provided a link to the DNR Guidance for Commercial Wind Energy Projects (http://www.dnr.state.mn.us/eco/ereview/additional_resources.html). We hope that you have had time to review the document as it contains information on resources that should be identified during early stages of project development. Please contact me directly if you have any questions about the content in this letter or if you would like to further discuss the ongoing wildlife surveys.

Sincerely,

Kevin Mixon
Regional Environmental Assessment Ecologist

Cc: Jamie Schrenzel, DNR
Randy Markl, DNR
Lisa Joyal, DNR
Bernice Cramblit, DNR
R4 REAT
Deb Pile, DOC
Rich Davis, DOC

Minnesota Historical Society
STATE HISTORIC PRESERVATION OFFICE

June 21, 2013

Mr. Patrick Smith
Director of Environmental Planning
Odell Wind Farm
7650 Edinborough Way, Suite 725
Edina, MN 55435

RE: Odell Wind Farm and Transmission Line
Cottonwood, Jackson, Martin and Watonwan Counties
SHPO Number: 2009-2529

Dear Mr. Smith:

Thank you for the opportunity to comment on the above project. It is being reviewed pursuant to the responsibilities given to the Minnesota Historical Society by the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act.

Due to the nature and location of the proposed project, we recommend that a cultural resources survey be completed. The survey must meet the requirements of the Secretary of the Interior's Standards for Identification and Evaluation, and should include an evaluation of National Register eligibility for any archaeological sites that are identified. This survey should also include assessment of effects on any properties that are listed in the State or National Register of Historic Places.

We will reconsider the need for archaeological survey if the project area can be documented as previously surveyed or disturbed. Any previous survey work must meet contemporary standards. **Note:** plowed areas and right-of-way are not automatically considered disturbed. Archaeological sites can remain intact beneath the plow zone and in undisturbed portions of the right-of-way.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, or requires a federal license or permit, it should be submitted to our office by the responsible federal agency.

If you have any questions regarding our review of this project, please contact Kelly Gragg-Johnson at (651) 259-3455.

Sincerely,

Mary Ann Heidemann, Manager
Government Programs and Compliance

Enclosure: List of Consultants

MINNESOTA HISTORICAL SOCIETY
State Historic Preservation Office
Contract Archaeologists
Last Updated: 8/18/2012

This listing is comprised of individuals and firms who have expressed an interest in undertaking contract archaeology in the State of Minnesota. It is provided for informational purposes to those who may require the services of an archaeological consultant. Inclusion on the list does not constitute an endorsement of the consultant's professional qualifications or past performance. The SHPO may remove contractors from the list if no work is completed in Minnesota over a two year period. The SHPO reserves the right to reject contract reports if the principal investigator or other contract personnel do not meet certain minimal qualifications such as the Secretary of the Interior's professional qualifications standards (Federal Register 9/29/83).

It is recommended that work references be checked and multiple bids be obtained before initiating a contractual agreement. The SHPO will not recommend specific contractors, but may be able to comment on previous work reviewed pursuant to state and federal standards and guidelines. The SHPO can be contacted at the Minnesota History Center, 345 Kellogg Boulevard West, St. Paul, MN 55102, 651-259-3450.

10,000 Lakes Archaeology, Inc.
220 9th Avenue South
South St. Paul, MN 55075
612/670-6431
gronhovd@10000lakesarchaeology.com
www.10000lakesarchaeology.com

The 106 Group Limited
370 Selby Avenue
St. Paul, MN 55102
651/290-0977
Fax 290-0979
anneketz@106group.com
www.106group.com

AECOM Environment
Amy Ollendorf, Ph.D.
161 Cheshire Lane North
Suite 500
St. Louis Park, MN 55441
763/852-4200
Cell 612/599-1255
Fax 763/473-0400
amy.ollendorf@aecom.com
www.aecom.com

AMEC Earth and Environmental
109 Woodward Avenue
Jefferson City, MO 65109
573/301-6084

AMEC Earth & Environmental
Kari Krause, RPA
Midwest Plaza Building, Suite 1200
800 Marquette Avenue
Minneapolis, MN 55402-2876
612/252-3790
Cell 612/787-8380
kari.krause@amec.com
www.amec.com/divisions.earth

