

ST. CROIX RIVER CROSSING PROJECT SUPPLEMENTAL DRAFT EIS
CHAPTER 9
NATURAL RESOURCE IMPACTS

9.0 INTRODUCTION

This chapter describes the natural resources of the project area and potential impacts on those resources that could result from the No-Build Alternative and the Build Alternatives. Where relevant, potential measures to mitigate identified impacts are also discussed. Topics addressed include: 1) freshwater mussels, 2) fish and the aquatic community, 3) vegetation, 4) wildlife, 5) protected species, and 6) terrain and climate. Construction impacts on natural resources are discussed in Chapter 12.

The Build Alternatives (described in Chapter 3) are within the range of build alternatives studied in previous project documents, including the 1990 Draft EIS. Much of the information in the previous documents regarding this project and in the 1990 Natural Resource Impacts Special Study also applies to the Build Alternatives and the No-Build Alternative in this SDEIS. In addition to these past project documents, source material for this chapter includes correspondence with NPS, Wis/DOT, U.S. FWS, MnDNR, and WisDNR, including summaries of various field surveys. Information on freshwater mussels is summarized from the report, *“Biological Assessment of Possible Project Impacts on Unionid Mollusks and Threatened and Endangered Species”* (June 1999). The *“Cooperative Management Plan – Lower St. Croix National Scenic Riverway – Minnesota/Wisconsin”*, 2002 prepared by WisDNR, MnDNR and NPS was also consulted for this chapter. In this chapter, descriptions of the affected environment, environmental consequences, and mitigation are divided into four geographic areas: (a) the St. Croix River, (b) the Minnesota shore and upland, (c) the Wisconsin shore and bluff, and (d) the Wisconsin upland.

The No-Build Alternative would result in no changes to natural resources. Impacts on natural resources from the Build Alternatives could result from the construction, operation, and maintenance of the new bridge and approach roadways, changes in operation and/or maintenance of the Lift Bridge, and from implementation of items proposed as potential mitigation for the impact of any of the Build Alternatives on the St. Croix River and the river valley (see Chapter 14). Potential mitigation items applicable to all Build Alternatives are described in Chapter 14. Upon identification of a Preferred Alternative, a mitigation package, appropriate to the level of impacts, will be identified by the lead agencies from the list of mitigation items as well as additional mitigation items identified by agencies or the public during the SDEIS comment period. Additional potential impacts associated with the mitigation package items for the Preferred Alternative will be presented in the Supplemental Final EIS.

9.1 ST. CROIX RIVER

Wild and Scenic River Impacts

This section discusses potential impacts on the Lower St. Croix National Scenic Riverway as they relate to the habitat and biologic resources of the St. Croix River itself (e.g., freshwater mussels, fish, protected species, etc.) and surrounding landscape. Potential impacts on the Riverway are described in greater detail in the following chapters:

- Chapter 4: Transportation Systems and Impacts (includes navigation on the river);
- Chapter 5: Social, Relocation, and Economic Impacts;
- Chapter 7: Visual Impacts Analysis;
- Chapter 8: Air Quality, Traffic Noise, and Contaminated Sites;
- Chapter 10: Water Resources (including floodplains and water quality);
- Chapter 12: Construction Impacts;
- Chapter 13: Cumulative Impacts; and,
- Chapter 14: Adverse Impacts That Cannot Be Avoided.

In addition, impacts on the Riverway are summarized in the Lower St. Croix National Scenic Riverway Draft Section 4(f) Evaluation (see Appendix E).

9.1.1 Affected Environment

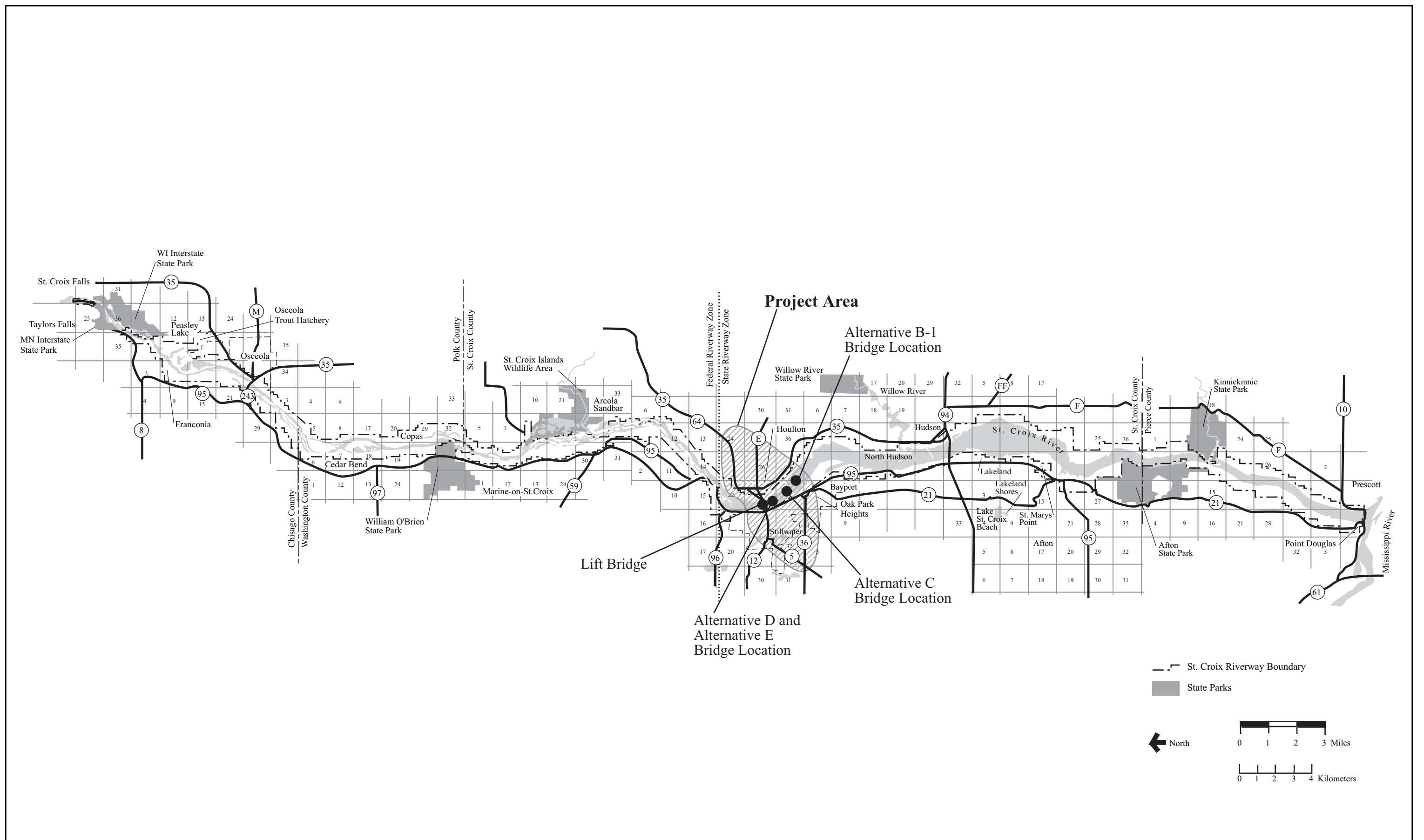
The Lower St. Croix National Scenic Riverway, which forms the border between Minnesota and Wisconsin, extends for 52 miles, from Taylors Falls, MN/St. Croix Falls, WI, to the confluence with the Mississippi River at Point Douglas, MN/Prescott, WI. The Riverway includes the river itself and adjacent lands (see Figure 9-1) and is managed by the Lower St. Croix Management Commission, which consists of the NPS, the MnDNR, and the WisDNR.

Upstream of Stillwater, development along the St. Croix River is fairly sparse. From Stillwater south to Prescott, areas of forested bluff are adjacent to the river in some areas; however, this area is more developed than the river north of Stillwater and includes many permanent and seasonal homes. Immediately south of Stillwater is a sewage treatment plant, Sunnyside Marina and Condominiums, the City of Oak Park Heights, and the Xcel Energy King Power Plant, which has a highly visible 785-foot smokestack. South of the power plant is the City of Bayport, Minnesota (including the Andersen Corporation's window manufacturing facility), and several other small cities bordering the river.

A wide variety of aquatic life occurs in the St. Croix River, from multiple phyla of algal phytoplankton to many invertebrate and fish species. Water quality is very good and does not appear to limit the occurrence of native aquatic animals in the river. The U.S. FWS describes the river as being "of pristine character."

9.1.1.1 Freshwater Mussels

The St. Croix River supports a large and diverse population of freshwater mussel (unionid) species; of these, two (Higgins eye and Winged mapleleaf) are on the Federal List of Endangered



Lower St. Croix National Scenic Riverway Boundary

Figure 9-1

and Threatened Species, and several others are on the Minnesota and Wisconsin state lists of threatened and endangered species. Recent (2004) additions to the list of candidate species for federal status are sheepsnose (*Plethobasus cyphus*) and spectaclecase (*Cumberlandia monodonta*). According to the U.S. FWS, natural processes and features that make the St. Croix River excellent mussel habitat include moderate to high flow currents, stable substrates, the presence of aquatic vegetation, and high water quality. Because of their importance, the freshwater mussel species and impacts on them are discussed separately from the other aquatic species in the project area.

Mussels are sedentary filter feeders that depend on a stable substrate for burrowing, and good water quality and flow for feeding, respiration, and reproduction. They also require an intermediate host (usually a fish species) to complete their life cycle. Changes in substrate characteristics, water quality, flow patterns, or host fish habitat can be detrimental to unionid species.

