

Scoping and Coordination



DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
231 SOUTH LA SALLE STREET, SUITE 1500
CHICAGO IL 60604

October 30, 2020

Planning Branch
Planning, Programs and Project Management

Ms. Deb Bartell
Manager
Federal Aviation Administration
Chicago Airports District Office
2300 E Devon
Des Plaines IL 60018

Ms. Deb Bartell:

The U.S Army Corps of Engineers, Chicago District (USACE) will be preparing a National Environmental Policy Act (NEPA) document on the effects associated with restoring stream habitat for fish and wildlife on the Root River in Racine, Wisconsin.

The study area is the immediate vicinity of the Horlick's Dam on the Root River in Racine, Wisconsin. The Root River drainage area upstream of the dam is approximately 198 sq. miles, encompassing portions of Waukesha, Milwaukee, Kenosha and Racine counties (Enclosure 1). The Horlick's Dam specifically resides on the Root River 5.3 miles upstream of Lake Michigan. The impoundment resides on the north side of Northwestern Ave between Old Mill drive to the west and Green Bay Rd to the east. The current project area consists of the stream channel and impoundment as depicted in Enclosure 2. A circle search indicates that the project area falls within 1 mile of the Batten International Airport.

The Racine County Public Works is working with USACE, in partnership with the Wisconsin Department of Natural Resources and Southeastern Wisconsin Planning Commission to reestablish natural stream hydrology and hydraulics, flowing stream habitat, substrate transport and sorting, and riverine organism passage via the removal of the Horlick's Dam.

As part of the NEPA scoping process, the USACE would appreciate any comments or concerns you might have about any potential effects, positive or negative, from this proposed project. These could include impacts to various habitats, threatened and endangered species, or cultural and social resources. The Chicago District specifically requests that FAA provides their guidance for coordination, effects assessment and monitoring requirements for habitat restoration in such close proximity to the Batten International Airport. After receiving the scoping input and conducting an effects assessment, the USACE will release a draft NEPA document for a formal public review as part of the feasibility study. Enclosure 3 is a list of State and Federal Agencies, Tribal Nations and general public receiving this request.

Due to the ongoing concerns regarding COVID-19, USACE is asking that comments/questions be submitted electronically by November 30, 2020 to Mr. Frank Veraldi, U.S. Army Corps of Engineers, at Frank.M.Veraldi@usace.army.mil.

Sincerely,

A handwritten signature in black ink that reads "Susanne J. Davis". The signature is written in a cursive, flowing style.

Susanne J. Davis, P.E.
Chief, Planning Branch

Enclosures

1. Root River Watershed
2. Horlick's Dam Project Area
3. Distribution List



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Susanne J. Davis

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Chief, Planning Branch

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October 30, 2020

Planning Branch
Planning, Programs and Project Management

Ms. Shauna Marquardt
Deputy Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services Field Office
4101 American Boulevard East
Bloomington MN 55425

Ms. Shauna Marquardt:

The U.S Army Corps of Engineers, Chicago District (USACE) will be preparing a National Environmental Policy Act (NEPA) document on the effects associated with restoring stream habitat for fish and wildlife on the Root River in Racine, Wisconsin.

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Sincerely,

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Susanne J. Davis, P.E.
Chief, Planning Branch

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October 30, 2020

Planning Branch
Planning, Programs and Project Management

Ms. Sarah Quamme
Field Supervisor
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Ecological Services Field Office
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Ms. Sarah Quamme:

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Sincerely,

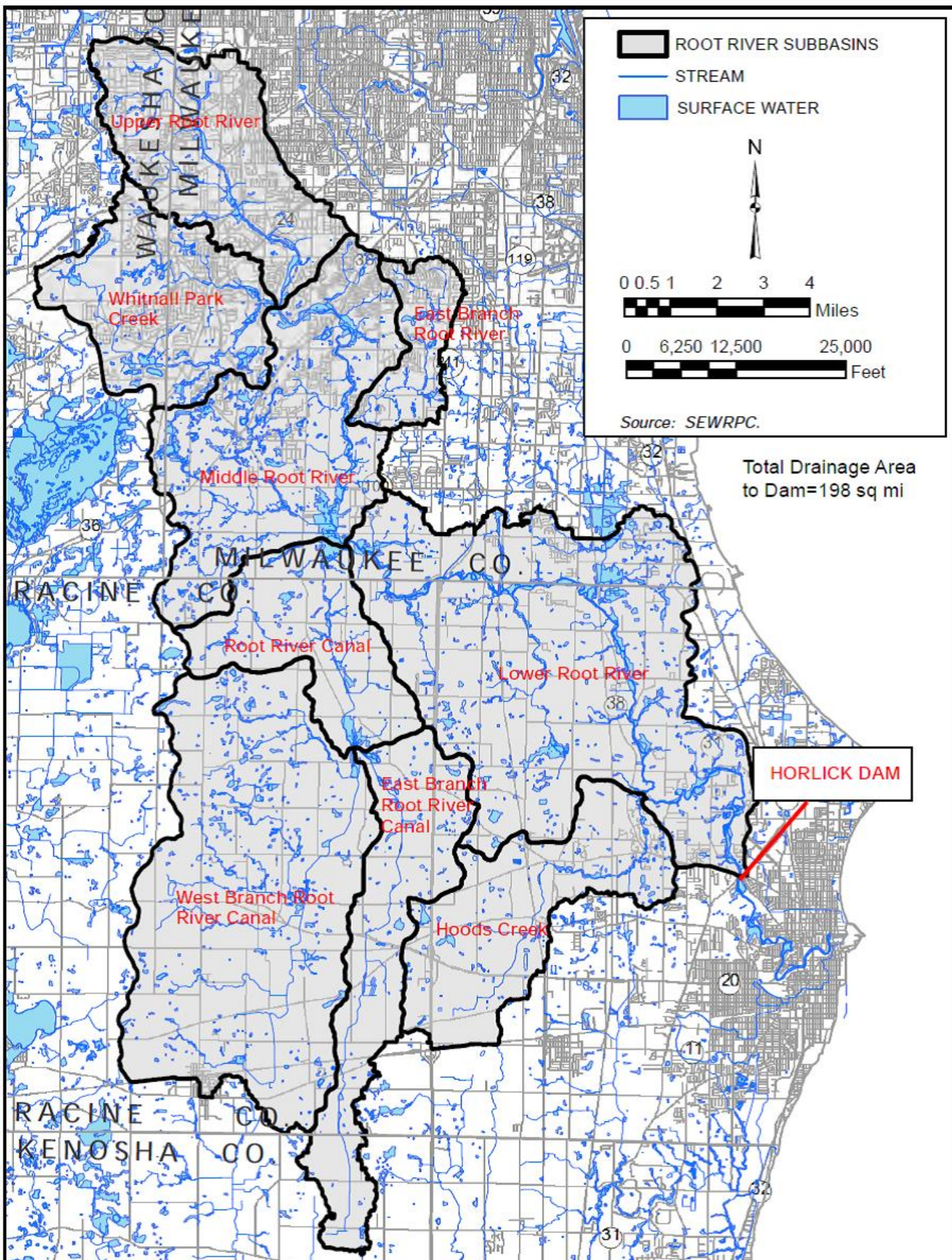
Susanne J. Davis

Susanne J. Davis, P.E.
Chief, Planning Branch

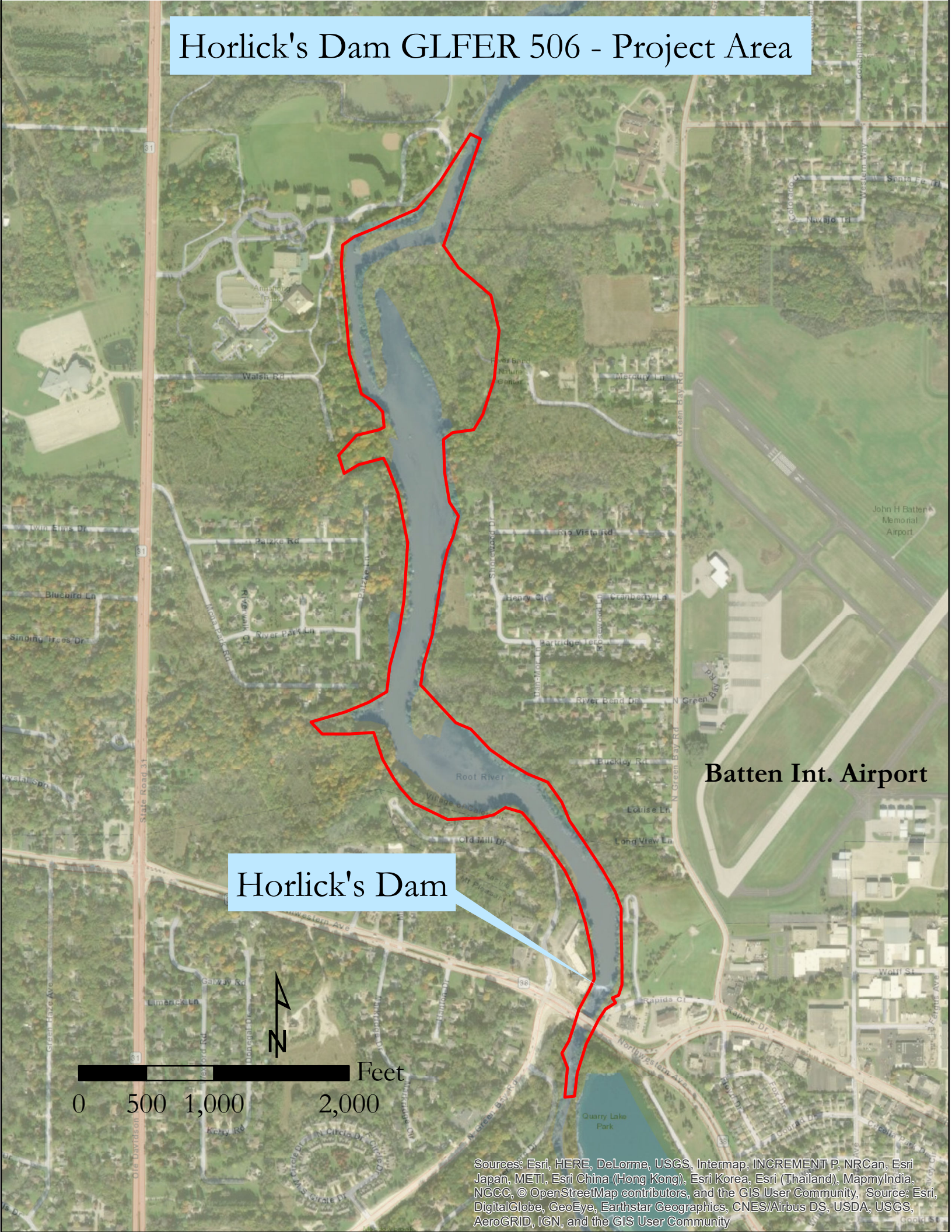
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THE ROOT RIVER WATERSHED UPSTREAM FROM HORLICK DAM



Horlick's Dam GLFER 506 - Project Area



Horlick's Dam

Batten Int. Airport



Feet

0 500 1,000 2,000

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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231 SOUTH LA SALLE STREET, SUITE 1500
CHICAGO IL 60604

November 15, 2021

CELRC-PDL-E

Ms. Daina Penkiunas
State Historic Preservation Officer Wisconsin Historical Society
816 State Street
Madison, WI 53706

SUBJECT: Horlick Dam Root River Restoration Project, Racine County, Wisconsin

Dear Ms. Penkiunas:

The U.S. Army Corps of Engineers (Corps) proposes to restore riverine habitat and connectivity for fishes, mussels, and wildlife along a stretch of the Root River (undertaking) in Racine County, Wisconsin (Figure 1). As part of our review under Section 106 of the National Historic Preservation Act, the Corps has determined that the proposed federal action is an undertaking that has the potential to affect historic properties. This letter provides a brief project description, documents the area of potential effect (APE), summarizes the efforts to identify historic properties, and provides agency findings as provided at 36 C.F.R. § 800.4. The letter requests agreement with the Corps' finding that there will be no historic properties affected by the proposed undertaking.

The Racine County Public Works requested that the Corps Chicago District initiate a study under the Great Lakes Fishery & Ecosystem Restoration Section 506 of WRDA 2000 (as amended) to ascertain the feasibility of restoring important riverine habitat and connectivity for fishes, mussels and wildlife along a stretch of the Root River. The purpose of the proposed project is to restore riverine habitat and connectivity to a stretch of river chronically impacted by the presence of the Horlick Dam. Generally, the need for the proposed project is driven by the presence of an impoundment that has changed riverine habitat (lotic) to lake-like (lentic) conditions, induced abnormal hydrogeomorphic settings, fragmented the river system, degraded substrate transport and sorting above and below the dam, and has degraded water quality within the study reach. These adverse habitat, connectivity, and water quality conditions reduce both abundance and species richness (i.e., number of different species) of riverine specific species.