Anthropology Research
University of North Dakota
236 Centennial Drive Stop 7094
Dennis L. Toom
Grand Forks, ND 58202
701/777-2436

ARCH3, LLC
Daniel R. Pratt, M.A.
1386 Idaho Avenue West
St. Paul, MN 55108
651/308-8749
Fax 651/917-9291
arch3llc@gmail.com
www.arch3llc.com

Archaeological Research Services
1812 15th Avenue South
Minneapolis, MN 55404
612/870-9775

Archaeology Laboratory
Augustana College
2032 South Grange Avenue
Sioux Falls, SD 57105
605/274-5493

Bear Creek Archaeology, Inc.
P. O. Box 347
24091 Yellow Avenue
Cresco, IA 52136
563/547-4545 FAX 563/547-5403
www.bearcreekarcheology.com

Louis Berger and Associates, Inc.
Attn. Randall M. Withrow
950 50th Street
Marion, IA 52302
319/373-3043

Blondo Consulting, LLC
Steven J. Blondo
3939 Sand Hill Road
Kettle River, MN 55757
218/485-1174
steven@blondoconsulting.com
www.blondoconsulting.com

Bolton & Menk, Inc.
Dale Maul
1224 Nicollet Avenue
Burnsville, MN 55337-6857
952/890-0509
Fax 952/890-8065
dalema@bolton-menk.com
www.bolton-menk.com

Commonwealth Cultural Resources
Kathryn C. Egan-Bruhy
PO Box 1061
Minocqua, WI 54548
715/358-5686

Consulting Archaeological Services
PO Box 686
Creston, IA 50801
515/333-4607

Cultural Herage Consultants
Todd Kapler
PO Box 3836
Sioux City, IA 51102-3836
Phone 712/239-9085
Fax 712/239-9086

Duluth Archaeology Center
5910 Fremont Street, Suite 1
Duluth, MN 55807
218/624-5489
archcenter@aol.com
www.dulutharchaeologycenter.com

Florin Cultural Resource Services
N12902 273rd Street
Boyceville, WI 54725
715/643-2918

Foth and Van Dyke, Inc.
Curtis M. Hudak
Eagle Point II
8550 Hudson Boulevard North
Suite 100
Lake Elmo, MN 55042
651/288-8593
Fax 651/288-8551
www.foth.com

R.C. Goodwin and Associates
309 Jefferson Highway, Suite A
New Orleans, LA 70121
504/837-1940
neworleans@rcgoodwin.com

HDR One Company
701 Xenia Avenue South
Suite 600
Minneapolis, MN 55416
763/591-5423
Fax 763/591-5413

Historic Preservation Associates
Contact: Timothy Klinger
P.O. Box 1064
Fayetteville, AR 72702
501/442-3779

Jeff Kinney and Associates
PO Box 43
Manvel, ND 58256
701/696-2289

Larson-Tibesar Assoc., Inc.
421 South Cedar Street
Laramie, WY 82070
307/742-4371 or 701/696-2236

Leech Lake Heritage Sites Program
115 6th Street NW
Suite E
Cass Lake, MN 56633
218/335-8095

McFarlane Consulting, LLC
318 Goodhue Street
St. Paul, MN 55102
651/699-1921

Metcalf Archaeological Consultants
PO Box 2154
Bismarck, ND 58501
701/258-1215

Minnesota State University Moorhead
Michael Michlovic or George Holley
Department of Anthropology & Earth Science
Moorhead, MN 56560
218/477-2035 or 218/477-2680
michlovc@mnstate.edu
holley@mnstate.edu

Mississippi Valley Archaeology Center
1725 State Street
LaCrosse, WI 54601
608/785-8463
boszhard.robe@uwlax.edu
www.uwlax.edu/mnvac/contracts.htm

Parsons Engineering Science Inc.
400 Woods Mill Road
Chesterfield, MO 63017
314/576-7330

Pathfinder CRM
Robert Vogel
168 West Main Street
P.O. Box 503
Spring Grove, MN 55974
507/498-3810

Quality Services
3459 Jet Drive
Rapid City, SD 57703
605/388-5309 or
605/209-0265

