

**Disturbance of Bald Eagles at Winter Roosting/Foraging Areas  
And  
Effects of Overhead Utility Line at River Crossings on Bald Eagles  
Review of current literature and overview of important eagle areas along the Minnesota  
River in Le Sueur, Sibley, Scott, and Nicollet Counties.**

US Fish and Wildlife Service  
Twin Cities Field Office, Minnesota 55425

**Current Protection of Bald and Golden Eagles**

Although bald and golden eagles were delisted from the Endangered Species Act on August 8, 2007, they are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (Eagle Act). The Eagle Act (1940) defines “disturb” as, “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” The Fish and Wildlife Services has generated The National Bald Eagle Management Guidelines, which are intended to help landowners minimize disturbance to bald eagles.

**Disturbance of Bald Eagles at Winter Roosting/Foraging Areas**

Bald Eagles that overwinter in Minnesota can be susceptible to mortality, caused by cold stress and starvation. Bald eagles congregate into groups called communal roosts in the winter in order to conserve energy, exploit protective microclimates, and reduce foraging costs. Protection of winter roosting and foraging areas is often recommended as a measure to reduce and prevent eagle winter mortality. Communal roosts are important for not only bald eagles, but golden eagles, numerous raptors, and other migratory birds. Interspecies roosting is not uncommon (Brown et al. 2006). Eagles can further reduce energetic costs when protected roosting areas are in close proximity to open water foraging areas (Stahlmaster and Gessaman 1984). Young bald eagles generally do not yet have nesting territories, and are the most susceptible to winter mortality due to being out-competed by older eagles. However, negative response of wintering eagles to human activities increases with eagle age (Stahlmaster and Newman 1978). Communal roosts are frequently located closer to water and further from human development than random sites (Buehler et al. 1991). Habitat alteration of established local winter foraging areas can cause significant disturbance to eagles (Stahlmaster and Newman 1978) and can cause a decrease in eagle populations where food is a limiting resource (Stahlmaster and Gessaman 1984). Additionally, alteration and destruction of roosting sites (summer and winter) can be a determining factor in decreasing bald eagle populations (Buehler et al. 1991). In Minnesota, two main sources of high-energy food are available to eagles; carcasses and fish caught in open water. Buffer zones are recommended between potential disruptive activity and important eagle foraging areas (Stahlmaster and Newman 1978, Stahlmaster and Kaiser 1997). Additional protective measures of communal roosts include preventing development along shorelines and protecting large diameter trees (Buehler et al. 1991).

## Bald and Golden Eagle Protection Act Guidance

The Bald Eagle Management Guidelines (USFWS 2007) states, “Migrating and wintering bald eagles often congregate at specific site for purposes of feeding and sheltering. Bald eagles rely on established roost sites because of their proximity to sufficient food sources. Roost sites are usually in mature trees where the eagles are somewhat sheltered from the wind and weather. Human activities near or within communal roost sites may prevent eagles from feeding or taking shelter, especially if there are not other undisturbed and productive feeding and roosting sites available. *Activities that permanently alter communal roost sites and important foraging areas can altogether eliminate the elements that are essential for feeding and sheltering eagles.*” (emphasis added)

The Final Environmental Assessment for the proposal to permit take as provided under the bald and golden eagle protection act states (USFWS 2009),

“The definition of “important eagle-use area” is an eagle nest, foraging area, or communal roost site that eagles rely on for breeding, sheltering, or feeding, and the landscape features surrounding such nest, foraging area, or roost site that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles. Not all foraging areas and communal roost sites are important enough such that interfering with eagles at the site will cause disturbance (resulting in injury or nest abandonment.) Whether eagles rely on a particular foraging area or communal roost site to that degree will depend on a variety of circumstances, most obviously, the availability of alternate sites for feeding or sheltering.”

