

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

POST-CONSTRUCTION REPORT GUIDELINES

- Below is an outlined guide of what we are looking for in the annual and final post-construction reports.
 - Some general guidelines include:
 - Explain all methods used in detail.
 - Provide all equations and methods used for all calculations
 - Provide average, range, confidence intervals, *p* values, and other statistics where applicable.
 - Provide raw data as Appendices or as accompanying files on a CD.
 - For final reports, include all years of study reporting on each individual year, as well as overall results and trends, detailing any similarities and/or difference between years of study.
 - All reports are due January 1 following that years data collection. Reports need to be sent to the Regional Environmental Assessment Ecologist for the projects location and to the Natural Heritage Review Coordinator.
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1. Executive Summary

2. Introduction

- a. Description of project area
 - i. Map of site including turbine locations, roads, transmission lines, substation, etc.
 - ii. Distribution, number and size of turbines (height, MW, etc.)
 - iii. Location of project (state, county, township, etc.)
 - iv. Any other general information
- b. Habitat/landcover
 - i. Landcover types – map and percentages of each
 - ii. Critical or unique habitats identified
- c. Wind speed
 - i. Overall wind speed and direction (wind rose)
 - ii. Prevailing winds from which direction and what times of the year

3. Methods

- a. Carcass searches
 - i. Turbines & search area
 1. No. turbines searched
 2. How turbines selected
 3. Dates of survey
 4. Time of day searched
 5. Maps of each turbine's search plot delineating vegetation classes and habitat
 6. Table showing searchable area in each vegetation class for each turbine
 - ii. Search methods
 - iii. Incidental kills – how documented

- b. Mortality Patterns
 - i. Temporal patterns - seasonal
 - ii. Spatial patterns - distance from turbine
 - iii. Weather and generation associations - how collected and analyzed
 - 1. Temperature
 - 2. Wind speed
 - 3. Other variables (MW, rotor sweep zone, etc.)
 - iv. Age, species, and gender
- c. Mortality estimates and adjustment– methods used showing all equations used (see last page of guidelines for mortality equations)
 - i. Searcher efficiency trials & scavenger removal trials
 - 1. Searcher efficiency methods
 - 2. Scavenger removal methods
 - 3. Searcher efficiency and scavenging removal corrections (SESR) – methods and equations used
 - ii. Searchable area corrections
- d. Mortality and habitat (landcover) correlations

4. Results

- a. Carcass searches
 - i. Overall data
 - 1. Summary of search effort
 - a. Average time each turbine searched
 - b. # days surveys conducted
 - c. Explanation why any days and/or turbines were not surveyed
 - 2. Bird carcasses
 - a. Total No. found
 - b. Breakdown by turbine
 - c. Breakdown by species
 - d. Breakdown by date, month, etc.
 - e. Alive, injured, sent to rehab, etc.
 - 3. Bat carcasses
 - a. Total No. found
 - b. Breakdown by turbine
 - c. Breakdown by species
 - d. Breakdown by date, month, etc.
 - e. Alive, injured, sent to rehab, etc.
 - 4. Maps showing carcass location at each search turbine, broken down in 10 m increments; any trends?
 - ii. Temporal patterns - Seasonal distribution of mortality
 - 1. Day
 - 2. Week
 - 3. Month
 - iii. Spatial patterns
 - 1. Distance from turbines
 - 2. Direction from turbine (showing N, S, E, W)

- iv. Weather and generation associations
 - 1. Temperature
 - 2. Wind speed
 - 3. Other variables (MW, rotor sweep zone, etc.)
- v. Age, species, and gender
 - 1. Males vs. females
 - 2. Species
 - 3. Adults vs. juveniles
- b. Mortality estimates and adjustments (see pages 6- 8 for guidance)
 - i. Searcher efficiency trials & scavenger removal trials
 - 1. Searcher efficiency
 - a. Overall searcher efficiency average and range
 - b. Individual searcher average and range
 - c. No. trials and searcher efficiency broken down by bat carcasses, bird carcasses, vegetation class, and date of trial
 - d. Fresh vs. frozen, intact vs. broken, colored vs. dull (birds), etc. and effects on searcher efficiency if any
 - 2. Carcass removal
 - a. Overall average No. days before carcass removal and range
 - b. Average and range of all bat carcass removal trials and all bird carcass removal trials
 - c. No. trials broken down by bat species and bird species
 - d. No. trials and mean carcass removal broken down by bats carcasses, bird carcasses, vegetation class, and date of trial
 - e. Fresh vs. frozen, intact vs. broken, colored vs. dull (birds), etc. and effects on carcass removal time if any
 - f. Carcass removal by vegetation class
 - 3. Searcher efficiency and scavenging removal (SESR) Corrections
 - ii. Searchable area corrections
 - iii. Mortality estimates and adjustments
 - 1. Bats
 - a. Total estimated No. of bats killed at site
 - b. Bats/turbine/year include confidence interval
 - c. Bats/MW/year include confidence interval
 - d. Bats/ft² of rotor area/year include confidence interval
 - 2. Birds
 - a. Total estimated No. of birds killed at site
 - b. Birds/turbine/year include confidence interval
 - c. Birds/MW/year include confidence interval
 - d. Birds/ft² of rotor area/year include confidence interval
 - 3. Turbines with greatest/least kills
 - 4. Other trends?
- c. Correlation of mortality and Weather data
 - i. Temperature
 - ii. Wind speed
 - iii. Other variables
- d. Note any other trends observed

5. Discussion

- a. Avian mortality
- b. Bat mortality
- c. Implications of results
- d. Suggestions for improvements to protocol
- e. Any recommended adjustments for this site for next year's surveys
- f. If final report, discuss entire study (both years)

6. References

7. Data sheets

- a. Mortality datasheets
 - i. Cover
 - ii. GPS location of all wind turbines
 - iii. Description of wind turbine searched for carcass (using Anderson Level III land cover codes)
 - iv. Daily Search Summary
 - v. Carcass Data Sheet
- b. Searcher efficiency data
- c. Carcass removal data

Mortality Estimate: Please use at least these methods to determine mortality; other methods are welcome and encouraged as long as they are done in addition to the below method.

To estimate the time that carcasses persisted in the study plots, the average time that a carcass was present in scavenger removal trials, t , was calculated. Because trials were halted after X days, the data are right-censored, and this was compensated for by estimating the mean time to removal using a maximum likelihood estimator for t using the following formula:

$$\bar{t} = \frac{\sum_{i=1}^s t_i}{s - s_c}$$

where s = the number of test carcasses used in search trials, s_c = the number of test carcasses that remained in the study area at the end of the 14-day removal trial, and t_i = the number of days carcass i remains in the search area. The probability that a carcass would be detected by searchers (p) was assessed through searcher efficiency trials. The estimate of p was calculated as the number of trial carcasses found by searchers divided by the total number of successful trials (excluding trials where the carcasses were not found by searchers and were also not found later that day by testers; these carcasses were assumed to be scavenged).

Erickson et al.'s (2004) mortality estimator calculates a per-turbine annual fatality rate (m) as:

$$m = \frac{c}{\hat{\pi}}$$

where c is the mean number of carcasses observed per turbine, and $\hat{\pi}$ adjusts for both carcass removal and observer detection under the assumption that carcass removal times (t_i) follow an exponential distribution:

$$\hat{\pi} = \frac{\bar{t} \cdot p}{I} \cdot \left[\frac{e^{\frac{I}{t}} - 1}{e^{\frac{I}{t}} - 1 + p} \right].$$

This searcher-efficiency, scavenger-removal (SESR) corrected estimate was calculated separately for each turbine, using the averaged figures of t and p . Because searches were conducted daily, I (the search interval) = 1.

Individual SESR-adjusted mortality figures for each turbine were adjusted for searchable area using two different methods. Finally, the estimated total annual mortalities for the searched turbines were summed and adjusted for the proportion of turbines searched. The final result is an estimate of the total mortality.

A confidence interval for the corrected estimate of total mortality is determined by bootstrapping the trials of carcass persistence and efficiency.

Bootstrapping Guidance:

The statistic whose confidence limits we are interested in calculating is the total fatality at a site. You have sampled a subset of turbines at the site and should have three different data sets that need to be combined in order to calculate fatality: Searcher efficiency (SE) trial data, carcass persistence (CP) trial data, and the actual casualty data. Your SE and CP trials should be able to estimate different parameters for different size classes of birds and bats and perhaps different seasons. It is critical that you have an adequate sample size to estimate each parameter. It is critical to remember the parameter that we are interested in bootstrapping is the fatality. We do not have a closed form estimate of its variance, so we need to bootstrap it. We cannot bootstrap the SE separately from the CP then apply them once to estimate fatality. We need to bootstrap sample each of these at each iteration. Because this process involves three bootstrap samples, there is no canned software that will carry this out but an experienced programmer should be able to calculate this in R or C or C++ or SAS. Please do not even think about doing it in Excel.

March 10, 2010

Mr. Kevin Mixon
Regional Environmental Assessment Ecologist
Minnesota Department of Natural Resources
Division of Ecological Resources Region 4
261 Highway 15 South
New Ulm, MN 56073-8915

RE: Prairie Rose Wind Farm and 115 kV Transmission Line in
Rock and Pipestone Counties, MN.

Dear Mr. Mixon:

Geronimo Wind Energy LLC (Geronimo) contacted you in July 2009, requesting MNDNR comments in regards to the proposed Prairie Rose Wind Project in Rock County, Minnesota.

Recently, the project boundary has changed and now includes additional sections adjacent to the previous project boundary (Figure 1-2) in Rock and Pipestone Counties. The project nameplate capacity will be 101 MW. In addition, Geronimo is proposing to construct a 115 kV High Voltage Transmission Line (HVTL) which would run between the project substation, located within the wind farm project boundary, and Xcel Energy's Split Rock Substation, located near Brandon, SD. The proposed route would run parallel to Rock County Highway 7 and Rose Dell Township Road 72 (Figure 1-1). This spring, Geronimo will submit a Site Permit Application for a Large Wind Energy Conversion System and a Route Permit Application for a HVTL to the Minnesota Public Utilities Commission (PUC).

Typically, wind facility construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, and an underground and/or aboveground 34.5 kV collector system. Although final turbine locations, access roads, and electrical connections have not been determined at this time, the tables below identify Township sections potentially affected by the project:

Table 1 – Original Sections within the Project Boundary

Township Name	Township	Range	Sections
Denver	104N	45W	7, 18, 19, 30
Rose Dell	104N	46W	11-16, 21-27, 34 and 35

Table 2 – Updated Sections within the Project Boundary

County	Township Name	Township	Range	Sections
Rock	Rose Dell	104N	46W	1-2, 28, 33
Rock	Denver	104N	45W	2-6, 8-10, 15-17, 20-22, 27-29, and 31-34
Rock	Springwater	103N	46W	1-4, 9-12
Pipestone	Elmer	105N	45W	20, 29-30, 31-34
Pipestone	Eden	105N	46W	36

Table 3 – Proposed Transmission Line Corridor

Township Name	Township	Range	Sections
Rose Dell	104N	46W	27-34
Rose Dell	104N	47W	25, 26, 35, 36

We welcome any comments the Minnesota Department of Natural Resources may have at this time or throughout the permit application process. Table 1 identifies the original sections within the Project boundary, Table 2 identifies updated sections within the expanded Project boundary, and Table 3 identifies sections adjacent to the proposed transmission line. In particular, HDR requests you review the sections located in Rose Dell, Denver, Springwater, Elmer, and Eden townships, identified in Tables 1, 2, and 3 for any comments on the new expansion areas.

Geronimo received a letter from you dated August 3, 2009. Geronimo has committed to conducting preconstruction surveys this spring to identify the presence of wetlands and wet features (including Topeka shiner habitat), native prairie, and bedrock outcrops, which will be considered during final micro-siting of project facilities.

Enclosed are maps detailing the location and project boundary of the Prairie Rose Wind Farm and 115 kV Transmission Line. If you require further information or have questions regarding this matter, please call me at (763) 591-5479.

Prairie Rose Wind Project
Minnesota Department of Natural Resources
March 10, 2010

Sincerely,

A handwritten signature in black ink that reads "Mike DeRuyter". The signature is written in a cursive style with a long horizontal stroke extending from the end of the name.

Mike DeRuyter
Environmental Scientist

Enclosures:

Figure 1-1 - Project Location Map (Transmission Line)

Figure 1-2 – Project Location Map (Wind Farm)

Cc: Patrick Smith, Geronimo Wind Energy, LLC

March 10, 2010

Ms. Lisa Joyal
Minnesota Department of Natural Resources
Natural Heritage Program
500 Lafayette Road
St. Paul, MN 55155-4025

RE: Prairie Rose Wind Farm and 115 kV Transmission Line in
Rock and Pipestone Counties, MN.

Dear Ms. Joyal:

Geronimo Wind Energy LLC (Geronimo) contacted you in October 2008, requesting a search of the Natural Heritage Information Service (NHIS) database and DNR comments in regards to the proposed Prairie Rose Wind Project in Rock County, Minnesota.

Recently, the project boundary has changed and now includes additional sections adjacent to the previous project boundary (Figure 1-2) in Rock and Pipestone counties. The project nameplate capacity will be 101 MW. In addition, Geronimo is proposing to construct a 115 kV High Voltage Transmission Line (HVTL) which would run between the project substation, located within the wind farm project boundary, and Xcel Energy's Split Rock Substation, located near Brandon, South Dakota. The proposed route would run parallel to Rock County Highway 7 and Rose Dell Township Road 72 (Figure 1-1). This spring, Geronimo will submit a Site Permit Application for a Large Wind Energy Conversion System and a Route Permit Application for an HVTL to the Minnesota Public Utilities Commission (PUC).

Typically, wind facility construction includes erecting wind turbines and constructing associated facilities such as gravel access roads and an underground and/or aboveground 34.5 kV collector system. Although final turbine locations, access roads, and electrical connections have not been determined at this time, the tables below identify Township sections potentially affected by the project:

Table 1 – Original Sections within the Project Boundary

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Table 3 – Proposed Transmission Line Corridor

Township Name	Township	Range	Sections
Rose Dell	104N	46W	27-34
Rose Dell	104N	47W	25, 26, 35, 36

We welcome any comments the Minnesota Department of Natural Resources may have at this time or throughout the permit application process, and request a revised search of the NHIS database. Table 1 identifies the original sections within the Project boundary, Table 2 identifies updated sections within the expanded Project boundary, and Table 3 identifies sections adjacent to the proposed transmission line. In particular, HDR requests you review the sections located in Rose Dell, Denver, Springwater, Elmer, and Eden townships, identified in Tables 1, 2, and 3, for NHIS data in the new expansion areas.

Geronimo received NHIS response # ERDB 20090193 on November 14, 2008, which detailed the known occurrences of rare species in the vicinity of the project, as well as Minnesota County Biological Survey Sites of Biodiversity Significance in the original project boundary. In addition, the attached e-mail correspondence includes follow-up conversations between Geronimo and the DNR after the NHIS response was received. Geronimo has committed to conducting preconstruction surveys this spring to identify the presence of native prairie and bedrock outcrops, which will be considered during final micro-siting of project facilities.

Prairie Rose Wind Project
Minnesota Department of Natural Resources
March 10, 2010

Enclosed are maps detailing the location and project boundary of the Prairie Rose Wind Farm and 115 kV Transmission Line. If you require further information or have questions regarding this matter, please call me at (763) 591-5479.

Sincerely,

A handwritten signature in black ink that reads "Mike DeRuyter". The signature is written in a cursive style with a long horizontal stroke extending to the right.

Mike DeRuyter
Environmental Scientist

Enclosures:

Figure 1-1 - Project Location Map (Transmission Line)

Figure 1-2 – Project Location Map (Wind Farm)

Copy of e-mail correspondence

Cc: Patrick Smith, Geronimo Wind Energy, LLC



Minnesota Department of Natural Resources

Division of Ecological Resources – Reg. 4

261 Hwy 15 South

New Ulm, MN 56073-8915

Phone: (507) 359-6073 Fax: (507) 359-6018 E-mail: kevin.mixon@dnr.state.mn.us

April 30, 2010

Mr. Mike DeRuyter
HDR Engineering
701 Xenia Avenue South
Minneapolis, MN 55416

RECEIVED
MAY - 4 2009
HDR Engineering, Inc.