Rolling Hills Consulting Services, LLC
Chad A. Goings
1221 East 3rd Street
Washington, IA 52353
319/461-7427
cagoings@aol.com

St. Cloud State University
Mark P. Muñiz, Ph.D., RPA
Assistant Professor
Director CRM Archaeology Graduate Program
Department of Sociology and Anthropology
262 Stewart Hall
720 Fourth Avenue South
St. Cloud, MN 56301
320/308-4162
Fax 320/308-1694
mpmuniz@stcloudstate.edu

SOILS Consulting
PO Box 121
Longville, MN 56655
218/682-2110

Southern Minnesota Archaeology Consulting, Inc.
Ryan Howell
125-10th Avenue SE
Rochester, MN 55904
507/993-9643
sminnarch@yahoo.com

Stemper and Associates
24505 Hardeggers Drive
Cleveland, MN 56017
507/931-0823
Fax 507/931-5356

Summit Envirosolutions
Andrea Vermeer
1217 Bandana Boulevard North
St. Paul, MN 55108
651/644-8080

Robert Thompson
13367 87th Place North
Maple Grove, MN 55369
612/788-7412

TRC Mariah
605 Skyline Drive
Laramie, WY 82070
307/742-3843

Trefoil Cultural & Environmental Heritage
Richard Rothaus, PHD
1965 W. Highview Drive
Sauk Rapids, MN 56379
320/761-9090
rothaus@trefoilcultural.com

Two Pines Resource Group
17711 260th Street
Shafer, MN 55074
651/257-4766
eterrell@twopinesresource.com
www.twopinesresource.com

University of South Dakota Archaeology Laboratory
Contact: Richard Fox
414 Clark Street
Vermillion, SD 57069
605/677-5594

WAPSI Valley Archaeology
PO Box 244
Anamosa, IA 52205
319/462-4760

Westwood Professional Services, Inc.
7699 Anagram Drive
Eden Prairie, MN 55344
952/937-5150
Fax 952/937-5822
www.westwoodps.com

Minnesota Pollution Control Agency
520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300
800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us | Equal Opportunity Employer

June 27, 2013

Mr. Patrick Smith
Director of Environmental Planning
Odell Wind Farm
7650 Edinborough Way, Suite 725
Edina, MN 55435

Re: Odell Wind Farm and Transmission Line

Dear Mr. Smith:

The Minnesota Pollution Control Agency (MPCA) Environmental Review Unit has reviewed the information in the letter and attachment dated May 24, 2013, regarding the Odell Wind Farm and Transmission Line in Cottonwood, Jackson, Martin, and Watonwan counties, Minnesota. Based on the limited information provided, and regarding matters for which the MPCA has regulatory responsibility and other interests, the MPCA staff has the following comments for your consideration.

- If the project will disturb a total of one acre or more of land, a National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit (CSW Permit) is required from the MPCA. The owner and operator (usually the general contractor) are jointly responsible for obtaining and complying with the conditions of the CSW Permit. A detailed Stormwater Pollution Prevention Plan (SWPPP), containing stormwater management requirements both during and post construction, as well as erosion control and sediment control requirements during construction, must be prepared prior to submitting a CSW Permit application. CSW Permit coverage is required prior to commencing land disturbing activities (i.e., clearing, grading, filling, or excavating) relating to the project. For an overview of this permit and program, please refer to the following factsheet: http://www.pca.state.mn.us/publications/wq-strm2-05.pdf. Questions regarding CSW Permit requirements should be directed to Roberta Getman at 507-206-2629.

- Please be aware that if a U.S. Army Corps of Engineers (USACE) Section 404 Individual Permit is required for any project related wetland impacts, an MPCA Clean Water Act (CWA) Section 401 Water Quality Certification or waiver must also be obtained as part of the permitting process. The Section 401 Water Quality Certification ensures that the activity will comply with the state water quality standards. Any conditions required within the MPCA 401 Certificate are then incorporated into the USACE 404 Permit. You can find additional information about the MPCA's 401 Certification process at www.pca.state.mn.us/water/401.html. For further information about the 401 Water Quality Certification process, please contact Jim Brist at 651-757-2245.