The Bald Eagle Management Guidelines (USFWS 2007) give the following recommendations for avoiding disturbance at important eagle use areas (nesting, foraging, and wintering areas) (emphasis added):

1. Minimize potentially disruptive activities and development in the eagles direct flight path between their nest and roost sites and important foraging areas
2. Locate long-term and permanent water-dependent facilities, such as boat ramps and marinas, away from important eagle foraging areas
3. Protect and preserve potential roost and nest sites by retaining mature trees and old growth stands, particularly within ½ mile from water.
4. **To avoid collisions, site wind turbines, communication towers, and high voltage transmission power lines away from nests, foraging areas, and communal roost sites**
5. Employ industry-accepted best management practices to prevent birds from colliding with or being electrocuted by utility lines, towers, and poles. **If possible, bury lines in important eagle areas.**
6. Where bald eagles are likely to nest in human-made structures and such use could impede operation or maintenance of the structures or jeopardize the safety of the eagles, equip the structures with either (1) devices engineered to discourage bald eagles from building nests, or (2) nesting platforms that will safely accommodate bald eagle nests without interfering with structure performance.

The Implementation Guidance for Eagle Take Permits under 50 CFR 22.26 and 50 CFR 22.27 indicate that because breeding home ranges of bald eagles can extend up to 2 miles from the nest, **new installation of [potentially] lethal infrastructure should be sited at least 2 miles away from important bald eagle-use areas** (emphasis added).

**Important wintering habitat for bald eagles and other migratory birds at proposed CapX 2020 sites.**

The Audubon Society of Minnesota has identified the Upper Minnesota River Valley as an Important Bird Area (IBA), covering the counties of Blue Earth, Brown, Chippewa, Le Sueur, Nicollet, Redwood, Renville, Sibley, and Yellow Medicine. Important Bird Areas (IBAs) are sites that provide essential habitat for one or more species of bird. IBAs include sites for breeding, wintering, and/or migrating birds. The criteria for designating the Upper Minnesota River Valley as an IBA include occurrence of State Species of Conservation Concern, Species in rare/unique habitat waterfowl (State defined) wading birds (State defined) seabirds/other colonial water birds (State defined) raptors/season (State defined) Research site. Audubon Minnesota works with partners, landowners, and Audubon Chapters to develop and implement conservation and monitoring plans at this site. This site is also a focus for Audubon's conservation actions in the future. (Audubon: <http://iba.audubon.org/iba/stateIndex.do?state=US-MN>. Accessed January 29, 2010). Figure 1.

**Specific important eagle and raptor habitat and wintering areas along the Minnesota River.**

**Belle Plaine:** The Minnesota Department of Natural Resources has designated the area north of Belle Plaine as the Minnesota Valley State Recreation Area. There are three eagle nests either in or adjacent to the proposed corridor (below, Figure 2). The proposed utility line crossing would separate the nearest nest (nest 1) from a foraging area (a sewage treatment pond). Having eagles cross the utility line many times a day traveling between foraging areas and the nest could increase the incidence of collisions, especially for nestlings learning to fly. The sewage treatment ponds also seasonally attract several dozen species of shorebirds and wading birds, including black-necked stilts.

<b>Location</b>	<b>Distance to Utility line corridor</b>	<b>Importance to Eagles</b>
Sewage treatment ponds	≤ 100 feet	Winter Forage
Nest 1	0 feet (within corridor)	Nesting
Minnesota River	0 feet (within corridor)	Movement Corridor, Foraging, Roosting
Nest 2	4,900 feet	Nesting
Nest 3	6,300 feet	Nesting

**Le Sueur:** There are five eagle nests near the town of Le Sueur along the Minnesota River, one of which is within the proposed corridor (Figure 3). The area near Le Sueur has multiple attributes that make it important to foraging and wintering eagle populations, as well as other migratory birds, indicated on Figure 4 (see legend). The number of wintering eagles that congregate in this area vary from year to year, depending on temperatures and river levels. This area contains Buck’s Lake, which is kept from freezing by a spring. Buck’s lake has abundant winter kill of fish (Figure 5, and 6) and is an important winter feeding area for eagles and other raptors (Figure 7). There is a heron rookery on site, and in 2009 a golden eagle was documented within ¾ of a mile of Buck’s Lake. Throughout the year, Buck’s lake attracts a variety of other birds, including loons, tundra and trumpeter swans, 17 documented species of ducks, pelicans, and cormorants. Directly southeast of Buck’s Lake is a sewage treatment pond, which provides a food base and important roosting habitat. In 2007 there were documented 72 bald eagles roosting around the sewage ponds. Directly to the east of the sewage treatment ponds is the US Highway 169 Bridge. Open water is often found here during the winter, and fish congregate under the bridge. Bald eagles forage here, and a nighttime roost of 20-25 eagles in the trees on either side of the bridge is common. Below are the distances from roosts, nests, and foraging areas to the proposed utility line corridor (Figure 3 and 4).