In re: Prairie Rose Wind Farm
Revised Project Boundary Review
Rock County, MN

Dear Mr. DeRuyter:

The Minnesota Department of Natural Resources (DNR) has received information concerning the revised project boundary for the above referenced wind project located in Rock County, MN. This letter supplements the DNR letter dated August 3, 2009 that was based on the original project boundary. The DNR is providing the following comments as a mechanism to collaboratively work together to identify potential natural resource issues that should be considered during project development.

The DNR recommends the large Conservation Reserve Program properties be avoided and an appropriate setback be established in order to reduce potential mortality and avoidance of the habitat by avian species. Further coordination should occur with the Farm Service Agency located in the county where the project is occurring. Contact the Farm Service Agency at (<http://www.fsa.usda.gov/FSA/stateoffapp?mystate=mn&area=home&subject=landing&topic=landing>) to coordinate the locations and potential issues concerning these properties.

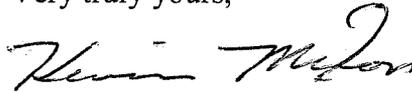
Project developers crossing (over, under, or across) any state land or public water with any utility (power lines, including feeder lines) need to secure a DNR license to cross (Minnesota Statue 84.415). Information on how to obtain a License for Utility can be found at http://www.dnr.state.mn.us/permits/utility_crossing/index.html. For information on where the Public Waters are located in your project area go to the following site and click on the Public Waters Inventory (PWI) Maps Download button: http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/download.html

This review constitutes an office review only and is not a substitute for reviewing potential turbine placement in the field. The DNR will provide review comments that are site specific to the proposed tower locations, transmission lines, and access roads. The DNR may request a site visit or meeting when potential turbine locations are determined.

Minnesota Administrative Rules 7836.0500, Subpart 7, requires the applicant to analyze potential environmental impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided. Groundwater resources, surface waters, wetlands, vegetation, wildlife, rare and unique natural resources, etc. are included. In order to address the potential environmental impacts the applicant should resolve all outstanding issues with the DNR prior to applying for the Site Application Permit from the Public Utilities Commission. The applicant is strongly encouraged to resolve the issues outlined in the DNR Natural Heritage Information System letter dated April 28, 2010 concerning rare features and surveys.

The DNR looks forward to working in a positive and collaborative manner on this project to ensure that sustainable energy sources are developed while protecting Minnesota's natural resources. Please contact me directly at 507-359-6073 if you have any questions.

Very truly yours,



Kevin Mixon
Regional Environmental Assessment Ecologist
Division of Ecological Services

Cc: Lisa Joyal, DNR
John Schladweiler, DNR
Ken Varland, DNR
Wendy Krueger, DNR
Jamie Schrenzel, DNR
Randall Doneen, DNR
Bob Hobart, DNR
Lisa Gelvin-Innvaer, DNR
Ben Schaefer, DNR
Paul Hansen, DNR
Rich Davis, U.S. FWS



Minnesota Department of Natural Resources

Division of Ecological Resources, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-4025

Phone: (651) 259-5109 E-mail: lisa.joyal@state.mn.us

April 30, 2010

Correspondence # ERDB 20090193-0003

Mike DeRuyter
HDR Engineering, Inc.
701 Xenia Avenue South, Suite 600
Minneapolis, MN 55416

RE: Natural Heritage information in the vicinity of the proposed Prairie Rose Wind Farm

County	Township (N)	Range (W)	Section(s)
Rock	104	47	25, 26, 35, 36
	104	46	1, 2, 11-14, 21-36
	104	45	2-10, 15-22, 27-34
	103	46	1-4, 9-12
Pipestone	105	45	20, 29-34
	105	46	36

Dear Mr. DeRuyter,

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 revised project boundary. Because the changes to the project boundary are substantial, this letter replaces the previous Natural Heritage letter dated November 14, 2008. The query results identify several rare features that 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 address the following issues in the Public Utilities Commission (PUC) Site Permit Application for this project:

- Blanding’s turtles (*Emydoidea blandingii*), a state-listed threatened species, have been reported from the vicinity of the proposed project. Although we have no records from directly within the project site, turtles have been documented in Poplar Creek which extends into the project boundary and may occur in the wetlands and waterways within the project boundary. Blanding’s turtles also use upland areas up to and over a mile distant from wetlands and streams. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Because of the tendency to travel long distances over land, Blanding’s turtles regularly travel across roads and are therefore susceptible to collisions with vehicles. Any added mortality can have a large impact to populations of Blanding’s turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels. Other factors contributing to the decline of this species include wetland drainage and degradation, and the development of upland habitat.

For your information, I have attached a Blanding’s turtle fact sheet that describes the habitat use and life history of this species. The fact sheet also provides two lists of recommendations for avoiding and minimizing impacts to this rare turtle. **Please refer to the first list of recommendations for your project.** These include specific recommendations regarding wetlands, utilities, and vegetation management that will pertain to this project. If greater protection for turtles is desired, the second list of additional recommendations can also be implemented. For further assistance regarding the Blanding’s turtle, please contact Lisa Gelvin-Innvaer, DNR Regional Nongame Specialist, at 507-359-6033.

The attached flyer should be given to all contractors working in the area. If Blanding's turtles are encountered on site, please remember that state law and rules prohibit the destruction of threatened or endangered species, except under certain prescribed conditions. If turtles are in imminent danger they should be moved by hand out of harm's way, otherwise they should be left undisturbed. Please report observations of Blanding's turtles in the project area to Lisa Gelvin-Innvaer.

- The streams within the project boundary are either federally designated as critical habitat for the Topeka shiner (*Notropis topeka*), a federally-listed endangered and state-listed special concern species, or flow into waterways that are federally designated as such. The plains topminnow (*Fundulus sciadicus*), a state-listed species of special concern, has also been documented in these streams. These two species are adversely impacted by actions that alter stream hydrology or decrease water quality. To minimize potential impacts, please see the enclosed recommendations for working in Topeka shiner habitat.
- Burrowing owls (*Speotyto cunicularia*), a state-listed endangered species, have nested in pastures within the project boundary in the past, and in 2007 this species successfully nested in a soybean field less than five miles from the project boundary. Burrowing owls typically use open, grazed pastures or native prairies populated by burrowing mammals. Given the extreme rarity of this species, the existence of suitable habitat within the project boundary, the proximity of a recent nest, and the potential risk of this species for collisions with wind turbines (see <http://www.energy.ca.gov/2008publications/CEC-500-2008-080/CEC-500-2008-080.PDF>), we recommend that a pre-construction survey for burrowing owls be conducted to determine if they are currently using the area and, if so, to assist in the placement of the turbines (the USFWS recommends a ¼ mile buffer from burrowing owl territories; see http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html). Please contact me before any survey work is initiated, as we will need to discuss potential surveyors, survey protocol, and other requirements.

Other rare grassland birds have also been documented in the area: the short-eared owl (*Asio flammeus*; this record is not on the enclosed reports), a state-listed bird of special concern, and the upland sandpiper (*Bartramia longicauda*), a Species in Greatest Conservation Need as identified in Minnesota's Comprehensive Wildlife Conservation Strategy (<http://www.dnr.state.mn.us/cwcs/index.html>). Wind farms can affect birds due to collision mortality, displacement due to disturbance, habitat fragmentation, and habitat loss. Potential impacts to grassland birds are a significant concern because many of these species are declining in number nationwide. Given the potential for grassland birds in the area, the proximity of the project to Sites of Biodiversity Significance and native prairie, and the potential for wind turbines to cause avian mortality, we also encourage pre- and post-construction avian monitoring in general.

- The Minnesota County Biological Survey (MCBS) has identified several Sites of Biodiversity Significance within the project boundary. 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 (for more information please refer to the enclosed MCBS guidelines). The Sites within the project boundary contain rare native plant communities and several state-listed plants and animals. Two of the native plant communities, Mesic Prairie and Crystalline Bedrock Outcrop: Sioux Quartzite Subtype, have a state rank of 2, which means that they are imperiled in Minnesota and are very vulnerable to

extirpation from the state. The other two communities, Basswood – Bur Oak – (Green Ash) Forest and Seepage Meadow/Carr Tussock: Sedge Meadow, have a state rank of 3 and are also vulnerable to extirpation in Minnesota. (GIS shapefiles of MCBS Sites of Biodiversity Significance and MCBS Native Plant Communities can be downloaded from the DNR Data Deli at <http://deli.dnr.state.mn.us>.) Given the rarity of these communities and the presence of state-listed plants and animals (see more detailed discussion below), we recommend avoidance of all Sites of Biodiversity Significance (except those rated ‘Below’) regardless of property ownership (please see the enclosed map). Avoidance of these areas will alleviate most of the Natural Heritage concerns addressed in this letter. A short summary of the Sites located within the project is listed below. A more detailed discussion of the different native plant communities follows this Site summary.

- The Sites of Moderate Biodiversity Significance in T104N R46W Section 2 (#85 and 86 on enclosed map), T104N R45W Section 34 (#189), T104N R46W Section 27 (#102), and T104N R46W Section 34 (#112) contain Crystalline Bedrock Outcrops and several state-listed plants.
- The Site of Moderate Biodiversity Significance (#52) in T105N R45W Sections 31 and 32 contains state-listed plants and Crystalline Bedrock Outcrop and Seepage Meadow/Carr Tussock native plant communities.
- The Site of Moderate Biodiversity Significance (#51) adjacent to Poplar Creek and its tributaries is an important buffer that likely provides habitat for Blanding’s turtles and also allows the natural meandering of streams designated as critical habitat for Topeka shiners.
- The Site of Moderate Biodiversity Significance (#110) in T104N R45W Section 32 contains Crystalline Bedrock Outcrops and a buffer around Beaver Creek which is federally designated as critical habitat for Topeka shiners.
- The Sites of High Biodiversity Significance (#10 and 212) in T104N R46W Section 28 contain over 400 acres of native prairie and abundant rock outcrops that are in excellent condition. This is one of the best outcrop areas on private land in Minnesota and numerous state-listed plants have been documented here.
- Several Sites of High Biodiversity Significance (#68, 192, 193, and 194) along ridge on the eastern edge of the project boundary contain Mesic Prairie, Crystalline Bedrock Outcrop and Seepage Meadow/Carr Tussock native plant communities. Again, several state-listed plants have been documented here.
- Routing the proposed transmission line south of Highway 7 and Township Road 72 will avoid impacting two Sites of Moderate Biodiversity Significance (#15 and 211).
- Sites ranked as Below do not meet the minimum biodiversity threshold for statewide significance. These sites, however, 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.

- The Crystalline Bedrock Outcrops within the project boundary contain several state-listed endangered (Wolf's spike-rush, *Eleocharis wolfii*; blackfoot quillwort, *Isoetes melanopoda*; hairy water clover, *Marsilea vestita*) and threatened (pigmyweed, *Crassula aquatica*; short-pointed umbrella-sedge, *Cyperus acuminatus*; mud plantain, *Heteranthera limosa*; slender plantain, *Plantago elongata*) plant species. These rare species are part of the distinctive flora that exists in bedrock outcrop communities. This flora consists of many species of vascular plants, mosses, and lichens that occur in no other habitat in Minnesota. Rock outcrop communities are small features that are embedded in a matrix of prairie, savanna, woodland, forest, or marsh vegetation. They are perhaps more usefully considered as an assemblage of several plant communities including a bare rock community composed mostly of lichens, a crevice and thin soil community with specialized vascular plants, a deeper soil community with prairie or woodland species, and a rainwater pool community supporting aquatic plants. The outcrops within the project area are a rare subtype of bedrock outcrop that has been documented on quartzite at scattered locations in Rock, Pipestone, and Cottonwood counties.

Given the rarity of these communities and the presence of state-listed threatened and endangered plants, **bedrock outcrop communities within the project area will need to be avoided.** 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 note that issuance of permits is discretionary, negotiations can take several months, and the applicant must document that there are no feasible alternatives to the taking.

In addition, please note that Crystalline Bedrock Outcrop native plant communities (of which jurisdictional wetlands are a part) qualify as "Rare Natural Communities" under the Minnesota Wetland Conservation Act. Minnesota Rules 8420.0548, Subp. 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, the DNR Wetlands Program Coordinator, at 651-259-5125.

- As noted above, the project area contains several native prairie remnants. In the mid-1800s, eighteen million acres of prairie covered Minnesota. 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.
 - Western prairie fringed orchids (*Platanthera praeclara*), a federally-listed threatened and state-listed endangered plant species, have been documented within a prairie remnant just outside of the project area. Western prairie fringed orchids usually occur in remnant native prairies and sedge meadows, but have also been observed at disturbed sites.
 - The phlox moth (*Schinia indiana*), a state-listed species of special concern, has been documented in nearby prairie remnants.
 - As mentioned above, several rare grassland birds have the potential to use the native prairie remnants within the project boundary.

Given the rarity of this native plant community, the potential for state-listed species to occur within it, and the presence of the bedrock communities embedded within the prairies, disturbance within prairie remnants should be avoided. **Please contact me if avoidance of prairie remnants is not feasible**, as animal and botanical surveys will likely be required. We will need to discuss potential contractors, survey protocol, and other requirements before any survey work is initiated.

If applicable, please send me a copy of the native prairie protection and management plan (Section III.C.6. of the Site Permit). The plan should include measures to avoid impacts to native prairie and measures to mitigate for impacts if unavoidable.

- MCBS has also identified two Seepage Meadow/Carr Tussock native plant communities in the project boundary within Sites of Biodiversity Significance. These native plant communities may provide habitat for the western prairie fringed orchid and may qualify as “Rare Natural Communities” under the Minnesota Wetland Conservation Act. **Please contact me if avoidance of these wetlands is not feasible**, as botanical surveys will likely be required.
- 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 it is determined that the project or requisite surveys will impact any species listed as either endangered or threatened, you will need to contact Rich Baker, Minnesota Endangered Species Coordinator, at 651-259-5073 to discuss the endangered species permitting process.
- The PUC Site Permit Application should clearly document the potential impacts to the above rare features, and identify any avoidance or mitigation measures (e.g., fact sheet recommendations) that will be implemented.
- Please send me a copy of the Preconstruction Biological Preservation Survey (Section III.D.1. of the Site Permit) required by the PUC.
- Given the presence of federally-listed species (western prairie fringed orchid and Topeka shiner) within and near the project area, I recommend that you contact the U.S. Fish & Wildlife Service, at 612 725-3548, to discuss all applicable federal regulations.
- Further guidance on wind farm siting can be found at http://www.fws.gov/midwest/Eco_Serv/wind/index.htm.

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 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.