We appreciate the opportunity to review this project. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the project for the purpose of pending or future permit action(s) by the MPCA. Ultimately, it is the responsibility of the project proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this project, please contact me at 651-757-2508.

Sincerely,

Karen Kromar

Karen Kromar
Planner Principal
Environmental Review Unit
Resource Management and Assistance Division

cc: Craig Affeldt, MPCA, St. Paul
Roberta Getman, MPCA, Rochester
Jim Brist, MPCA, St. Paul
Randy Hukriede, MPCA, Marshall

Southwest Regional Development Commission

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Slayton, MN 56172-1142
(507) 836-8547
Fax: (507) 836-8866
E-Mail: srdc@swrdc.org / Website: www.swrdc.org

June 13, 2013

TO: Patrick Smith, Director of Environmental Planning, Patrick@geronimoenergy.com

FR: Annette Bair, SRDC Physical Development Director, phydev@swrdc.org

RE: Response to a letter from Odell Wind Farm, LLC, a subsidiary of Geronimo Wind Energy, LLC regarding a proposed Wind Farm and Transmission Line in Southwest Minnesota

Overview of project for the SRDC Board: Odell Wind Farm is requesting agency comments for a proposed wind energy project (up to 200 MW) in Cottonwood, Jackson, Martin, and Watonwan counties and Transmission Line (115 kV) in Cottonwood, Jackson, and Martin Counties and associated facilities. Locations of the Transmission line and tower sites are not currently known.

- The Developer has been in contact, with a minimum of a letter requesting input of the two projects. In Cottonwood and Jackson County there have been meetings / discussion regarding the transmission lines and towers; Jackson County recently held a CUP hearing for a Met tower.
- The Developer met last fall with at least one of the Martin County Commissioners. Watonwan County is aware of the project but would like more details.

Comments for Odell Wind Farm, LLC: The Southwest Region Development Commission appreciates the opportunity to provide input into the proposed project process.

- This project is unique in that the footprint for the wind project is in four counties and the transmission line in three. The State encourages a Development Agreement (at least for the wind farm component) when permitting / constructing the wind turbines. While it may be difficult to coordinate a single Development Agreement with the four (or three) counties, the SRDC would recommend holding a joint meeting with the County Engineers and Zoning Administrators to work out the impact of the project. For example, haul routes in more than one county, addressing the location of the transmission lines once a route it sited, etc.

(continued)

- Of environmental concern, would be to close proximity of Mountain County Park, a 24 acre Park located 2 miles SE of Mountain Lake city, and includes an island in the center of a dry lake bed, once the largest lake in Cottonwood County. The Park is on the National Register of Historic sites as a result of a 1976 Archaeological survey where artifacts and cultural data from inhabitants dating back to 500 BC were found. The site is the oldest human dwelling ever found in Minnesota. The island top is in primitive natural condition and supports wildlife and birds of many species. It is utilized by the Cottonwood County Bird Club throughout the year for bird counts.
- Geronimo was recently involved with the Wind Project in Rock and Pipestone Counties where following the construction of the Wind Farm and Transmission Line, a community fund was set up to provide local grants. Will this project be doing something similar?

Thank you for this opportunity to provide comment regarding the proposed project.

Cc: Cottonwood, Jackson, Martin, and Watonwan County Engineers, Zoning Administrators,

Rural MN Energy Board Members, and Region Nine Development Commission.

RURAL MINNESOTA ENERGY BOARD

Blue Earth Brown Cottonwood Faribault Freeborn
Jackson Lincoln Lyon Martin Mower
Murray Nobles Pipestone Renville Redwood
Rock Sibley Watonwan

Tom Warmka, Chair *Will Purvis, Vice Chair*
Ken Hoime, Secretary *Larry Hansen, Treasurer*

2401 Broadway Ave Suite 1, Slayton, MN 56172
Phone 507/836-1631 FAX 507/836-8866
Email: phydev@swrdc.org website: http://www.rmeb.org

September 11, 2013

Rural Minnesota Energy Board
Monday September 23, 2013
CRD Board Room 2401 Broadway Ave, Slayton, MN
Agenda

