United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 American Blvd E.
Bloomington, Minnesota 55425-1665

January 13, 2011

Mr. Eric Washburn, Bridge Administrator
U.S. Department of Homeland Security
United States Coast Guard
1222 Spruce Street
St. Louis, Missouri 63103-2832

Dear Mr. Washburn:

Enclosed please find our final biological opinion regarding the impacts of the proposed La Crosse Railroad Drawbridge (Canadian Pacific Railway Bridge 283.27) Alteration Project in Pool 8 of the Upper Mississippi River located in Houston County, Minnesota. In our biological opinion, we have concluded that this project is not likely to jeopardize the continued existence of Higgins eye (*Lampsilis higginsii*) in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended. The project is likely to result in the incidental take of Higgins eye. Therefore, the biological opinion includes Reasonable and Prudent Measures to minimize the impact of this take.

The proposed project area contains or is immediately adjacent to lands and waters that are part of the Upper Mississippi River National Wildlife & Fish Refuge. Please continue to coordinate with the refuge's La Crosse District (608/783-8401) regarding any potential impacts to the refuge.

Although no longer listed under the Endangered Species Act, take (including disturbance) of bald eagles (*Haliaeetus leucocephalus*) is still prohibited by the Bald and Golden Eagle Act (Eagle Act). We ask that special attention be paid to Important Eagle Use Areas. This is defined under 50 CFR §22.3 as follows:

> [A]n eagle nest, foraging area, or communal roost site that eagles rely on for breeding, sheltering, or feeding, and the landscape features surrounding such a nest, foraging area, or roost site that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles.

Due to the uncertainty with the timing of the proposed action and the dynamic nature of eagle use areas, we recommend that the Coast Guard confer with U.S. Fish and Wildlife Service (Service) when it knows when construction is likely to begin. This will allow us to efficiently and collaboratively identify Important Eagle Use Areas that could be affected, if any, and to appropriately address any potential impacts to eagles in light of the Eagle Act's prohibitions and implementing regulations.

The Service's National Bald Eagle Management Guidelines (http://www.fws.gov/midwest/eagle/) would be the basis for the Service's specific recommendations.

For further coordination regarding this biological opinion and related bald eagle issues, please contact Mr. Phil Delphey, of my office, at (612) 725-3548, extension 2206.

Sincerely,

Tony Sullins
Field Supervisor

cc: Mr. Rich Baker, Minnesota Department of Natural Resources, St. Paul, MN
Mr. Jim Nissen, Upper Mississippi River National Wildlife & Fish Refuge, Onalaska, WI
Mr. Paul Machajewski, U.S. Army Corps of Engineers, Fountain City, WI
Mr. Mike Davis, Minnesota Department of Natural Resources, Lake City, MN
Mr. Tim Flagler, HNTB Corporation, Kansas City, MO

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425-1665

BIOLOGICAL OPINION

La Crosse Railroad Drawbridge (Canadian Pacific Railway Bridge 283.27) Alteration Project

January 4, 2011

U.S. FISH AND WILDLIFE SERVICE
TWIN CITIES FIELD OFFICE
BLOOMINGTON, MINNESOTA

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Introduction

This document transmits the Fish and Wildlife Service's (Service) Biological Opinion (Opinion) based on our review of the La Crosse Railroad Drawbridge (Canadian Pacific Railway Bridge 283.27) Alteration Project in Pool 8 of the Upper Mississippi River located in Houston County, Minnesota, and its effects on Higgins eye (*Lampsilis higginsii*) in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended. Your request for formal consultation was received on 26 February, 2010.

The Opinion is based on information provided in the Biological Assessment, received 12 November 2009 and additional information provided to the Service. A complete administrative record of this consultation is on file at this office.

Consultation History

On 12 August 2009, Mr. Daniel Van Petten, HNTB Corporation (representing the U.S. Coast Guard), contacted the Service to inform us that a survey of the area to be affected by the proposed bridge alteration had recorded a high quality mussel bed and a single live Higgins eye. On 8 September 2009, the Service received a letter from Mr. Roger Wiebusch, U.S. Coast Guard, that described the proposed action and requested comments from the Service and initiation of consultation regarding the effects of the proposed project. On 1 October 2009, the Service responded to the letter, describing the information required under 50 CFR 402.14 to initiate formal consultation under section 7(a)(2) of the Act. On 12 November 2009 the Service received USCG's biological assessment via email, along with a request for comments. On 8 December 2009, the Service received a new request for formal consultation via email from the Coast Guard, with reference to the previously submitted biological assessment. The Service reviewed the information provided on 8 December and on 31 December 2009, sent a letter to the Coast Guard, describing additional information that would be required to initiate formal consultation under the Act. The Service received a letter from the Coast Guard on 26 February 2010 that contained that additional information. The receipt of a complete initiation package on that date was then documented in a letter from the Service to the Coast Guard on 25 March 2010. On that same date, the Minnesota Department of Natural Resources (MDNR) also sent a letter to the Coast Guard's representative, Mr. Van Petten, which outlined MDNR's proposed conditions for a "takings permit" to be issued under the State of Minnesota's endangered species statute.

The Service provided a draft of this biological opinion to the Coast Guard on 9 June 2010. Mr. William Knutson of the Coast Guard verbally agreed to the contents of that draft on 19 July. The Service subsequently sent the Coast Guard additional drafts containing minor changes on 20 July and 12 August to which the Coast Guard agreed on 20 July and 23 September 2010, respectively.

Final changes were made to the Conservation Measures section of the Biological Opinion in December 2010 based on agreements made verbally and via email between the Service and the Coast Guard.