Mussel habitat in the project area tends to be best in the shallow “wave wash” zone near the river banks. Very few mussels are found in the main river channel due to poor habitat (lack of stable substrate). Average densities of mussels in the near-shore environment is less than one per square meter (0.09 per square foot) in Minnesota and about eight per square meter (0.7 per square foot) in Wisconsin. During mussel relocation work for the 1995 Final EIS Preferred Alternative, thousands of individual mussels were collected and relocated. Twenty-five different live mussel species were collected, including four individuals of the federally-endangered Higgins eye pearly mussel (*Lampsilis higginsii*) species. Also found were seven live mussel species representing species of concern in Minnesota and Wisconsin. In a 1999 mussel survey, 25 live mussel species were collected near the Alternative B-1 bridge area.

The federally-endangered winged mapleleaf mussel (*Quadrula fragosa*) has not been found in the project area. However, a single remnant population of the species is known to exist in the St. Croix River extending northward from Osceola, Wisconsin, about 22 miles north of the project area. Additional information on the occurrence of federally-protected mussel species in the St. Croix River near the project area is provided in the U.S. FWS Biological Opinion (to be completed for the Final Supplemental EIS).

In addition to the endangered mussel species discussed above, correspondence from the MnDNR (March 26, 1999) indicates two other protected mussel species present in the river: the spike mussel (*Elliptio dilatata*, a Minnesota state species of special concern), and the round pigtoe mussel (*Pleurobema coccineum*, a Minnesota state-threatened species).

9.1.1.2 Fish and the Aquatic Community

In addition to mussels, the St. Croix River supports diverse aquatic life ranging from phytoplankton to invertebrates and fish species. Populations of walleye, smallmouth bass, northern pike and other game fish are present. The 1990 Natural Resource Impacts Special Study provides detailed inventories of non-protected fish species, microinvertebrate organisms, and water quality measurement data.

In addition to the endangered mussel species discussed in Section 9.1.1.1, a review of the MnDNR database of threatened and endangered species indicates that the blue sucker (*Cycleptus*

elongatus), a Minnesota state fish species of special concern, is present in the river. Wisconsin rare fish known to occur in the Lower St. Croix River include crystal darter (*Crystallania asprella*) (endangered); blue sucker, paddlefish (*Polydon spathula*) and greater redhorse (*Moxostoma valenciennesi*) (threatened); American eel (*Anguilla rostrata*), western sand darter (*Ammocrypta clara*), and pugnose minnow (*Opsopoeodius emiliae*)(special concern).

9.1.1.3 Terrain and Climate

The St. Croix River in the project area is edged by slopes ranging from steep bluffs rising sharply from the water's surface to beaches that transition gradually into upland areas. Changes in relief are greatest on the Wisconsin side of the river between Houlton and Hudson. The normal pool elevation of the St. Croix River is 675 feet. The subsurface topography of the St. Croix River includes a central channel that averages about 20 feet deep.

Climate in the project area is characterized by cold winters and short, fairly warm summers. The coldest month is January, with mean daily minimum and maximum temperatures of 2 and 22 degrees Fahrenheit, respectively. July is the warmest month, with mean daily minimum and maximum temperatures of 60 and 83 degrees Fahrenheit, respectively. On average, there are 14 days above 90 degrees Fahrenheit per year and 167 days between killing frosts. Average annual precipitation is 24 inches, with an average annual snowfall 42 inches. June is the wettest month of the year and January is the driest. Sixty-five percent of the average annual precipitation occurs between May and September.

9.1.2 Environmental Consequences

Potential impacts on the St. Croix River would result primarily from construction-related activities for the Build Alternatives and potentially from mitigation measures depending upon their nature and location. In addition to the information below, more detail on potential project impacts on the St. Croix River is provided in the following related documents:

- The Mn/DOT report, "*Biological Assessment of Possible Project Impacts on Unionid Mollusks and Threatened and Endangered Species*" (June 1999, updated in 2004);
- Draft Section 4(f) Evaluation for the Lower St. Croix National Scenic Riverway (Appendix E); and
- The Biological Opinion prepared by the U.S. Fish and Wildlife Service (December 1999 and January 2001).

It is anticipated that a revised Biological Opinion will be given once a Preferred Alternative is selected by the project proposers.

Assessment of potential impacts on mussels and development of proposed mitigation was developed in coordination with the U.S. FWS (including information for the 1995 Final EIS Preferred Alternative) and with the MnDNR and the WisDNR.

9.1.2.1 Freshwater Mussels

Implementation of the Build Alternatives could affect freshwater mussels both directly and indirectly. Mussel surveys of all potentially-disturbed areas were conducted in 1999 as part of the SDEIS process. Survey results indicated that potential mussel impacts is greater near the Wisconsin shoreline, but also exists (to a lesser degree because of the substrate and resultant habitat) near the Minnesota shoreline. Based on information reviewed and input from the reviewing agencies, it was agreed to assume that any of the Build Alternatives would affect protected mussels for the purposes of preparing the SDEIS. Following selection of a Preferred Alternative, additional surveys may be conducted as necessary to understand and prepare mitigation plans for any mussel impacts.

Direct impacts could result from bridge pier construction, and barge fleeting and docking activities during construction. The bridge type selected for any of the Build Alternatives would determine the number of piers that would be placed in the St. Croix River (see Chapter 3). The Build Alternatives would also result in indirect impacts on mussels with the placement of bridge piers on the Minnesota and Wisconsin shores. Mussels have been identified in both these areas; however, mussel populations are much higher on the Wisconsin shore because of the local habitat.

The shoreline work areas necessary to construct the new bridges and approach roadways are anticipated to include temporary docking facilities on both sides of the river. Bridge construction could affect Higgins' eye mussels located within the proposed work and barge docking area in Wisconsin. In addition, indirect impacts such as erosion and sedimentation would result from the construction activities (access road, stormwater pond and discharge channel) and from the placement of bridge piers in the river. This sedimentation would have minor impacts on mussel beds located downstream of the project site. (Construction activities and impacts are discussed further in Chapter 12.)

Zebra mussels have been found in the lower reaches of the St. Croix River, including the project area. Establishment of zebra mussel populations in this portion of the St. Croix River would represent a direct threat to the continued existence of *L. higginsi*, winged mapleleaf, and other native mussels in the St. Croix River. To minimize any additional threat to the mussel species from the project, construction equipment will be decontaminated for zebra mussels in accordance with U.S. FWS, MnDNR and WisDNR recommended procedures.

The Build Alternatives would result in improved water quality in the St. Croix River near the Lift Bridge because of the treatment of stormwater runoff from the Build Alternative bridges and their approaches in treatment ponds prior to discharge to the St. Croix River. This would indirectly result in positive impacts on mussel habitat located in this area, and would also help to minimize impacts on other mussel habitats in the river and within the project area. Although these positive impacts on water quality in the St. Croix River would be relatively small, they would still result in positive impacts on mussel habitat.

9.1.2.2 Fish and the Aquatic Community

Potential impacts on fish and aquatic life could result from construction of the Build Alternatives and related mitigation items that disturb habitat, water quality, or substrate.

Water quality impacts are expected to be temporary, and in general, effects on fish and aquatic life are expected to be minimal. Disturbed areas would be concentrated around the piers of the Build Alternative bridges and any temporary barge facilities. Fish would likely move away from these areas during construction, thus minimizing impacts. Some temporary or possibly permanent effects on bottom-dwelling (benthic) organisms could occur in construction areas. In addition, some temporary secondary effects on fish could occur due to disruption of benthic food sources.

Construction of the Build Alternatives and associated mitigation items could have indirect, positive, long-term impacts on fish and the aquatic community as a result of positive impacts on water quality in the river. These include positive impacts on water quality from construction of stormwater treatment facilities to treat stormwater (including potential spills) from the Build Alternatives' bridges and approach roadways before it enters the St. Croix River; and the providing of stormwater detention basins for spill protection for the Build Alternatives' bridges.

The No-Build Alternative would not result in new adverse impacts on fish and the aquatic community.

No adverse direct or indirect impacts are anticipated on the Minnesota or Wisconsin protected fish species, provided construction best management practices are used to minimize bottom disturbance, construction site erosion, and turbidity. Other potential impacts on endangered species in the St. Croix River were discussed previously in this Chapter. The No-Build Alternative would have no adverse impacts on protected species.

9.1.2.3 Terrain and Climate

Impacts on the terrain of the river (i.e., the river bottom) would result from the addition of piers for the Build Alternatives' bridges. Potential impacts on the river environment resulting from these actions are discussed elsewhere in this chapter. Neither the Build Alternatives nor the No-Build Alternative would alter the climatological conditions in the project area.

9.1.3 Mitigation

9.1.3.1 Freshwater Mussels

Relocating freshwater mussels from construction areas near the Wisconsin shoreline to other suitable habitat is proposed as mitigation for impacts on mussels in the project area. Based on the previously proposed 1995 Final EIS Preferred Alternative and the U.S. FWS Biological Opinion (including the mussel relocation protocol) prepared at that time, a mussel relocation plan for the project was designed, reviewed, approved, and implemented in 1996. A similar effort is proposed for the Build Alternatives. The U.S. FWS considers it imperative to avoid actions that would harm both the Higgins eye and the winged mapleleaf mussels.

Mussel relocation and construction equipment decontamination activities would be coordinated with appropriate agencies, including the U.S. FWS, MnDNR, and WisDNR, and would be conducted according to any terms and conditions specified in the U.S. FWS Biological Opinion (anticipated to be completed for the SFEIS of this project). A U.S. FWS/DNR recommended protocol for decontamination of construction equipment has been developed to avoid further contribution of zebra mussels into the St. Croix River. The protocol stipulates that all construction barges, work boats, and equipment must be decontaminated by elimination of zebra mussels and must remain decontaminated prior to being allowed into the St. Croix River. Boats from the Mississippi would be decontaminated by removing them completely from the water for a period of time and following other measures, depending on the season and other circumstances. The protocol also allows for boats to be brought overland to the St. Croix provided they are decontaminated prior to launching in the St. Croix River. The details of the decontamination protocol agreement are provided in a letter from U.S. FWS to FHWA (dated December 20, 1999), included in Appendix H.