1. **Call to Order at 1:00 PM**
2. **Pledge of Allegiance**
3. **Announcements**
4. **Introductions**
5. **Changes to the Agenda/Approval**
6. **Review / Approve Energy Board Minutes of July 19, 2013**
7. **Financial report -** Treasurer Hansen
8. **Sub committees Reports:**
   - **Legislative -** all
   - **PACE (Property Assessed Clean Energy)** – *Betsy Herding*
     RMEB PACE RLF Committee**:** *Gerald Magnus, Gene Metz, Will Purvis, Scott Sanders, Bob Fox,*
9. **Odell Wind Farm and Geronimo Solar (30 minutes)** *confirmed*
10. **Member Updates on Energy projects and issues**
11. **Updates on past tours**
    - **GEVO**
    - **Poet**
12. **Other Business and Reports**
    - **CERT update.**
      - Steering Committee – thank retiring members of SW CERT, appoint an RMEB member to SW CERT
      - CERT Seed grants – applications due Oct 18th, Labor only
      - 5 projects moving forward (PACE, Community Solar, Education / YES! Teams, Energy on the On the farm)
13. **New Business**
14. **Meeting Dates –**November 25 Heating the Midwest with Biomass- *requested*
    Please bring your calendars for 2014 meeting dates (usually 4th Mondays of odd months):

Jan 27, Mar 24, May (26th is Memorial Day – May 19 or June 1?), July 28, Sept 22, Nov 24.

15. **Adjourn**

APPENDIX C

LANDOWNER LIST

LANDOWNERS

Naomi Bottin
Bottin Family Trust
43628 County Road 1
Mountain Lake, MN 56159

Wayne Hanson
66224 361st Lane
Butterfield, MN 56120

Noel Rahn
7650 Edinborough Way
Edina, MN 55435

Irene Sandbo
1101 2nd Street South
St. James, MN 56081

Gary Wilson
134 240TH St.
Odin, MN 56160

Jurkowski Family Trust
8321 E. Hillsdale Drive
Orange, CA 92869

Stanley W. Johanek Trust &
Anna I. Johanek Trust
43416 600th Ave
Mountain Lake, MN 56159

Marion Burkhardt
50 Ash Street W
Trimont, MN 56176

Marvan Gohr
PO Box 493
Mountain Lake, MN 56159

Kevin Karschnik
57881 County Rd. 13
Mountain Lake, MN 56159

Mavis Rohman
180 3rd Ave. NE
Trimont, MN 56176

Kyle Sinn
206 230th Street
Trimont, MN 56176

BWT Holdings LLLP
164 Industrial Parkway
Jackson, MN 56143

Loyal & Bertha Klassen
Revocable Trusts
306 Golf Course Rd
Mountain Lake, MN 56159

Dennis Carlson
449 230th Street
Trimont, MN 56176

Leslie Grev
813 County Rd. 8
Ormsby, MN 56162

Urban Nawrocki
2267 30th Ave.
Trimont, MN 56176

Norman Sandbo
226 235th Street
Odin, MN 56160

Ray Wilson
Ray F. Wilson Revocable Living Trust
60542 930TH St.
Odin, MN 56160

Elvira Wrede Revocable Trust
8321 E. Hillsdale Drive
Orange, CA 92869

Rolling Hills Turkey Ranch Inc.
213 7th Street N
Mountain Lake, MN 56159

APPENDIX D

LOCAL GOVERNMENT UNIT CORRESPONDENCE

Unit Name	Government Type	County	Primary Contact
Cottonwood County	County	Cottonwood	
Cottonwood County Environmental Office	County	Cottonwood	Gordy Olson, Director
Cottonwood County Highway Department	County	Cottonwood	JinYeene Neumann, Engineer
Mountain Lake Township	Township	Cottonwood	Alan Coners, Clerk
Lakeside Township	Township	Cottonwood	Bruce Nagorske, Clerk
Jackson County	County	Jackson	Janice Fransen, Coordinator
Jackson County Planning & Zoning	County	Jackson	Andy Geiger, Administrator
Jackson County Highway Department	County	Jackson	Tim Stahl, Engineer
Kimball Township	Township	Jackson	Kathleen Peterson, Clerk
Christiania Township	Township	Jackson	Steve Soehren, Clerk
Martin County	County	Martin	Scott Higgins, Coordinator
Martin County Planning & Zoning	County	Martin	Pam Flitter, Zoning Official
Marin County Highway Department	County	Martin	Kevin Peyman, Engineer
Cedar Township	Township	Martin	Steven Syverson, Clerk
Watonwan County	County	Watonwan	
Watonwan County Environmental Zoning & Services	County	Watonwan	Bruce Johnson, Director
Watonwan County Public Works	County	Watonwan	Roger Risser, Director/Engineer
Odin Township	Township	Watonwan	Joann Haugen, Clerk
City of Windom	City	Cottonwood	Steve Nasby, City Administrator
City of Mountain Lake	City	Cottonwood	Wendy Meyer, Clerk
City of Jackson	City	Jackson	Steve Walker, Clerk