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.**

This letter 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, Kevin Mixon, at 507-359-6073. 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
Natural Heritage Review Coordinator

enc. Rare Features Database: Index Report
Rare Features Database: Detail Report
Rare Features Database Reports: An Explanation of Fields
Blanding's Turtle Fact Sheet and Flyer
USFWS Topeka Shiner Recommendations
MCBS Guidelines
Map

cc: Jamie Schrenzel, DNR
Doug Norris, DNR
Rich Baker, DNR
Fred Harris, DNR
Kevin Mixon, DNR
Lisa Gelvin-Innvaer, DNR
Richard Davis, USFWS
Phil Delphey, USFWS

Printed April 2010
Data valid for one year

Minnesota Natural Heritage Information System
Index Report of records within 1 mile radius of:
ERDB #20090193-0003 - Prairie Rose Wind Farm
Multiple TRS
Pipestone and Rock Counties

Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	State Rank	Global Rank	Last Observed Date	EO ID #
Vertebrate Animal						
<u>Bartramia longicauda</u> (Upland Sandpiper) #221 T103N R45W S7 ; Rock County		NON	S4B	G5	1989-06-05	9749
<u>Emydoidea blandingii</u> (Blanding's Turtle) #1064 T105N R45W S35, T105N R45W S25 ; Pipestone County		THR	S2	G4	1996-07-25	34467
<u>Fundulus sciadicus</u> (Plains Topminnow) #19 T105N R45W S26, T105N R45W S27 ; Pipestone County		SPC	S3	G4	2006-07-18	33481
<u>Fundulus sciadicus</u> (Plains Topminnow) #26 T105N R45W S33 ; Pipestone County		SPC	S3	G4	2007-05-24	35215
<u>Notropis topeka</u> (Topeka Shiner) #41 T105N R45W S26, T105N R44W S31, T105N R45W S36, T105N R45W S27, T [...] ; Pipestone County	LE	SPC	S3	G3	2008-05-(28-30)) or 2008-06-(25-26) Pipestone	22341
<u>Notropis topeka</u> (Topeka Shiner) #53 T104N R46W S30, T104N R46W S19 ; Rock County	LE	SPC	S3	G3	2006-05-17	23297
<u>Notropis topeka</u> (Topeka Shiner) #54 T103N R47W S2, T103N R47W S1, T103N R47W S3 ; Rock County	LE	SPC	S3	G3	2006-07-12	23296
<u>Notropis topeka</u> (Topeka Shiner) #67 T104N R45W S32, T103N R45W S5 ; Rock County	LE	SPC	S3	G3	1999-08-17	25644
<u>Notropis topeka</u> (Topeka Shiner) #68 T105N R45W S33 ; Pipestone County	LE	SPC	S3	G3	2007-05-(21 or 22 or 23)	25643
<u>Notropis topeka</u> (Topeka Shiner) #69 T105N R45W S16, T105N R45W S21 ; Pipestone County	LE	SPC	S3	G3	1999-08-17	25642
<u>Notropis topeka</u> (Topeka Shiner) #80 T104N R46W S5, T105N R46W S35, T104N R46W S3 ; Pipestone, Rock County	LE	SPC	S3	G3	2007-05-(21 or 22 or 23)	25714
<u>Speotyto cunicularia</u> (Burrowing Owl) #4 T104N R45W S9 ; Rock County		END	S1B,SNRM	G4	1983-08-19	1448
<u>Speotyto cunicularia</u> (Burrowing Owl) #18 T103N R45W S19, T103N R45W S7 ; Rock County		END	S1B,SNRM	G4	1990	8681

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Element Name and Occurrence Number	Federal Status	MN Status	State Rank	Global Rank	Last Observed Date	EO ID #
Vertebrate Animal						
<u>Speotyto cunicularia</u> (Burrowing Owl) #31 T105N R45W S30, T105N R45W S18, T105N R45W S16, T105N R45W S20, T [...]; Pipestone County		END	S1B,SNRM	G4	1988	29617
Invertebrate Animal						
<u>Lasmigona compressa</u> (Creek Heelsplitter) #284 T104N R47W S26; Rock County		SPC	S3	G5	1999-09-PRE	33754
<u>Oarisma powesheik</u> (Powesheik Skipper) #7 T104N R45W S15, T104N R45W S23, T104N R45W S22, T104N R45W S14; Rock County		SPC	S3	G2G3	1967-07-10	2677
<u>Schinia indiana</u> (Phlox Moth) #6 T104N R46W S16; Rock County		SPC	S3	G2G4	2007-06-19	34716
Vascular Plant						
<u>Bacopa rotundifolia</u> (Water-hyssop) #22 T105N R45W S32; Pipestone County		SPC	S3	G5	2006-09-29	33942
<u>Bacopa rotundifolia</u> (Water-hyssop) #23 T103N R45W S5; Rock County		SPC	S3	G5	2007-06-27	34615
<u>Buchloe dactyloides</u> (Buffalo Grass) #24 T105N R46W S23, T105N R46W S22, T105N R46W S24; Pipestone County		SPC	S3	G4G5	2008-06-04	33941
<u>Buchloe dactyloides</u> (Buffalo Grass) #27 T104N R46W S20, T104N R46W S34, T104N R46W S27, T104N R46W S28, T [...]; Rock County		SPC	S3	G4G5	2008-06-06	33967
<u>Buchloe dactyloides</u> (Buffalo Grass) #28 T103N R45W S18, T103N R45W S8, T103N R45W S7, T103N R45W S5; Rock County		SPC	S3	G4G5	2007-06-27	33968
<u>Buchloe dactyloides</u> (Buffalo Grass) #31 T104N R46W S2; Rock County		SPC	S3	G4G5	2008-05-22	34613
<u>Buchloe dactyloides</u> (Buffalo Grass) #32 T104N R45W S10, T104N R45W S26; Rock County		SPC	S3	G4G5	2008-06-05	34620
<u>Buchloe dactyloides</u> (Buffalo Grass) #35 T103N R45W S2, T104N R45W S34; Rock County		SPC	S3	G4G5	2008-06-05	35220

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Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	State Rank	Global Rank	Last Observed Date	EO ID #
Vascular Plant						
<u>Crassula aquatica</u> (Pigmyweed) #10 T104N R46W S16 ; Rock County		THR	S2	G5	2007-06-14	34600
<u>Cyperus acuminatus</u> (Short-pointed Umbrella-sedge) #9 T104N R46W S28 ; Rock County		THR	S2	G5	2006-09-25	33966
<u>Cyperus acuminatus</u> (Short-pointed Umbrella-sedge) #10 T103N R45W S5 ; Rock County		THR	S2	G5	2007-06-27	34618
<u>Elatine triandra</u> (Three Stamened Waterwort) #24 T104N R46W S34 ; Rock County		NON	SNR	G5	2008-06-24	35226
<u>Eleocharis wolfii</u> (Wolf's Spike-rush) #7 T103N R45W S7, T103N R45W S8 ; Rock County		END	S1	G3G4	2007-06-26	33965
<u>Heteranthera limosa</u> (Mud Plantain) #4 T103N R45W S5 ; Rock County		THR	S2	G5	2007-06-27	34616
<u>Isoetes melanopoda</u> (Blackfoot Quillwort) #7 T104N R46W S28 ; Rock County		END	S1	G5	2007-06-14	34608
<u>Limosella aquatica</u> (Mudwort) #3 T103N R45W S8, T103N R45W S9, T103N R45W S22, T103N R45W S26, T [...] ; Rock County		SPC	S3	G5	2008-06-10	4906
<u>Limosella aquatica</u> (Mudwort) #13 T104N R46W S28, T104N R46W S29 ; Rock County		SPC	S3	G5	2007-06-14	34607
<u>Limosella aquatica</u> (Mudwort) #14 T104N R46W S2 ; Rock County		SPC	S3	G5	2007-06-07	34611
<u>Limosella aquatica</u> (Mudwort) #15 T103N R45W S5 ; Rock County		SPC	S3	G5	2007-06-27	34617
<u>Limosella aquatica</u> (Mudwort) #19 T104N R46W S27, T104N R46W S34 ; Rock County		SPC	S3	G5	2008-06-24	35213
<u>Limosella aquatica</u> (Mudwort) #20 T103N R45W S2, T104N R45W S34 ; Rock County		SPC	S3	G5	2008-06-05	35214

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Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	State Rank	Global Rank	Last Observed Date	EO ID #
Vascular Plant						
<u>Limosella aquatica</u> (Mudwort) #21 T104N R45W S23 ; Rock County		SPC	S3	G5	2008-06-05	35216
<u>Limosella aquatica</u> (Mudwort) #22 T104N R45W S3 ; Rock County		SPC	S3	G5	2008-06-06	35217
<u>Marsilea vestita</u> (Hairy Water Clover) #4 T103N R45W S7 ; Rock County		END	S1	G5	2008-06-26	34601
<u>Marsilea vestita</u> (Hairy Water Clover) #5 T104N R46W S28 ; Rock County		END	S1	G5	2007-06-28	34604
<u>Marsilea vestita</u> (Hairy Water Clover) #6 T104N R46W S2 ; Rock County		END	S1	G5	2007-06-07	34612
<u>Marsilea vestita</u> (Hairy Water Clover) #7 T103N R45W S5 ; Rock County		END	S1	G5	2007-06-27	34619
<u>Marsilea vestita</u> (Hairy Water Clover) #10 T103N R45W S2, T104N R45W S34 ; Rock County		END	S1	G5	2008-06-05	35229
<u>Myosotis verna</u> (Forget-me-not) #19 T104N R46W S2 ; Rock County		NON	SNR	G5	2008-05-22	35231
<u>Myosotis verna</u> (Forget-me-not) #20 T104N R46W S27, T104N R46W S34 ; Rock County		NON	SNR	G5	2008-05-22	35232
<u>Myosotis verna</u> (Forget-me-not) #21 T104N R45W S23 ; Rock County		NON	SNR	G5	2008-06-05	35233
<u>Myosotis verna</u> (Forget-me-not) #22 T104N R45W S34 ; Rock County		NON	SNR	G5	2008-06-05	35234
<u>Plagiobothrys scouleri</u> (Meadow Popcorn-flower) #1 T103N R45W S8, T103N R45W S7 ; Rock County		NON	SNR	GNR	2008-06-25	34625
<u>Plagiobothrys scouleri</u> (Meadow Popcorn-flower) #2 T104N R46W S28 ; Rock County		NON	SNR	GNR	2007-06-14	34626

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Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	State Rank	Global Rank	Last Observed Date	EO ID #
Vascular Plant						
<u>Plagiobothrys scouleri</u> (Meadow Popcorn-flower) #3 T103N R45W S5 ; Rock County		NON	SNR	GNR	2007-06-27	34627
<u>Plagiobothrys scouleri</u> (Meadow Popcorn-flower) #7 T104N R45W S23 ; Rock County		NON	SNR	GNR	2008-06-05	35239
<u>Plagiobothrys scouleri</u> (Meadow Popcorn-flower) #8 T104N R45W S3 ; Rock County		NON	SNR	GNR	2008-06-06	35240
<u>Plantago elongata</u> (Slender Plantain) #5 T104N R46W S20, T104N R46W S28, T104N R46W S29 ; Rock County		THR	S2	G4	2008-06-06	34605
<u>Plantago elongata</u> (Slender Plantain) #6 T104N R46W S2 ; Rock County		THR	S2	G4	2007-06-07	34614
<u>Plantago elongata</u> (Slender Plantain) #9 T104N R46W S34 ; Rock County		THR	S2	G4	2008-06-24	35243
<u>Plantago elongata</u> (Slender Plantain) #10 T104N R45W S23, T104N R45W S10 ; Rock County		THR	S2	G4	2008-06-05	35244
<u>Plantago elongata</u> (Slender Plantain) #11 T104N R45W S34 ; Rock County		THR	S2	G4	2008-06-05	35245
<u>Platanthera praeclara</u> (Western Prairie Fringed Orchid) #83 T104N R46W S16 ; Rock County	LT	END	S1	G3	2009-07-09	31490
<u>Schedonnardus paniculatus</u> (Tumblegrass) #17 T104N R46W S29 ; Rock County		SPC	S3	G5	2007-06-14	34606

Records Printed = 61

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. For plants, taking includes digging or destroying. For animals, taking includes pursuing, capturing, or killing.

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MCBS Native Plant Communities Database:
(records within or adjacent to project boundary)

GIS shapefiles of MCBS Sites of Biodiversity Significance and MCBS Native Plant Communities can be downloaded from the DNR Data Deli at <http://deli.dnr.state.mn.us>.

	<u>MCBS NPC ID</u>	<u>Acres</u>	<u>State Rank</u>	<u>EO Rank</u>	<u>Last Observed Date</u>	<u>Comments</u>
Site of Biodiversity Significance #52 in County #59						
<u>Native Plant Community</u>						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T105N R45W Section 32	48845	0.09	2	C	2006	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T105N R45W Section 32	48847	0.11	2	C	2006	Disturbed by extremely heavy grazing.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T105N R45W Section 32	48848	2.13	2	C	2006	Disturbed by extremely heavy grazing.
Seepage Meadow/Carr Tussock: Sedge Subtype Version 2.0 Classification: WMs83a1 Version 1.5 Classification: T105N R45W Section 32	48851	2.44	3	C	2006	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T105N R45W Section 32	48852	1.35	2	C	2006	Disturbed by extremely heavy grazing.
Site of Biodiversity Significance #10 in County #67						
<u>Native Plant Community</u>						
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49569	2.35	2	D	2007	

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Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49570	4.20	2	D	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49571	0.50	2	D	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49572	1.88	2	D	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49573	0.90	2	D	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 28	49574	3.87	2	AB	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 28	49575	0.56	2	C	2007	
Basswood - Bur Oak - (Green Ash) Forest Version 2.0 Classification: MHs38b Version 1.5 Classification: T104N R46W Section 28	49580	0.72	3	NR	2007	Open grown oaks in lightly grazed pasture.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	49581	0.54	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.

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Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	49582	0.23	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49583	0.11	2	NR	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49584	0.46	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49593	2.08	2	NR	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	49712	3.07	2	D	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	49722	0.91	2	C	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	50233	1.58	2	NR	2007	

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Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	50234	0.28	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	50235	0.50	2	C	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	50289	0.11	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	50290	0.27	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	50291	0.07	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	50292	0.17	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	50293	0.05	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.

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Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 28	50294	0.61	2	A	2007	Fairly undisturbed rock outcrops with high diversity including numerous pools.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	50295	0.63	2	B	2007	Pasture with good dominance by native species and good native flora. Managed with periodic light grazing. Contains abundant outcrops in excellent condition.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	50296	7.53	2	A	2007	Outstanding remnant of little-disturbed rock outcrops and prairie. Numerous ephemeral rainwater pools with high diversity of rock outcrop specialist plants. pools.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	50316	0.40	2	D	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	50317	0.90	2	D	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 28	50318	1.03	2	D	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R46W Section 29 T104N R46W Section 28	50319	142.43	2	D	2007	Pasture dominated mostly by nonnatives but with abundant native grasses. Diversity very low.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 28	50323	24.93	2	AB	2007	Exposed outcrops in drainages within large pasture. Outstanding diversity of rock outcrop specialist plants. Within degraded prairie pasture.

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Site of Biodiversity Significance #68 in County #67

Native Plant Community

Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 15	49869	2.56	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 15	49870	0.56	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 15	49871	0.59	2	NR	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49890	1.59	2	NR	2007	Heavily grazed pasture adjacent to rock outcrops. Native prairie component unknown. Needs field survey.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49891	0.96	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10 T104N R45W Section 11	49892	6.86	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49909	2.28	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49910	1.38	2	NR	2007	

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Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49911	14.03	2	NR	2007	Heavily grazed pasture adjacent to rock outcrops. Native prairie component unknown. Needs field survey.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49912	0.71	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49913	0.80	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49914	1.02	2	NR	2007	
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10 T104N R45W Section 11	49915	0.51	2	NR	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10 T104N R45W Section 11 T104N R45W Section 15 T104N R45W Section 14	49916	9.19	2	NR	2007	Heavily grazed pasture adjacent to rock outcrops. Native prairie component unknown. Needs field survey.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10 T104N R45W Section 11 T104N R45W Section 14	49926	68.13	2	NR	2007	Heavily grazed pasture adjacent to rock outcrops. Native prairie component unknown. Needs field survey.

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Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10 T104N R45W Section 11	49930	1.14	2	NR	2007	
Site of Biodiversity Significance #85 in County #67						
<u>Native Plant Community</u>						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	49606	1.78	2	BC	2007	Narrow zone of exposed rock along drainageway between cultivated fields.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	49607	0.37	2	BC	2007	Narrow zone of exposed rock along drainageway between cultivated fields.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	49608	0.55	2	C	2007	Narrow zone of exposed rock along drainageway between cultivated fields.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	49611	2.31	2	C	2007	Narrow zone of exposed rock along drainageway between cultivated fields.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	49612	0.51	2	C	2007	Narrow zone of exposed rock along drainageway between cultivated fields.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	49613	0.45	2	C	2007	Narrow zone of exposed rock along drainageway between cultivated fields.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	49614	0.68	2	C	2007	Narrow zone of exposed rock along drainageway between cultivated fields.