Procedures have been developed and would be implemented as part of the Build Alternatives to ensure the safe relocation of *L. higginsii* and any other state- or federally-listed endangered mussels in areas identified for removal and relocation. Common species would be relocated as well. Mussel relocation sites will be identified and delineated before beginning the relocation effort. The area along the Minnesota shoreline is generally not suitable for mussel relocation because of the less desirable river substrate; the Wisconsin shoreline is more suitable. It is likely that a suitable relocation site will be found near the Wisconsin shore downstream of the Alternative B-1 bridge location. Mussels would be relocated from the identified construction areas and from the areas where temporary docking facilities and work boats and barges would be located in both Minnesota and Wisconsin.

9.1.3.2 Fish and the Aquatic Community

Minimizing the number of bridge piers that would be located in the river would reduce potential effects on aquatic life. The number of piers for any of the Build Alternative bridges is not known, and would be determined by the bridge type selected for the preferred alternative during the SFEIS for this project. Efforts described in Section 9.1.2.1 to reduce impacts on freshwater mussels also could decrease impacts on fish and other aquatic life. Construction-related debris will be kept out of the river to the greatest extent possible, and all appropriate erosion control measures will be followed during construction to protect water quality (see Chapter 12).

Mitigation of impacts on freshwater mussels is discussed in Section 9.1.3.1. Because there would be no impacts on other protected species in the river, no additional mitigation is needed.

9.1.3.3 Terrain and Climate

Mitigation for potential impacts on the river bottom “terrain” from construction of bridge piers would be considered with any of the Build Alternatives, as discussed in Chapter 12. Otherwise, there are no impacts on terrain or climate from either the No-Build Alternative or Build Alternatives, and therefore, no mitigation is needed.

9.2 MINNESOTA SHORE AND UPLAND

9.2.1 Affected Environment

For the purposes of this discussion, the Minnesota shore and upland includes the area from the western project terminus to the western shore of the St. Croix River, including Trunk Highway (TH) 36 from TH 5 east to the TH 36/TH 95 interchange in Oak Park Heights, the interchange area, and the Build Alternative's crossing locations.

9.2.1.1 Vegetation

The project area in Minnesota is generally urbanized and consists primarily of areas already used for transportation purposes (TH 36 and TH 95) or for other urban development (businesses along the TH 36 corridor and frontage roads, downtown Stillwater), with little undisturbed natural area. Little to none of the original vegetation (oak openings and prairie) remains in this area. Adjacent to the St. Croix River (near the Xcel King Power Plant property) is a less disturbed area that includes wetlands, floodplain forest, and other woody vegetation. The remainder of the Minnesota project area that is not paved or otherwise developed as buildings or parking areas is vegetated with typical urban ground cover, including trees, grass, suburban lawn and landscaping, and managed grassed lands within the rights-of-way of TH 36 and other roadways.

9.2.1.2 Wildlife

The vegetation in this part of the project area provides habitat for birds and small mammals. Wildlife within and near the project area in Minnesota consists of species that are considered common in urban and suburban areas of the state.

9.2.1.3 Protected Species

Swallow

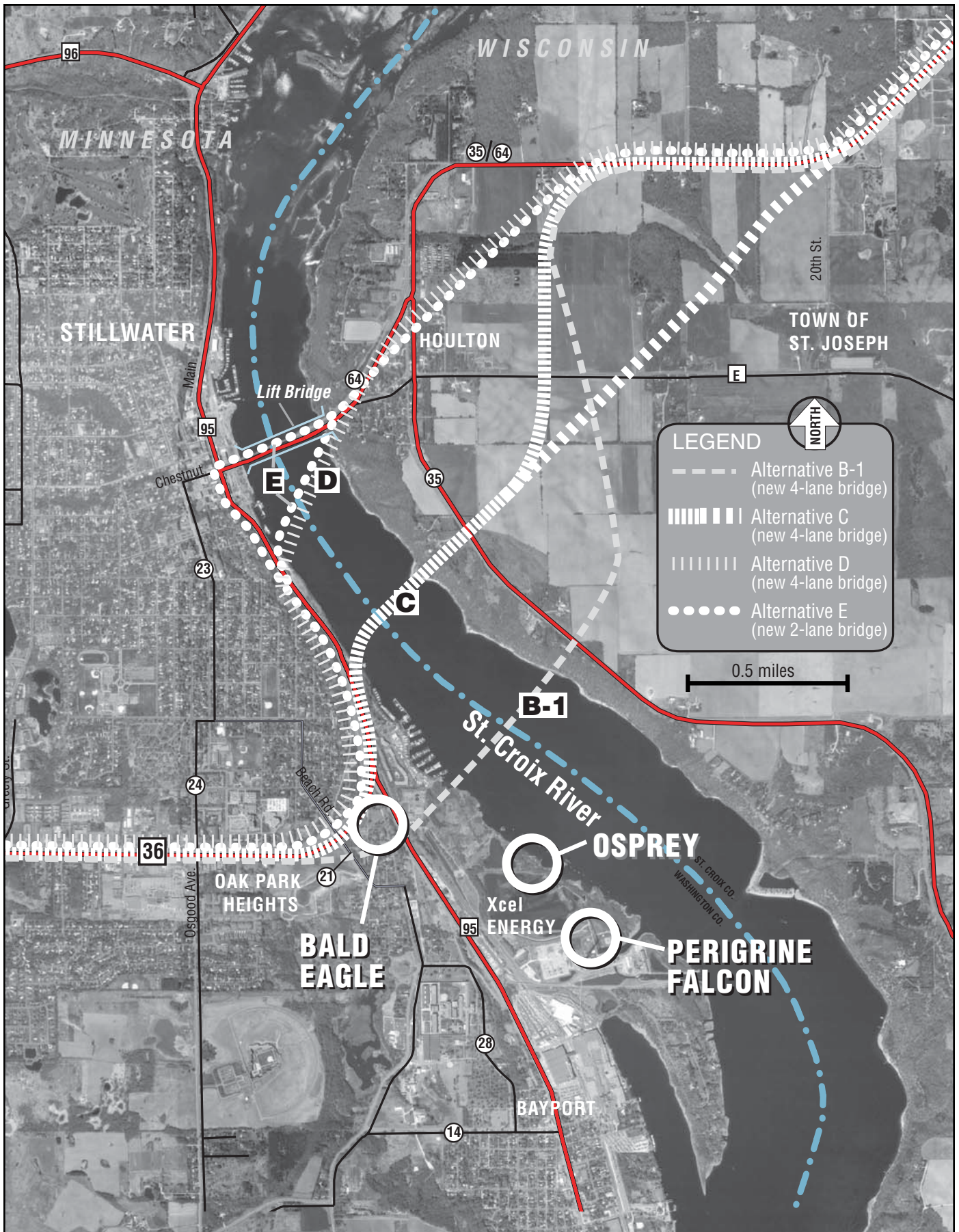
The Lift Bridge provides habitat for nesting swallows, a species of bird protected by the federal Migratory Bird Treaty Act.

Osprey

An active osprey (*Pandion haliaetus*) nest is located on the barge off-loading facility on the bank of the St. Croix River at the NSP King Power Plant in Bayport (Figure 9-2). The osprey is classified as a Minnesota species of special concern, is listed as a threatened species in Wisconsin, and is protected under the federal Migratory Bird Treaty Act. The osprey is not listed as a federal threatened or endangered species.

Peregrine Falcon

An active peregrine falcon (*Falco peregrinus*) nest is located on the exhaust stack of the NSP King Power Plant in Bayport, Minnesota (Figure 9-2). Although formerly a federally-listed endangered species, the peregrine falcon was removed from the U.S. FWS list in August 1999. It will remain classified as a threatened species in Minnesota, an endangered species in Wisconsin, and will continue to be protected under the federal Migratory Bird Treaty Act.



Protected Species Nesting Locations (Approximate)

Figure 9-2

Bald Eagle

The bald eagle is currently federally listed as a threatened species. Delisting or re-classification of this species has been considered. Regardless of the species federal status, it will continue to remain classified as a species of special concern in Minnesota and will continue to be protected under the federal Migratory Bird Treaty Act and the Bald Eagle Protection Act. The Bald Eagle Protection Act further protects these birds by prohibiting taking of their nests and eggs.

The St. Croix River and its adjacent forest cover provide the necessary habitat conditions to allow the nesting of bald eagles (*Haliaeetus leucocephalus*). An active nesting pair of bald eagles nested near the river in 1999, and have since nested in several locations in the area near the proposed TH 36/TH 95 interchange. These locations include an area south of Alternative B-1 on the Xcel Energy King Power Plant property in Bayport, Minnesota, approximately 100 yards south of one of the eagle nest's former location near the river, and immediately adjacent to TH 36 near the proposed interchange location (see Figure 9-2). The MnDNR no longer performs yearly monitoring of nesting eagle pairs, although residents familiar with the nest site reported no activity at this location in the spring of 2004. It is not currently known if the pair have nested elsewhere in or near the project area.

9.2.1.4 Terrain and Climate

The terrain of the Minnesota shore rises gently from the river surface elevation (675 feet) and then rises more steeply as the distance from the river increases. In the upland area west of the river bluff, the terrain is gently rolling to flat and ranges in elevation from 850 feet to 950 feet. The climate in the project area is described in Section 9.1.1.3.

9.2.2 Environmental Consequences

9.2.2.1 Vegetation

Because the project (in Minnesota) is primarily in a developed roadway corridor that traverses an urban and suburban environment, most vegetation has been disturbed to a large degree by past human activity. Construction of the Build Alternatives (the TH 36/TH 95 interchange in particular) would require the removal of trees, shrubs, and undergrowth in affected areas. Construction impacts on trees are discussed further in Chapter 12.