ODELL
WIND FARM
Cottonwood, Jackson, Martin,
& Watonwan Counties, MN

May 29, 2013

Cottonwood County
900 3rd Avenue
Windom, MN 56101

Re: Odell Wind Farm, LLC Wind Energy and Transmission Project
Notice of Availability for Meeting

Dear Cottonwood County:

Odell Wind Farm, LLC ("Odell"), a wholly-owned subsidiary of Geronimo Wind Energy, LLC ("Geronimo"), is proposing to construct a 200 megawatt wind farm and related approximately 9.5 mile, 115 kilovolt transmission line project in Jackson, Cottonwood, Martin, and Watonwan Counties ("Project").

Geronimo is a Minnesota-based developer that has successfully completed three other wind farms in southwest Minnesota, including a 20 MW Marshall Wind Farm in Lyon County, the 20 MW Odin Wind Farm in Watonwan and Cottonwood Counties and the recently constructed 200 MW Prairie Rose Wind Farm in Rock County.

Odell is currently gathering information in preparation for filing a Site Permit Application for a Large Wind Energy Conversion System and a Route Permit Application for a High Voltage Transmission Line ("Permit Applications") to the Minnesota Public Utilities Commission ("PUC"). We encourage your participation in the PUC's permitting processes.

At this time, Odell's turbine locations, access roads and electrical connections have not been finalized. Similarly, the transmission line route is not yet finalized. The enclosed map identifies the Project's location, boundary and transmission route evaluation area, which is the area being considered for the transmission route and possible alternative routes.

We would appreciate the opportunity to meet with you to discuss the Project prior to submitting Odell's Permit Applications. If you are interested in meeting with a member of our Project team, please contact me at (952) 988-9000 by July 1st, 2013. This will ensure that we have adequate time to address questions or concerns raised by your local unit of government in our Permit Applications.