BIOLOGICAL OPINION

I. Description of the Proposed Action

The proposed action is the alteration of the Canadian Pacific Railway Bridge number 283.27 near La Crescent, MN at River Mile 699.8 in Pool 8 of the Upper Mississippi River. This will include removal of the existing horizontal swing span, most of the existing river piers, and all but two sections of the existing bridge structure. Existing stone piers will be replaced with drill shaft and steel lined foundations that will contain poured concrete piers.

The project is being funded jointly by the US Coast Guard and the Canadian Pacific Railway in accordance with the Truman Hobbs Act, which allows for the alteration of bridges that have been declared to be unreasonable obstructions to navigation. The new vertical lift section will have a 300 ft wide navigation channel, nearly twice the clearance that is present with the horizontal swing span bridge.

Subcontractors and fabricators will begin work as soon as possible after awarding of the contract. Construction mobilization will take several months. The drill shafts will be constructed by drilling machines mounted on river barges secured in the river by temporary dolphins and pilings. Construction of Pier 2 – where impacts to Higgins eye are anticipated (see below) – will likely take 30 days from beginning to end. Those 30 days would include placement of temporary spuds for the construction barge, construction of the template and temporary casing needed for construction of the drilled shaft, and removal of those structures. One or two work barges will be positioned at different locations along the bridge alignment throughout the construction period, but barges will only be spudded to the river bottom next to the new Pier 2 during that 30-day period. The vertical lift towers and associated piers will be built and the old swing section pivot pier and the pier protection cells will be removed to accommodate the eastward movement of the navigation channel. The through truss sections and through plate girder sections may be installed in 2011-2012. New bridge sections will be constructed off-site, transported to the construction site by barge, and erected directly from the river barges.

A. Action Area

The action area is defined as all areas to be affected directly or indirectly by the proposed Federal action. The area to be directly affected by the federal action includes the locations of the existing and proposed bridge components, adjacent areas where barges will be moored, the area through which barges will travel during bridge construction, the location(s) where old bridge sections will be dismantled and recycled, and the location(s) where material from demolished piers, wooden fender systems, and pier protection cells will be processed and/or disposed.

B. Conservation Measures

A mussel survey conducted in 2009 by Helms (2009) determined that a high-quality mussel bed exists at the eastern end of the project area; a single live Higgins eye was recorded near this mussel bed. Activities associated with construction of the new Pier 2 would impact mussels in this bed. To reduce these impacts, the Coast Guard stated in its Biological Assessment that "(R)elocation plans and subsequent monitoring plans will be developed by both the USFWS and MN DNR." In the BA, the Coast Guard also stated that "(T)he relocation of mussels from the project impact area to an undisturbed area can only be accomplished when the water temperature is above 40 degrees Fahrenheit, and preferably above 50 degrees Fahrenheit, and air temperature is above 32 degrees Fahrenheit."

Spudding (mooring) of barges, excavation of drill shafts, and deposition of sediments excavated during drilling would each adversely impact mussels. In its 24 February 2010 letter to the Service, the Coast Guard stated that it could use a material barge and a siphon to deposit material excavated from the new Pier 2 shaft into a material barge to eliminate the impacts that would occur as a result of a sediment plume. MDNR later proposed (in its 25 March 2010 letter to HNTB Corporation) that the Coast Guard modify the proposed action to incorporate this alternative into final project plans. The Coast Guard subsequently agreed to remove the excavated material in a manner that would preclude the deposition of excavated sediments into the river, but may do so by siphon or mechanical means.

MDNR also proposed that the Coast Guard relocate all mussels found within the impact area of the proposed new Pier 2 – that is, from an area that would include a forty-foot buffer around the 8 x 30 foot ''temporary casing," as described at the bottom of page 2 of the Coast Guard's 24 February 2010 letter to the Service. MDNR proposed that relocation be conducted according to the standards presented in the Minnesota Freshwater Mussel Survey and Relocation Protocol (see Appendix A). We assume that the Coast Guard will incorporate these mussel relocation recommendations into final project plans. Including the buffer, the area from which mussels would be relocated totals 88 feet by 110 feet (about 900 square meters).

II. Status of the Species

A. Species Description

For a complete description of the species, see pp. 1-2 of the species' recovery plan (U.S. Fish and Wildlife Service 2004).

B. Life History

Reproduction

Major aspects of the unionid reproductive cycle have been well described. Males release sperm into the water, often in packets, that is taken in through the incurrent siphon by the female. Fertilization occurs and zygotes are brooded in the water tubes of the gills by the female. Embryos develop into larvae (glochidia) that are released in various ways. In the genus Lampsilis, the edge of the mantle of the female develops into a ribbon-like flap in front of the branchial opening. This flap has been described as "minnow-like" in appearance, often having a dark "eye-spot," and thus it has been suggested to be important in attracting fish hosts. The glochidia attach to a fish host, where they remain for approximately three weeks (at water temperatures of 20-22^{o}C) as they transform into juveniles. They then drop off their fish host, develop a byssal thread, which may assist in dispersal, and upon settling on suitable habitat, use the byssal thread as a means of attachment, to prevent being swept away in water currents. See the recovery plan (U.S. Fish and Wildlife Service 2004:81-82) for a complete list of fish species tested as potential fish hosts for Higgins eye.

Higgins eye spawn in the summer and larvae are retained in the marsupia through the winter until they are released the following spring/summer.