The Horlick Dam is classified as a Low Hazard Dam with a hydraulic height of 17 feet and a structural height of 19 feet. The upstream impoundment surface area is approximately 60 acres. In addition to the concrete dam, there is a 119.5-foot concrete spillway on the east bank. The stop log section is 6.7 feet wide and is approximately 36 feet from the west side of the main spillway. The main spillway has one horizontal bend, approximately 59 feet from the east side of the dam. The current dam was constructed in 1975 to replace the deteriorating Horlick Dam. The original dam was constructed in 1834

and operated as a sawmill until 1870. The dam was rebuilt in 1873 and in 1885 with a fish-way and was operated as a grist mill until 1940. After 1940, the dam was used to maintain the upstream impoundment for recreational purposes. The current Horlick Dam was rebuilt in 1975, downstream of the former structure. The proposed ecosystem restoration plan includes the following elements:

- Demolition and removal of the Horlick Dam to the natural bedrock elevation
- An incremental removal of the Horlick Dam to ensure that restored sediment transport does not exceed the average annual sediment budget for a stream and watershed of this size and type
- Appropriate recycling and disposal of all man-made materials generated from the dam demolition and removal
- Use of machinery and equipment specifically designed and environmentally safe for aquatic work
- Sowing of temporary native cover crops on exposed banks, new upland soils or fine sediment bars that become exposed during the incremental dewatering and removal process
- A three-year construction period to support staged removal, monitoring and adaptive management
- A three-year post construction monitoring period to determine success and future sustainability

The undertaking is located in Sections 3, 30, and 31 of Township 4 North, Range 23 East and Section 6 of Township 3 North, Range 23 East near the City of Racine, Racine County, Wisconsin (Figure 2). The Area of Potential Effect (APE) for the undertaking encompasses the project area, including staging and access routes, and totals approximately 227 acres. The Corps believes that the APE is sufficient to identify and consider potential effects of the proposed project.

We would like to summarize efforts taken to date to identify cultural resources within the APE. An archival review was completed for the project APE on the Wisconsin Historic Preservation Database (WHPD) and the National Register of Historic Places (NRHP). There are no previously known archaeological sites or historic properties located within the project APE. The Corps is making a good faith effort to gather information from affected Tribes identified pursuant to 36 C.F.R. § 800.3(f). We have notified the Citizen Potawatomi of Oklahoma, the Forest County Potawatomi Community of Wisconsin, the Fort Belknap Indian Community of the Belknap Reservation of Montana, the Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin, the Little Traverse Bay Bands of Odawa Indians of Michigan, the Menominee Indian Tribe of Wisconsin, the Miami Tribe of Oklahoma, the Ottawa Tribe of Oklahoma, and the Prairie Band Potawatomi Nation to assist in identifying properties which may be of religious and cultural significance. The Tribes did not comment on the undertaking.

The Corps has made a reasonable and good faith effort to identify historic properties that may be affected by this undertaking. The current Horlick Dam was built in 1975 and does not meet the age or significance threshold to be considered eligible for the NRHP. Due to archival research and riverine disturbance in the project footprint, the Corps has determined that there would be no historic properties affected by the proposed undertaking.

The Corps requests your review and agreement with our finding of No Historic Properties Affected. If you have any questions or desire additional information, please contact the project Archaeologist, Ms. Ashley Dailide, at ashley.m.dailide@usace.army.mil or (312) 846-5581. I may be contacted at susanne.j.davis@usace.army.mil or (312) 846-5580.

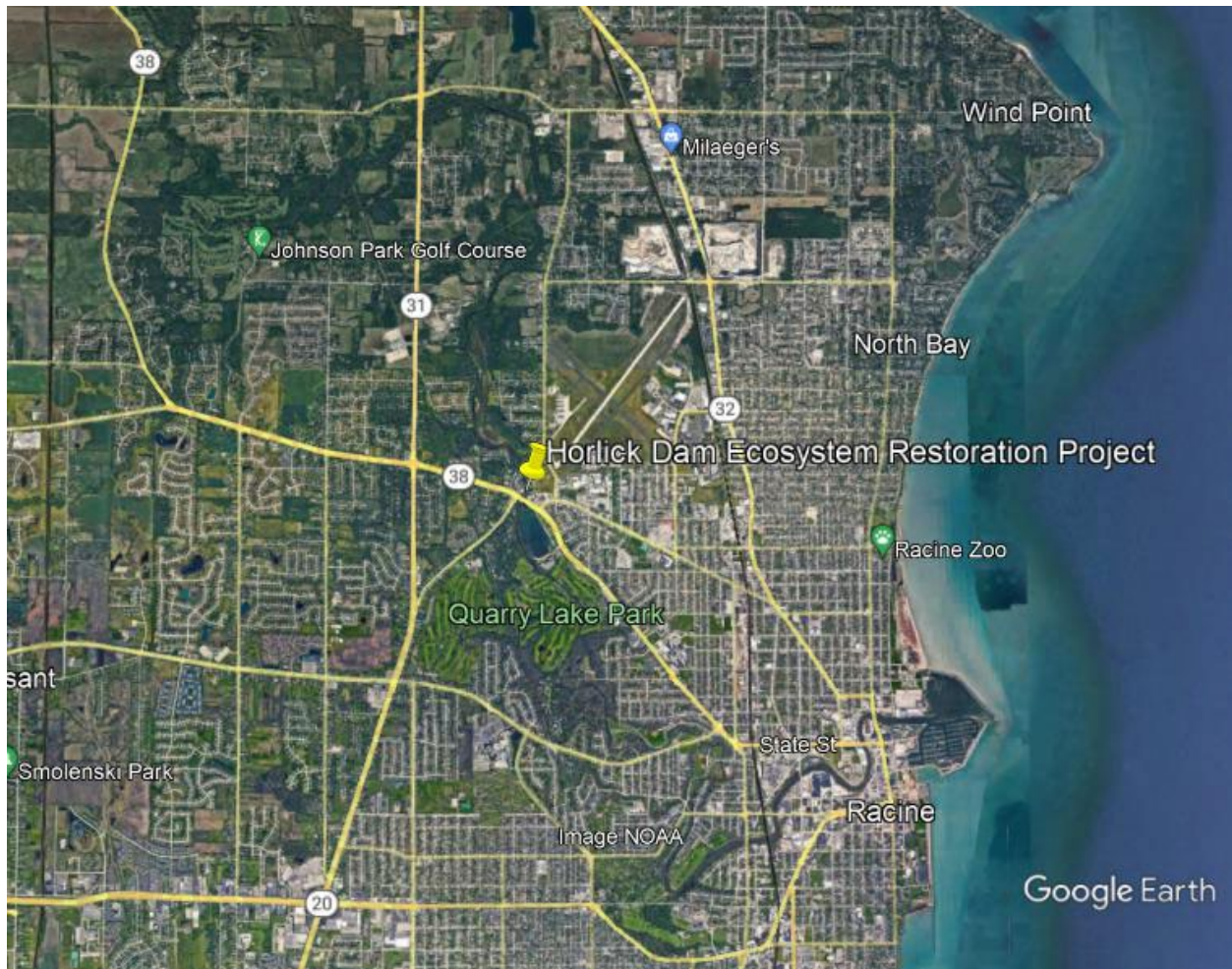
Sincerely,

A handwritten signature in black ink that reads "Susanne J. Davis". The signature is written in a cursive, flowing style.