<b>Location</b>	<b>Distance to Utility Line Corridor</b>	<b>Importance to Eagles</b>
Buck’s Lake	0 feet (within corridor)	Winter Forage
Horseshoe Lake	0 feet (within corridor)	Winter Forage
Sewage Treatment Pond	0 feet (within corridor)	Winter Forage, Roosting
US Hwy 169 bridge	0 feet (within corridor)	Winter Forage, Roosting
Minnesota River	0 feet (within corridor)	Movement Corridor, Foraging, Nesting
Nest 1	0 feet (within corridor)	Nesting
Nest 2	2,200 feet	Nesting
Nest 3	6,800 feet	Nesting
Nest 4	7,200 feet	Nesting
Nest 5	7,800 feet	Nesting

**Impact of Overhead Utility Lines on Bald Eagles, Raptors, and other Migratory Birds.**

The Fish and Wildlife Service has provided information indicating that disturbance of wintering bald eagles and habitat alteration of foraging and roosting areas negatively affects Bald Eagles, and may lead to a decline in population numbers. This section outlines the evidence for overhead utility lines being the cause of the disturbance of bald eagles, raptors, and other migratory birds. Mortality can occur either by electrocution (when birds complete an electrical circuit) or by collision (birds flying directly into utility lines) (Mojica et al. 2009) (Figures 8, 9, and 10). Large birds are more susceptible to electric shock than smaller birds (Lehman et al. 2007), making bald eagles particularly vulnerable. Electric shock is a substantial cause of mortality and injury to raptors (Dwyer and Mannan 2007). Utility line electrocution can also leave birds with crippling injuries, such as burns, charred wings, and missing feet (see Figure 10). These injuries can significantly shorten a raptors lifespan. Utility lines located near raptor

nests (within 300 m) result in high levels of mortality for adults and nestlings, in some areas as high as 1.4 electrocutions per nest where utility line retrofits are absent. Poles that are closer to raptor nests are more likely to result in raptor mortality than poles that are further away from nests (Dwyer and Mannan 2007). Utility lines and utility poles are often attractive structures for raptors (including bald eagles) to roost and/or nest, as they afford a good view of the landscape (Lehman 2001). Raptors that make use of utility structures are at increased risk of mortality, and the utility line is at risk for greater damage (power outages, fire, etc) by nesting eagles.

Locating a utility line in an area of known eagle concentration will likely result in higher raptor mortalities. The area near Belle Paine and Le Sueur (detailed above) are both important nesting, foraging, roosting, and wintering area for bald and golden eagles. It is the opinion of the Fish and Wildlife Service that siting of an above ground utility line in either location will increase eagle mortality and will not provide any benefit for eagles.

Birds are more susceptible to utility line collisions and electrocutions when utility lines cross flight paths and movement corridors (Mojica et al. 2009). The Minnesota River is considered a major movement corridor for bald eagles, raptors, and other migratory birds. Risk of collisions is compounded if surrounding vegetation is shorter than the line. Vegetation that is higher than utility lines forces birds to fly safely above lines. Such vegetation is not possible when utility lines cross rivers. Because of difficulty in recovering carcasses of electrocuted eagles (especially over rivers), mortality estimates are most likely higher than documented. Dwyer (2004) estimated that 1 out of every 3 electrocutions went undetected due to scavenging and crippling (but not lethal) injuries. Lines close to open water (within 1km) and with little or low vegetation have the highest risk of causing raptor collisions (Mojica et al. 2009). Lowering cross arms on utility poles and installing bushing covers on all transformer poles can reduce mortality by up to 75%, within 300 meters of nests or other important raptor use areas (Lehman et al. 2007). Effectiveness of markers on lines to avoid collisions is not well known or studied for the majority of migratory birds (Janss and Ferrer 1998). One study performed in a high raptor density area suggests 400 raptors/year die along 100k stretch of utility lines (Jannes and Ferrer 1998).