Habitat

Higgins eye is a large river mussel species. Davis and Hart (1995) indicated that it was found in the more "riverine" portion of Upper Mississippi River Pool 7 and in the tailwater reaches of other Mississippi River navigation pools. Wilcox et al. (1993) proposed the following decision criteria for estimating the likelihood of occurrence of *L. higginsii*:

- Substrate: Substrate not firmly packed clay, flocculent silt, organic material, bedrock, concrete or unstable moving sand;

- Current velocity: Current velocities less than 1 m/s during periods of low discharge;

- Mussel relative abundance: If 2,000 or more mussels are sampled and no L. higginsii are found, then it is unlikely to be present;

- Density: Density of all mussels should exceed 10/m2, and any rare species (including *L. higginsii*) should occur at densities greater than 0.01 individuals/m2;

- Species Richness: Species richness (number of species) should exceed 15 when as few as 250 individuals have been collected.

Substrate stability may be important in determining the presence of freshwater mussel communities. It is the permanence of the populations in substrate that appears to be most important in constituting a mussel "bed." At smaller spatial scales however, such as within mussel beds, substrate difference provided little predictive power (Holland-Bartels et al. 1990). Heath (1995) found no correlation between overall mussel density and substrate size in the Wisconsin River where *L. higginsii* was found. Hornbach et al. (1995) have indicated that substrate size does influence mussel density, although accounting for only a small proportion of the variability in mussel density. Mussels also apparently help to stabilize the substrate of the river in some areas.

Higgins eye has been found in various substrates from sand to boulders, but not in areas of unstable shifting coarse sands. Miller and Payne (1995:10) considered substratum that was free of plants and consisted of stable, gravelly sand as suitable for Higgins eye.

The distribution of mussels is at least partially mediated by the distribution of their host-fish. Therefore, the distribution of mussels in relation to wing dams and other habitat features may be influenced by the relative distribution of their host fishes in relation to these features. Higgins eye is found in substrate that consists of coarse sand and gravel, but not in either finer (silt) or coarser (cobble) substrates. Cawley (1996) indicated that Higgins eye were most common in sand/gravel substrate. Higgins eye occurrence is not limited solely to areas where the river bottom is free of rooted plants. Divers have recently found significant numbers of Higgins eye in substrates with rooted plants in the "littoral areas of river channels" at Cassville, WI and Cordova, IL.

B. Status and Distribution

The historical range of Higgins eye is not known with certainty. Although nowhere abundant, it is believed to have been widely distributed, inhabiting the Mississippi River from just north of St. Louis, Missouri to Minneapolis-St. Paul, Minnesota. It was also found in several UMR tributaries, including the Ohio, Illinois, Sangamon, Iowa, Cedar, Wapsipinicon, Rock, Wisconsin, Black, Minnesota, and St. Croix River (U.S. Fish and Wildlife Service 2004). The extent of the range of Higgins eye has been reduced approximately 53 percent from its historic distribution to a 302-mile reach of the Mississippi River (Havlik 1980) and is now found only in the UMR upstream of Canton, Missouri, in the St. Croix River between Wisconsin and Minnesota, the Wisconsin River, and in the lower Rock River in Illinois (U.S. Fish and Wildlife Service 2004). In addition, fish infested with Higgins eye glochidia have been released recently into the Iowa, Cedar, and Wapsipinicon Rivers in Iowa. Of these three rivers,

reintroduced Higgins eye have only been recovered thus far in the Wapsipinicon River (Wege et al. 2007).

U.S. Fish and Wildlife Service's recovery plan for Higgins eye (U.S. Fish and Wildlife Service 2004) focuses on the recovery of the species within Essential Habitat Areas (EHA). In the plan, the Service described ten EHAs, but also noted that it intended to "assess other areas that may contain the features that indicate that they are of utmost importance for the conservation of Higgins eye." Since then the Service has added four additional EHAs (U.S. Fish and Wildlife Service 2008).

To make a tangible contribution towards achieving the species recovery objectives, an EHA must:

1) contain a reproducing and self-sustaining population of Higgins eye;
2) contain a dense and diverse mussel community;
3) and, not be threatened by zebra mussels or other relevant factors (U.S. Fish and Wildlife Service 2004:vi-vii).

Although the 14 EHAs may represent the best of the sites currently inhabited by Higgins eye, zebra mussels have infested almost all of these sites. Zebra mussels are a significant threat to Higgins eye at all ten of the EHAs in the Upper Mississippi River and in at least two of the three EHAs in the St. Croix River (U.S. Fish and Wildlife Service 2008). Only one EHA, in the St. Croix River near Franconia, Minnesota, is not currently inhabited by zebra mussels. The one other EHA not inhabited by zebra mussels, in the Wisconsin River at Orion, Wisconsin, does not currently meet the recovery plan's criteria for mussel density and diversity.

Zebra mussels may not have caused the extirpation of Higgins eye at any Essential Habitat Area (EHA), but have had a profound impact on population sizes. At the Prairie du Chien EHA, for example, density of native mussels has decreased from about 148 to 18 mussels/square meter since before zebra mussel invasion (Fig. 1); Higgins eye numbers at this site may only be about 15% of the species' pre-zebra mussel levels (Mussel Coordination Team 2006, 2008).