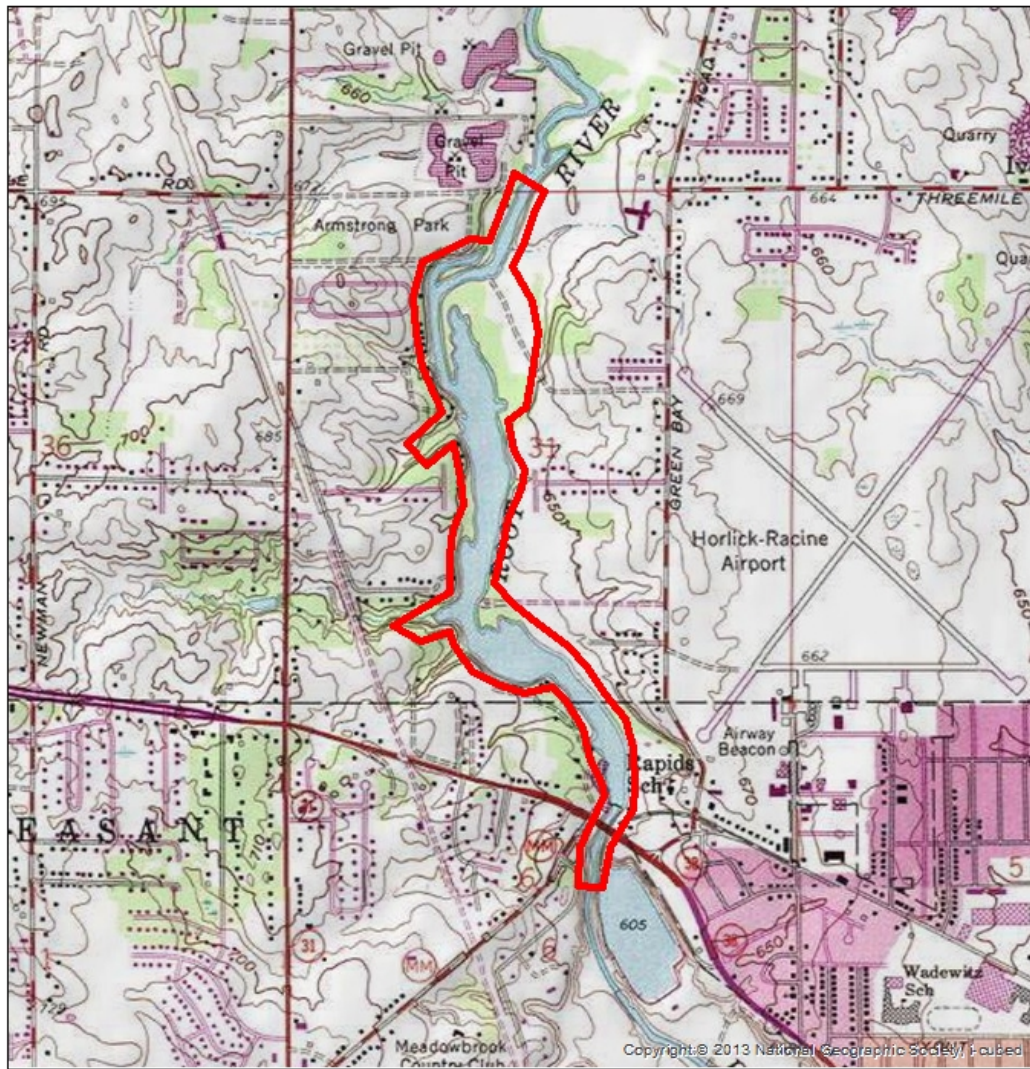
Susanne J. Davis, P.E.
Chief, Planning Branch
Chicago District

Enclosure

Figure 1: Project Vicinity Map



Horlick Dam Root River Restoration Project APE



0 0.25 0.5 1 1.5 2 Miles

Legend



Horlick Dam Root River APE



Distribution List for Horlick's Dam GLFER – October 2020

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Distribution List for Horlick's Dam GLFER – October 2020

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Distribution List for Horlick's Dam GLFER – October 2020

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Distribution List for Horlick's Dam GLFER – October 2020

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Distribution List for Horlick's Dam GLFER – October 2020

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From: [Peloso, Elizabeth](#)
To: [Veraldi, Frank M CIV \(USA\)](#)
Cc: [Cara.Pratt@cityofracine.org](#); [Barnes, Edlynzia](#); [Sarah Quamme \(Sarah_quamme@fws.gov\)](#); [Jim Killian \(James.Killian@wisconsin.gov\)](#)
Subject: [Non-DoD Source] EPA NEPA scoping comments - Horlick Dam Removal and Habitat Restoration, Racine Co WI
Date: Tuesday, November 24, 2020 9:01:11 AM
Attachments: [image001.png](#)
[2020-11-23 Horlicks Dam Removal and Habitat Restoration - EPA scoping comments.pdf](#)

Hi Frank!

Attached to this email are EPA's comments concerning the scoping request for the proposed Horlick Dam Removal and Habitat Restoration project in Racine County, WI.

EPA no longer sends hard copies of NEPA correspondence via US Mail so this is the only copy you'll receive.

Please do not hesitate to contact me if you have questions or comments regarding our letter. We appreciate the opportunity to be involved in the NEPA process!

Regards,
Liz Peloso

Liz Peloso, PWS

Wetland/Environmental Scientist
NEPA Team - Tribal and Multimedia Programs Office
U.S. Environmental Protection Agency - Region 5
Office of the Regional Administrator
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

November 23, 2020

REPLY TO THE ATTENTION OF:
Mail Code RM-19J

VIA ELECTRONIC MAIL ONLY

Frank Veraldi
U.S. Army Corps of Engineers – Chicago District
231 S. LaSalle St, Ste. 1500
Chicago, Illinois 60604

RE: EPA scoping comments – Horlick Dam Removal and Habitat Restoration; City of Racine and Village of Caledonia, Racine County, Wisconsin

Dear Mr. Veraldi:

The U.S. Environmental Protection Agency has reviewed U.S. Army Corps of Engineers' (USACE) correspondence dated October 30, 2020, requesting scoping comments on the proposed Horlick Dam Removal and Habitat Restoration in Racine County, Wisconsin. Racine County is the owner of the dam. This letter provides our comments on the proposal, pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

The proposed project site is located in the vicinity of the Horlick Dam, which is located on the Root River, approximately 5.3 miles upstream of Lake Michigan. The dam blocks fish passage to 160.2 miles of upstream river and tributary habitat. Horlick Dam was originally constructed in 1835 and has been reconstructed four times since then. It currently does not meet state safety standards and must be brought into compliance with a Wisconsin Department of Natural Resources (WDNR) order that requires that the dam be removed or repaired by 2024.

The scoping document stated that the Racine County Public Works department is working with USACE, in partnership with the WDNR and the Southeastern Wisconsin Regional Planning Commission (SEWRPC), to reestablish natural stream hydrology and hydraulics, flowing stream habitat, substrate transport and sorting, and riverine organism passage via the removal of the Horlick Dam.

Based on the limited information provided, EPA offers the following comments for consideration when preparing the EA for the proposed project.