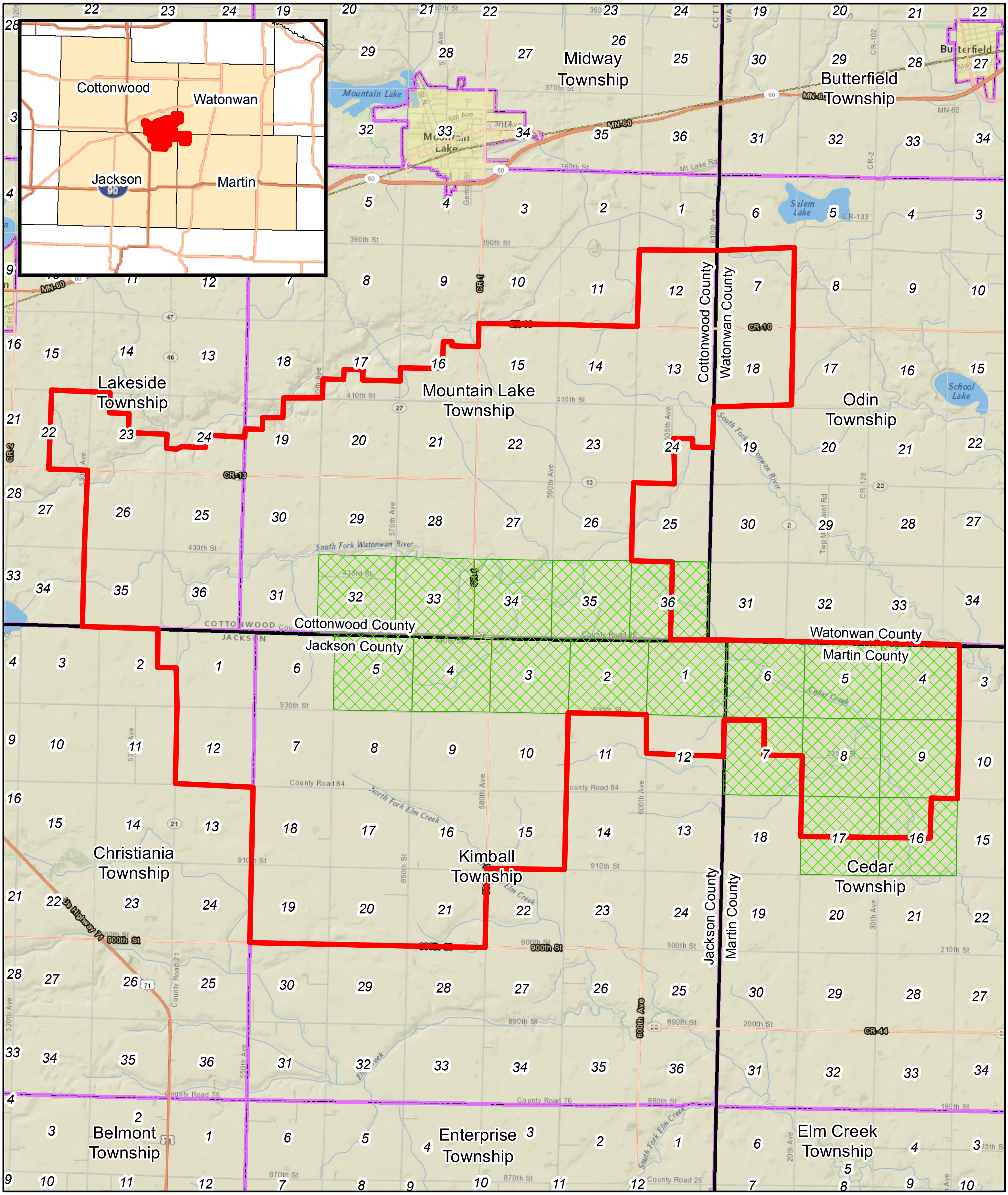
We look forward to working with you as this Project moves forward.

Sincerely,

Patrick Smith
Director of Environmental Planning

Enclosures:
Odell Wind Farm Project Location Map

5912533_2



Odell Footprint

Route Evaluation Area

County

County Subdivisions

GERONIMO ENERGY

0 0.75 1.5 3

Miles

ODELL WIND FARM

Cottonwood, Jackson, Martin, & Watonwan Counties, MN

Project Location Map

Document Path: O:\GIS\GISData\Projects\Odell Wind Farm\Projects\OD_ProjectLocationMap_05232013_CJ.mxd

cjjenson Date: 5/24/2013

Board of County Commissioners
Cottonwood County

900 Third Avenue
Windom, Minnesota 56101
Phone: 507.831.5669 FAX: 507.831.1183
E- mail: kelly.thongvivong@co.cottonwood.mn.us
Website: www.co.cottonwood.mn.us

May 28, 2013

Geronimo Energy
7650 Edinborough Way, Suite 725
Edina, MN 55435

To Whom It May Concern:

Cottonwood County is aware that wind is a clean, abundant, renewable, domestic and accessible source of energy, the use of which is promoted by Geronimo Energy, U.S. Department of Energy and other federal, state, and local agencies and organizations as safe, economical, technically proven, non-polluting and an important part of the state's energy generation mix.

Cottonwood County encourages the development of wind farms while still maintaining the health and safety for the residents of the county. We also believe that the development of these types of projects will provide numerous temporary construction jobs and high paying permanent jobs, which will have a long lasting positive economic impact for the residents of Cottonwood County and provide significant economic development to the local townships when built.

The Board of Commissioners of Cottonwood County gives our support to Geronimo Energy for the expansion of the Odell Wind Farm project, with the first phase being the construction of approximately 119 turbines in Cottonwood, Jackson, Martin and Watonwan Counties.