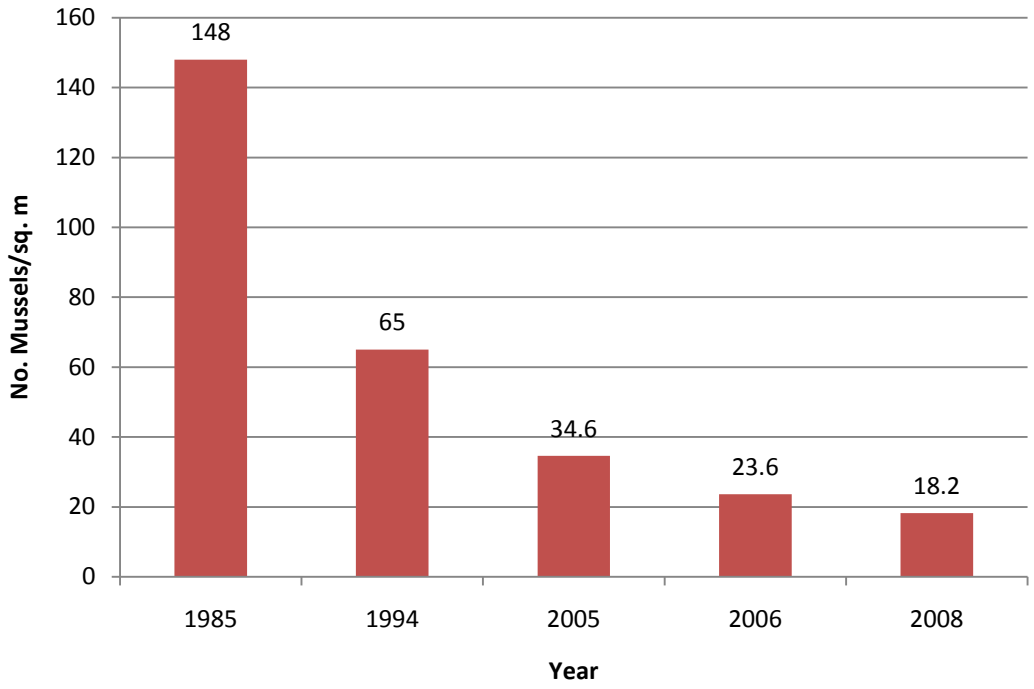

Figure 1. Number of native mussels recorded per square meter in the long-term monitoring area in the Prairie du Chien Essential Habitat Area. Zebra mussels invaded this area in about 1991, resulting in sharp decreases in native mussel density.

In an attempt to offset the adverse effects of the operation and maintenance of the nine-foot navigation channel, U.S. Army Corps of Engineers began propagating and reintroducing Higgins eye into historical habitats not infested with zebra mussels. Gravid (fertile) females are collected in the wild and used to infest host fish at Genoa National Fish Hatchery. Infested fish are placed in cages that are then placed into various river locations. Glochidia then complete transformation and fall to the bottom of the cages where they are allowed to develop to sizes suitable for release. Since 2000, propagated Higgins eye subadults have been released in eight areas in the Rock River, Upper Mississippi River, and Wisconsin River; in addition, infested fish have been released at five locations in the Cedar River, Iowa River, Wapsipinicon River, and Wisconsin River.

III. Environmental Baseline

Regulations implementing the Act (50 CFR §402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area which have already undergone Section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultations in progress. Such actions include, but are not limited to, previous timber harvests and other land management activities.

The impoundment of the Mississippi River and the ongoing water level management and channel maintenance activities may be the most significant human actions that have affected the physical and biological features of the action area. The introduction of zebra mussels has also profoundly affected native mussel habitats in the action area. Only about 1% of the native mussels collected by Helms (2009) had no zebra mussels attached – most had "several hundred attached (Helms 2009, p. 14).

A. Status of the Species in the Action Area

Higgins eye likely occurs in a mussel bed, described by Helms (2009) that lies along the left descending (eastern) bank of the channel in the action area. Helms (2009) defined the boundaries of the mussel bed to correspond to the sample points where mussel densities were equal to or greater than ten mussels per square meter. This bed likely extends up- and downstream of the action area, but Helms (2009) did not attempt to find its outer boundaries. Helms (2009) found one live and one dead Higgins eye just outside or on the edge of the defined mussel bed.

Although not detected among the thirteen samples collected in the mussel bed described by Helms (2009), Higgins eye likely occurs there due to its detection nearby. Species present at low densities may not be detected by some surveys, especially when few samples are collected. Although likely present in the bed, the lack of any detections within the bed indicate that Higgins eye is likely present at low densities. In other Mississippi River locations where Higgins eye has been recorded recently at low densities, it has comprised about 0.4 – 0.8 percent or less of all native mussels (U.S. Fish and Wildlife Service 2008). We will assume that Higgins eye comprises 0.6 percent of all mussels in the bed. Mussel density within the bed was about 38 per square meter (Helms 2009, p. 8) – therefore, we assume that Higgins eye is present at a density of 0.2 per square meter.

B. Factors Affecting Species in the Action Area

The factors affecting the species in the action area are primarily described above under "Environmental Baseline" in this Opinion. Zebra mussels are likely the most proximate factor that is affecting Higgins eye and other native mussels in the action area. Densities of all native mussels would be higher if zebra mussels were not present – perhaps about eight times higher (e.g., Fig. 1).

IV. Effects of the Proposed Action

A. Direct Effects

Direct effects are defined as the direct or immediate effects of the action on the species or its habitat. Direct effects result from the agency action, including the effects of interrelated and interdependent actions.

The proposed action would directly affect Higgins eye by capturing and relocating individuals within the defined relocation area – the 900 square meter area that includes the new Pier 2 and a buffer area around the new pier (see Conservation Measures, above). We assume that Higgins eye density is 0.2 per square meter. Therefore, about 180 Higgins eye may be present within the relocation area. If we assume that 90% of those will be found and moved upstream of the action area, about 18 Higgins eye may be left in the direct impact area. These Higgins eye would likely be killed by excavation of drill shafts, spudding of barges, and/or other activities that occur within this area.

B. Indirect Effects

Indirect effects are caused by or result from the agency action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the immediate footprint of the project area, but would occur within the action area as defined.