9.2.2.2 Wildlife

Given their locations primarily on existing roadway corridors and in a generally urbanized area, the Build Alternatives would not introduce new barriers to wildlife movement in Minnesota, except in short lengths between TH 95 and the St. Croix River; existing barriers would be broadened or widened in other areas of the Minnesota corridor. Most of the wildlife in the area consists of species that have adapted to a disturbed physical environment and would be tolerant of possible disturbances from the project. Although construction of the Build Alternatives could remove and/or displace some kinds of habitat and could displace wildlife in certain areas, habitat loss and the resulting impacts on wildlife are not expected to be substantial. Displaced wildlife might relocate to adjoining habitat, possibly increasing competition for food and shelter for some species.

Potential general effects of highway development on wildlife include habitat loss through its conversion into a paved highway surface, decreased attractiveness of habitat adjacent to the highway as a result of noise and activity, and an increase in wildlife-vehicle accidents as a result of increased traffic volumes.

9.2.2.3 Protected Species

Swallow

As discussed in Section 9.2.1.3, the Lift Bridge provides habitat for nesting swallows.

Osprey

The osprey nest located on the barge off-loading facility at the Xcel King Power Plant would be affected by the proposed removal of the off-loading facility that has been identified as a potential mitigation item (see Chapter 14). Removal of the platform would eliminate the existing nest and any future nests at this particular location. Xcel Energy would move the osprey nesting platform to a new location in the general area. It is anticipated that the osprey would follow and re-establish a nest at the new location.

Peregrine Falcon

The Build Alternatives would not adversely affect the identified peregrine falcon nesting area. Construction activity is not expected to adversely disturb the species in general.

Bald Eagle

As discussed in Section 9.2.1.3, the bald eagle pair nesting in this area established a nest near the proposed TH 36/TH 95 interchange. Although the road design was significantly altered to avoid directly impacting the nest tree (located about 55 feet from existing TH 36), this nesting pair, if they remain at this nest location, would be impacted by construction activities of the proposed interchange.

According to the U.S. FWS, road and bridge construction could have impacts on nesting bald eagles. Specifically, impacts could occur from construction activities that disturb nesting eagles during the spring and summer months. This could result in nest abandonment and subsequent loss of unfledged eaglets in the nest. The U.S. FWS estimates that, during nesting season, a maximum of two eaglets per construction season could be lost in this way. Therefore, a maximum total of eight eaglets could potentially be lost during project construction, assuming four seasons of work. The Biological Opinion of the U.S. FWS is anticipated to be prepared during the SFEIS.

9.2.2.4 Terrain and Climate

Localized impacts on terrain from the Build Alternatives would occur along TH 36, primarily between TH 5 and the new TH 36/TH 95 interchange where the existing grade would be lowered or otherwise altered. Neither the No-Build nor Build Alternatives would result in adverse impacts on climate.

9.2.3 Mitigation

9.2.3.1 Vegetation

Landscaping and revegetation will be implemented as mitigation for vegetative loss in appropriate areas. The use of native plant materials will be investigated and implemented where appropriate. Detailed plans for revegetation will be developed as part of the final design of the project.

9.2.3.2 Wildlife

Potential impacts on wildlife would be addressed through revegetation as described in Section 9.2.3.1.

9.2.3.3 Protected Species

Potential impacts on osprey resulting from removal of the barge off-loading facility (if included as mitigation) would be minimized by moving the nesting platform to a suitable area nearby during the non-nesting season, prior to removal of the off-loading facility.

As described in Section 9.2.2.3, impacts on the bald eagle nest near the proposed TH 36/ TH 95 interchange would occur as a result of the Build Alternatives. Design of the TH 36/TH 95 interchange with each of the alternatives has already been altered from its original design to preserve the nesting tree. Measures to further mitigate impacts on the bald eagle nest would be undertaken, such as the timing and duration of construction. During final design efforts will be made to limit construction activities near the bald eagle nest during nesting activities.

Measures would be undertaken to reduce construction impacts on any other nests discovered in the project area during bridge construction and staging. For example, tree cutting and human activity would be restricted for a certain distance from nesting bald eagles. Such measures would be formalized, if necessary, through the development of construction specifications.

9.2.3.4 Terrain and Climate

No mitigation is needed for direct changes in terrain in the Minnesota upland area resulting from the Build Alternatives. Mitigation for secondary impacts on terrain (e.g., drainage) is addressed elsewhere in this SDEIS. Because no impacts on climate would occur from the Build Alternatives or the No-Build Alternative, no mitigation is needed.

9.3 WISCONSIN SHORE AND BLUFF

9.3.1 Affected Environment

For the purposes of this discussion, the Wisconsin shore and bluff is defined as the general area that would be affected by the eastern touchdown point of the Build Alternative bridges, extending from the shoreline to approximately State Trunk Highway (STH) 35. The bluffline is

defined as the “top of a slope preservation zone,” while slope preservation zone is defined as “an area with a slope greater than 12 percent with the horizontal interval of measurement not exceeding 50 feet” (as per Appendix A of the *Cooperative Management Plan – Lower St. Croix National Scenic Riverway*, January 2002). From west to east, this area includes a sandy beach area (alluvial fan) adjacent to the river that leads to a more heavily vegetated band above the beach area that in turn gives way to a more level area beyond the bluffline. For Alternatives B-1 and C, which both traverse up the bluff through a ravine, this area is steep, heavily-vegetated and relatively undisturbed. For Alternatives D and E, the area is steep but relatively developed, and includes the transportation corridor (STH 64 and County Trunk Highway [CTH] E) and developed areas associated with the Town of Houlton. Natural resource surveys of the affected environment in this area were conducted by WisDNR, Wis/DOT, and Mn/DOT.

9.3.1.1 Vegetation

Common herbaceous species growing on the beach at the foot of the bluffs/ravines in the areas of the four Build Alternatives include horseweed, poison ivy, wild lettuce, figwort, columbine, evening primrose, woodland sunflower, leafy spurge, flowering spurge, hedge nettle, common mullein, and wild grape.

Trees closest to the shore or beach of the St. Croix River (on the lower bluff) in the areas of Alternatives B-1 and C, and along the STH 64 approach and new bridge approach of Alternatives D and E include eastern red cedars, red pines, silver maples, and cottonwood trees. No unique or outstanding trees or tree species have been identified in these areas.

The upper bluff and ravine areas of Alternatives B-1 and C generally support a young- to middle-aged forest of mixed hardwood trees (basswood, northern red oak, white oak, bur oak, green ash, American and Siberian elm, trembling aspen, big tooth aspen, paper birch, black cherry, and cottonwood). Estimated tree height is 60 to 80 feet except for some openings in the forest on the mid- to upper-areas of the south-facing slopes of the ravines through which the alternatives would pass. Historic maps indicate the presence of small openings on the upper south-facing side slopes. Through succession in the last 20 or 30 years, the openings have been replaced by stands of brush and young forest, including aspen, birch, and red oak trees. These trees are about 30 to 60 feet in height and canopy coverage is less dense than elsewhere on the bluff. Very few plant species associated with prairie or oak openings occur on these slopes. The remainder of the south- and west-facing slopes support a middle-aged, southern dry/mesic forest. The north-facing slopes typically support a southern mesic forest. The ground layer vegetation on the north-facing slopes is a mixture of species with both southern and northern affinities.

The segment of CTH E that traverses the Wisconsin bluff, and which would be disturbed by Alternatives D and E, is lined by common annual and perennial grasses and weed species. Common native species include tall goldenrod, showy goldenrod, bergamot, woodland sunflower, evening primrose, and poison ivy. Woody vegetation outside the clear zone of CTH E consists of mixed hardwood trees and brush, including bur oak, red oak, American elm, Siberian elm, sugar maple, and tartarian honeysuckle. The STH 64 approach is lined by a similar plant community but has a greater shrub component that includes smooth sumac, prickly ash, and buckthorn. Small red cedar, and paper trees, and several large cottonwoods are also present along the STH 64 right-of-way.

Common shrub and vine species in the bluff and ravine areas of Alternatives B-1 and C, and along the STH 64 and Alternative D and E new bridge approaches include staghorn sumac, gray dogwood, prickly ash, and Virginia creeper. Common herbaceous species growing in old fields at the top of the bluffs of Alternatives B-1 and C include spotted knapweed, poison ivy, blackberry, tall goldenrod, Kentucky blue grass, and brome grass. Common herbaceous species growing on the bluff and ravine slopes of the four Build Alternatives include enchanter's nightshade, hog peanut, bulbet fern, lady fern, maidenhair fern, poison ivy, woodland aster, wood violet, sessile bellwort, muhly grass, wild sarsaparilla, horsetails, sweet cicely, Canada mayflower, and columbine.

Impacts on vegetative species protected in Wisconsin would require formal consultation with the WisDNR under the Wisconsin Endangered Species Act to develop a plan to avoid and minimize impacts on the plants to the extent possible, and may include authorization for an incidental take of some plants. Conditions of an incidental take authorization would likely include seed harvesting and/or translocation of the affected plants to another, more protected location.

9.3.1.2 Wildlife

The abundant and relatively undisturbed vegetation described in Section 9.3.1.1 provides habitat for a number of common species including small mammals (mice, voles, squirrels, cottontail rabbits, etc.), larger mammals (whitetail deer, coyote, fox, raccoon, striped skunk, etc.) songbirds (American robin, black capped chickadee, tufted titmouse, ovenbird, chipping sparrow, crested flycatcher, northern cardinal, etc.), and game birds such as ruffed grouse. As described in Section 9.3.1.3, no endangered, threatened, or special concern species are known to occur on the site.

9.3.1.3 Protected Species

Review of the Natural Heritage Inventory database maintained by the WisDNR and field surveys indicated no records of state-endangered, threatened, or special concern species in the Wisconsin shore and bluff area, with the exception of a small population of dotted blazing star (*Liatris punctata* var. *nebraskiana*), a Wisconsin state-endangered plant, between the St. Croix River and STH 35, near the area where Alternative B-1 would cross the river bluff. No plants of this species were identified along the Wisconsin shore and bluff in the July 1999 WisDNR field survey. Some individual dotted blazing star plants were identified in the Wisconsin upland area adjacent to STH 35 (see Section 9.4.1.3). It was assumed for this SDEIS that any of the Build Alternatives would potentially impact this species.