The Bald Eagle Management Guidelines (USFWS 2007) suggests siting transmission utility lines away from nests, foraging areas, and communal roost sites in order to avoid collisions, and to bury utility lines in important eagle areas. Additionally, insulting wires and fitting poles with perch guards can reduce bird mortality.

### **New Regulations to Issue Permits for Non-Purposeful take of Eagles and Removal of Eagle Nests.**

The Fish and Wildlife Service now has the authority to issue permits for non-purposeful eagle disturbance and nest removal (50 CFR 22.26 and 22.27). However, these permits cannot be issued unless the certain criteria are followed. These criteria include (but are not limited to):

- “The direct and indirect effects of the take and required mitigation...are compatible with the preservation of the bald eagle.”
- “The taking cannot practicably be avoided.”
- “The applicant has avoided and minimized impacts to eagles to the maximum extent possible.”

Because of the early planning stages of this project, the project proponent is able to modify construction plans in such a way as to comply with the above criteria. If the above criteria are not met, future permits for eagle disturbance cannot be issued. Additionally, any eagle disturbance or mortality will be the responsibility of the project proponent and governed by the criminal penalty provision of the Bald and Golden Eagle Treaty Act and the Migratory Bird Treaty Act.

## Synopsis

- The Minnesota River is considered a major movement corridor for bald eagles, raptors, and other migratory birds.
- Habitat alteration of established local winter foraging areas communal roost sites, and nesting areas can cause significant disturbance to eagles and can cause a decrease in eagle populations.
- There are seven known bald eagle nests in the 16-mile stretch of river between Belle Plaine and Le Sueur, indicating the importance of summer roosting and foraging areas as well.
- The area near Belle Paine and Le Sueur (detailed above) are both important nesting, foraging, roosting, and wintering area for bald and golden eagles.
- It is the opinion of the Fish and Wildlife Service that siting of an above ground utility line in either location will increase eagle mortality and will not provide any benefit for eagles.
- If the project proponent does not avoid and minimize impacts to eagles to the fullest extent practicable, future permits for eagle disturbance cannot be issued.

## Recommendations

- In the important eagle area of the Minnesota River Valley, overhead utility lines should be buried when crossing rivers or areas of low vegetation.
- Transmission lines should be sited away at least 2 miles from nests, foraging areas, and communal roost sites in order to avoid collisions. The important eagle area identified in Figures 2, 3, and 4 should be avoided.
- Utility lines should be strung in areas where surrounding vegetation is higher than utility poles to reduce collision risk.
- Insulate poles and wires to reduce the risk of electric shock to birds.
- Providing perch guards on utility line poles near areas of high eagle concentration to prevent bird electrocution.
- Siting guidelines outlined by Avian Power Line Interaction Committee (APLIC) should be followed.

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**Figure 1.** Minnesota Audubon's designated Important Birding Areas. The Upper Minnesota Valley is outlined in Red.