Effects of handling and placement on the survival and reproduction of relocated Higgins eye is expected to be low if appropriate methods are used during relocation. At two sites in the St. Croix River in Minnesota and Wisconsin, annual mortality among relocated Higgins eye ranged from 3-7 percent 1-2 years after relocation – mean annually mortality was 5% (Dunn et al. 1999). At least some mortality may be due to factors not associated with relocation. Cope et al. (2003) found similar (100%) survival between relocated and control Higgins eye in the St. Croix River 2-3 years after relocation. In another survey, all 22 recovered Higgins eye that had been moved from Upper Mississippi River Pool 11 near Cassville, Wisconsin to Pool 3 near Hastings, MN were alive after two years – no dead Higgins eye were found and six of the sixteen females were gravid (Davis 2003).

Mortality of relocated mussels may be affected by habitat conditions in the relocation area (e.g., substrate consolidation), stress during handling and transport, and time of year (Dunn et al. 1999). In one case, placement of mussels into extremely consolidated substrate combined with rapidly declining water temperatures to result in high post-relocation mortality (Dunn et al. 1999). We assume that the Coast Guard will follow the relocation protocol provided by Minnesota DNR[1] on 25 March 2010 (Appendix). If this protocol is

[1] 25 March 2010 letter from Minnesota Department of Natural Resources.

followed, we expect about five percent of the relocated Higgins eye to die within two years of relocation. If 90% of the Higgins eye in the relocation area are found and moved – 162 Higgins eye – about eight will die within two years of relocation. Some of these deaths will likely be due to causes other than relocation, but we will assume that all deaths within two years were caused by relocation (handling stress, etc.).

The placement of the new Pier 2 into the mussel bed will permanently alter the habitat within the bed, but the proportion of the bed affected may be small. The two 6-feet-diameter bridge supports left in the river will permanently remove mussel habitat from the river bottom. In addition, about one meter around each pier will become unsuitable for Higgins eye and other mussels due to extreme scour and fill caused by flow around the supports (M. Davis, Minnesota Department of Natural Resources, pers. comm. 28 May 2010). The direct and indirect impacts of the new piers will permanently remove about 25 square meters of mussel habitat from within the bed. The mussel bed is at least 1375 square meters; therefore, only about 2 percent of the existing mussel bed may be rendered permanently unsuitable for Higgins eye.

V. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

We can think of no actions that will not be subject to future Section 7 consultation that would have a predictable impact on Higgins eye in the action area.

VI. Conclusion

After reviewing the current status of Higgins eye, the environmental baseline for the action area, the effects of the proposed La Crosse Railroad Drawbridge (Canadian Pacific Railway Bridge 283.27) Alteration Project and the cumulative effects, it is the Service's Opinion that the action, as proposed, is not likely to jeopardize the continued existence of Higgins eye. No critical habitat has been designated for this species; therefore, none will be affected.

The action is likely to kill some Higgins eye in the project area – about 26 – but effects on local Higgins eye reproduction and abundance may be short-lived. The full extent of the mussel bed is unknown, but it is at least 1375 square meters. At the assumed density of 0.2 per square meter, there are about 275 Higgins eye in the mussel bed. The proposed action would kill 9% or fewer of the Higgins eye in the bed, depending on the extent of the bed. In addition,

direct and indirect impacts of the new Pier 2 may result in some scouring of mussel habitat, but this would only affect a small proportion – about 2 percent – of the mussel bed. Finally, the action would have only local impacts and would not affect Higgins eye in the 14 Essential Habitat Areas and the 14 additional areas where it has been reintroduced since 2000.

VII. Incidental Take Statement

Section 9 of the Act and Federal regulation pursuant to Section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such activity. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is defined as take incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), take incidental to and not an intended part of the agency action is not considered prohibited taking under the Act, provided such take is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary and must be undertaken by the Coast Guard for the exemption in Section 7(o)(2) to apply. If the Coast Guard fails to assume and implement the terms and conditions the protective coverage of Section 7(o)(2) may lapse. To monitor the impact of incidental take, the Coast Guard must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

A. Amount or Extent of Take Anticipated

We relied on the following assumptions to estimate anticipated incidental take:

- Higgins eye density is 0.2 per square meter in the mussel bed, which includes the mussel relocation area;
- 90% of all Higgins eye in the relocation area will be found and moved upstream;
- 5% of relocated Higgins eye will die due to handling stress or other factors related to relocation;
- All Higgins eye remaining in the relocation area would be killed by excavation of drill shafts, spudding of barges, and/or other activities.

Based on these assumptions, incidental take will include the following:

- About 162 Higgins eye will be captured and relocated from within the mussel relocation area - about eight of these will die due to stress from relocation;
- About 18 Higgins eye will not be found within the relocation area and will die as a result of drill shaft excavation, barge mooring, etc.

B. Effect of the Take

In the attached Opinion, we concluded that the anticipated incidental take would not jeopardize the continued existence of Higgins eye.

A. Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure(s) (RPM) are necessary and appropriate to minimize take of species.

1. Use the best available techniques to minimize the number of Higgins eye incidentally taken during and after relocation and to monitor post-relocation survival and growth of Higgins eye.
2. Ensure that any project features not thoroughly described before completion of the biological opinion, are assessed as soon as possible and before construction to ensure that additional impacts to Higgins eye will not occur.

B. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the agency must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. RPM 1 – Use the best available techniques to minimize the number of Higgins eye incidentally taken during and after relocation and to monitor post-relocation survival and growth of Higgins eye.

   1.1. Before collecting and relocating any Higgins eye, submit to the Service[2] a draft scope-of-work (SOW) that describes the methods to be used to find and relocate mussels from the mussel relocation area. This SOW should describe the location into which mussels will be removed (Collection Area) and relocated (Relocation Area).