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Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	49689	0.71	2	C	2007	Narrow zone of exposed rock along drainageway between cultivated fields.
Site of Biodiversity Significance #86 in County #67						
<u>Native Plant Community</u>						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 2	50210	2.26	2	CD	2008	
Site of Biodiversity Significance #102 in County #67						
<u>Native Plant Community</u>						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 27	50228	7.38	2	AB	2008	Excellent plant diversity on shallow soils over bedrock and cracks. Growing in robust pillows of rock spikemoss. Site is highly drought-prone. Ephemeral pools are nearly absent. Trash piles at south end.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 27	50232	0.51	2	AB	2008	Excellent plant diversity on shallow soils over bedrock and cracks. Growing in robust pillows of rock spikemoss. Site is highly drought-prone. Ephemeral pools are nearly absent. Trash piles at south end.
Site of Biodiversity Significance #110 in County #67						
<u>Native Plant Community</u>						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 32	50237	2.86	2	NR	2008	Much exposed rocks in drainages within sloping pasture. Likely contains rare plants.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 32	50238	1.17	2	NR	2008	Much exposed rocks in drainages within sloping pasture. Likely contains rare plants.

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Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 32	50242	3.90	2	NR	2008	Much exposed rocks in drainages within sloping pasture. Likely contains rare plants.
Site of Biodiversity Significance #112 in County #67						
<u>Native Plant Community</u>						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 34	50223	9.45	2	BC	2008	Large area of exposed rocks along drainage in active pasture. Moderate diversity outcrop plants present. Many terrestrial spp missing, but many aquatic pool spp present.
Site of Biodiversity Significance #189 in County #67						
<u>Native Plant Community</u>						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 34	50051	3.81	2	BC	2007	outcrops in drainage in heavily grazed pasture; numerous excellent rainwater pools with numerous rare plants; other parts highly disturbed
Site of Biodiversity Significance #192 in County #67						
<u>Native Plant Community</u>						
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49902	0.37	2	NR	2008	Heavily grazed pasture on top of ridge
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49903	0.30	2	NR	2008	Heavily grazed pasture on top of ridge
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49904	0.15	2	NR	2008	Heavily grazed pasture on top of ridge
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49905	0.10	2	NR	2008	Heavily grazed pasture on top of ridge

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Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49906	4.62	2	B	2008	Abundant bedrock outcrops on top of bedrock ridge. Very good diversity of native rock specialist species in cracks and margins of rock exposures. Few ephemeral pools present. In horse pasture.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49907	0.19	2	B	2008	Abundant bedrock outcrops on top of bedrock ridge. Very good diversity of native rock specialist species in cracks and margins of rock exposures. Few ephemeral pools present. In horse pasture.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49908	5.05	2	NR	2008	Prairie pasture grazed by horses on top of ridge
Site of Biodiversity Significance #193 in County #67						
<u>Native Plant Community</u>						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49931	0.89	2	NR	2007	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49932	1.37	2	NR	2007	Sheep pasture
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 10	49933	2.07	2	NR	2007	Exposed ridges of Sioux quartzite on large ridge. Within sheep pasture.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 10	49934	1.64	2	NR	2007	Sheep pasture
Site of Biodiversity Significance #194 in County #67						
<u>Native Plant Community</u>						

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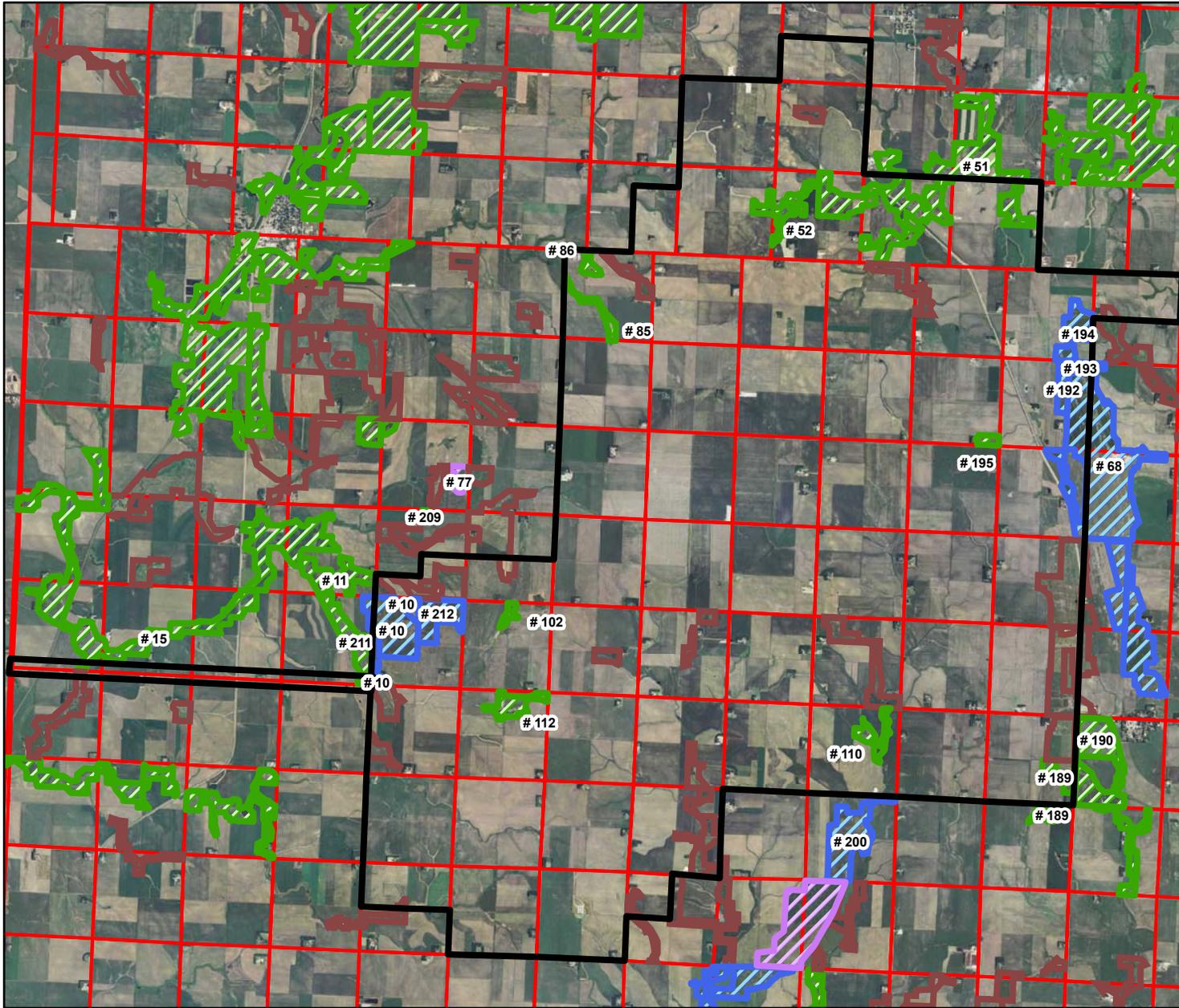
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 3	49852	0.63	2	C	2007	Outcrops with moderate diversity in formerly grazed pasture at north end of large quartzite ridge. Surrounded by native prairie grasses and much brome.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 3	49853	1.38	2	C	2007	Outcrops with moderate diversity in formerly grazed pasture at north end of large quartzite ridge. Surrounded by native prairie grasses and much brome.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 3	49854	4.44	2	B	2008	Sioux quartzite outcrops with very good diversity in formerly grazed pasture. Many typical species are highly abundant. Several ephemeral pools. Native prairie grasses and forbs with heavy brome infestation between outcrops.
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 3	49855	5.80	2	CD	2007	now hayed; grazed in past; dom by exotic and native prairie grass; 0 forbs
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 3	49856	0.69	2	B	2008	Sioux quartzite outcrops with very good diversity in formerly grazed pasture. Many typical species are highly abundant. Several ephemeral pools. Native prairie grasses and forbs with heavy brome infestation between outcrops.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R45W Section 3	49857	0.29	2	C	2008	
Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 3	49858	0.66	2	CD	2007	now hayed; grazed in past; dom by exotic and native prairie grass; 0 forbs

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Mesic Prairie (Southern) Version 2.0 Classification: UPs23a Version 1.5 Classification: T104N R45W Section 3 T104N R45W Section 10	49859	20.05	2	CD	2007	now hayed; grazed in past; dom by exotic and native prairie grass; 0 forbs
Seepage Meadow/Carr Tussock: Sedge Subtype Version 2.0 Classification: WMs83a1 Version 1.5 Classification: T104N R45W Section 3	49862	1.03	3	NR	2007	
Site of Biodiversity Significance #211 in County #67						
Native Plant Community						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 29	49592	1.76	2	CD	2007	Abundant outcrops on long ridge. Highly disturbed by heavy grazing.
Site of Biodiversity Significance #212 in County #67						
Native Plant Community						
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 28	49576	1.20	2	B	2007	Exposed outcrops in drainages within large pasture. Good native diversity on outcrops. Degraded prairie in pasture is dominated mostly by tame grasses but has some natives.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 28	49577	1.10	2	B	2007	Exposed outcrops in drainages within large pasture. Good native diversity on outcrops. Degraded prairie in pasture is dominated mostly by tame grasses but has some natives.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 28	49578	0.66	2	B	2007	Exposed outcrops in drainages within large pasture. Good native diversity on outcrops. Degraded prairie in pasture is dominated mostly by tame grasses but has some natives.
Crystalline Bedrock Outcrop (Prairie): Sioux Quartzite Sub Version 2.0 Classification: ROs12a2 Version 1.5 Classification: T104N R46W Section 28	49579	1.64	2	B	2007	Exposed outcrops in drainages within large pasture. Good native diversity on outcrops. Degraded prairie in pasture is dominated mostly by tame grasses but has some natives.

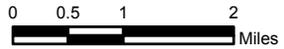
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Legend

- Prairie Rose Project Boundary**

- MCBS Sites of Biodiversity**
 -  Outstanding
 -  High
 -  Moderate
 -  Below
- PLS Sections**

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 Rare Feature, Prairie Railroad Survey, Native Plant Community,
 and Sites of Biodiversity Significance data are from the
 Natural Heritage Information System. The absence of rare features
 for a particular location should not be construed to mean that the
 DNR is confident rare features are absent from that location.

Guidelines for Assigning Statewide Biodiversity Significance Ranks to Minnesota County Biological Survey Sites

Biodiversity significance ranks are a measure of the statewide importance of Minnesota County Biological Survey (MCBS) sites for native biological diversity. They are assigned by MCBS ecologists at the conclusion of work in a survey region and are based on the presence of rare species at a site, the size and condition of native plant communities (NPCs) within the site, and the landscape context of the site. Biodiversity significance ranks are used to prioritize and guide conservation and management of MCBS sites.

To assign biodiversity significance ranks, MCBS sites are grouped and rated for each of Minnesota’s ecological classification system (ECS) subsections. Ranking sites by subsection helps to highlight the best examples of Minnesota’s rare species and native plant communities in all of the state’s diverse landscapes. There are four biodiversity significance ranks—**outstanding**, **high**, **moderate**, and **below**—which are defined in the table below. Explanations of technical terms are provided on the following page.

	OUTSTANDING	HIGH	MODERATE
Rare Species	<p>Sites containing the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most intact functional landscapes. These sites are characterized by one or more of the criteria (I, II, III) below.</p> <p>I. One of the best occurrences of a G1, G2, S1, or S2 species. or A concentration (four or more) of excellent or good occurrences (A or B rank) of S1, S2, or S3 species, at least one of which is an S1 or S2 species.</p> <p>These species occurrences must be in an NPC assigned a Condition Rank of C or above (except for special circumstances where plant communities are not present, such as a bat cave or mussel bed).</p>	<p>Sites containing very good quality occurrences of the rarest species, high-quality examples of rare NPCs, and/or important functional landscapes. These sites are characterized by one or more of the criteria (I, II, III) below.</p> <p>I. A B or C rank occurrence of a G1, G2, S1, or S2 species. or A concentration (four or more) of A or B rank occurrences of S3 species.</p> <p>These species occurrences must be in an NPC assigned a Condition Rank of C or above (except for special circumstances where plant communities are not present, such as a bat cave or mussel bed).</p>	<p>Sites containing occurrences of rare species, moderately disturbed NPCs, and/or landscapes that have strong potential for recovery. These sites are characterized by one or more of the criteria (I, II, III) below.</p> <p>I. A C or D rank occurrence of a G1, G2, S1, or S2 species. or A single A or B rank occurrence of an S3 species. or Two or more BC or C rank occurrences of an S3 species.</p> <p>These species occurrences must be in an NPC assigned a Condition Rank of C or above (except for special circumstances where plant communities are not present, such as a bat cave or mussel bed).</p>
Native Plant Community	<p>II. One of the highest quality examples (based on Condition Rank, size, and context) in an ECS subsection of the rarest (i.e., S1, S2, or S3) NPCs. or A group of important NPCs (S1, S2, or S3) that together are of sufficient size and quality to constitute one of the highest quality natural areas in an ECS subsection.</p>	<p>II. A high-quality example (based on Condition Rank of B or higher, size, and context)—though not among the best in an ECS subsection—of one of the rarest (S1, S2, or S3) NPCs.</p>	<p>II. An occurrence of an NPC with a Condition Rank of C or above. or An occurrence of an S1 or S2 NPC with a Condition Rank of CD that is among the largest for the NPC type in an ECS subsection.</p>
Landscape Context	<p>III. One of the largest, least-fragmented, least-developed landscape areas in an ECS subsection, with the full spectrum of matrix to small patch NPCs (any S rank; mostly A to BC Condition Ranks) and the highest potential for intact ecological functioning (e.g., fire, natural patch dynamics, natural water-level fluctuations).</p>	<p>III. A little-fragmented, little-developed landscape area that has the full spectrum of matrix to small-patch native plant communities (any S rank), high potential for intact ecological functioning, and also fits one of the following descriptions:</p> <ul style="list-style-type: none"> - It is mostly composed of A to BC Condition Rank NPCs but is not one of the largest landscape areas in the ECS subsection. <p>or</p> <ul style="list-style-type: none"> - It is one of the largest landscape areas in the ECS subsection but has significant amounts of human-induced disturbance such that the Condition Ranks of most NPCs are BC or less. 	<p>III. A little-developed landscape area that is not among the largest in an ECS subsection and is not mostly composed of A to BC Condition Rank NPCs, but has high potential to recover the full spectrum from matrix to small patch NPCs and intact ecological functioning.</p>
	<p>BELOW</p> <p>Sites below the minimum threshold for statewide biodiversity significance. These sites lack occurrences of rare species and natural features, or do not meet MCBS standards for Outstanding, High, or Moderate rank. These sites may include areas of conservation value at the local level such as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or areas with good potential for restoration of native habitat.</p>		

Terms Used in Guidelines for Assigning Biodiversity Significance Ranks

Native Plant Community

A native plant community (NPC) is a group of native plants that interact with each other and with their environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native plant species form recognizable units, such as oak savannas, pine forests, or marshes, that tend to repeat over space and time. Native plant communities are classified and described by considering vegetation, hydrology, landforms, soils, and natural disturbance regimes. Examples of natural disturbances include wildfires, severe droughts, windstorms, and floods. For an overview of Minnesota's NPCs, see <http://www.dnr.state.mn.us/npc/classification.html>.

Ecological Classification System Subsection

An ecological classification system (ECS) subsection is a unit of the Minnesota Department of Natural Resources' hierarchical system for ecological mapping and landscape classification. Subsections are defined using glacial deposition processes, surface bedrock formations, local climate, topographic relief, and the distribution of plants, especially trees. Minnesota has 26 subsections. For more information, see <http://www.dnr.state.mn.us/ecs/index.html>.