PURPOSE AND NEED / PROJECT ALTERNATIVES

EPA recommends that the forthcoming EA identify and substantiate the purpose and need for the proposed project as well as the preferred alternative. The project purpose and the project need statements for the proposed action should be clear and concise for reviewers of the EA. After underlying problems have been identified and substantiated, the alternatives identified to solve the underlying problems should then be identified and explained. The no-action alternative and all action alternatives that would satisfy the substantiated purpose and need should be fully assessed in the EA. The EA should identify any alternatives considered but dismissed from further consideration (if applicable) and should provide elimination criteria and clear explanations for their early elimination.

PROJECT DESIGN:

- The scoping document states that the dam is proposed to be removed. Prior public news stories on the project in recent years listed at least 4 repair options that could be undertaken in lieu of removal. The EA should discuss prior alternatives and justify the decision why repairs were dismissed, and removal was recommended.
- EPA recommends that the forthcoming EA discuss the following:
 - The EA should document how long the current dam has been in place, information on location and type of prior (legacy) dams, the type of existing dam and its current condition, and the material of which it is constructed.
 - Project design may include full or partial removal of impounded materials. If the project site will require dredging, the analyses should discuss USACE's plan for disposal of any contaminated or uncontaminated sediments. Sediment analyses should be undertaken, and the EA should discuss whether sediment behind the dam is suitable for beneficial re-use (i.e., land application, brownfield restoration, upland fill, landfill cover, habitat construction, etc.). Information on the placement locations for all dredged sediment should be included in the EA.
 - Mitigation of deleterious impacts resulting from the remobilization of previously-impounded sediments may be required. Potential remedial measures may include full or partial removal of impounded materials, staged removal of a dam to control sediment remobilization, and/or stabilizing sediment exposed through dam removal. Based on sediment testing, EPA assumes that sediment analyses will inform how USACE plans to deal with contaminated sediment (if present at the project site), in addition to removal of inert sediment.
 - The EA should include a discussion of sediment dispersion or removal. EPA generally does not support flushing of dam sediments downstream. Depending on the volume and composition of the sediment, spatially-uniform remobilization of sediment may occur as the river channel gradually reestablishes itself through the formerly impounded upstream area. If the volume of sediment is sufficient, however, removal of the dam may not immediately restore the upstream hydraulic gradient. In this case, remobilization of sediments may occur through head-cutting, with the cut progressing upstream. The period of time required for a head cut to reach equilibrium is determined by several factors including, but not limited to, sediment composition, channel-forming flow events, high-flow events, physical characteristics of the

- channel (e.g., ledge), presence of infrastructure (e.g., pipelines), and whether river channel aggradation has occurred upstream of the impoundment¹.
- The EA should discuss expected effects of dam removal (both positive and negative) on water quality in the Root River.
 - The EA should provide a wetland delineation and robust analysis of wetland impacts associated with all project alternatives. Wetlands appear to be present upstream of the dam within the project study area, along with many tributaries to the river. Project design and the alternatives analysis should incorporate a wetland delineation to ensure wetlands in the project vicinity are located and that wetland impacts are avoided, unavoidable impacts are minimized, and mitigation is provided for unavoidable, minimized impacts (as per the Clean Water Act Section 404(b)(1) guidelines).
 - The EA should discuss the potential for erosion due to project implementation. In particular, the EA should discuss if or how dam removal will increase the possibility of bank scour or in-stream erosion. The EA should also discuss, for each alternative, whether bank erosion control or in-stream grade control measures are proposed or necessary, and if yes, where are they proposed and how were they designed.
 - The EA should provide information pertaining to construction access and how work will be done (i.e., construction staging from the river bank vs. in-river work). If cofferdams or other temporary dewatering measures are proposed, those measures, their impacts, and the lengths of time they will be installed, should be discussed.
 - The EA should describe information on proposed construction sequencing, including the proposed timeline for this project and the specific proposed steps to accomplish the project.
 - The EA should include a discussion of how USACE plans to deal with non-sediment components if the dam and appurtenant structures are removed, including a discussion on where materials from concrete caps and abutments will be disposed.
 - The EA should include a determination as to whether a legacy dam exists and whether the removal of a legacy dam will need to be incorporated into any of the action alternatives that propose removal of the Horlick Dam. When a new dam is constructed in the same or close location to an original dam (as Horlick Dam was reconstructed multiple times), it was historically common to submerge the older dam (or its remnants). A submerged older dam is referred to as a legacy dam. The need for removal of an upstream legacy dam as part of a downstream dam removal project is fairly common in the field of dam removal.

IMPACT ANALYSIS

When analyzing the proposed project and alternatives, USACE must consider actions that result as a direct or indirect consequence - that is, connected, similar, and cumulative actions².

Specifically, this would include indirect impacts to upstream wetlands. These actions should be incorporated into the description of the proposal (and alternatives, if relevant). In determining the scope of the proposed project, as an example, previously-issued U.S. Army Corps of Engineers (USACE) or Section 404 dredge and fill permits under the Clean Water Act and

¹ [http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/25-25\(14\)_FR.pdf](http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/25-25(14)_FR.pdf)

² 40 CFR 1508.25

Federal Energy Regulatory Commission hydroelectric licenses issued for projects within the project footprint could be considered connected actions.³

AIR QUALITY

The forthcoming EA should discuss if Racine County is in non-attainment or maintenance for any of the National Ambient Air Quality Standards (NAAQS). Because of their impact on human health, EPA has emphasized the need to address PM_{2.5} (and diesel emissions) through the National Clean Diesel Campaign⁴, along with regional initiatives.

The forthcoming EA should identify and discuss existing air quality and air quality impacts at the project location, and those potentially associated with future construction and operations at site of the proposed project. The impacts of all action alternatives on air quality should be assessed by evaluating each alternative's impacts on the NAAQS. Each alternative's potential emissions should be discussed and should include both direct and indirect emissions that are reasonably foreseeable. Be aware that there may be state and local air quality requirements to consider. These requirements can include, but are not limited to, provisions such as State indirect source regulations and State air quality standards.

GENERAL CONFORMITY

This project may need to address the General Conformity Rule⁵ requirements. Under the General Conformity Rule, Federal agencies must work with State, Tribal and local governments in a nonattainment or maintenance area to ensure that Federal actions conform to the clean air quality goals as contained in the State Implementation Plan. General Conformity is required for all National Ambient Air Quality Standard nonattainment and maintenance areas unless impacts are considered to be *de minimus*.

CONSTRUCTION IMPACTS

EPA recommends that the forthcoming EA recommend specific measures and best management practices that will be undertaken to minimize construction impacts to air quality, water resources, soil, and other regulated resources. The EA should discuss proposed construction measures, including a discussion of staging areas and their locations, access to the worksite, and a discussion of any proposed in-stream construction.