9.3.1.4 Terrain and Climate

The Wisconsin shore and bluff area consists of a narrow strip of beach and floodplain along the river with a sharp rise to the bluff line in most areas. Elevation at the top of the bluff for each alternative is approximately 850 feet, (a 200-foot rise from the river). The climate in this area was described in Section 9.1.1.3.

9.3.2 Environmental Consequences

9.3.2.1 Vegetation

An area of trees and associated understory vegetation and beach area vegetation on the Wisconsin bluff and shore would be removed to allow for construction of the bridges, stormwater pond and channel for each of the Build Alternatives, although less so for Alternatives D and E, whose alignments take advantage of an existing roadway corridor to minimize impacts. Vegetative change (e.g., loss of trees) could occur to varying degrees in the area of the bridge abutments, piers, stormwater ponds and channels, and any areas shadowed by the new structure. Field survey results concluded that remaining trees in this area are expected to respond relatively well to construction activities if appropriate measures are taken to protect them during construction. Vegetative impacts will be managed through implementation of landscaping and revegetation guidelines developed as part of final project design.

9.3.2.2 Wildlife

Impacts on the local wildlife community in the Wisconsin shore and bluff area of any of the Build Alternatives are anticipated to be small. Although the Build Alternatives in this area would introduce a new barrier to wildlife movement and would be expected to result in some overall habitat loss, resulting impacts on wildlife are not expected to be substantial, especially given the relative size of the affected area in relation to the large areas of nearby habitat. Displaced wildlife might relocate to adjoining habitat, possibly increasing competition for food and shelter for some species.

Possible general effects of highway development on wildlife include habitat loss through conversion into a paved highway surface/ponding/trail, decreased attractiveness of habitat adjacent to the highway resulting from noise and activity, and an increase in wildlife-vehicle accidents as a result of increased traffic volumes.

9.3.2.3 Protected Species

As described in Section 9.3.1.3, no threatened or endangered species have been identified in the Wisconsin shore and bluff area with the exception of the dotted blazing star (*Liatris punctata* var. *nebraskiana*). It was assumed for this SDEIS that any of the Build Alternatives would potentially impact this species. Field surveys for the species would be performed prior to construction, and mitigation measures such as relocating populations of the plants to designated protected areas, and/or funding efforts to acquire land known to support this species for preservation and/or relocation will be pursued.

9.3.2.4 Terrain and Climate

The terrain of the Wisconsin shore and bluff would be altered by the construction of the Build Alternatives. Estimates of impacts are presented on Table 9-1. Figure 9-3 shows the existing bluff area as defined by the Lower St. Croix National Scenic Riverway Cooperative Management

Plan and Figures 9-4a through 9-4f show impacts on the bluff from the various alternatives. The area of overall bluff impacts in acres¹ (including areas for trails up the bluff and stormwater ponds) ranges from 2.18 acres with Alternative B-1 to 13.29 acres with Alternative E. The volumes of cut (permanent removal) impacts range from 20,807 cubic yards with Alternative B-1 to 215,517 cubic yards with Alternative E. The volume of fill permanent placement ranges from 2,083 cubic yards with Alternative C (Option 1) to 73,032 cubic yards with Alternative D.² Alternatives B-1 and C use existing ravines, so the majority of bluff cut and fill impacts would occur further back in the ravine, resulting in lessened impacts on the face of the bluff. Additional impacts on the bluff would occur during construction with any of the Build Alternatives to allow for temporary construction haul roads and work areas. This impact and the measures proposed to minimize it are discussed in Chapter 12. The visual impacts of this activity are discussed in Chapter 7.

TABLE 9-1
WISCONSIN BLUFF IMPACTS^{(1),(2)}

	Impacted Bluff Area (acres)	Impacted Bluff Volumes - Cut (cubic yards)	Impacted Bluff Volumes - Fill (cubic yards)
Alternative B-1	2.18	20,807	5,282
Alternative C (WI Option #1)	3.98	96,418	2,083
Alternative C (WI Option #2)	3.98	109,963	2,301
Alternative D	11.69	181,158	73,032
Alternative E	13.29	215,517	60,455

⁽¹⁾Includes impacts resulting from the construction of the bridge, roadways, stormwater ponds, and trails.

⁽²⁾Data subject to change – does not include impacts from an entrance/welcome monument to Wisconsin (all Build Alternatives).

Neither the Build Alternatives nor the No-Build Alternative would result in any impacts on climate.

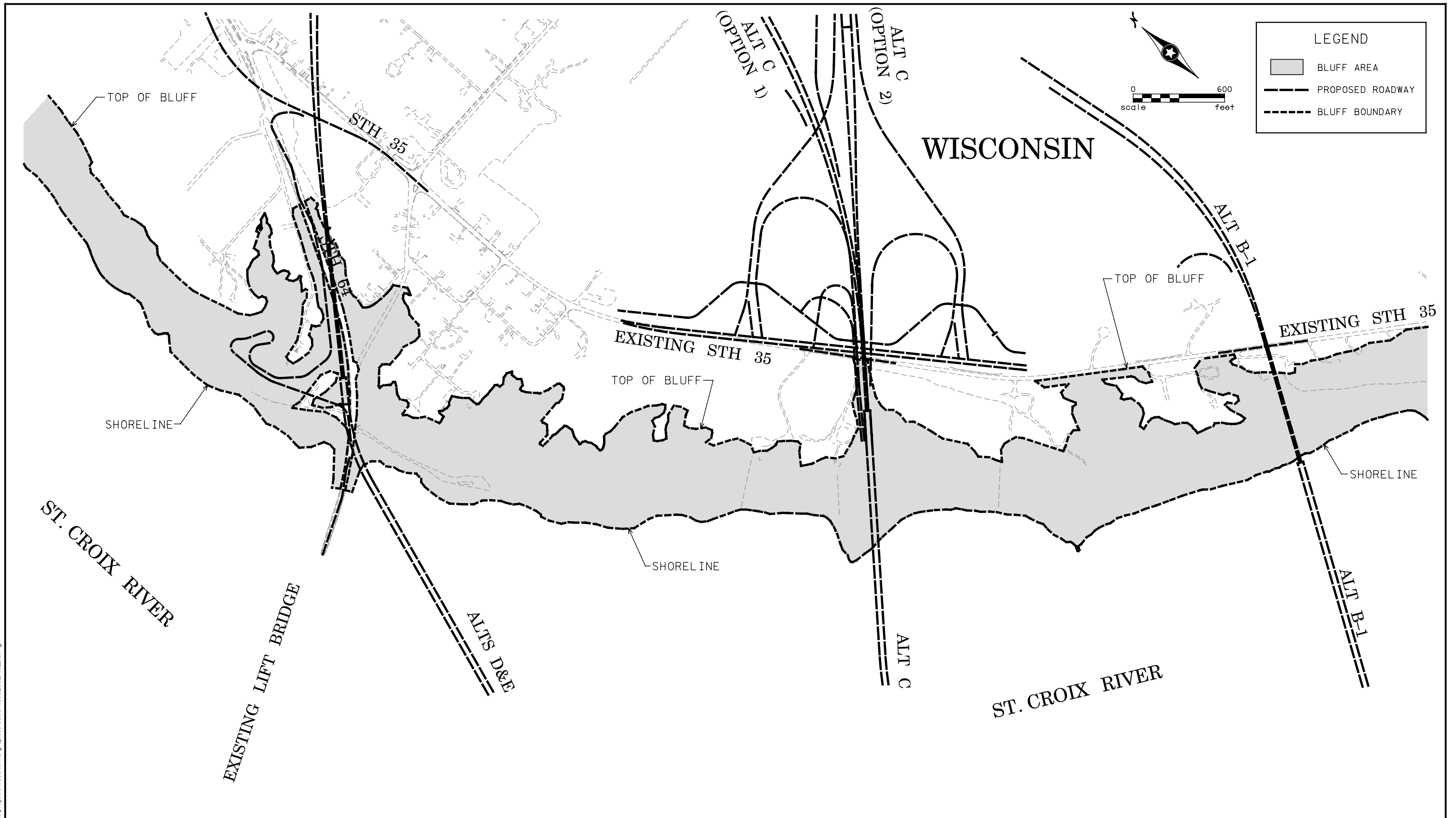
9.3.3 Mitigation

9.3.3.1 Vegetation

Landscaping and revegetation would be implemented as mitigation for vegetative loss in appropriate areas. The use of native plant materials would be investigated and implemented where appropriate. Detailed plans for revegetation would be developed as part of the final design of the project.