 **Audubon** MINNESOTA  
Important Bird Areas of Minnesota

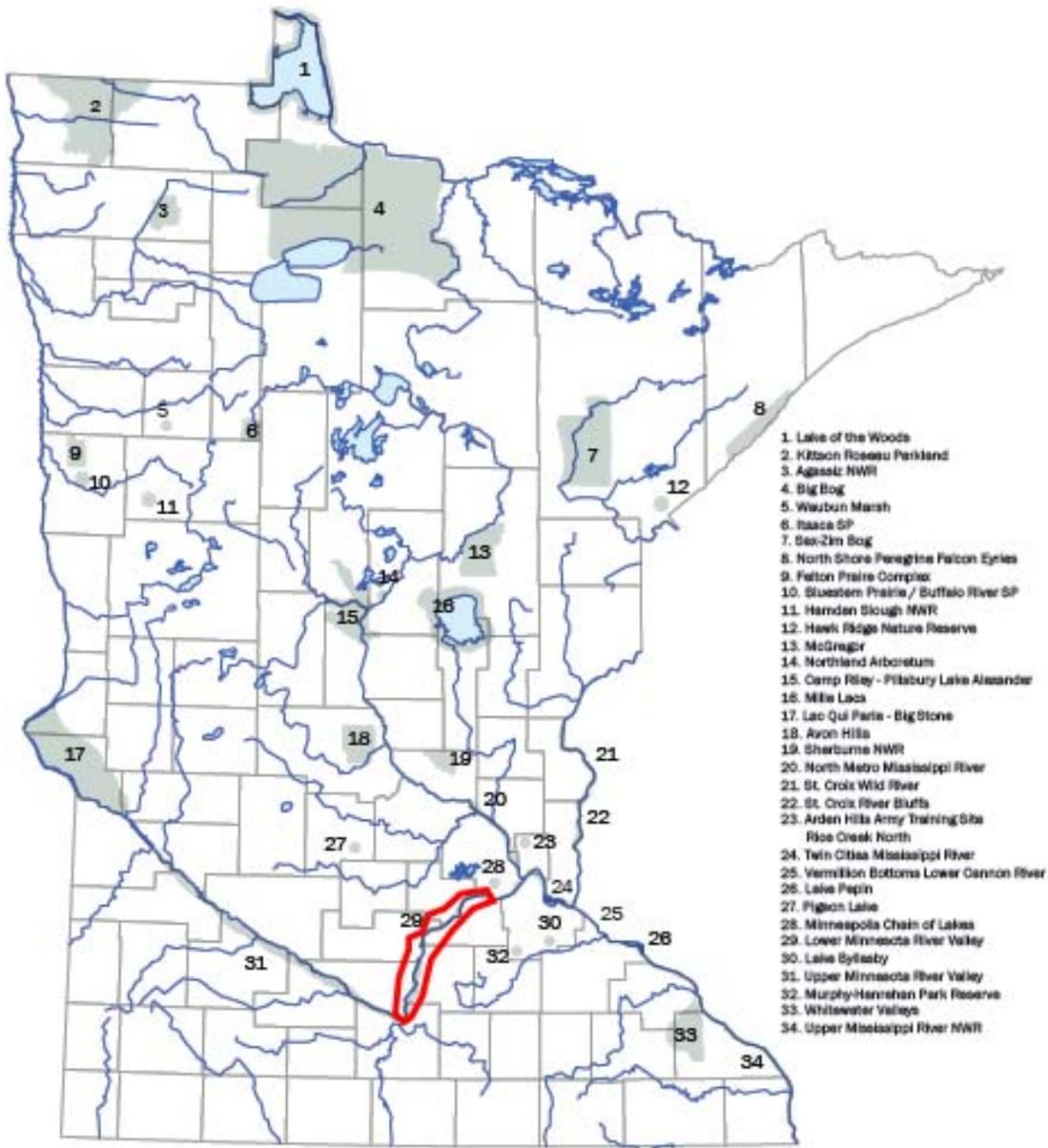


Figure 2. Vicinity of proposed Belle Plain crossing.