Sincerely,

John W. Oeltjenbruns

John Oeltjenbruns
County Board Chairman

RESOLUTION 13-184
IN SUPPORT OF ODELL WIND FARM

WHEREAS, Jackson County is committed to the promotion, use, and development of wind energy as a renewable energy source; and

WHEREAS, the Odell Wind Farm, a phased project spanning 35,000 acres, is under development in Cottonwood, Jackson, Martin and Watonwan Counties; and

WHEREAS, when fully developed, the Odell Wind Farm would represent a total investment of roughly $310 million and bring tax revenues of approximately $875,000 per year to the Counties and Townships; and

WHEREAS, developments such as the Odell Wind Farm bring good paying jobs, as well as an environmentally sound energy source to Southwest Minnesota and Jackson County.

NOW, THEREFORE, BE IT RESOLVED that the Jackson County Board of Commissioners hereby supports Geronimo Wind Energy in their development of the Odell Wind Farm in Jackson County.

Adopted this 28th day of May 2013.

William Tusa, Chairman

ATTEST: Janice Fransen
Janice Fransen, County Coordinator

June 14, 2013

Geronimo Energy
7650 Edinborough Way, Suite 725
Edina, MN 55435

Attention: Jordan Burmeister, Project Manager

Re: Odell Wind Farm Project

TO WHOM IT MAY CONCERN:

The Economic Development Authority of Windom promotes economic development in the City of Windom, Minnesota, and surrounding areas. The EDA engages in activities to provide technical assistance to existing industrial and commercial businesses and to attract new industrial and commercial enterprises to Windom and surrounding areas. In its activities, the EDA acknowledges the importance of energy to retain and grow existing businesses and entice new enterprises to locate in Southwestern Minnesota.

Wind is a domestic source of abundant, accessible, clean and renewable energy. Wind energy is an ever-growing component of the overall energy production required to power business, commerce, and residential homes and developments. Wind energy is recognized by the U.S. Department of Energy and other federal, state and local agencies and organizations as a safe, economical, proven, and non-polluting component of Minnesota's energy generation system.

The EDA applauds Geronimo Energy for its efforts in planning for the development of a wind energy generation system in Southwestern Minnesota and fostering cooperation among landowners, businesses, contractors, legislators, and other interested parties to help make the Odell Wind Farm a reality.

The construction and operation of the Odell Wind Farm will provide jobs for the area's workforce and draw additional skilled workers to Southwestern Minnesota. These employment opportunities will create long-term positive economic effects for the entire area.

The Economic Development Authority of Windom and its Board of Commissioners support Geronimo Energy's efforts in the construction of approximately 119 wind turbines in Cottonwood, Jackson, Martin and Watonwan Counties as the first phase of the Odell Wind Farm Project.

Sincerely,

Aaron A. Backman

Aaron A. Backman, Executive Director
Economic Development Authority of Windom

AAB:mah

ECONOMIC DEVELOPMENT AUTHORITY OF WINDOM ✦ BUILDING AND ZONING OFFICE
444 Ninth Street • PO Box 38 • Windom, MN 56101
Phone: 507-831-6125 Fax: 507-831-6142

Resolution
In Support of Odell Wind Farm

WHEREAS: The Jackson Economic Development Corporation (JEDC) has as its mission to "strengthen the local economy by bringing new businesses and industries to the Jackson area and helping existing businesses prosper," and

WHEREAS: The Odell Wind Farm, a phased project spanning 35,000 acres, is development in Cottonwood, Jackson, Martin and Watonwan Counties; and

WHEREAS: when fully developed, the Odell Wind Farm would represent a total investment of roughly $310 million and bring tax revenues of approximately $875,000 per year to the Counties and Townships; and

WHEREAS: Developments such as Odell Wind Farm bring high paying jobs, as well as an environmentally sound energy source to Southwest Minnesota and Jackson County.

NOW, THEREFORE, BE IT RESOLVED that the JEDC hereby supports Geronimo Wind Energy in their development of the Odell Wind Farm in Jackson County.

Adopted this 22nd day of October 2013.

Clayton Lewis, President

ATTEST:

Bradley W. Anderson, Secretary