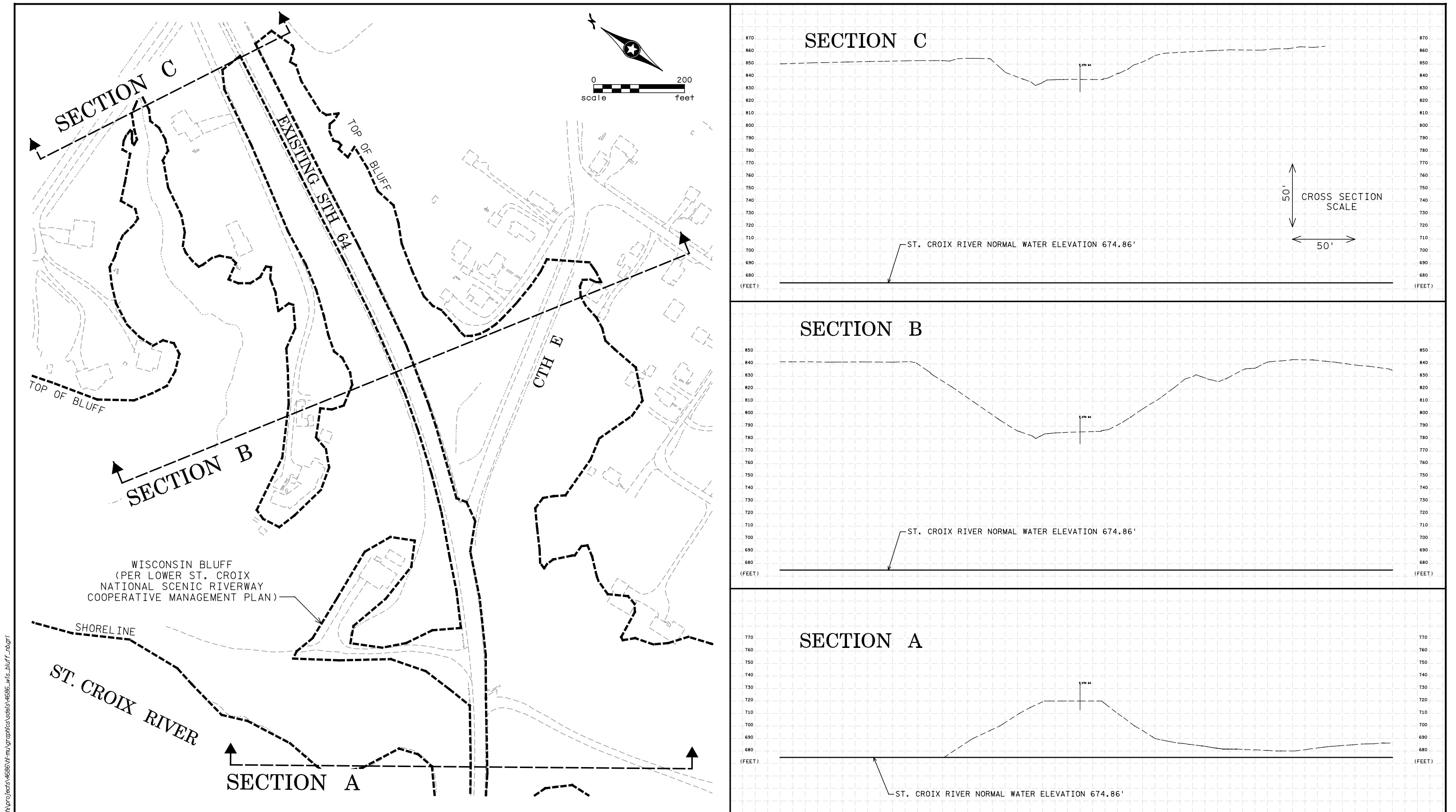
¹ The bluff area includes the area from the shoreline to the bluffline as defined in Section 9.3.1. The exact area of impact underneath the bridge (from shoreline to bridge abutment) for all Build Alternatives is not known at this time pending resolution of the bridge type analysis, and subsequently, the location of bridge piers.

² Impacted bluff volumes for all Build Alternatives were measured from the preliminary bridge abutment to the bluffline out to preliminary construction limits. Cut and fill activities for bridge construction between the shoreline and bridge abutment for any of the Build Alternatives would depend upon the bridge type selection and bridge pier location. Both the bridge type and pier location for any of the Build Alternatives are not known at this time.



Wisconsin Bluff Boundary (per Lower St. Croix National Scenic Riverway Cooperative Management Plan)