[2] Field Supervisor, Twin Cities Ecological Services Field Office, 4101 American Blvd. E., Bloomington, MN 55425 or phil_delphey@fws.gov

1.2. The Collection Area shall include the area within the temporary casing for the new Pier 2 and the area within a 40-foot buffer around the casing. Along with the draft-scope-of-work, provide the Service with a vector data set (e.g., a shapefile) that describes the location and shape of the Collection Area.

1.3. The Relocation Area must be at least 100 feet upstream of any anticipated construction activities associated with the proposed action, must support a reproducing mussel community with total mussel densities exceeding ten per square meter (before relocation), and be in an area of stable substrate. If feasible, the relocation area should be located within the bed found by Helms (2009). The Relocation Area will be selected by conducting a dive to estimate mussel density – count mussels within 1-meter quadrats placed every 1000 square feet to determine existing mussel density. Along with the draft-scope-of-work, provide the Service with a vector data set (e.g., a shapefile) that describes the location and shape of the Relocation Area.

1.4. Within the Relocation Area, establish a separate grid to place Higgins eye and any state-listed endangered and threatened species (TE species) to monitor post-relocation survival. This 'TE Species Grid' shall consist of a 1 x 5 array of one-square-meter cells, with as many cells as is necessary to place only five TE species per cell (Appendix B). The grid should be placed about 10 m from the area in which non-TE species will be relocated.

1.5. Place five TE species within each 1-square-meter cell within the TE Species Grid and establish as many cells as necessary, based on the number of TE species collected. See Ecological Specialists (2003) and Appendix B for further details regarding these methods.

1.6. Obtain written approval from the Service to place the Relocation Area outside of bed described by Helms (2009) and/or in a follow-up (reconnaissance) survey. A reconnaissance survey will likely be necessary to identify a suitable relocation area.

1.7. All Higgins eye collected shall be marked/etched with a unique identifier. No intrusive activities (e.g., prying open valves) are permitted. Provide photographs of each Higgins eye collected.

1.8. Record external morphometry (e.g., number of external annuli, length, etc.), reproductive status, and approximate number of attached zebra mussels, if any for each Higgins eye collected. Place into the relocation area by hand on their side so that they may burrow into the river bottom on their own. Where the substrate is very compacted cobble, excavate a hole just large enough to receive the animal to a depth of ¾ of its length and place the mussel into it with the posterior end (siphons) up.

1.9. Collection of mussels must be done only when the air temperature is above 32° F and the water temperature is above 40° F. Specimens may not be collected and transported to a new location when air temperature is above 95° F.

1.10. Keep Higgins eye in a flow-through live well or in the river after capture and before placement in the relocation area to maintain environmental conditions at or near ambient river conditions.

1.11. Unionid density within the relocation area shall be no more than double the pre-relocation density upon completion of the relocation. Expand the dimensions of the recipient bed in 1000 square foot increments as needed to avoid increasing the existing population density by more than double.

1.12. As a quality assurance protocol, collect and re-scatter 50 marked unionids of various sizes and species into the source site at least 24 hours – but no more than 48 hours – prior to the relocation. The relocation will not be considered complete until at least 45 of those 50 mussels have been found.

1.13. Before relocating mussels, submit to the Service a list of personnel to be involved with the relocation and a summary of their experience handling unionid mussels.

1.14. Relocation shall be carried out no more than 180 days before construction of Pier 2 is initiated.

1.15. No later than six months after relocation is complete, provide a report to the Service that includes a complete discussion of field procedures, data collection methods, results, and conclusions, including the following;

1.15.1. The date(s) when the relocation was conducted.

1.15.2. The air (daily high and low) and water temperatures for all days during which relocation was conducted.

1.15.3. The number of Higgins eye relocated, including sex, estimated age (number of external annuli), length, and unique identifier. Data shall be provided electronically to the Service in a table or spreadsheet.

1.15.4. The dimensions of the TE Species Grid and the geographic coordinates (UTM and/or latitude/longitude) of its corners or centerpoint.

1.15.5. Habitat conditions at the TE Species Grid, including water depth, substrate composition, sedimentation, and any other relevant data.

1.15.6. A complete description of injuries and/or mortalities to Higgins eye while in possession, the dates of occurrence, any circumstances surrounding the incidents, and a description of any steps that may be taken to reduce the likelihood that such injuries and/or mortalities will occur in the future.

1.15.7. Disposition of any salvaged specimens.

1.15.8. Legible photocopies of all field data sheets.

1.16. Monitor the status and survival of mussels in the relocation area annually for at least two years after relocation. Provide a draft monitoring scope-of-work to the Service no later than December 31, 2010. The monitoring plan will include, at a minimum, the following:

1.16.1. A thorough search of the TE monitoring grid and the area within five meters of the grid.

1.16.2. A description of the status (live, fresh dead, or weathered dead), length, and unique identifier of each Higgins eye recovered from within the TE monitoring grid and the date when each Higgins eye was observed. For any female Higgins eye, report whether or not they exhibit signs of gravidity.

2. RPM 2 – Ensure that descriptions of any project features not provided in detail to the Service before completion of this biological opinion, are provided to the Service before construction begins to ensure that additional impacts to Higgins eye will not occur.

2.1. Before beginning construction, provide the Service with the following:

2.1.1. A description of the area through which barges will travel during bridge construction;

2.1.2. A description of the location(s) where old bridge sections will be dismantled and recycled;

2.1.3. A description of the location(s) where material from demolished piers, wooden fender systems, and pier protection cells will be processed and/or disposed.