VEGETATION AND WILDLIFE HABITAT

The forthcoming EA should include information on current vegetation. Should tree removal or clearing be proposed, the EA should disclose the types and numbers (and acreage of shrubby areas or trees) that are proposed to be cleared for construction. The EA should also disclose

³ Connected actions are those that are "closely related" to the proposal and alternatives. Connected actions automatically trigger other actions, they cannot or will not proceed unless other actions have been taken previously or simultaneously, or they are interdependent parts of a larger action and depend on the larger action for their justification.

⁴ <http://epa.gov/diesel/>

⁵ 42 U.S.C. 7506(c), Section 176(c)

whether these clearing areas are located in wetlands or stream as well as potential impacts to Indiana bat and northern long-eared bat, both species listed on the Endangered Species Act. Additionally, EPA recommends that discussion of tree clearing/removal (if located in wetland areas) specify whether trees will be mechanically cleared (bulldozed) or cut at their base (leaving the trunks intact). This differentiation in tree removal is important with regard to regulatory requirements under Sections 404 and 401 of the Clean Water Act.

EPA recommends voluntary mitigation for any tree loss associated with the project. Mitigation might include, but is not limited to, replanting of native tree species adjacent to the river, or assisting local, county, or state agencies with any appropriate ongoing or planned reforestation plans. The EA should document any voluntary mitigation measures to be undertaken to compensate for the loss of trees.

FEDERAL AND STATE ENDANGERED/THREATENED/RARE SPECIES AND CRITICAL HABITAT

The USFWS's website⁶ lists the presence of three Federally-threatened or endangered species in Racine County. While no mussels are on this list, that does not mean that the Root River does not provide an important source of unionid [mussel] diversity present in the region and may provide an important native mussel source population for nearby streams and marshes in the Lake Michigan Watershed. The EA should discuss any coordination efforts USACE has undertaken with the WDNR regarding the potential for impacts to other state-listed species, or if USACE has coordinated with WDNR to determine if state-listed species are present within any areas proposed to be disturbed via project construction. Correspondence with the WDNR regarding required consultation efforts should be included in the forthcoming EA. Additionally, the EA should include information on the requirement for consultation for both Federally- and state-threatened and endangered species, and information on the status and results of those consultation efforts.

HISTORIC, ARCHITECTURAL, ARCHAEOLOGICAL, & CULTURAL RESOURCES

It is assumed that the current dam is older than 50 years old, which would make it eligible for listing on the National Register of Historic Places. The Draft EA should include information on USACE's consultation with the Wisconsin State Historic Preservation Office (SHPO) under Section 106 of the National Historic Preservation Act regarding potential detrimental impacts to the Horlick Dam and/or any other sites within the project's Area of Potential Effect.

WATER QUALITY

- The Root River downstream of Horlick Dam is listed as impaired⁷ (i.e., not meeting water quality standards) on the WDNR Clean Water Act Section 303(d) list of impaired waterbodies. The forthcoming EA should discuss existing water quality issues, the existing impairments, and how the proposed project may affect water quality in the Root River. The EA should discuss how the proposed project fits in with existing river restoration plans, including, but not limited to, the Root River Watershed Restoration Plan (expires 2024).

⁶ <https://www.fws.gov/midwest/endangered/lists/wisc-cty.html>

⁷ <https://dnr.wi.gov/water/impairedDetail.aspx?key=10533>

Additional grants and management projects that should be considered during project design can be found on WDNR's website.⁸

- The Draft EA should discuss protections to be implemented to reduce turbidity during construction. If active in-river turbidity monitoring is proposed or required by resource agencies, information on monitoring to be undertaken should be included. The Draft EA should discuss how USACE proposed to ensure that turbidity does not exceed levels that are protective of fish and microinvertebrates. We recommend that the Draft EA include correspondence or information from the state resource agencies regarding discussions on turbidity monitoring.

SEDIMENT TESTING/DREDGING

The forthcoming EA should include a robust discussion of sediment accumulation upstream of the dam, and include at a minimum, the following information:

- A map/figure outlining the proposed sediment dredging location(s);
- Narrative information on the type and quantity (cubic yards) of material proposed to be dredged, and a proposed dredging schedule;
- Information on prior sediment sampling (if applicable) and results of all prior sampling;
- Specific information on current sediment testing (to include elutriate testing, if deemed necessary); and
- A discussion on where dredged sediments will be permanently disposed.

PERMITS/PLANS

The EA should also include a list of all Federal, state, and local permits that will be required to undertake the proposed actions. If construction plans for the action alternatives are available at the time, please include them with the EA. EPA understands that construction plans may be draft or at less than 100% design.

WETLANDS

EPA recommends that a formal wetland delineation be undertaken to determine the potential for wetlands in all access/staging/clearing areas, and in areas of/adjacent to the river pool upstream that could be affected by dam removal. An action alternative that involves either direct or indirect impacts to wetlands would not be "self-mitigating" per se. Direct impacts to wetlands would be due to the placement of dredged or fill material; indirect wetland impacts are attributed primarily to the loss of wetland hydrology associated with the drop in water level following dam removal. In addition to wetland fill, the loss of (via indirect impacts to) wetlands, is of concern to EPA. Many wetland functions and values will be lost if existing wetlands revert to upland areas. While there the potential for the development of new wetlands in areas currently inundated by the Horlick Dam impoundment, there is substantial uncertainty as to the quality, location, and acreage of wetlands that may actually develop post-dam removal.

Forthcoming NEPA documentation should include specific narrative information on proposed mitigation for direct wetland impacts. Additionally, EPA recommends that USACE continue to

⁸ <https://dnr.wi.gov/water/waterDetail.aspx?key=10533>

work with WDNR to develop an acceptable mitigation plan to compensate for both direct and indirect wetland impacts that may occur with project implementation. Details on mitigation for indirect wetland impacts (including mitigation ratios, mitigation type, mitigation location(s), etc.), should be included in the EA.

EPA encourages additional coordination between USACE and the state resource agencies to ensure that project implementation does not result in a net loss of wetland. The Draft EA should discuss how USACE is in compliance with Executive Order 11990 (Protection of Wetlands).

The Draft EA should discuss the effects the proposed project will have on lowering the pool elevation behind the dam, including the likelihood of instability over a period of many years as the river adjusts to a new, stable channel. In the interim period, the channel may headcut, which may induce incision, wasting of banks, and channel widening. Channel instability may also contribute to erosion of the many acres of exposed sediments upstream post-dam-removal. The Draft EA should include additional information on fluvial geomorphology changes expected or possible in the new channel as it forms post-dam removal, and the potential for these fluvial processes to affect the proposed restoration efforts.

MEASURES OF SUCCESS:

The EA should discuss the potential for restoration activities along the affected river stretches if the dam and its appurtenant structures are removed. EPA recommends development of an Adaptive Management Plan (AMP) with a description of actions to be undertaken if it is determined that restoration is unsuccessful based on the measures of success selected. We recommend the AMP include action triggers based on monitoring. This should be included as an appendix to the EA.