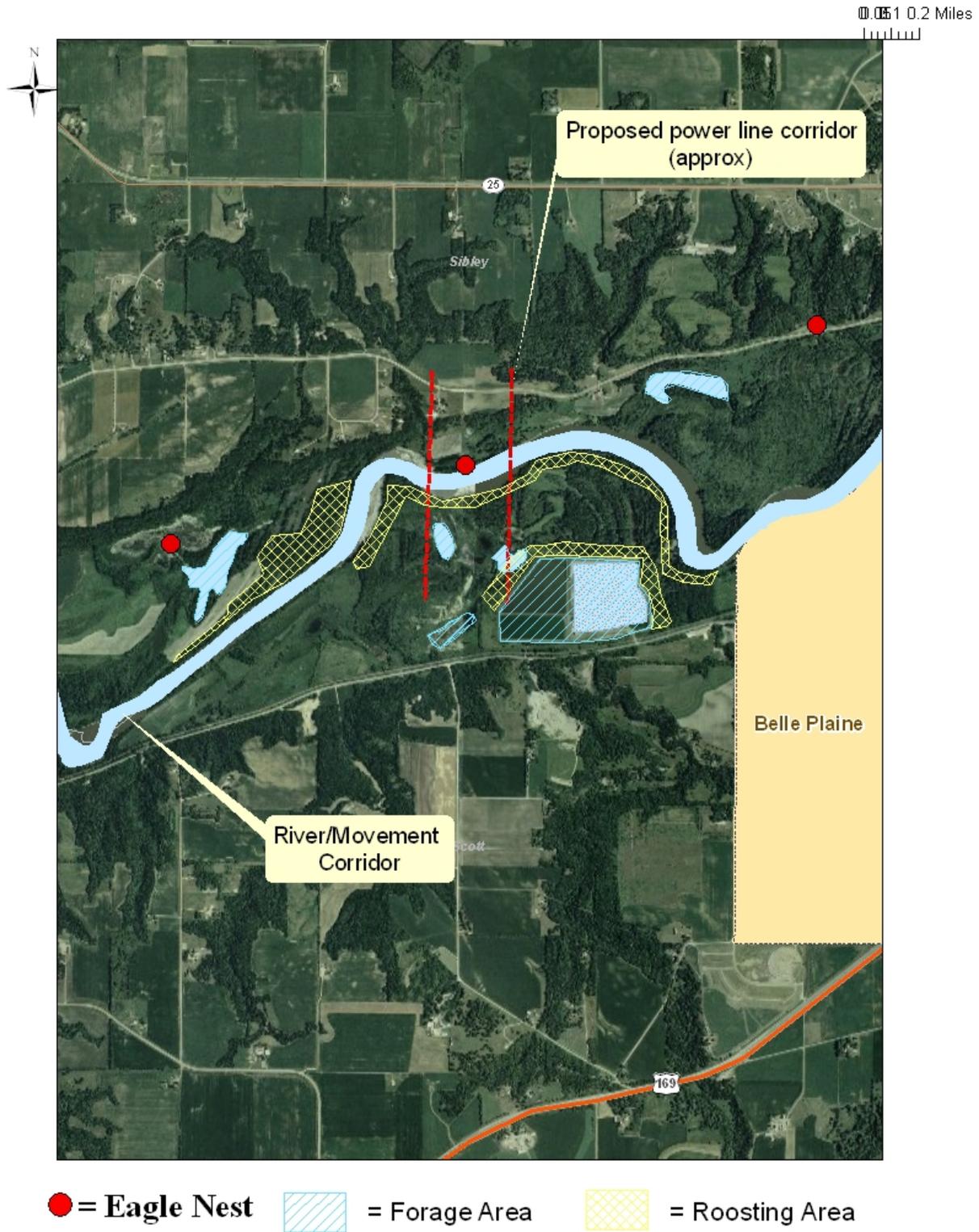
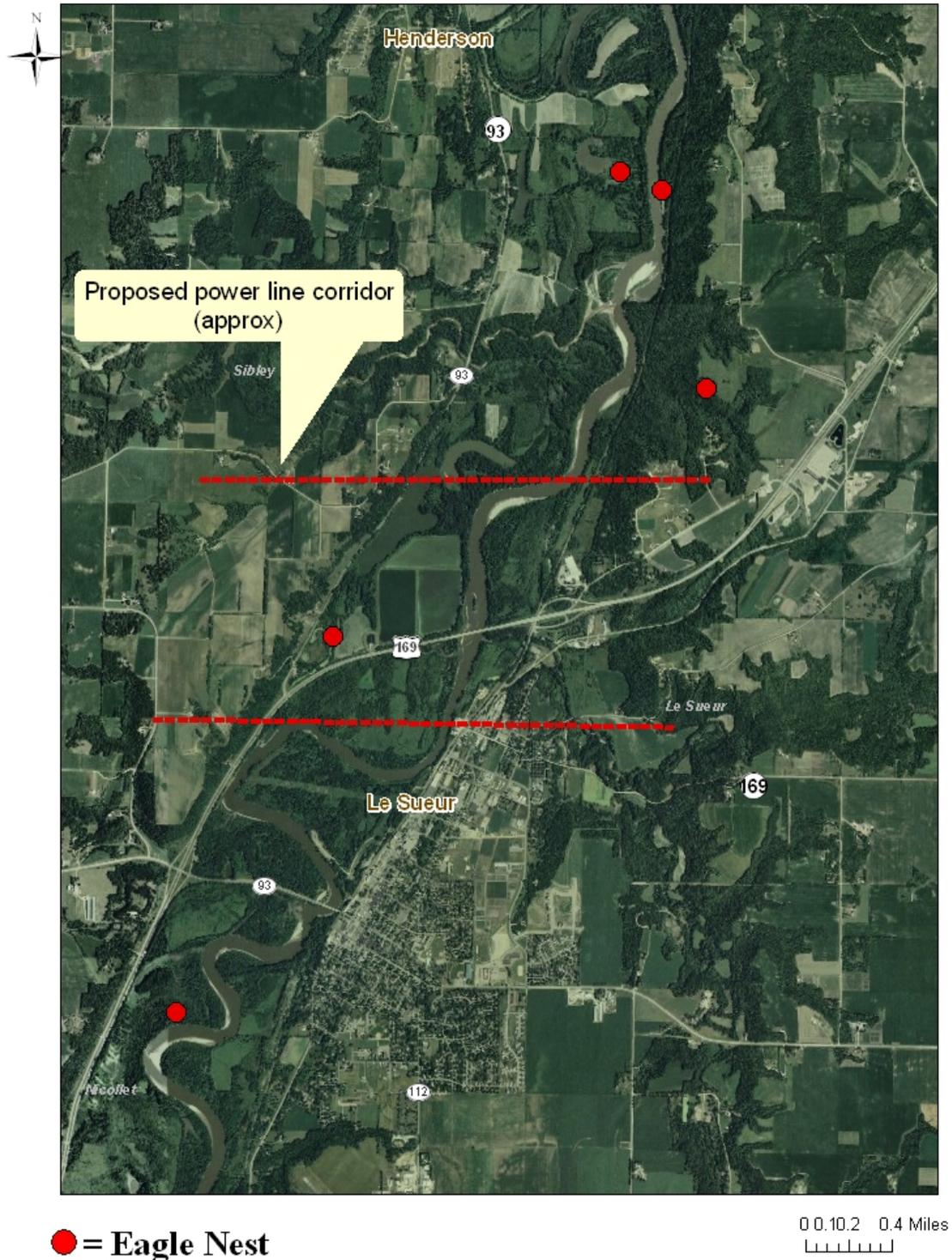