2.2. The Service must have at least 30 days to review this information. Construction may not begin until the Coast Guard has received confirmation in writing from the Service that these project components will not result in additional impacts to Higgins eye. If any of these project components are likely to result in additional unanticipated impacts, the Coast Guard must reinitiate consultation with the Service before construction may begin.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

E. Reporting Requirements

Federal agencies have a continuing duty to monitor the impacts of incidental take resulting from their activities [50 CFR 402.14(i)(3)]. In doing so, the Federal agency must report the progress of the action and its impact on the species to the Service as specified below.

1. Provide to the Service with an annual report no later than January 31 each year that specifies the progress and results of implementing the Reasonable and Prudent Measures and their terms and conditions and any report required therein (e.g., TE Grid monitoring report). These reports must be provided to the Service beginning on the first January 31 after completion of this biological opinion and continuing until the first January 31 after the second year of post-relocation monitoring.
2. Any Higgins eye shells and any specimens accidentally killed or that are moribund or freshly-dead and contain soft tissue are to be preserved according to standard museum practices, properly identified and indexed (collection site, including latitude and longitude or UTM coordinates, site conditions when collected, and date collected). All dead specimens shall be sent to a public scientific or educational facility or museum in the state the individuals were collected. All specimens retained remain the property of the United States Government and must clearly be identified as such.

This annual report shall be submitted to Field Supervisor, U.S. Fish and Wildlife Service, 4101 American Boulevard East, Bloomington, Minnesota, 55425-1665.

VIII. Conservation Recommendations

Section 7(a)(1) of the Act, directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation Recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop information.

- Participate in the implementation of the Conservation Plan for Freshwater Mussels of the Upper Mississippi River System (Upper Mississippi River Conservation Committee 2004).

- Participate in public outreach efforts, in coordination with the Service and other resource agencies, as a means to disseminate information on life history and distribution of zebra mussels, the ecological importance of native mussels including Higgins eye, winged mapleleaf (*Quadrula fragosa*), sheepnose (*Plethobasus cyphyus*), spectaclecase *(Cumberlandia monodonta*), and snuffbox (*Epioblasma triquetra*), control measures to

limit the spread of zebra mussels on the Upper Mississippi River and tributaries, and status of mussel propagation, relocation and other conservation efforts.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

IX. Reinitiation – Closing Statement

This concludes formal consultation for the potential effects of the project on listed species. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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Appendix A. Minnesota freshwater mussel survey and relocation protocol.

MINNESOTA FRESHWATER MUSSEL SURVEY AND RELOCATION PROTOCOL

Minnesota Department of Natural Resources, Division of Ecological Resources
U.S. Fish and Wildlife Service, Twin Cities Field Office
April 16, 2010

REQUIRED PERMITS: Live mussels cannot be handled in Minnesota without a permit from the Minnesota Department of Natural Resources. Before conducting mussel surveys, contact the Minnesota Endangered Species Coordinator (651-259-5073; richard.baker@state.mn.us) to request a permit. If you anticipate encountering federally listed species (list attached) while conducting mussel surveys, a federal permit may also be required. Contact the U.S. Fish and Wildlife Service Regional Office (612-713-5343; permitsR3ES@fws.gov to request a permit.

TEMPERATURE LIMITATIONS: Mussel surveys and relocations in Minnesota may only be conducted when air temperature is greater than 32^{o} F. and water temperature is greater than 40^{o} F.

LEVEL I MUSSEL SURVEY TO ESTIMATE MUSSEL DENSITY

A. Level I Survey methods:

1. Conduct qualitative surveys at a frequency of at least one per every 20,000 square feet of project impact zone. Distribute surveys across the impact area, concentrating on areas with suitable mussel habitat, especially shorelines and dropoffs. Without compromising the safety of the surveyor, Level I Surveys should leave no more than 100 feet between the edges of any two adjacent survey areas or between the edge of a survey area and the edge of the project impact zone. (See example, Figure 1) If more than 1 mussel/minute or a listed species is collected, a Level II Survey may be required.

2. Each qualitative survey will be of 20 minutes in duration. Search by feel, wading in shallow water and using SCUBA in deeper water, methodically covering the survey area. All mussels found will be identified to species with one example of each species found within a surveyphotographed. All mussels handled will be returned to the substrate. Specimens of live endangered or threatened mussels must be returned to the substrate by hand, placed on their side, and allowed to burrow on their own. Where the substrate is very compacted cobble, a hole just large enough to receive the animal to a depth of ¾ of its length should be excavated and the mussel placed into it with the posterior end (siphons) up. Other species may be returned to the substrate from the water surface.

3. The Level I survey will include a shoreline search for evidence of mussel presence as indicated by recently dead shells.

NOTE: If a federally listed mussel species is encountered during a Level I Survey, the surveyor must contact the Twin Cities Field Office of the U.S. Fish and Wildlife Service at 612-725-3548.

B. Level I Survey report must include at least:

1. Detailed description of methods used
2. Map or aerial photo clearly identifying the location of each survey area
3. Composition of substrate, depth, and other physical conditions within each survey area
4. List of live and dead mussel species found within each survey area
5. Total number of mussels encountered per minute within each survey area
6. One photograph of each state listed species found within each survey area
7. Species and number of any recently dead shells found during shoreline search

LEVEL II MUSSEL SURVEY TO ESTIMATE THE NUMBER OF EACH SPECIES OF MUSSEL PRESENT

A. Level II Survey Methods:

1. A systematic grid measuring no greater than 20m x 20m will be used to locate quadrat sample locations throughout the portion of the project impact zone in which the Level I Survey encountered mussels at a rate of at least 1 mussel per minute. (See example, Figure 2) At each grid intersect, a ¼ m^2 total substrate quadrat sample will be collected from within a quadrat equipped with a ¼ inch mesh bag (Figure 3).