G-ranks and S-ranks for Rare Species and Native Plant Communities

The rare species and native plant communities documented by MCBS have been assigned conservation status ranks according to a method developed by the conservation organization NatureServe and its member natural heritage programs. These ranks reflect the relative imperilment of the world's species and native plant communities. Conservation status ranks are assigned on a scale of 1 to 5:

- 1 = critically imperiled
- 2 = imperiled
- 3 = vulnerable to extirpation or extinction
- 4 = apparently secure
- 5 = demonstrably widespread, abundant, and secure.

Assignment of these ranks is based on a variety of factors, including abundance, distribution, trends, and threats. Conservation status is determined at three geographic scales: global (G), national (N), and state or province (S). As a result, there are three sets of ranks, each consisting of a letter indicating the geographic scale of the assigned rank, followed by a number indicating the imperilment of the species or plant community at that scale. For example, a "G1" species or native plant community is critically imperiled across its entire range (i.e., globally) and is regarded as being at very high risk for extirpation. An "S3" species or community, in comparison, is vulnerable and at moderate risk within a particular state, although it may be secure elsewhere.

Occurrence Ranks for Rare Species

Occurrence ranks for rare species are intended to reflect the likelihood that an occurrence or population of a rare plant or animal species will persist under current conditions. The criteria used in ranking rare species occurrences include population size and occupied area, habitat conditions, and landscape context. Ranks are assigned on a scale of A to D.

A-rank occurrences have large population size and occupy large areas of good quality habitat in favorable landscape settings and are therefore very likely to persist for the foreseeable future in their current condition or better.

B-rank occurrences have population size, area and quality of habitat, and landscape settings that make them likely to persist for the foreseeable future in their current condition or better.

C-rank occurrences are unlikely to persist under current conditions, or may persist for the foreseeable future with appropriate protection or management, or are likely to persist but may not maintain current or historical levels of population size or genetic variability.

D-rank occurrences have high risk of extirpation because of small population size or area of occupancy, deteriorated habitat, poor conditions for reproduction, inappropriate management, or other factors.

Condition Ranks for Native Plant Communities

Condition Ranks for native plant communities reflect the degree of ecological integrity of a specific occurrence of a native plant community. Condition Ranks are assigned by considering species composition, vegetation structure, ecological processes and functions, level of human disturbance, presence of exotic species, and other factors. Condition Ranks are assigned on a scale of A to D.

A-rank occurrences have excellent ecological integrity. They have species composition, structure, and ecological processes typical of the natural or historic range of the community and have been little disturbed by recent human activity or invasive species.

B-rank occurrences have good ecological integrity. They include lightly disturbed plant communities and communities that were disturbed in the past but have recovered and now have relatively natural composition and structure. B-rank occurrences normally will return to A-rank condition with protection or appropriate management.

C-rank occurrences have fair ecological integrity. They show strong evidence of human disturbance, but retain some characteristic species and have some potential for recovery with protection and management.

D-rank occurrences have poor ecological integrity. The original composition and structure of the community have been severely altered by human disturbances or invasion by exotic species. They have little chance of recovery to their natural or historic condition.

Native Plant Community Size

For a site to be ranked "OUTSTANDING" or "HIGH" based on a plant community occurrence, the community must be of sufficient quality and size that its long-term survival is likely. This means that the community is large enough to allow for continuation of the ecological processes that shaped the community or for their maintenance through management. Exemplary are fire-dependent communities that occur in landscapes still influenced by wildfires or in settings where it is possible to use fire as a management tool. Specific criteria for what constitutes large versus small for any given community type are not incorporated into these guidelines because community types occur in different sizes depending on the community and location in Minnesota. For example, a 20-acre mesic prairie in southeastern Minnesota is considered to be highly significant because of the near absence of that prairie type in the region and may be the largest and best example of the community in a given ECS subsection. A 20-acre prairie is less significant in parts of northwestern Minnesota where larger examples remain.

Landscape Context

The viability of a given plant community or rare species population is highly dependent on landscape context (i.e., the condition of the surrounding landscape). Sites ranked "OUTSTANDING" or "HIGH" based on landscape context must have sufficient areas of native habitat surrounding the rare species or plant community occurrences that the long-term survival of these features is likely. These sites occur in intact, functional landscapes composed predominantly of native plant communities, including matrix and large-patch communities that cover large areas of the landscape as well as communities that develop in small patches on cliffs, in small wetlands, or in other localized habitats. Intact landscapes are characterized by ecological processes that have not been disrupted by modern human activity. For example, Minnesota's prairies historically were maintained by frequent wildfires but with land-clearing and habitat fragmentation, wildfires in prairie landscapes have greatly diminished in frequency. Prairies surrounded by cleared or developed land must be deliberately managed with fire to persist and are more vulnerable to being overrun by invasive species than prairies in intact landscapes.

Recommendations for Projects Affecting Waters Inhabited by Topeka Shiners (*Notropis topeka*) in Minnesota

**U.S. Fish and Wildlife Service
Twin Cities Field Office
(612) 725-3548**

Background

Topeka shiner (*Notropis topeka*) occurs throughout the Big Sioux and Rock River Watersheds in five southwestern Minnesota counties (Figure 1). The U.S. Fish and Wildlife Service (Service) listed Topeka shiner as an endangered species in 1998 and designated critical habitat¹ for it in 2004. The Endangered Species Act (ESA) prohibits the taking² of this species.

Endangered Species Act Guidance for Actions Affecting Topeka Shiner Habitat

Federal Agency Actions

Federal agencies or their designated non-federal representatives must consult with the Service on any action that they fund, authorize, or carry out that may affect Topeka shiner or its critical habitat. If an agency proposes to implement an action that is likely to result in adverse effects to Topeka shiner, it must undergo formal consultation with the Service. If the agency determines that an action may affect Topeka shiners, but that those effects are not likely to be adverse, it may avoid formal consultation by receiving written concurrence on this determination from the Service.

For general information regarding the section 7 process, contact the Service's Twin Cities Field Office at (612)725-3548 or review our internet site - <http://www.fws.gov/midwest/Endangered/section7/index.html>.

Private or Local (Non-federal) Actions

Private landowners, corporations, state or local governments, and other non-federal entities or individuals who wish to conduct activities that might incidentally take Topeka shiners must first

¹ See 69 Federal Register 44,736 (July 27, 2004) or <http://www.fws.gov/midwest/endangered/fishes/index.html#topeka> for further information about Topeka shiner critical habitat.

² The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

obtain an incidental take permit from the U.S. Fish and Wildlife Service (Service). To determine whether an action may require an incidental take permit, coordinate with the Service when planning actions that may affect streams or off-channel habitats in the Rock River or Big Sioux River watersheds in Minnesota. Contact the Service's Twin Cities Field Office (612/725-3548) for further information or see the following website for information regarding Endangered Species permits – <http://endangered.fws.gov/permits/index.html?#forms>.

Project Recommendations

The following recommendations are provided to help design actions that would avoid or minimize adverse effects to Topeka shiner. These recommendations may not address every way in which proposed actions may affect this species and may not preclude the need for formal consultation for federal actions or for an incidental take permit for non-federal actions.

Therefore, we highly recommend that you coordinate as early in the planning process as possible with the Service's Twin Cities Field Office (612/725-3548) when contemplating any action that may affect streams or associated off-channel habitats (oxbows, abandoned channels, etc.) in the Big Sioux River or Rock River watersheds in Minnesota (Fig. 1).

In some cases, projects may not be implemented without going against one or more of these recommendations. In those cases, project planners, landowners, etc. should promptly coordinate with the Service's Twin Cities Field Office to determine whether formal section 7 consultation (federal agencies) or an incidental take permit (private landowners, local government agencies, etc.) would be required.

1. Do not dewater stream reaches or temporarily divert streams for construction. Pumping to dewater stream areas or off-channel habitats will almost always require formal section 7 consultation (federal actions) or an incidental take permit (non-federal actions, see above) if Topeka shiners are likely to be present.
2. To avoid disrupting Topeka shiner spawning, do not conduct in-stream work before August 15.
3. Follow all applicable requirements and best management practices for stormwater and erosion control – for example, requirements contained within stormwater permits from Minnesota Pollution Control Agency (MPCA).³
4. Minimize removal of riparian (streamside) vegetation; if such removal is necessary, it

³ Resources for designing effective erosion control – Protecting Water Quality in Urban Areas Manual (MPCA, see <http://www.pca.state.mn.us/water/pubs/sw-bmpmanual.html>); Minnesota Department of Transportation Erosion Control Handbook for Local Roads (<http://www.mnltap.umn.edu/pdf/erosioncontrolhandbook.pdf>). Also see <http://www.pca.state.mn.us/water/stormwater/stormwater-c.html#factsheets>.

should occur sequentially as needed over the length of the project and it should be replaced as soon as if feasible upon project completion.

5. Mulch areas of disturbed soils and reseed promptly with non-invasive plant species, preferably native species.
6. Implement appropriate erosion and sediment prevention measures to the maximum extent practicable. Inspect devices frequently to ensure that they are effective and in good repair, especially after precipitation.
7. Leave existing features, such as bridge abutments, retaining walls, and riprap, in place as much as is feasible.
8. Ensure that erosion prevention measures are in place and in adequate condition when leaving work site.
9. Design and install instream structures in a manner that will not impair passage of Topeka shiners and other fish species during and after construction.
10. Where feasible, replace bridges with bridges or other open-bottomed structures to avoid altering the natural stream bottoms.
11. Do not operate motorized vehicles instream. Excavation, culvert placement, etc. should be conducted from streambanks outside of standing or flowing water.
12. Backfill placed in the stream shall consist of rock or granular material free of fines, silts, and mud. Machinery parts (i.e., backhoe buckets, etc.) shall be cleaned of all such material and free of grease, oil, etc. before their instream use.
13. Prevent materials and debris from falling into the water during construction.
14. If the project is modified, or if field conditions change, the applicant or agency representative should contact U.S. Fish and Wildlife Service before proceeding.
15. Ensure that contractors and subcontractors understand all permit provisions that are necessary to avoid or minimize adverse effects to Topeka shiners.

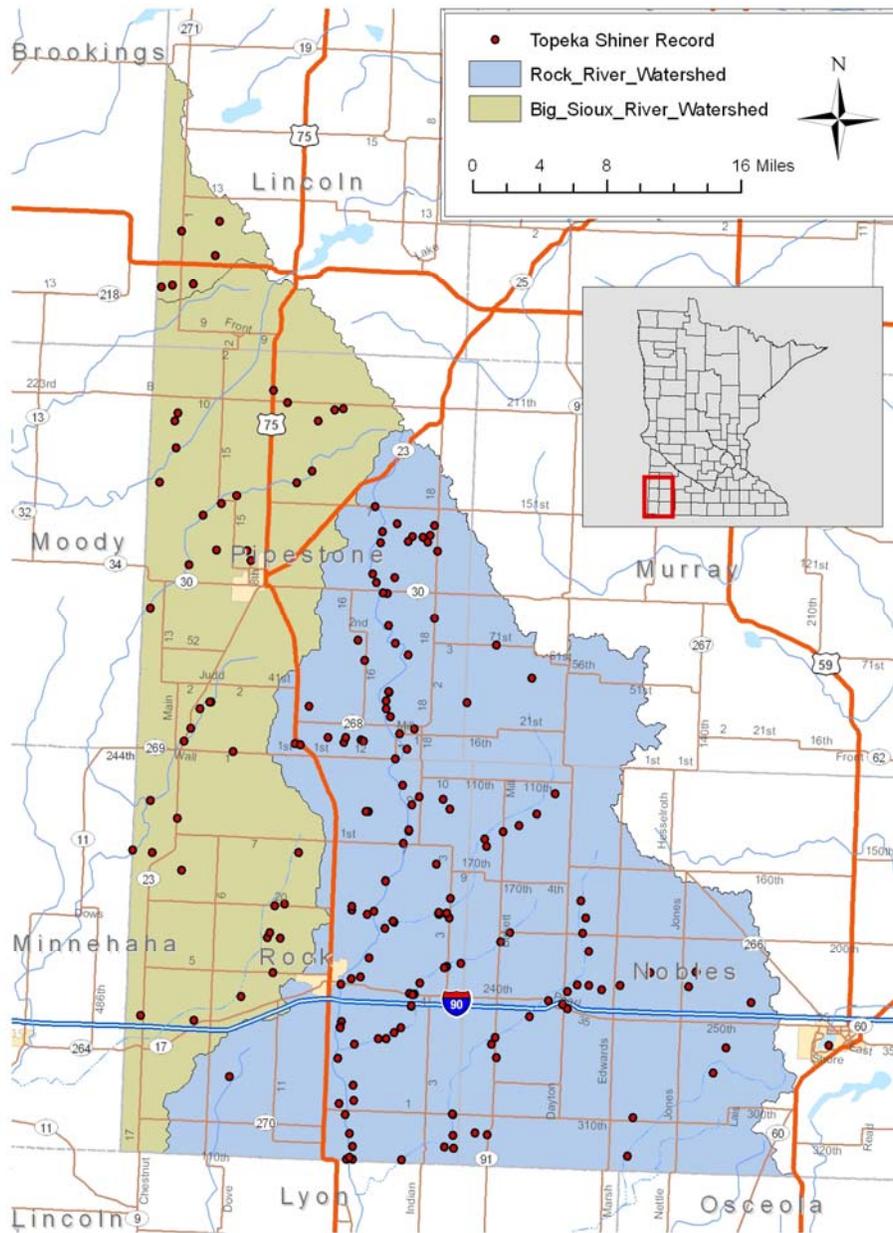


Figure 1. Recorded occurrences of Topeka shiner in Minnesota. Data included here were provided by the Natural Heritage and Nongame Research Program of the Division of Ecological Services, Minnesota Department of Natural Resources (DNR), and were current as of March 2008. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that Topeka shiners are absent. For information on a specific area, contact U.S. Fish and Wildlife Service, (612) 725-3548.



U.S. Fish & Wildlife Service

Threatened and Endangered Species

Topeka Shiner in Minnesota

The Topeka shiner (*Notropis topeka*) is a small fish found in prairie streams in Iowa, Kansas, Minnesota, Missouri, and South Dakota. Under the Endangered Species Act it was federally listed as “endangered” in 1998.

The species has been extirpated from about 80 percent of its historical range due to degradation of stream habitats, stream channelization, construction of small impoundments, and introduction of predator fishes that are not native to its small stream habitat, like bass and northern pike. (See below for further details on the species’ life history.)

How does listing the Topeka shiner as “endangered” affect people who live within the range of the species?

It is illegal for anyone to “take” (i.e., kill, harm, harass, capture, etc.) Topeka shiners without special permission (under Section 9 of the Endangered Species Act). This prohibition affects persons whose actions and projects may unintentionally or *incidentally* take Topeka shiners, even if that is not the purpose of their activity. Activities that may incidentally take Topeka shiners include bridge or culvert replacement projects and groundwater withdrawals near streams where Topeka shiners occur.

The U.S. Fish and Wildlife Service can issue permits to private landowners, corporations, state or local governments, or other non-federal landowners who want to conduct activities that might incidentally take Topeka shiners. To obtain a permit, the applicant must prepare a Habitat Conservation Plan (HCP) that offsets the harmful effects that the activity may have on the species. The HCP allows development to proceed while promoting listed species conservation.



Photo by ©Konrad Schmidt

Topeka shiners were once found in prairie streams throughout the midwest.

What would a typical Habitat Conservation Plan involve?

The permit applicant would have to offset the take of Topeka shiners that is likely to occur as a result of their project. The applicant would work with the Service to ensure that the mitigation sufficiently offsets the impacts to Topeka shiners. In other words, small impacts would require relatively small mitigation projects and large impacts would require more substantial mitigation. Mitigation could include actions such as fencing to prevent or reverse livestock impacts to streams inhabited by Topeka shiners, streambank restoration, or other habitat practices.