MONITORING/MAINTENANCE:

The EA should discuss duration of monitoring and rationale for selecting that time period. Key features of the monitoring plan should also be included (e.g., vegetation density, invasive species, observed wildlife, wildlife habitat, etc.). Monitoring plans should also discuss the intervals at which (after construction and restoration activities are complete) project performance will be measured. Monitoring plans should clearly state which entity(s) (e.g., USACE, state resource agency, local government, non-governmental organization) will be responsible for monitoring and maintenance activities, and if an entity other than USACE will be responsible for monitoring and maintenance activities, how USACE will ensure project standards are met.

CORRESPONDENCE

For all environmental impact categories requiring coordination with other Federal or state agencies, EPA recommends that you provide copies of both your letters to those agencies, as well as the responses from those agencies, in the EA. Please include a complete copy of the wetland delineation/determination and state regulatory correspondence with the forthcoming EA.

Thank you for the opportunity to provide scoping comments on this project. Please send us a copy of the Draft Environmental Assessment once issued. If you have any questions about this letter, please contact the lead NEPA reviewer, Ms. Liz Pelloso, PWS, at 312-886-7425 or via email at pelloso.elizabeth@epa.gov.

Sincerely,

KENNETH WESTLAKE Digitally signed by
KENNETH WESTLAKE
Date: 2020.11.23
16:27:49 -06'00'

Kenneth A. Westlake, Deputy Director
Tribal and Multimedia Programs Office

cc (via email):

Cara Pratt, City of Racine, WI (Cara.Pratt@cityofracine.org)

Lynzi Barnes, USEPA-Great Lakes National Program Office (barnes.edlynzia@epa.gov)

Sarah Quamme, USFWS (sarah_quamme@fws.gov)

Jim Killian, Wisconsin DNR (James.Killian@wisconsin.gov)

From: [Ron Wesley](#)
To: [Veraldi, Frank M CIV \(USA\)](#)
Subject: [Non-DoD Source] Horlick Dam Racine WI
Date: Friday, November 27, 2020 9:17:36 AM

Hello Frank,

We (Salmon Unlimited of WI) have a few concerns with the modifications/removal of the Horlick Dam in Racine, WI. First and foremost, we have concerns there will be problems controlling water levels within the complete river system. This dam keeps water in the river above the dam during the dry time(most of the year) and also helps to protect all of the downstream property during the fast/high water times of the year. Removal of the dam would likely ruin the Root River Steelhead Facility during flood seasons. That facility has been instrumental in the egg collection for salmon and trout for the entire state. It is one of the two egg collection sites in the state of WI, the other being Strawberry Creek. Strawberry Creek has had flooding issues and was unable to be utilized if you look at historical collection numbers. The next thought is removal of the dam or adding a fish ladder in that location would allow the invasive round goby to decimate more of the river. I appreciate the opportunity to weigh in on the decisions that may determine the future of our valuable resource, Root River.

--

Ron Wesley
President
Salmon Unlimited of Wisconsin

414 852 1825



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Marquette Biological Station
1095 Cornerstone Drive
Marquette, Michigan 49855



IN REPLY REFER TO:
FWS/R3/MBS/BAR

November 30, 2021

Ms. Samantha Belcik
Chicago District
U.S. Army Corps of Engineers
231 South LaSalle Street, Suite 1500
Chicago, Illinois 60604

Dear Ms. Belcik:

Attached are the results of sea lamprey production potential surveys conducted by the U.S. Fish and Wildlife Service on the Root River, WI upstream of Horlick Dam during 2021.

In brief, no larval lamprey were discovered in our sampling, therefore, we were unable to estimate the amount of sea lamprey that could be produced should Horlick Dam be removed. Our sampling found quality larval lamprey habitat is available for sea lamprey production; however, the absence of native lamprey in our surveys suggests that risk of sea lamprey recruitment is relatively low for this system. The lack of native lamprey populations in the Root River may be influenced by environmental factors limiting lamprey survival in the system.

While the risk of sea lamprey infestation above Horlick Dam is low, the Sea Lamprey Control Program (Program) would like to pursue designs for an alternative barrier to block sea lamprey should infestation occur once Horlick Dam is removed. The Wisconsin Department of Natural Resources (DNR) and the Program should consider investigating modifications to the DNR Root River Steelhead Facility to ensure that it can be operated as a seasonal sea lamprey barrier if the need arises. Additionally, sea lamprey surveys must continue above the site in order to quickly document recruitment. If sea lamprey are documented in the stream after the removal of Horlick Dam, lampricide treatments may need to occur to limit sea lamprey predation on Lake Michigan fishes.

We appreciate the opportunity to provide this information and the perspective of the Program for this project. If you have any questions or would like to discuss further, please do not hesitate to contact me at 906/226-1218 or kevin_mann@fws.gov.

Sincerely,

Kevin Mann

Kevin Mann
Barrier Biologist, Sea Lamprey Control Program

Enclosure (1)

Sea Lamprey Production Potential Study – 2021

Root River above Horlick Dam, Lake Michigan



**U.S. Fish and Wildlife Service
Sea Lamprey Control
Marquette Biological Station
1095 Cornerstone Drive
Marquette, MI 49855**

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I. Introduction

The Great Lakes Fishery & Ecosystem Restoration (GLFER) Committee and the US Army Corp of Engineers (USACE) have identified the Root River and Horlick Dam removal as a priority project to improve fish passage and habitat restoration. The removal of Horlick Dam has been determined worthy of federal pursuit, and will move forward with feasibility and engineer studies (USACE 2020). Based on the positive Federal Interest Determination for dam removal, the Sea Lamprey Control Program (Program) has identified the Root River and its tributaries (above Horlick Dam) as a primary candidate for a sea lamprey production potential study. The Program uses multiple control methods to reduce sea lamprey populations in the Great Lakes tributaries including barriers and dams that block adult sea lamprey from spawning and larval habitat. The purpose of this study is to define the nature of the native lamprey populations in the watershed above a sea lamprey barrier with intentions of providing a surrogate for estimating sea lamprey production potential. The objectives for sampling the Root River and its tributaries are:

1. Assess blocking potential of barriers located upstream of Horlick Dam (if present).
2. Determine the extent of native lamprey distribution.
3. Estimate the potential population upstream of Horlick Dam.

Barriers prevent sea lamprey from reaching spawning habitat and can significantly reduce the number of stream miles that require treatment. The benefits associated with barriers include savings on lampricide and application costs. Additionally, barriers serve as important structures for controlling sea lamprey populations by restricting their production to areas downstream. Barriers reduce stream connectivity for fish passage, but often eliminate the need for lampricide treatment upstream, reducing chemical exposure in the upstream biological community. Barriers vary widely in their purpose, design, seasonal operation, and blocking potential. Some barriers have fish passage integrated into their design (e.g., fish ladders) to allow passage of species other than sea lamprey. Sea lamprey surveys occur above a barrier to determine if it's still a blocking structure.