2. All mussels and substrate will be removed to a depth of 10-15cm, placed into the bag, and brought to the surface. All mussels found will be identified to species, measured for length, and aged by counting annual growth arrest lines. This information and the UTM coordinates will be recorded for each quadrat. All mussels handled will be kept cool and out of the sun as much as possible and finally relocated to suitable habitat at least 100 ft. upstream of the area of the project impact zone. At least one photograph will be taken of each state listed species found within a quadrat.

3. The total number of quadrats sampled will be determined in consultation with MNDNR personnel based upon the spatial scale of the site and information generated by the Level 1 Survey.

NOTE: If a federally listed mussel species is encountered during a Level II Survey, the surveyor must contact the Twin Cities Field Office of the U.S. Fish and Wildlife Service at 612-725-3548.

B. Level II Survey report must include at least:

1. Detailed description of methods used
2. Map or aerial photo clearly identifying the location/UTM coordinates of each quadrat
3. Composition of substrate, depth, and other physical conditions within each quadrat
4. Number of specimens of live and dead mussel of each species found within each quadrat
5. One photograph of each state listed species found within a quadrat
6. Length and age frequencies for each species present, summarized across all quadrats

RELOCATION

"Relocation" entails physically moving all mussels within the project impact zone to a suitable translocation habitat upstream of the impact site. Other than mussels relocated following a Level II Survey, relocation will be conducted only if required and as permitted by the MNDNR (and the USFWS, if federally listed species are present).

In general, mussels within a project impact zone will be systematically collected and relocated to suitable habitat at least 100 ft. upstream of the area of the project impact zone. Specimens of live endangered or threatened mussels must be returned to the substrate by hand, placed on their side, and allowed to burrow on their own. Where the substrate is very compacted cobble, a hole just large enough to receive the animal to a depth of ¾ of its length should be excavated and the mussel placed into it with the posterior end (siphons) up. Other species may be returned to the substrate from the water surface.

Unionid density within the relocation area should not exceed $100/m^2$ after the relocation is complete. Relocation and report details will be determined in consultation with MNDNR staff and specified in a MNDNR permit. Any relocation involving federally listed species will require USFWS approval.

FRESHWATER MUSSELS LISTED UNDER
MINNESOTA STATE ENDANGERED SPECIES LAW (MN STATUTES 84.0895)
(including federal status)
Effective 7/1/1996

Endangered

Arcidens confragosus, rock pocketbook
Elliptio crassidens, elephant-ear
Fusconaia ebena, ebonyshell
Lampsilis higginsi, Higgins eye (federal status: endangered)
Lampsilis teres, yellow sandshell
Plethobasus cyphyus, sheepnose (federal status: candidate)
Quadrula fragosa, winged mapleleaf (federal status: endangered)
Quadrula nodulata, wartyback

Threatened

Actinonaias ligamentina, mucket
Alasmidonta marginata, elktoe
Cumberlandia monodonta, spectaclecase (federal status: candidate)
Cyclonaias tuberculata, purple wartyback
Ellipsaria lineolata, butterfly
Epioblasma triquetra, snuffbox
Megalonaias nervosa, washboard
Pleurobema coccineum, round pigtoe
Quadrula metanevra, monkeyface
Simpsonaias ambigua, salamander mussel
Tritogonia verrucosa, pistolgrip
Venustaconcha ellipsiformis, ellipse

Special Concern

Elliptio dilatata, spike
Lasmigona compressa, creek heelsplitter
Lasmigona costata, fluted-shell
Ligumia recta, black sandshell
Obovaria olivaria, hickorynut

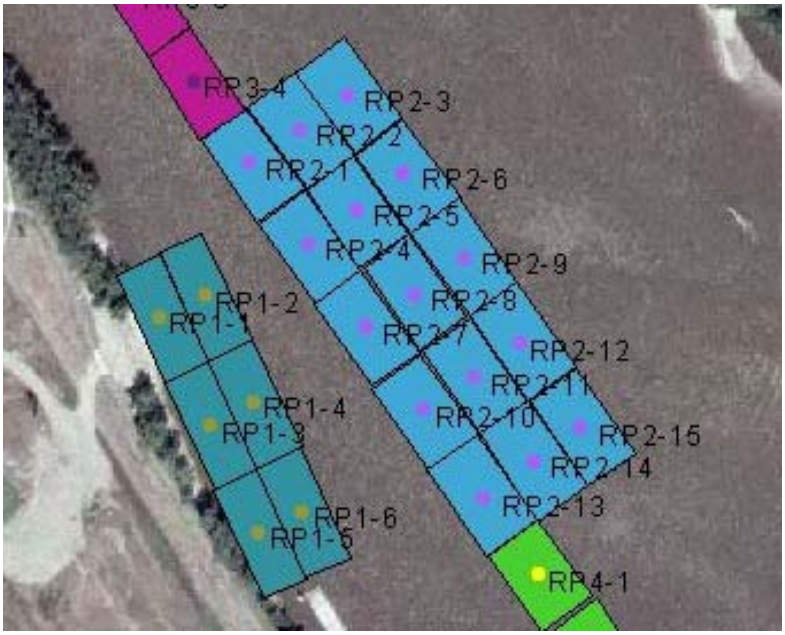

Figure 1. Example of Level I Survey design used to estimate mussel density within the impact zone of a proposed bridge construction project. Each block was subjected to a 20 minute qualitative survey.

Figure 2. Example of Level II Survey grid at same site as in Figure 1. A quadrat was sampled at each point.

Figure 3. ¼ meter square quadrat sampler with attached ¼ inch mesh bag.

Appendix B. Design of 'TE Species' monitoring grid to be established within the Relocation Area. Adapted from Ecological Specialists (2003).