Is critical habitat designated for the Topeka shiner in Minnesota?

Yes. On July 27, 2004, the Service designated critical habitat on 57 stream segments totaling 605 stream miles in Minnesota. This included, more or less, all of the stream segments known to be occupied by the Topeka shiner at the time. Since then, Topeka shiners have been documented in additional stream segments. Therefore, the Topeka shiner is known to occur both within and

outside of stream segments designated as critical habitat.

Do I have to do anything different if my project is within Topeka shiner critical habitat?

The Act only prohibits *federal agencies* from destroying or adversely modifying critical habitat. However, the Act’s prohibitions against “take” of Topeka shiners apply to everyone, not just federal agencies (see the first answer).

Where is Topeka shiner critical habitat?

In Minnesota, Topeka shiner critical habitat is distributed throughout the Big Sioux River and Rock River watersheds. To determine whether a specific area is Topeka shiner critical habitat, contact the U.S. Fish and Wildlife Service.

Who do I contact in Minnesota to determine what is required under the Endangered Species Act?

Contact the U.S. Fish and Wildlife Service by phone at (612) 725-3548 or by e-mail at Richard_Davis@fws.gov. The Service will answer questions about your specific project and can provide technical assistance to help you

determine whether your action requires an incidental take permit.

Natural History Information

The following information is reprinted, with permission, from the website *Natural Fishes of Minnesota* (http://www.gen.umn.edu/research/fish/fishes/topeka_shiner.html).

Where do they live?

In Minnesota, Topeka shiners occur only in streams of the Missouri River drainage in the southwestern corner of the state. They inhabit the Rock River and many of its tributaries, as well as many of the streams that flow into Big Sioux drainage of South Dakota. These low-gradient, slow-moving streams are naturally winding, with bottoms made of sand, gravel, or rubble usually covered by a deep layer of silt. We have recently discovered that Topeka shiners prefer

pool-like areas that are outside the main channel courses. These pools are in contact with groundwater and usually contain vegetation and areas of exposed gravel. Topeka shiners almost always are found with sand shiners, orange-spotted or green sunfish, fathead minnows, white suckers, and black bullheads.

How big do they get and how long do they live?

Topeka shiner size varies considerably by sex and location. The largest males reach 2.8 to 3 inches and a little over 0.18 oz. The largest females reach 2.4 to 2.6 inches and a little over 0.11 oz. They typically reach about 2 years of age, but a few live as long as 3 years.

What do they eat?

Topeka shiners are omnivorous (eat plant and animal matter) opportunists

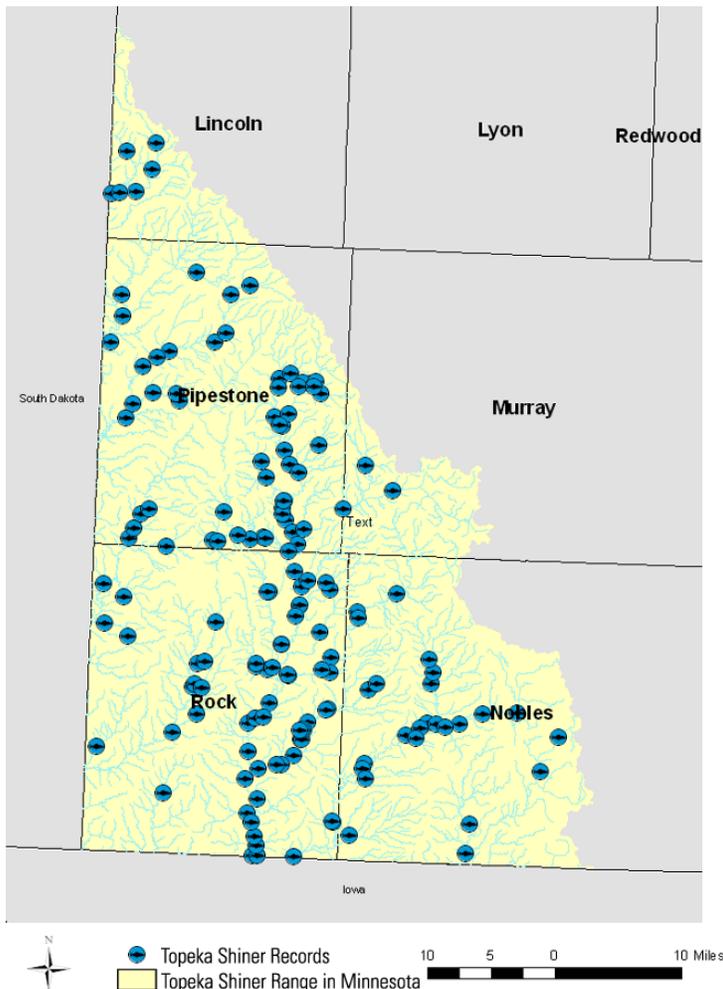
(they eat what's available). We have found over 25 different food groups in their stomachs in Minnesota. These groups include nine orders of insects, five kinds of waterfleas, snails, fingernail clams, water mites, worms, freshwater sponge, moss animals, sideswimmers, algae, plant stems and seeds, and fish larvae. If it is not too big, they eat it!

What eats them?

Topeka shiners could be eaten by larger creek chubs, black bullheads, yellow perch, and the occasional northern pike. However, we have found their remains in only a few stomachs out of hundreds that we examined. However, in Kansas and Missouri, largemouth bass that have been stocked in ponds are a major predator and may be partly responsible for their decline in those states.

How do they reproduce?

Most Topeka shiners mature sometime during the spring or summer of their second year (at 11-13 months of age). Their spawning season lasts for 8-10 weeks starting in mid-May to early June when water temperature reaches 22° C (71.6° F). They do not build their own nest, but share a nest with orange-spotted or green sunfish. Males establish small territories around the nest and aggressively defend it from all other Topeka shiners. Females may enter a territory only to be chased out repeatedly. If she is persistent she will finally be accepted by the male. The two spawn head to head above the nest. The female releases only a few eggs during each brief spawning episode. Topeka females produce clutches of eggs (groups of eggs that become ready for spawning at about the same time). A single clutch varies from 150-800 eggs depending on the size and condition of the female. We do not know how many clutches a female produces in a season, but we suspect it is several. At 22° C it takes about 5 days for the eggs to hatch and another 4 days before the larvae begin to feed.



In Minnesota, the federally endangered Topeka shiner occurs only in the Big Sioux and Rock River watersheds, where they are widespread. Persons implementing actions in these areas should ensure that they are in compliance with the Endangered Species Act. Topeka shiners also occur in South Dakota and Iowa, but records for those states are not shown here. Data provided by Minnesota DNR, Natural Heritage and Nongame Research Program and are current as of June 23, 2006

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Questions and Answers about the Topeka Shiner Critical Habitat Designation

1) What action is the Fish and Wildlife Service taking?

The Fish and Wildlife Service is designating 836 miles of stream in the States of Iowa, Minnesota, and Nebraska as critical habitat for the Topeka shiner, an endangered species protected under the Federal Endangered Species Act.

Excluded from the designation is all previously proposed critical habitat in the States of Kansas, Missouri, and South Dakota as well as habitat on the Fort Riley Military Installation in Kansas.

2) What is the Topeka shiner?

This small, silvery minnow is 3 inches or less in length. It is found in small to mid-size prairie streams with relatively high water quality and cool-to-moderate temperatures. If this fish is to survive and flourish, the form and structure of the streams where it lives must be safeguarded, so that the habitat and the balance of fish species in these streams is not significantly altered. While the Topeka shiner can sometimes live in streams with degraded habitat conditions, its long-term survival in these streams is at risk. The Topeka shiner was listed as endangered on Dec. 15, 1998.

3) Why is the Service designating critical habitat for the Topeka shiner?

In an April 4, 2001 court settlement, the Service agreed to designate critical habitat for the Topeka shiner by Aug. 13, 2003. Due to budget constraints, the Service petitioned the court for an extension of the deadline until July 17, 2004.

4) What is critical habitat?

Critical habitat designates areas that contain habitat essential for the conservation of a threatened or endangered species and which may require special management considerations. A designation does not set up a preserve or refuge and has no specific regulatory impact on landowners' actions on their land that do not involve federal agency funds, authorization or permits.

5) Which areas are designated as critical habitat for the Topeka shiner?

The critical habitat designation includes:

Iowa:

Raccoon River Watershed:

County	Stream	segments	Total stream miles
Calhoun	8	68	
Carroll		2	7
Dallas		3	3
Greene		8	87
Sac		4	12
Webster	1		9

Boone River Watershed:

<u>County</u>	<u>Stream</u>	<u>segments</u>	<u>Total stream miles</u>
Hamilton	1		1
Wright	3		16

Rock River Watershed:

<u>County</u>	<u>Stream</u>	<u>segments</u>	<u>Total stream miles</u>
Lyon	3		16
Osceola	1		5

Minnesota:

Big Sioux River Watershed:

<u>County</u>	<u>Stream</u>	<u>segments</u>	<u>Total stream miles</u>
Lincoln	4		27
Pipestone	13		106
Rock		11	101

Rock River:

<u>County</u>	<u>Stream</u>	<u>segments</u>	<u>Total stream miles</u>
Murray		2	19
Nobles		14	115
Pipestone	8		90
Rock		16	146

Nebraska:

Elkhorn River Watershed:

<u>County</u>	<u>Stream</u>	<u>segments</u>	<u>Total stream miles</u>
Madison		1	6

6) Which areas are excluded from the critical habitat designation?

All previously proposed lands in the states of Kansas, Missouri, and South Dakota and on the Fort Riley Military Installation in Kansas are excluded from the designation.

7) Why are these lands excluded?

Lands in the States of Missouri, Kansas, and South Dakota were excluded from critical habitat designation because those states have management plans that provide comprehensive conservation measures and programs necessary to achieve recovery of the Topeka shiner. These state management plans satisfied the following three criteria: (1) they provide a conservation benefit to the species (i.e., the plans must maintain or provide for an increase in the species population or enhancement or restoration of its habitat within the area covered by the plan); (2) they provide assurances that they will be or will continue to be implemented; and (3) they provide assurances that they will be effective (i.e., the plans must identify biological goals, have provisions for reporting progress, and are of a duration sufficient to implement the actions and achieve the goals and objectives).

The Fort Riley Military Installation in Kansas was excluded because it has an integrated natural resource management plan that provides adequate management and conservation benefit for the shiner.

In addition, the Endangered Species Act requires the Service take into consideration the economic impact, impacts to national security, and any other relevant impact, of specifying any particular area as critical habitat. Based on these considerations, areas can be excluded from critical habitat designation when the benefits of exclusion outweigh the benefits of inclusion, provided the exclusion will not result in the extinction of the species.

8) How did the Service determine what should be designated as critical habitat for the Topeka shiner?

The best scientific data available was used to determine areas that contain the physical and biological features essential for the conservation of the Topeka shiner. In designating critical habitat, the Service reviewed the conservation of the species undertaken by local, State and Federal agencies, Tribal governments, and private individuals and organizations since the species was listed in 1998. The Service reviewed available information concerning Topeka shiner habitat use and preferences, habitat conditions, threats, limiting factors, population demographics, and the known location, distribution, and abundance of Topeka shiners.

9) Are there areas being designated as critical habitat where Topeka shiner are not currently known to occur?

No. All areas designated as critical habitat for the Topeka shiner are considered occupied by the species or are short stream segments that provide critical links between occupied habitats.

10) How does critical habitat affect private landowners?

A critical habitat designation has no specific regulatory impact on private landowners who take actions on their land that do not involve Federal funding or require a Federal permit. Activities normally conducted by a landowner or operator of a business not involving Federal funding, permitting, or authorization in order to occur would not be affected.

It is important, however, to remember that because the Topeka shiner is a listed species, private landowners may not harm or otherwise take Topeka shiners unless they have an incidental take permit issued by the Service. This obligation results from the listing of the Topeka shiner as an endangered species, not the critical habitat designation.

11) Would a critical habitat designation affect swimming, boating and fishing?

In most cases, a critical habitat designation will not impact swimming, boating or fishing. In rare instances, where Federal funding, authorization or permits are required – such as construction of a new boating facility – consultation with the Fish and Wildlife Service may be necessary. Most of these types of projects already are being reviewed under the section 7 interagency consultation requirements of the Endangered Species Act.

12) Who would be affected by a critical habitat designation?

Federal agencies are required to consult with the Service on actions they carry out, fund, or authorize that might affect critical habitat. It is important to note that in most cases, this is already occurring under the section 7 interagency consultation requirements of the Endangered Species Act. Non-Federal entities, including private landowners, that may also be affected could include, for example, those seeking a U.S. Army Corps of Engineers 404 permit under the Clean Water Act to build an in-water structure, those seeking Federal approval to discharge effluent into the aquatic environment, or those seeking Federal funding to implement land management practices where such actions affect the aquatic environment that has been designated as critical habitat. But again, in most cases where this link exists between activities on private lands and Federal funding, permitting, or authorization, consultation under section 7 of the Endangered Species Act is already occurring.

13) What effect does the critical habitat designation for Topeka shiner have on National Fire Plan interagency coordination?

It prompts Federal agencies to consider the effects of proposed actions on critical habitat. Each Federal agency must confer with the U.S. Fish and Wildlife Service on any action that may affect listed species or designated critical habitat. This includes any actions proposed under the National Fire Plan. Consultation can take the form of informal discussions during which the Service may suggest modifications to the action to avoid or minimize impacts to critical habitat. If the Federal agency determines that the proposed action is not likely to adversely affect designated critical habitat and the Service concurs with this determination, consultation can be concluded informally. If the proposed action is likely to adversely affect critical habitat, formal consultation is required.

14) Will this critical habitat designation affect water rights or usage?

It will not affect water rights. In cases where irrigation is provided through a Federal agency, such as the Bureau of Reclamation, that agency would have to consult with the Service to determine whether water withdrawals would adversely impact Topeka shiner critical habitat. However, it is important to note that most of these types of projects already are being reviewed under the section 7 interagency consultation requirements of the Endangered Species Act.

15) Will this critical habitat designation impact the use of land adjacent to the designated waterways?

Possibly. If the adjacent land is Federal land or the land is private but has a Federal nexus involving funding or permits, the proposed land use activity would be assessed for its potential impacts on Topeka shiner critical habitat in the aquatic environment through consultation with the Federal agency. Most of these types of projects already are being reviewed under the section 7 interagency consultation requirements of the Endangered Species Act.

16) How long does a critical habitat designation remain in effect?

A critical habitat designation remains in effect until the species is considered recovered and is removed from the Endangered Species list. Prior to recovery, if new information indicates that changes should be made in the designation, this may be done through the formal rule-making process.

17) Where can I get more information on the Topeka Shiner and critical habitat?

For general information on Topeka shiners and the designation of critical habitat contact Vernon Tabor at the Kansas Ecological Services Field Office, at the above address; telephone 785/539-3474; facsimile 785/539-8567.

For local information on Topeka shiners in your state, contact one of the Service field offices below:

Columbia, Missouri Ecological Services Field Office
101 Park Deville Dr., Suite A
Columbia, MO 65203
tel: 573/234-2132

Rock Island, Illinois Ecological Services Field Office (for Iowa information)
4469 48th Avenue Court
Rock Island, IL 61201
tel: 309/793-5800

Rich Davis
Twin Cities, Minnesota Ecological Services Field Office
4101 East 80th Street
Bloomington, MN 55425
tel: 612/725-3548 ext. 2214



Questions and Answers about the Topeka Shiner



1) What is a Topeka shiner?

The Topeka shiner is a small minnow, normally less than 3 inches long. It is silvery-green with a distinct dark stripe preceding the dorsal fin and a dusky stripe along the entire length of the fish. The scales above this line are outlined with dark pigment, appearing cross-hatched, while the scales below this line have no pigment, appearing silvery-white in color.

2) What is the range of the Topeka shiner?