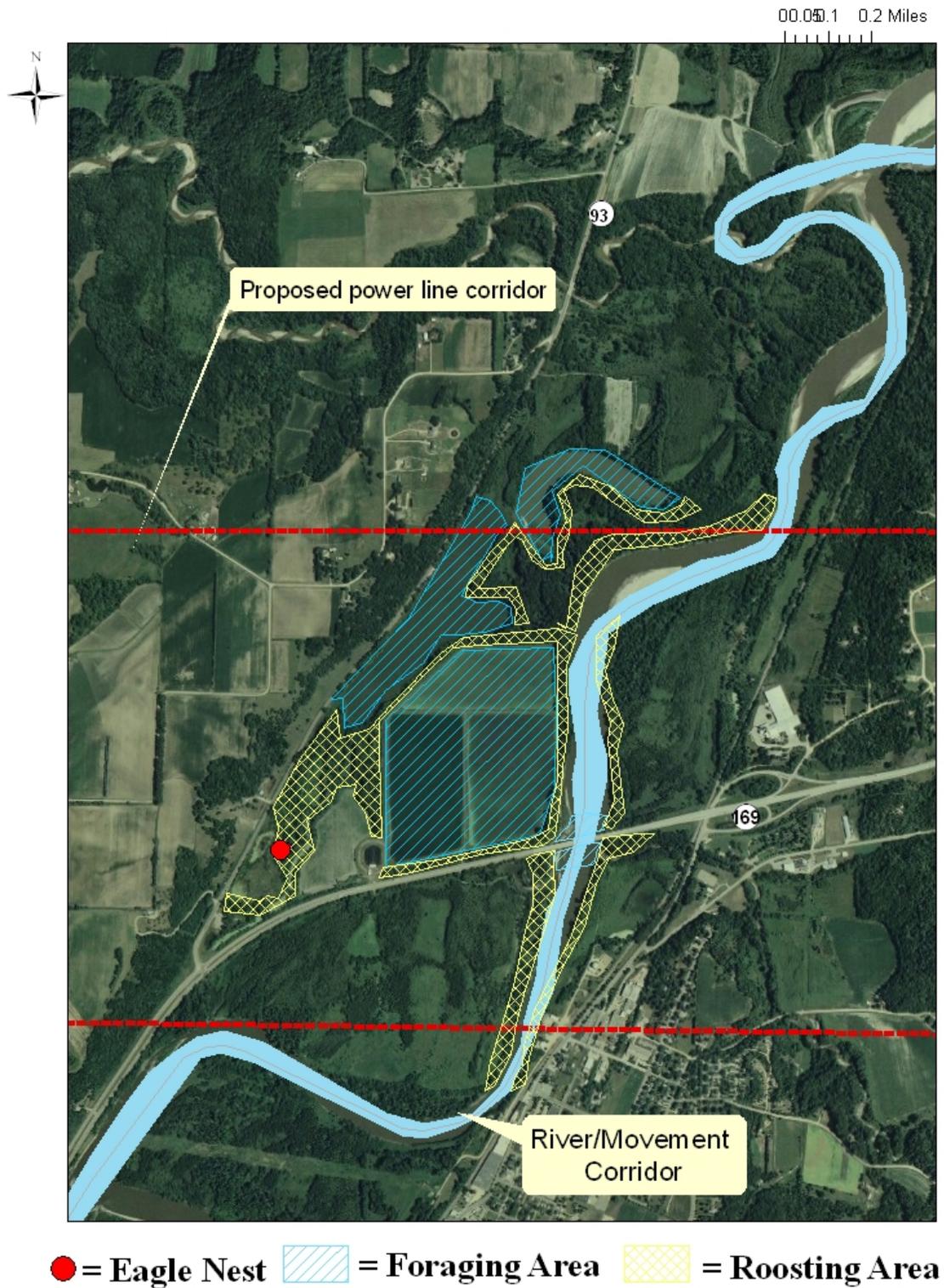