Figure 9-3

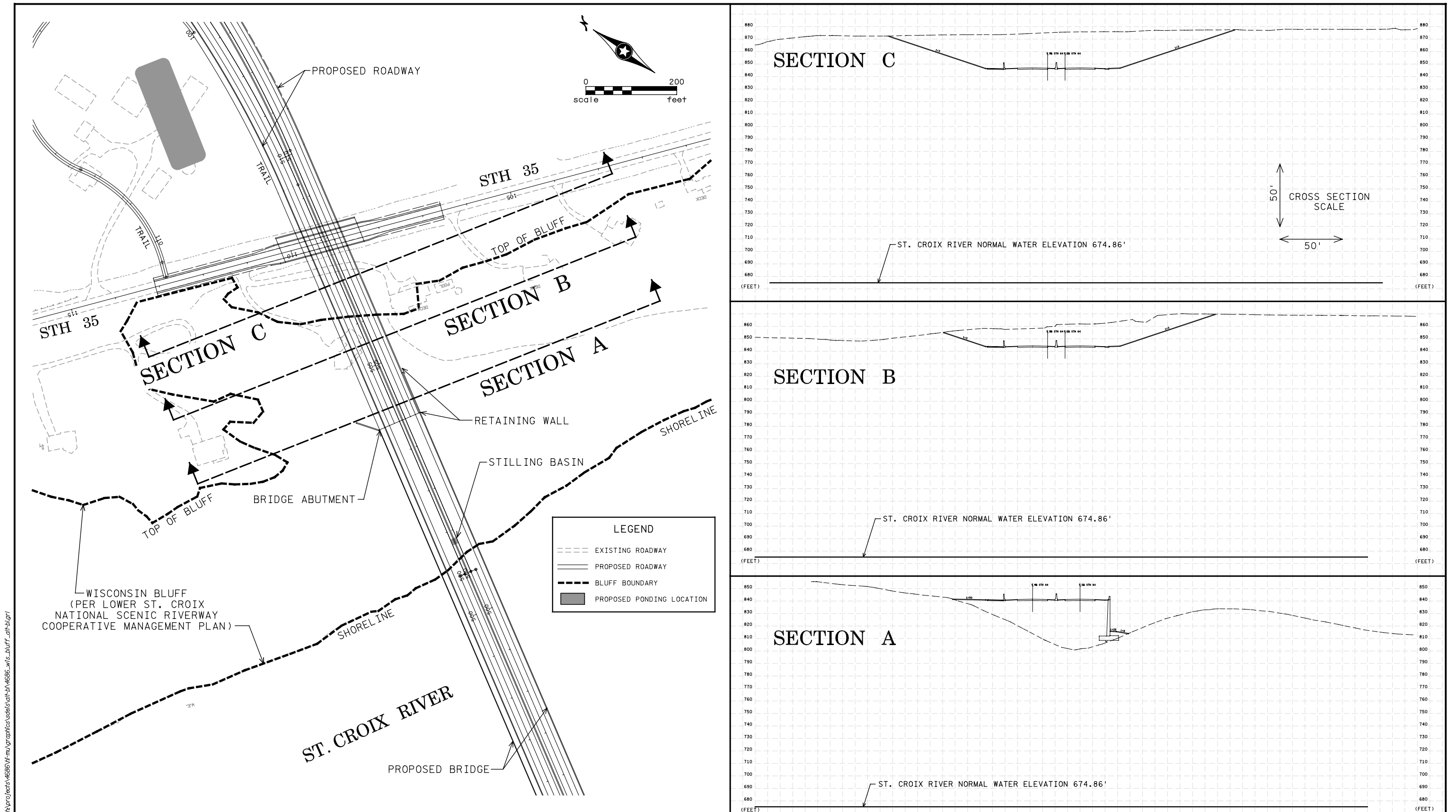


Wisconsin Bluff Impacts - No Build Alternative

St. Croix River Crossing Project

Figure 9-4a

2004 Supplemental Draft Environmental Impact Statement

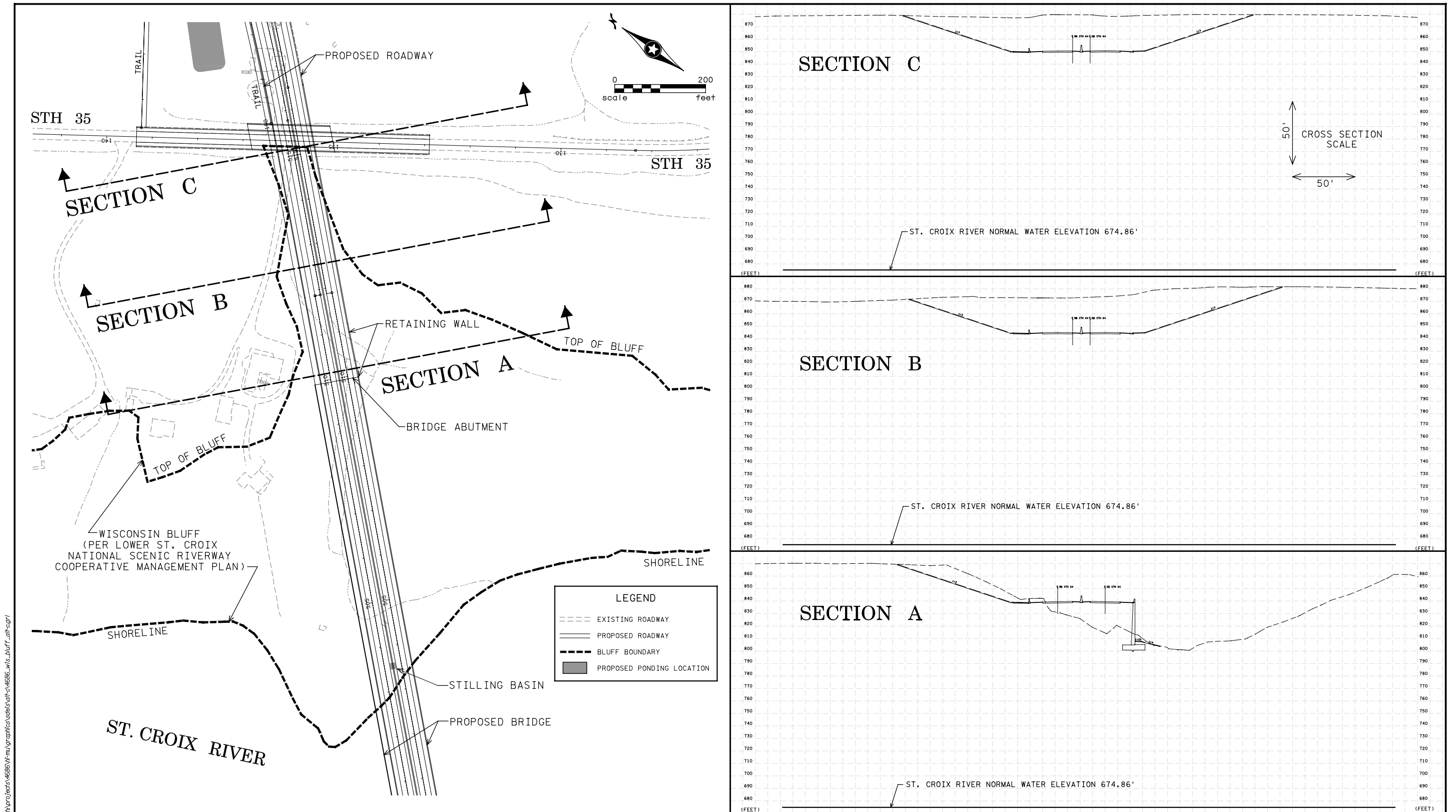


Wisconsin Bluff Impacts - Alternative B-1

St. Croix River Crossing Project

Figure 9-4b

2004 Supplemental Draft Environmental Impact Statement

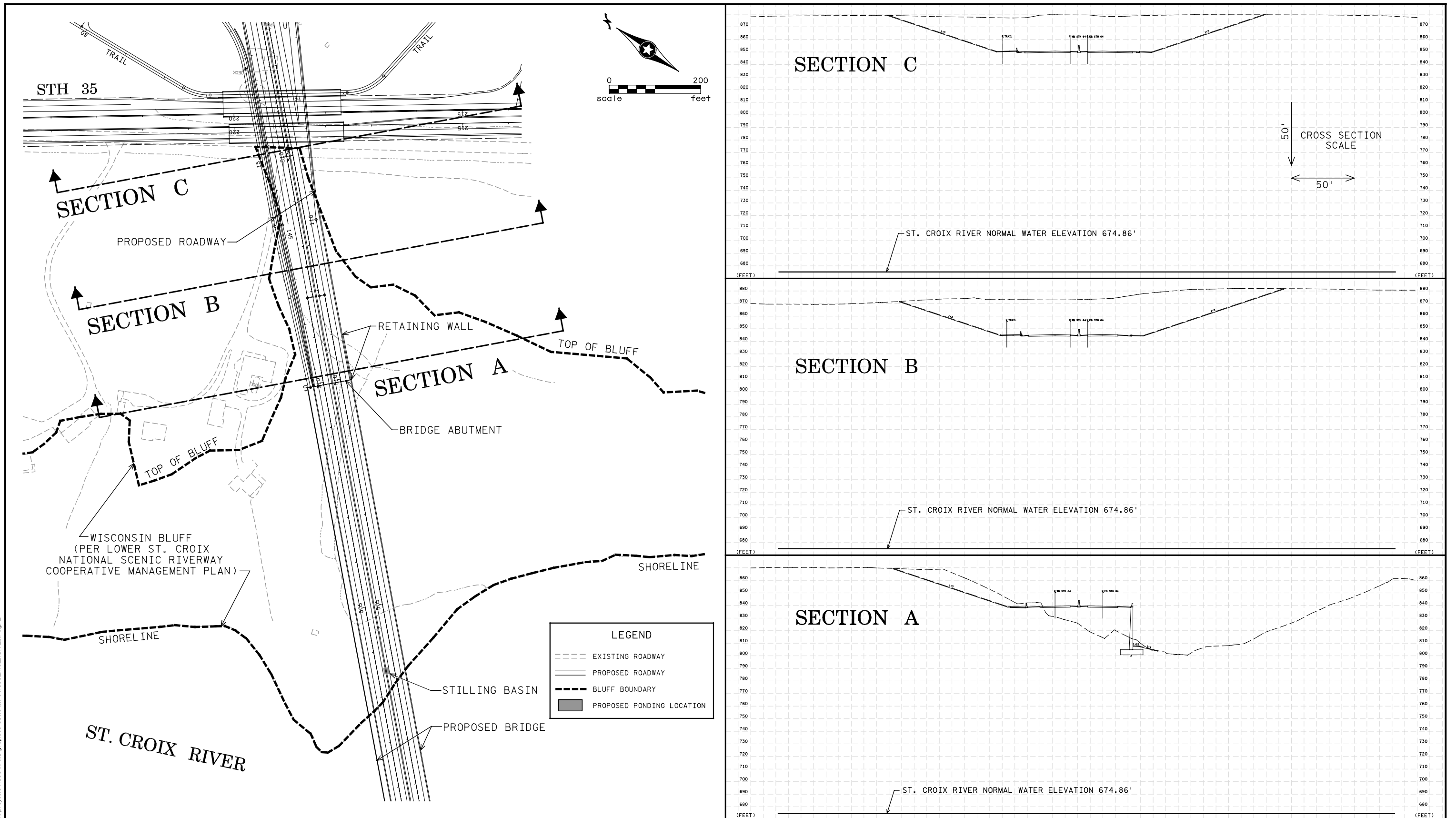


Wisconsin Bluff Impacts - Alternative C (Option 1)

St. Croix River Crossing Project

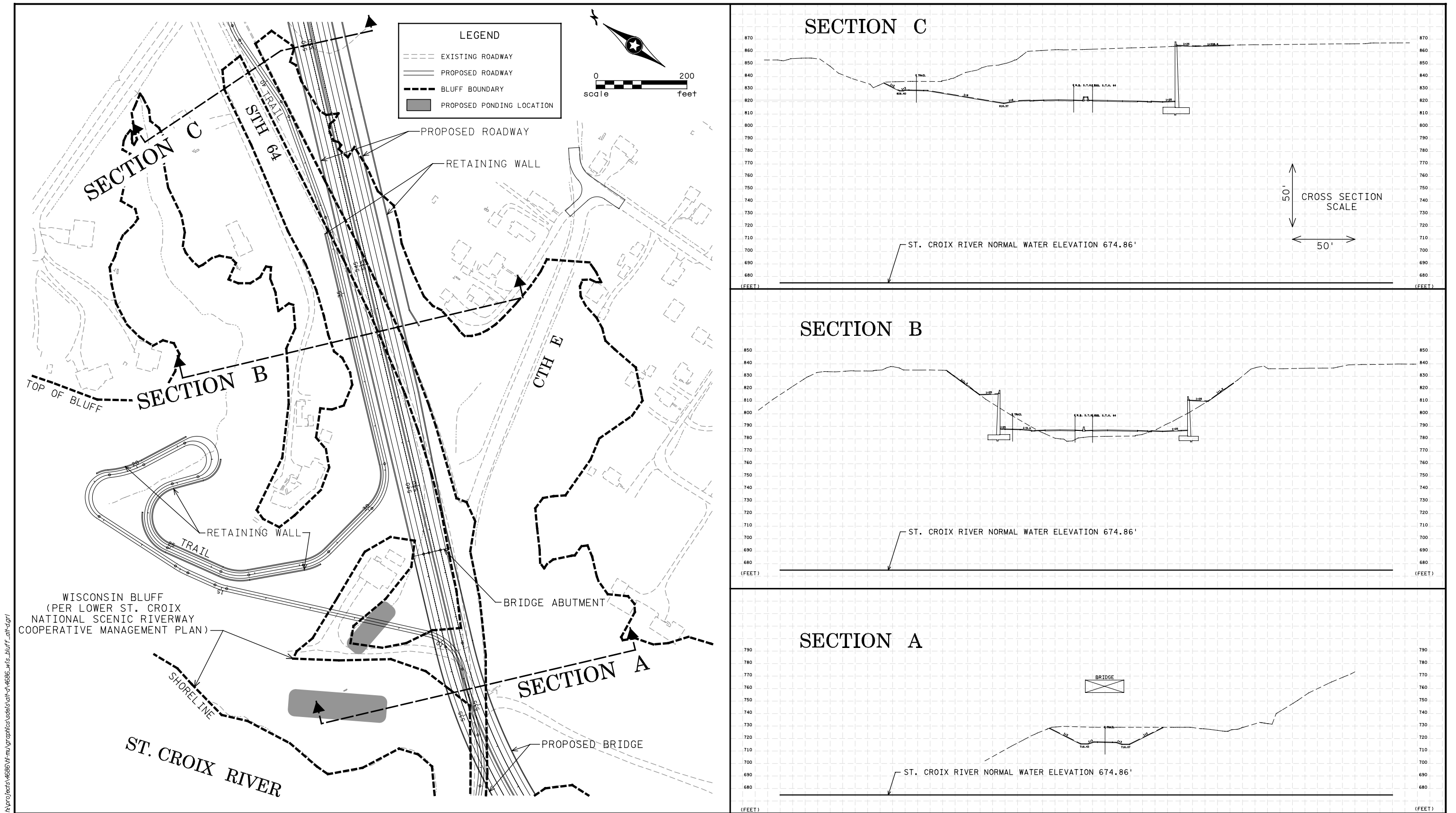
Figure 9-4c

2004 Supplemental Draft Environmental Impact Statement



Wisconsin Bluff Impacts - Alternative C (Option 2)
St. Croix River Crossing Project

Figure 9-4d
2004 Supplemental Draft Environmental Impact Statement



Wisconsin Bluff Impacts - Alternative D
St. Croix River Crossing Project

Figure 9-4e
2004 Supplemental Draft Environmental Impact Statement

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SECTION C

0 200
scale feet

SECTION B

TRAIL

SHORELINE

RIVER

SECTION A

SECTION C

870
860
850
840
830
820
810
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790
780
770
760
750
740
730
720
710
700
690
680

ST. CROIX RIVER NORMAL WATER ELEVATION 674.86'

50' CROSS SECTION SCALE

50'

870
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840
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750
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SECTION B

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ST. CROIX RIVER NORMAL WATER ELEVATION 674.86'

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SECTION A

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ST. CROIX RIVER NORMAL WATER ELEVATION 674.86'

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9.3.3.2 Wildlife

Possible impacts on wildlife would be addressed through revegetation, as described in Section 9.3.3.1.