The Topeka shiner's historic range included parts of Iowa, Kansas, Minnesota, Missouri, Nebraska, and South Dakota. It is still present in these states, but exists only in small, isolated populations in a significant portion of its current range.

3) Where do Topeka shiners live?

Topeka shiners live in small to mid-size prairie streams in the central United States where they are usually found in pool and run areas. Suitable streams tend to have good water quality and cool to moderate temperatures. Many of these streams have year-round flow, although some may become dry during summer or periods of prolonged drought. Occasionally, Topeka shiners are found in larger streams that are downstream of large populations. In Iowa, Minnesota, and portions of South Dakota, Topeka shiners also live in oxbows and off-channel pools.

4) Why is the Topeka shiner declining?

The Topeka shiner was once a common fish throughout its range but its presence has declined by about 70 percent at known collection sites during the last 40 to 50 years. Habitat destruction, sedimentation, and changes in water quality are thought to have caused the population decline. Also, the creation of impoundments on small prairie streams that were stocked with predaceous fish like the largemouth reduced Topeka shiner numbers.

5) What activities harm Topeka shiner habitat?

- , development and degradation of streams
- , in-stream gravel mining
- , changes in the stream hydrology
- , stream channelization projects
- , dam construction and development
- , destruction of off-channel habitats, such as oxbows

6) What is being done to protect the Topeka shiner?

Measures to protect the Topeka shiner include:

Listing: The Topeka shiner is listed as an endangered species throughout its range (parts of Kansas, Iowa, Minnesota, Missouri, Nebraska, and South Dakota).

Recovery Plans: The Service is developing a recovery plan that describes and prioritizes actions necessary to conserve the Topeka shiner.

Research: Several university and private researchers and Federal and State biologists are researching the needs of the Topeka shiner. The results of their studies will help us manage the species and its habitat.

Management and Habitat Protection: State and private organizations are working to create protection and management plans to ensure the recovery of the fish. The state of Missouri has developed a comprehensive management plan, which focuses efforts on conserving Topeka shiners in the state. In Minnesota, the Department of Natural Resources and the Service have cooperated to develop a list of Best Management Practices for projects that take place in and along streams occupied by Topeka shiners. South Dakota has completed a Topeka shiner State Management Plan. In Kansas, the Topeka shiner is State-listed as a threatened species and the State has designated its own critical habitat for the species.

7) What protection does the Topeka shiner currently receive as a listed species?

The ESA prohibits the import, export, or interstate or foreign sale of protected animals and plants without a special permit. Under the ESA, take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

The ESA requires Federal agencies to consult with the Service to conserve listed species and ensure that any activity they fund, authorize, or carry out will not jeopardize the continued survival and recovery of a listed species or destroy or adversely modify its critical habitat. The ESA also directs all Federal agencies to use their existing authorities to develop and carry out programs to conserve endangered and threatened species.

The Service may issue permits for activities that are otherwise prohibited under the ESA, if these activities are for scientific purposes or to enhance the propagation or survival of the affected species, or for take that is incidental to otherwise lawful activities.

8) What can I do to conserve Topeka shiners?

There are a number of things that landowners and others can do to conserve Topeka shiners, including:

- , restoring stream habitats
- , placing vegetated buffers along streams (e.g., by managing livestock access to streambanks)
- , revegetating exposed, eroding banks
- , conserving soil throughout watersheds
- , avoiding or reducing direct impacts to streams and oxbows

The U.S. Department of Agriculture, Soil and Water Conservation Districts, U.S. Fish and Wildlife Service, and State conservation agencies can assist landowners with the funding and implementation of projects to conserve Topeka shiners and their stream habitats.

9) Where can I get more information on the Topeka Shiner and critical habitat?

For general information on Topeka shiners and the designation of critical habitat contact Vernon Tabor at the Kansas Ecological Services Field Office, at the above address; telephone 785/539-3474; facsimile 785/539-8567.

For local information on Topeka shiners in your state, contact one of the Service field offices below:

Columbia, Missouri Ecological Services Field Office
101 Park Deville Dr., Suite A
Columbia, MO 65203
tel: 573/234-2132

Rock Island, Illinois Ecological Services Field Office (for Iowa information)
4469 48th Avenue Court
Rock Island, IL 61201
tel: 309/793-5800

Rich Davis
Twin Cities, Minnesota Ecological Services Field Office
4101 East 80th Street
Bloomington, MN 55425
tel: 612/725-3548 ext. 2214

Endangered, Threatened, and Special Concern Species of Minnesota

Blanding's Turtle
(Emydoidea blandingii)

Minnesota Status: Threatened
Federal Status: none

State Rank¹: S2
Global Rank¹: G4

HABITAT USE

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation (e.g., cattails, water lilies) are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands (those that dry up in the late summer or fall) are frequently used in spring and summer -- these fishless pools are amphibian and invertebrate breeding habitat, which provides an important food source for Blanding's turtles. Also, the warmer water of these shallower areas probably aids in the development of eggs within the female turtle. Nesting occurs in open (grassy or brushy) sandy uplands, often some distance from water bodies. Frequently, nesting occurs in traditional nesting grounds on undeveloped land. Blanding's turtles have also been known to nest successfully on residential property (especially in low density housing situations), and to utilize disturbed areas such as farm fields, gardens, under power lines, and road shoulders (especially of dirt roads). Although Blanding's turtles may travel through woodlots during their seasonal movements, shady areas (including forests and lawns with shade trees) are not used for nesting. Wetlands with deeper water are needed in times of drought, and during the winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing.

LIFE HISTORY

Individuals emerge from overwintering and begin basking in late March or early April on warm, sunny days. The increase in body temperature which occurs during basking is necessary for egg development within the female turtle. Nesting in Minnesota typically occurs during June, and females are most active in late afternoon and at dusk. Nesting can occur as much as a mile from wetlands. The nest is dug by the female in an open sandy area and 6-15 eggs are laid. The female turtle returns to the marsh within 24 hours of laying eggs. After a development period of approximately two months, hatchlings leave the nest from mid-August through early-October. Nesting females and hatchlings are often at risk of being killed while crossing roads between wetlands and nesting areas. In addition to movements associated with nesting, all ages and both sexes move between wetlands from April through November. These movements peak in June and July and again in September and October as turtles move to and from overwintering sites. In late autumn (typically November), Blanding's turtles bury themselves in the substrate (the mud at the bottom) of deeper wetlands to overwinter.

IMPACTS / THREATS / CAUSES OF DECLINE

- loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- loss of upland habitat through development or conversion to agriculture
- human disturbance, including collection for the pet trade* and road kills during seasonal movements
- increase in predator populations (skunks, raccoons, etc.) which prey on nests and young

*It is illegal to possess this threatened species.

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided to help local governments, developers, contractors, and homeowners minimize or avoid detrimental impacts to Blanding's turtle populations. **List 1** describes minimum measures which we recommend to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat. **List 2** contains recommendations which offer even greater protection for Blanding's turtles populations; this list should be used *in addition to the first list* in areas which are known to be of state-wide importance to Blanding's turtles (contact the DNR's Natural Heritage and Nongame Research Program if you wish to determine if your project or home is in one of these areas), or in any other area where greater protection for Blanding's turtles is desired.

List 1. Recommendations for all areas inhabited by Blanding's turtles.	List 2. Additional recommendations for areas known to be of state-wide importance to Blanding's turtles.
GENERAL	
A flyer with an illustration of a Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.	Turtle crossing signs can be installed adjacent to road-crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.
Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed.	Workers in the area should be aware that Blanding's turtles nest in June, generally after 4pm, and should be advised to minimize disturbance if turtles are seen.
If a Blanding's turtle nests in your yard, do not disturb the nest.	If you would like to provide more protection for a Blanding's turtle nest on your property, see "Protecting Blanding's Turtle Nests" on page 3 of this fact sheet.
Silt fencing should be set up to keep turtles out of construction areas. It is <u>critical</u> that silt fencing be removed after the area has been revegetated.	Construction in potential nesting areas should be limited to the period between September 15 and June 1 (this is the time when activity of adults and hatchlings in upland areas is at a minimum).
WETLANDS	
Small, vegetated temporary wetlands (Types 2 & 3) should not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer).	Shallow portions of wetlands should not be disturbed during prime basking time (mid morning to mid- afternoon in May and June). A wide buffer should be left along the shore to minimize human activity near wetlands (basking Blanding's turtles are more easily disturbed than other turtle species).
Wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50' wide. This area should be left unmowed and in a natural condition.
ROADS	
Roads should be kept to minimum standards on widths and lanes (this reduces road kills by slowing traffic and reducing the distance turtles need to cross).	Tunnels should be considered in areas with concentrations of turtle crossings (more than 10 turtles per year per 100 meters of road), and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. Contact your DNR Regional Nongame Specialist for further information on wildlife tunnels.
Roads should be ditched, not curbed or below grade. If curbs must be used, 4 inch high curbs at a 3:1 slope are preferred (Blanding's turtles have great difficulty climbing traditional curbs; curbs and below grade roads trap turtles on the road and can cause road kills).	Roads should be ditched, not curbed or below grade.

ROADS cont.	
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or greater in diameter, and elliptical or flat-bottomed.	Road placement should avoid separating wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details).
Wetland crossings should be bridged, or include raised roadways with culverts which are 36 in or greater in diameter and flat-bottomed or elliptical (raised roadways discourage turtles from leaving the wetland to bask on roads).	Road placement should avoid bisecting wetlands, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details). This is especially important for roads with more than 2 lanes.
Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.	Roads crossing streams should be bridged.
UTILITIES	
Utility access and maintenance roads should be kept to a minimum (this reduces road-kill potential).	
Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.	
LANDSCAPING AND VEGETATION MANAGEMENT	
Terrain should be left with as much natural contour as possible.	As much natural landscape as possible should be preserved (installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blanding's turtles).
Graded areas should be revegetated with native grasses and forbs (some non-natives form dense patches through which it is difficult for turtles to travel).	Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.
Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1 st and before June 1 st).	Ditches and utility access roads should not be mowed or managed through use of chemicals. If vegetation management is required, it should be done mechanically, as infrequently as possible, and fall through spring (mowing can kill turtles present during mowing, and makes it easier for predators to locate turtles crossing roads).

Protecting Blanding's Turtle Nests: Most predation on turtle nests occurs within 48 hours after the eggs are laid. After this time, the scent is gone from the nest and it is more difficult for predators to locate the nest. Nests more than a week old probably do not need additional protection, unless they are in a particularly vulnerable spot, such as a yard where pets may disturb the nest. Turtle nests can be protected from predators and other disturbance by covering them with a piece of wire fencing (such as chicken wire), secured to the ground with stakes or rocks. The piece of fencing should measure at least 2 ft. x 2 ft., and should be of medium sized mesh (openings should be about 2 in. x 2 in.). It is *very important* that the fencing be **removed before August 1st** so the young turtles can escape from the nest when they hatch!

REFERENCES

- ¹Association for Biodiversity Information. "Heritage Status: Global, National, and Subnational Conservation Status Ranks." NatureServe. Version 1.3 (9 April 2001). <http://www.natureserve.org/ranking.htm> (15 April 2001).
- Coffin, B., and L. Pfanmuller. 1988. Minnesota's Endangered Flora and Fauna. University of Minnesota Press, Minneapolis, 473 pp.

REFERENCES (cont.)

- Moriarty, J. J., and M. Linck. 1994. Suggested guidelines for projects occurring in Blanding's turtle habitat. Unpublished report to the Minnesota DNR. 8 pp.
- Oldfield, B., and J. J. Moriarty. 1994. Amphibians and Reptiles Native to Minnesota. University of Minnesota Press, Minneapolis, 237 pp.
- Sajwaj, T. D., and J. W. Lang. 2000. Thermal ecology of Blanding's turtle in central Minnesota. *Chelonian Conservation and Biology* 3(4):626-636.

CAUTION



BLANDING'S TURTLES MAY BE ENCOUNTERED IN THIS AREA

The unique and rare Blanding's turtle has been found in this area. Blanding's turtles are state-listed as Threatened and are protected under Minnesota Statute 84.095, Protection of Threatened and Endangered Species. Please be careful of turtles on roads and in construction sites. For additional information on turtles, or to report a Blanding's turtle sighting, contact the DNR Nongame Specialist nearest you: Bemidji (218-308-2641); Grand Rapids (218-327-4518); New Ulm (507-359-6033); Rochester (507-280-5070); or St. Paul (651-259-5764).

DESCRIPTION: The Blanding's turtle is a medium to large turtle (5 to 10 inches) with a black or dark blue, dome-shaped shell with muted yellow spots and bars. The bottom of the shell is hinged across the front third, enabling the turtle to pull the front edge of the lower shell firmly against the top shell to provide additional protection when threatened. The head, legs, and tail are dark brown or blue-gray with small dots of light brown or yellow. A distinctive field mark is the bright yellow chin and neck.

**BLANDING'S TURTLES DO NOT MAKE GOOD PETS
IT IS ILLEGAL TO KEEP THIS THREATENED SPECIES IN CAPTIVITY**

SUMMARY OF RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS TO BLANDING'S TURTLE POPULATIONS

(see Blanding's Turtle Fact Sheet for full recommendations)

- This flyer should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.
- Turtles that are in imminent danger should be moved, by hand, out of harms way. Turtles that are not in imminent danger should be left undisturbed to continue their travel among wetlands and/or nest sites.
- If a Blanding's turtle nests in your yard, do not disturb the nest and do not allow pets near the nest.
- Silt fencing should be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been revegetated.
- Small, vegetated temporary wetlands should not be dredged, deepened, or filled.
- All wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.
- Roads should be kept to minimum standards on widths and lanes.
- Roads should be ditched, not curbed or below grade. If curbs must be used, 4" high curbs at a 3:1 slope are preferred.
- Culverts under roads crossing wetland areas, between wetland areas, or between wetland and nesting areas should be at least 36 in. diameter and flat-bottomed or elliptical.
- Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.
- Utility access and maintenance roads should be kept to a minimum.
- Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.
- Terrain should be left with as much natural contour as possible.
- Graded areas should be revegetated with native grasses and forbs.
- Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).

Minnesota Pollution Control Agency

March 10, 2010

Ms. Elise M. Doucette
Minnesota Pollution Control Agency
Environmental Review Division
520 Lafayette Road North
St. Paul, MN 55155-4194

RE: Prairie Rose Wind Farm and 115 kV Transmission Line in Rock and
Pipestone Counties, MN.

Dear Ms. Doucette:

Geronimo Wind Energy LLC (Geronimo) recently received comments from you in a letter dated February 16, 2010, regarding the Certificate of Need Notice Plan for the Prairie Rose 115 kV transmission line in Rock County, Minnesota. The proposed transmission line is in support of Geronimo's proposed Prairie Rose Wind Farm in Rock and Pipestone Counties, Minnesota.

The project nameplate capacity will be 101 MW. The 115 kV High Voltage Transmission Line (HVTL) that would run between the project substation, located within the wind farm project boundary, and Xcel Energy's Split Rock Substation, located near Brandon, SD. The proposed route would run parallel to Rock County Highway 7 and Rose Dell Township Road 72 (Figure 1-1). This spring, Geronimo will submit a Site Permit Application for a Large Wind Energy Conversion System and a Route Permit Application for a HVTL to the Minnesota Public Utilities Commission (PUC).

Typically, wind facility construction includes erecting wind turbines and constructing associated facilities such as gravel access roads, and an underground and/or aboveground 34.5 kV collector system. Although final turbine locations, access roads, and electrical connections have not been determined at this time, the tables below identify Township sections potentially affected by the project:

Table 1 –Sections within the Project Boundary

County	Township Name	Township	Range	Sections
Rock	Rose Dell	104N	46W	1-2, 11-16, 21-28, and 33-35
Rock	Denver	104N	45W	2-7, 8-10, 15-19, 20-22, 27-30, and 31-34
Rock	Springwater	103N	46W	1-4, 9-12
Pipestone	Elmer	105N	45W	20, 29-30, 31-34
Pipestone	Eden	105N	46W	36

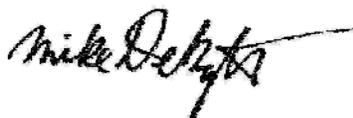
Table 2 – Proposed Transmission Line Corridor

Township Name	Township	Range	Sections
Rose Dell	104N	46W	27-34
Rose Dell	104N	47W	25, 26, 35, 36

We welcome any comments the Minnesota Pollution Control Agency may have at this time or throughout the permit application process. Table 1 identifies the sections within the Project boundary and Table 2 identifies sections adjacent to the proposed transmission line.