Figure 3. Known eagle nests in vicinity of proposed Le Sueur crossing.



**Figure 4.** Eagle habitat resources in vicinity of proposed Le Sueur crossing.



**Figure 5.** Buck's Lake (west side, by Hwy 93) typical eagle food resources. Photo date 1-20-2010.



**Figure 6.** Buck's Lake, west side. Winter Kill under thin ice. Photo date 1-20-2010.



**Figure 7.** Bald Eagles gathered on Buck's Lake, foraging on winter kill fish. Photo date 2-7-2010. Courtesy of Art Straub.



**Figure 8.** Raptor mortality related to utility line.

**Adult great-horned owl electrocuted by a 46 kV phase to ground fault.**



Photo courtesy of James Dwyer, Virginia Tech

**Figure 9.** Raptor injury/mortality related to utility line.

This Harris' hawk was collected alive. It was unable to fly but appeared unharmed. While under observation it shed the primary flight feathers of the right wing as a result of necrosis of the wing following an electric shock incident.



Photo courtesy of James Dwyer, Virginia Tech

**Figure 10.** Raptor injury related to utility line.

A fledgling Harris' hawk which has lost its right foot and tarsometatarsus but survived. Note the scar at the proximal end of the fibula which indicates that current passed through the leg only, and not into the body of the bird.



Photo courtesy of James Dwyer, Virginia Tech