9.3.3.3 Protected Species

Mitigation measures for impacts on the dotted blazing star (*Liatris punctata* var. *nebraskiana*) (such as relocating populations of the plants to designated protected areas, and/or funding efforts to acquire land known to support this species for preservation and/or relocation) will be pursued.

9.3.3.4 Terrain and Climate

Because Alternatives B-1 and C use existing ravines to traverse the bluff face, the majority of bluff impacts would occur further back in the ravine, minimizing impacts on the face of the bluff. Impacts on the bluff are further minimized by locating the stormwater pond near the river's edge and not at the top of the bluff. Alternatives D and E include a trail adjacent to the roadway that follows a winding path to minimize the slope encountered by trail users. This trail swings widely away from the roadway, thus increasing the area of impact. However, the degree of impact is expected to be slight.

Mitigation of secondary impacts on terrain (e.g., drainage) is addressed elsewhere in this SDEIS. Because no impacts on climate would occur from either the Build Alternatives or the No-Build Alternative, no mitigation is needed.

9.4 WISCONSIN UPLAND

The Wisconsin upland area includes the Build Alternatives project area from approximately STH 35 to the eastern project terminus, north of 150th Avenue in Somerset Township. All Build Alternatives including two options for Alternative C (Option 1 and Option 2, as described in Chapter 3) are included in this area.

9.4.1 Affected Environment

9.4.1.1 Vegetation

Each of the Build Alternatives in Wisconsin would be constructed partially on an existing roadway corridor, and partially on agricultural land. In addition to crops, vegetation of the Wisconsin upland portion of the project includes plants and grasses typically found adjacent to highway right-of-way in an agricultural area. Small areas of trees are present throughout this area, including windbreaks between agricultural fields, undeveloped portions of residential areas, and wooded ravines unsuitable for development of farming. Few trees are present in this area of the project.

Alternatives B-1 and C (Option 1) would be constructed in a new corridor for about two-thirds of their length, while the other Build Alternatives (D and E) would use the existing roadway

corridor. Alternative C (Option 2) would primarily be constructed in a new corridor. The new corridors traverse mostly undeveloped land that is primarily agricultural. (Farmland impacts are discussed in Chapter 6). The remaining segments of Alternative C (Option 2) traverses wooded, brushy, ravine, or wetland habitats. (Wetland impacts are discussed in Chapter 10.) According to a field survey by the WisDNR, the wooded area is composed of a second-growth southern mesic and dry-mesic forest community. The southern portion of this area has been heavily affected by pasturing and subsequent invasion of aggressive native and exotic species. Common species in the woodlot include white oak, northern red oak, maple, black cherry, and box elder. Sugar maple, butternut, and American elm are also present. Shrub species include gooseberry, common buckthorn, red-berried elder, and prickly ash. Ground layer vegetation includes enchanter's nightshade, jack-in-the-pulpit, twisted stalk, wild geranium, wood anemone, sweet cicely, fragrant bedstraw, wild sarsaparilla, Virginia creeper, sessile bellwort, perfoliate bellwort, common nettle, spikenard, lady fern, and blue cohosh.

The ravine that would be traversed by the middle segment of Alternative C (Option 2) is part of a discontinuous drainage channel formed by glacial meltwater. The bottom and side slopes of the ravine have been disturbed by land uses such as pasturing and tilling for crop production. According to the WisDNR field survey, the east-facing ravine slope supports a young forest of paper birch, red maple, and aspen. Prickly ash is the dominant shrub species and common buckthorn is also present. Dominant herbaceous plants include enchanter's nightshade, sweet cicely, fragrant bedstraw, Virginia creeper, and lady fern. The west-facing ravine slope supports a thicket of mulberry, aspen, paper birch, and red maple saplings; shrubs of prickly ash, staghorn sumac, and gray dogwood; with an herbaceous layer dominated by twisted stalk, sweet cicely, and tall goldenrod. The bottom of the ravine is cultivated for agricultural crops, and is not a wetland area.

Both Alternatives B-1 and C (Option 1) include the possible realignment of a segment of CTH E. This relocation would traverse agricultural and roadway areas with characteristics and impacts similar to the main portion of the Alternatives.

Alternative C (Option 2) would traverse mostly agricultural land from STH 35 to the northeast for approximately one mile. The alignment would then pass by a recent (2003 – 2004) residential development before joining the existing alignment of STH 35/64. The vegetation that would be impacted has characteristics similar to that of Alternative C (with Option 1), with the exception of the ravine that is not crossed by Alternative C (Option 2).

Alternatives D and E would pass through mostly agricultural land from STH 35 to the northeast for approximately $\frac{3}{4}$ mile before joining existing STH 35/64. The vegetation that would be impacted has characteristics similar to that of Alternative C (Option 1).

Both Alternatives D and E include the possible relocation of STH 35 and a local road connection from the proposed STH 35/64 interchange to existing STH 35/64. The vegetation that would be impacted by this relocation would be primarily agricultural, with some existing roadside vegetation.

9.4.1.2 Wildlife

The general setting for all Alternatives in Wisconsin is agricultural, rural residential, or within the community of Houlton. Potentially-affected habitat associated with the Build Alternatives is generally agricultural or grassed ditches associated with roadway right-of-way. For Alternative C (Option 2) potentially-affected habitat also includes the two woodlots and small wetland area described in Section 9.4.1.1. Wildlife species typical of an agricultural landscape are anticipated to be found in the area of the Build Alternatives.

9.4.1.3 Protected Species

WisDNR staff conducted a field survey of the non-agricultural areas of the Alternative C (Option 2) for the presence of endangered, threatened or rare plant and animal species (June 9, 1999). One Wisconsin state special concern song bird species [western meadowlark (*Sturnella neglecta*)] was observed in the open farmland segment of this alternative in the summer of 1999. No adverse impacts on this species are anticipated. In 1998 a segment of STH 35 was surveyed for the presence of dotted blazing star (*Liatris punctata var. nebraskiana*), a Wisconsin state endangered plant. A number of individuals of the species were identified adjacent to STH 35 on both sides of the highway south of where Alternative C would cross STH 35. Correspondence from the WisDNR did not indicate the presence of other threatened or endangered plant or animal species in the project area in Wisconsin.

In 1998 a segment of STH 35 was surveyed for the presence of dotted blazing star (*Liatris punctata var. nebraskiana*), a Wisconsin state endangered plant. A number of individuals of the species were identified adjacent to STH 35 on both sides of the highway south of where Alternative C would cross STH 35.

9.4.1.4 Terrain and Climate

The terrain of the Wisconsin upland area is level to gently rolling and varies in elevation from about 850 feet at the top of the bluff to 950 feet at the eastern project terminus. The climate of this area is described in Section 9.1.1.3.

9.4.2 Environmental Consequences

9.4.2.1 Vegetation

Alternatives B-1, C (Option 1), D and E would traverse either developed roadway corridors, or agricultural land where vegetation consists of landscaped terrain or planted crops respectively. As a result, impacts on native vegetation would be minimal. Alternative C (Option 2) would also traverse wooded areas in the woodlot and wooded ravine areas described in Section 9.4.1.1. Construction of the highway would require removal of trees and associated understory vegetation in these areas within the future roadway right-of-way.

9.4.2.2 Wildlife

Impacts on the composition of the local wildlife community in the Wisconsin upland area are anticipated to be minimal. Most of the indigenous wildlife in the area consists of species that have adapted to a disturbed physical environment and would be tolerant of possible disturbances from the project. Construction of the Build Alternatives might permanently remove some kinds of habitat and displace wildlife in certain areas. Each of the Build Alternatives would create new barriers to wildlife movement for parts of the roadway lengths, including along the river bluff. Alternative C (Option 2) in particular would result in some impact on habitat and wildlife in the wooded area and ravine that it crosses. However, habitat loss and resulting impacts on wildlife would not be expected to be substantial as wooded habitat in the project area is already highly fragmented. Further fragmentation caused by the highway would not be considered significant.

Potential general effects of highway development on wildlife include habitat loss through conversion into a paved highway surface, decreased attractiveness of habitat adjacent to the highway resulting from noise and activity, loss of capacity to sustain the original wildlife populations resulting from habitat alteration, and increase of wildlife-vehicle accidents as a result of increased traffic volumes.

9.4.2.3 Protected Species

Possible impacts on dotted blazing star (see Section 9.4.1.3) could result from construction of any of the Build Alternatives. This species has been found in the area of Alternative C along STH 35, and could occur in any of the disturbed areas of the Wisconsin upland.

9.4.2.4 Terrain and Climate

Grading of existing terrain would be required for all of the Build Alternatives. The gently rolling character of the agricultural lands would be maintained to the extent allowed by safety and design standards. Neither of the Build Alternatives nor the No-Build Alternative would result in impacts on climate.

9.4.3 Mitigation

9.4.3.1 Vegetation

Landscaping and revegetation would be implemented as mitigation for vegetative loss in appropriate areas. The use of native plant materials would be investigated and implemented where appropriate. Detailed plans for revegetation would be developed as part of the final design of the project.

9.4.3.2 Wildlife

Possible impacts on wildlife would be addressed through revegetation as described in Section 9.4.3.1.

9.4.3.3 Protected Species

Mitigation of impacts on the dotted blazing star would be done through formal consultation with the WisDNR under the Wisconsin Endangered Species Act. Formal consultation would entail developing a plan to avoid and minimize impacts on the plants to the extent possible, and may include authorization for an incidental take of some plants. Conditions of an incidental take authorization would likely include seed harvesting and/or translocation of the affected plants to another, more protected location.

9.4.3.4 Terrain and Climate

Because impacts on terrain in the Wisconsin upland area would be minimal, no mitigation would be required. Mitigation for secondary impacts on terrain (e.g., drainage) is addressed elsewhere in this SDEIS. Because no impacts on climate would occur from either the Build Alternatives or the No-Build Alternative, no mitigation would be needed.