Enclosed are maps detailing the location and project boundary of the Prairie Rose Wind Farm and 115 kV Transmission Line. If you require further information or have questions regarding this matter, please call me at (763) 591-5479.

Sincerely,



Mike DeRuyter
 Environmental Scientist

Enclosures:

Figure 1-1 - Project Location Map (Transmission Line)

Figure 1-2 – Project Location Map (Wind Farm)

Cc: Patrick Smith, Geronimo Wind Energy, LLC



Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, MN 55155-4194 | 651-296-6300 | 800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us

February 16, 2010

Ms. Christina K. Brusven
Fredrikson & Byron, P.A.
200 South Sixth Street, Suite 4000
Minneapolis, MN 55402-1425

RE: Prairie Rose Transmission, LLC 115 kV Transmission Line
Rock County, Minnesota

Dear Ms. Brusven:

Thank you for the opportunity to review the Certificate of Need Notice for a proposed 115 kV transmission line to connect Prairie Rose Wind Farm to the Split Rock Substation near Brandon, South Dakota. Regarding matters for which the Minnesota Pollution Control Agency (MPCA) has regulatory responsibility and other interests, the MPCA has the following comments to provide at this time.

- If the total project will disturb one acre or more of land, a National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit is required from the MPCA prior to construction. Information regarding the MPCA's Construction Stormwater Program can be found on the MPCA's Web site at:
<http://www.pca.state.mn.us/water/stormwater/stormwater-c.html>.
- Please be aware that the Split Rock Creek is listed on the MPCA 2008 303(d) Total Maximum Daily Load (TMDL) list of impaired waters for dissolved oxygen. We recommend you check with our current listing of impaired waters at our MPCA Web site at
<http://www.pca.state.mn.us/water/tmdl/tmdl-303dlist.html>. The impairment will dictate additional increased stormwater treatment both during construction and require additional increased permanent treatment post construction. These requirements will be included in the NPDES/SDS Construction Stormwater Permit. Prairie Rose Transmission, LLC should identify that compliance with these increased stormwater water quality treatments can be achieved on the project site or elsewhere.
- In addition, any project that will result in over 50 acres of disturbed area and has a discharge point within one mile of an impaired water is required to submit their Stormwater Pollution Prevention Plan (SWPPP) to the MPCA for a review at least 30 days prior to the commencement of land disturbing activities. If the SWPPP is found to be out of compliance with the terms and conditions of the General Permit, further delay may occur. The MPCA encourages the project proposer to meet with staff at preliminary points to avoid this situation.
- Based on this project's need to obtain a United States Army Corp of Engineers Section 404 Permit and the project's proximity to impaired waters, this project may also require a Clean Water Act Section 401 Water Quality Certification or waiver from the MPCA to verify compliance with state water quality standards. For further information about the 401 Water Quality Certification process, please contact Kevin Molloy at 651-757-2577 or Bill Wilde at 651-757-2825.

Ms. Christina K. Brusven
February 16, 2010
Page 2

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 by e-mail at elise.doucette@state.mn.us or by telephone at 651-757-2316.

Sincerely,

A handwritten signature in black ink that reads "Elise M. Doucette". The signature is written in a cursive style with a long, sweeping underline that extends to the right.

Elise M. Doucette
Environmental Review Division
Regional Division

EMD:mbo

Minnesota Historical Society/State Historic Preservation Office



RECEIVED
SEP 11 2009
HDR Engineering, Inc.

September 9, 2009

Mr. Stephen Sabatke
HDR Engineering, Inc.
701 Xenia Avenue South, Suite 600
Minneapolis, MN 55416

RE: Geronimo Wind Energy's Prairie Rose Wind Project
Rock County
SHPO Number: 2009-3187

Dear Mr. Sabatke:

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

Due to the nature of the proposed project, we recommend that an archaeological 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 properties that are identified. For your information, we have enclosed a list of consultants who have expressed an interest in undertaking such surveys.

If the project area can be documented as previously disturbed or previously surveyed, we will re-evaluate the need for survey. Previously disturbed areas are those where the naturally occurring post-glacial soils and sediments have been recently removed. Any previous survey work must meet contemporary standards.

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 with reference to the appropriate federal agency.

If you have any questions on our review of this project, please contact me at (651) 259-3456.

Sincerely,



Dennis A. Gimmestad
Government Programs and Compliance Officer

Enclosure: List of Consultants



Minnesota
Historical Society

STATE HISTORIC PRESERVATION OFFICE

April 12, 2010

Mr. Stephen Sabatke
HDR Engineering
701 Xenia Ave. S, Suite 600
Minneapolis, MN 55416

RE: Prairie Rose Wind Farm boundary expansion and transmission line
Rock and Pipestone Counties
SHPO Number: 2009-3187

Dear Mr. Sabatke:

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

We initially reviewed this project on 9 September 2009, recommending that an archaeological survey be conducted. We have now received notice (your letter dated 22 March 2010) that the project boundary has been expanded and an associated transmission line has been added to the project scope. We still recommend that a survey be conducted for this project as now proposed.

If the project area can be documented as previously disturbed or previously surveyed, we will re-evaluate the need for survey. Previously disturbed areas are those where the naturally occurring post-glacial soils and sediments have been recently removed. Any previous survey work must meet contemporary standards.

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 with reference to the appropriate federal agency.

If you have any questions on our review of this project, please contact our Compliance Section at (651) 259-3455.

Sincerely,



Mary Ann Heidemann, Manager
Government Programs and Compliance

Minnesota Department of Transportation



Minnesota Department of Transportation

395 John Ireland Boulevard
Saint Paul, MN 55155
Mailstop 678

(651) 366-4635
stacy.kotch@state.mn.us

RECEIVED

AUG 19 2009

August 17, 2010

HDR Engineering, Inc.

David Birkholz, State Permit Manager
Minnesota Office of Energy Security
85 7th Place East, Suite 500
St. Paul, MN 55101

RE: In the Matter of Prairie Rose Wind Farm
PUC Docket No. IP-6843/WS-10-425

Dear Mr. Birkholz,

On July 7, 2010, the Minnesota Office of Energy Security (OES) issued a Notice of Public Information and Scoping Meeting, which includes a public comment period regarding the scope of the environmental report (ER) and the draft site permit that is under consideration with respect to the Geronimo Wind Energy, LLC, for the Prairie Rose Project 101 Megawatt Large Wind Energy Conversion System (LWECS) in Rock and Pipestone Counties. The Minnesota Department of Transportation (Mn/DOT) has reviewed the draft site permit regarding the proposed project and submits the following comments in response to the Notice.

Mn/DOT appreciates the opportunity to comment on the draft site permit. Mn/DOT notes that there are several provisions that may have impacts on the state transportation system.

The draft site permit should include language specifying that the Permittee shall obtain all relevant permits or authorizations from road authorities relating to any electric cables and/or feeder lines that may be proposed to be placed in a public road right-of-way. Mn/DOT has adopted a formal policy and procedures for accommodation of utilities on the highway rights-of-way ("Utility Accommodation Policy"). A copy of Mn/DOT's policy can be found at <http://www.dot.state.mn.us/utility/files/pdf/appendix-b.pdf>. Mn/DOT's policy seeks to permit utilities to occupy portions of the trunk highway rights-of-way where such occupation does not put the safety of the traveling public or highway workers at risk or unduly impair the public's investment in the transportation system. Compliance with

An Equal Opportunity Employer



Mn/DOT's Utility Accommodation Policy, and similar policies of other road authorities, should be included as a condition of the site permit.

Please note that Mn/DOT is uncertain at this time whether the Prairie Rose Wind Farm Project is an entity that has lawful authority to place its facilities in a public road right-of-way. This matter should be addressed in the ER.

US Highway 75 runs adjacent to and through the location of the proposed wind farm. US 75 has been designated as the "King of Trails" State Scenic Byway. Scenic byways are designated because they possess one or more of six intrinsic qualities, including: scenic, cultural, recreational, natural, historic and archaeological qualities. An analysis of the physical and visual impact on each of these six intrinsic qualities should be conducted to determine the impact on the scenic byway route. Mitigation measures should be included to minimize unavoidable impacts on intrinsic qualities within the scenic byway corridor. Each scenic byway has a leaders group and/or stakeholder group. The leaders group for the King of Trails Scenic Byway should be contacted as part of the environmental review process.

The environmental review and draft site permit should address matters relating to the proximity of the wind turbine towers to US 75, including matters such as the impact of blade flicker affecting drivers on the highway, the potential for ice falling off the blades, and the potential for the wind turbine tower to fall in a storm. Mn/DOT requests that the wind tower turbines be located a prudent distance away from US 75 to avoid potential adverse impact on highway travelers.

Any wind farm construction work, including delivery or storage of structures, materials or equipment that may affect Mn/DOT right-of-way is of concern such that Mn/DOT should be involved in planning and coordinating such activities. The site permit should include language specifying that the Permittee shall obtain all relevant permits from road authorities relating to the transport of oversize materials and equipment related to the project over public roads, as well as installation of facilities that may be proposed to occupy portions of public road rights-of-way. Please note that if work is required within Mn/DOT right of way for temporary or permanent access, such work should be coordinated with Geri Vick in Mn/DOT's District 8 Utility Permits Office at 320-214-6364 or Geri.Vick@state.mn.us or with Marc Fischer in Mn/DOT's District 7B Permits Office at 507-831-8012 or Marc.Fischer@state.mn.us.

An Equal Opportunity Employer



Sincerely,



Stacy Kotch

Utility Transmission Route Coordinator
Minnesota Department of Transportation

Enclosures

cc:

Mark Anderson

Jarrett Hubbard

Mark Scheidel

Geri Vick

Marc Fisher

Michael Deruyter - HDREngineering

An Equal Opportunity Employer



Southwest Regional Development Commission

SOUTHWEST REGIONAL DEVELOPMENT COMMISSION PROJECT REVIEW

AGENDA ITEM: 6

MEETING DATE: Sept. 9, 2010

SUBJECT: A LWECS PUC Site Permit for Prairie Rose Wind Project in Pipestone and Rock Counties

COMMITTEE ACTION X STATUS OR SCHEDULED REPORT INFORMATION

BACKGROUND/RATIONALE:

The proposed project is for up to 101 MW nameplate capacity wind farm with an estimated time frame of going on-line during the first quarter of 2012, the permit requested includes the following:

1. A wind turbine layout consisting of up to 67 turbines, depending on turbine specifications; the application describes the possible use of General Electric 1.5 MW, Vestas 1.8 MW or Siemens 2.3 MW wind turbines. Regardless of machine selected, the hub height will be 80 m with RD ranging from 77-101 m;
2. Associated facilities, including gravel access roads, an electrical collection system, permanent meteorological towers, one step-up substation, a Sonic (SODAR) or Light (LIDAR) Detection and Ranging unit and an O&M building.

The project has an associated 24-mile 115 kV transmission system that would connect to the Split Rock Substation near Brandon, South Dakota (see IP-6839/TL-10-134).

The proposed site is located west of Hardwick and south and east of Jasper in Rock and Pipestone counties. The project is proposed to be constructed in Denver, Rose Dell and Spring Water townships in Rock County and Elmer and Eden townships in Pipestone County (see attached map). The Project Boundary encompasses approximately 35,335 acres, of which approximately 14,000 acres are under site control with approximately 50 acres used by turbines and associated facilities.

Projected base energy for the 101 MW wind project is a net capacity of 40 to 45%, with an estimated annual output of 341,640 to 394,200 MWH. Estimated costs for the project are between \$197 to 205 million.

REGIONAL GOALS AND IMPACT/STAFF COMMENTS:

Recreational Resources. The developer did a good job of describing the WMAs, USFWS, State and County Parks. The Casey Jones Trail Corridor should be noted, as per Minnesota Statute 85.015 below. While the trail has not been developed thus no setbacks can be identified, the Region encourages the developer to work with the DNR as the trail is developed and as there is expansion of the Prairie Rose Wind farm, so both land uses can co-exist. The highlighted Statute text would be the trail corridor related to the project.

Minnesota Statute 85.015 Sub. 2 (Casey Jones Trail)

Subd. 2. Casey Jones Trail, Murray, Redwood, Pipestone, and Rock Counties.

(a) The trail shall originate in Lake Shetek State Park in Murray County and include the six-mile loop between Currie in Murray County and Lake Shetek State Park. From there, the first half of the trail shall trail southwesterly to Slayton in Murray County; thence westerly to the point of intersection with the most easterly terminus of the state-owned abandoned railroad right-of-way, commonly known as the Casey Jones unit; thence westerly along said Casey Jones unit to Pipestone in Pipestone County; thence southwesterly to Split Rock Creek State Park in Pipestone County; thence southeasterly to Blue Mounds State Park in Rock County; thence southerly to Luverne and Schoneman Park in Rock County, and there terminate. The second half of the trail shall commence in Lake Shetek State Park in Murray County and trail northeasterly to Walnut Grove in Redwood County; thence northeasterly to Redwood Falls in Redwood County to join with the Minnesota River State Trail.

(b) The trail shall be developed as a multiuse, multiseasonal, dual treadway trail. Nothing herein shall abrogate the purpose for which the Casey Jones unit was originally established, and the use thereof shall be concurrent.

(CONTINUED)

Traffic. The Region recommends the developer also work closely with the Pipestone and Rock County Highway Departments and other road authorities (Twp and State) to discuss access permits prior to determining the physical location of the access road to the turbine sites.

A more thorough understanding of the construction traffic, type, size weight and axles and volume would be appropriate. Based on the Regions knowledge of a project of similar size 66 towers (in Jackson County), the similar project generated 79 truck loads per turbine (turbine parts, gravel, rebar, tools, concrete) plus 1584 general truck loads for the Jackson Co project, or a total of 6798 loads. The Prairie Rose site permit application identifies an increase of 20-30 vehicles per day; I am assuming these are truckloads and not the construction workers. This is likely to be true, if the construction loads come in over an 8 month time frame, however I suspect that there will be a higher concentration of loads during fewer months.

More significantly is the impact to the infrastructure. The Minnesota County Engineers have been working with the Local Road and Research Board to develop a paved road consumption calculator to determine the amount of road life consumed by the traffic generated by the development project. It is strongly recommended that Rock County work with the Developer utilizing the model to assist in determining road life costs associated with the proposed project.

In reviewing the maps, it appears that there are no turbines scheduled for placement in Pipestone County. The developer has noted that permits will be needed from the County. There is an overweight permit process (found on the Pipestone County Highway Department web site) for any overweight/over dimension loads that may be traveling on the county roadways. If any of the entrances to the turbine are from Pipestone County Roads, it is recommended they discuss entrance permits prior to determining access roads to the tower sites.

Finally, while not a public sector issue, the Region encourages the developer to take into account some general land owner concerns the Region has been hearing recently:

- private tile lines. Seek landowner information about location of private tiles and take precautions to reduce crushing them with the construction activities;
- be mindful of state and federal conservation programs lands, when they are disturbed, there are repercussions for the land owner; and
- before final placement of the turbines, if the landowner plans to make improvements to their homestead (bins, dryers, silos) is the distance between the turbine and homestead sufficient?

Southwest Region Staff comments:

Staff appreciated reviewing this site application permit; it appeared to be more thorough than past application reviewed. The developer made early contact with Rock County in the process which is appreciated.

Time SRDC staff spent performing this review:

Review by Annette Bair, SRDC Physical Development Director

Review time 3 hours.

Project income to the SRDC \$0