Larval sea and native lamprey distribution, as well as habitat surveys were conducted downstream and upstream of Horlick Dam in April 2014. No lamprey species were found in the watershed, although a significant amount of suitable larval habitat was identified upstream of Horlick Dam along with some sections containing adult spawning habitat. Further electrofishing quantitative assessment surveys (QAS) were conducted throughout the system upstream of Horlick dam in July 2021. No lamprey were found during these surveys. Sea lamprey have been found in Burns Ditch in Indiana (approximately 80 miles south of Racine, WI) until a sea lamprey barrier was installed in 1997, suggesting that the Root River watershed is not outside of the potential historical range for sea lamprey.

Horlick Dam is located 20 miles south of Milwaukee, WI and 5.3 river miles upstream of Racine, WI, where the Root River drains into Lake Michigan. Horlick Dam serves as a lowermost barrier for sea lamprey, preventing their potential infestation of approximately 97 river miles of the Root River drainage basin upstream of the dam. Rebuilt in 1975, Horlick Dam has a 12' hydraulic height which currently does not contain a fish passage structure.

If Horlick Dam is removed, the Wisconsin Department of Natural Resources Root River Steelhead Facility could act as a seasonal sea lamprey barrier if modified and operated appropriately. The facility is located

two miles downstream of Horlick Dam and contains an instream weir and fish ladder. This weir and ladder system is operated seasonally using stop logs and barrier grates that could act as a barrier to adult sea lamprey migration.

The Root River has never been treated with lampricide by the Program. The absence of sea and native lamprey in the Root River limits our ability to estimate sea lamprey production. However, given the size and the moderately dendritic nature of the watershed, estimated treatment costs (including chemical and staff costs) would be approximately \$318,000 per treatment.

II. Methods – Larval Assessment

a) Reach Selection

Biological reaches are typically undefined for production potential estimates, geographical reaches are identified (Table 1) prior to field surveys. For the Root River, reaches are geographically established (Figure 1) using barrier locations, tributaries, or groups of tributaries. Based on the examination of the variance of larval densities measured during these surveys, biological reaches are necessary to complete work in subsequent years and to keep surveys standardized.

Table 1: Survey reaches found above Horlick Dam on the Root River and its tributaries.

Reach	Reach #	Tributaries
Horlick Dam to Jct. Root River Canal	3	-
Above Jct. Root River Canal	4	Tess Corners Creek
Hoods Creek	5	-
Root River Canal	6	East Branch Root River Canal, West Branch Root River Canal

b) Habitat Classification

Larval habitat is classified into three categories of Type I, II, or III. Habitat is measured along transects at all access sites surveyed during sampling. In addition, the collective width of spawning habitat is measured along each transect regardless of habitat type. Habitat measurements begin from the left bank of the stream (facing upstream) and continues across the stream along transects. A metric tape or electronic laser measuring device measures each segment of habitat. When habitat changes are greater than 0.1 m, stream width, average depth, and habitat type are recorded. The average depth of a segment less than 1 m long is measured as the average of the beginning and ending depths of the segment (two measurements). Average depth of segments greater than 1 m long is measured as the average of the beginning, mid-point, and ending depths of the segment.

Habitat measurements are valid for 10 years unless a catastrophic event occurs within a stream. Habitat transects will only be described and measured under reliable sampling

conditions. If conditions are reliable, habitat transects should be described and measured even when circumstances preclude density sampling.

- **Type I** consists primarily of silt, with sand and detritus as secondary components. Type I habitat is preferred by larval lamprey with cover provided by woody debris or aquatic macrophytes. Type I substrates are indicative of a depositional hydraulic environment that exists in eddies, inside bends, or behind large permanent or semi-permanent objects.
- **Type II** consists primarily of sand mainly consisting of medium and coarse sands. Compared with Type I, mean values for silt and detritus decline, while those for gravel and rubble rise. Type II habitats are found in transitional environments where velocity ranges from five to ten cm/s. Flows are unimpeded by frictional forces associated with stream banks, bends, or upstream objects. Type II habitat is acceptable, but not preferred larval habitat. Substrate is soft enough for larvae to burrow.
- **Type III** habitat is unacceptable habitat because larvae cannot burrow into it. Substrate is often bedrock or hardpan clay but may include rubble and coarse gravel. Interstices in coarse substrates may contain some Type I or Type II material, but these areas will be dismissed if the length (along transects) is less than the minimum recordable measure (0.1 m).

c) **Site Selection**

Sample sites are determined by random selection of six sites (within a reach) from a list of locations with suitable access spaced a minimum of 800 m apart. Habitat is sampled as it is encountered beginning with the first available habitat up or downstream of the starting point. If the first available habitat encountered is not a 15 m² contiguous area, then sub-plots of a minimum 1 m² will be sampled and summed until 15 m² has been sampled. This process is repeated for Type II plots. Type I plots are sampled first and then Type II plots are completed. In the rare case that an inadequate amount of Type I habitat is available in a given stream, Type II plots will be sampled following the guidelines established for sampling Type I habitat up to the maximum of 20 plots. Anaerobic habitat conditions are not considered high-quality larval lamprey habitat.

d) **Habitat Transects**

Habitat is measured along four transects (2 upstream and 2 downstream of the access site) perpendicular to the bank at each access site selected for density sampling. Transects are spaced dependent on the mean stream width (MSW) of the river. For streams with a MSW less than five meters, transects are spaced at three MSW and for streams with a MSW of five or more meters, transects are spaced at two MSW. MSW is the width of the first transect at each site (if it appears to be representative of stream width at the site). Differential spacing of transects dependent on MSW is required to achieve the target of 95% confidence. The first transect begins 40 m upstream or downstream of any in-stream man made structure that affects stream hydrology. The minimum number of transects sampled on any stream is 24. Special procedures are used when the following conditions are encountered:

- When habitat transects from one density sampling site overlap with transects from another site, fewer transects than 4 are sampled.
- When the reach is less than 9600 m long the 24 transects can be evenly placed throughout the reach.
- When the stream is too deep or turbid to describe habitat visually, the survey is rescheduled, or habitat is described using a probe pipe or sampling device such as an Ekman or Ponar dredge.

e) Larval Density Sampling Plan

Mean density of larval lamprey is estimated in a reach by electrofishing a minimum of 12 plots. If conditions prevent sampling upstream or downstream from an access point, both plots can be obtained in the same direction from the access site, but no two plots should be less than 40 m apart. Parameters for electrofishing (Table 3) are followed for sampling.

Table 2: Standardized settings for backpack electrofishing. These settings are standardized and followed for all sampling. Pulse rates are measured in pulses per second (pps).

SLOW PULSE		FAST PULSE		BURST	VOLT RANGE 100 – 250
RATE	DUTY CYCLE	RATE	DUTY CYCLE		
3 pps	25%	30 pps	25%	3:1	125

A plot consists of 15 m² of Type I habitat. Type I habitat is sampled as it is encountered beginning with the first available habitat up or downstream of the starting point. If the first available habitat encountered is not a 15 m² contiguous area, the sub-plots of a minimum of one m² will be sampled and summed until 15 m² has been sampled. In the rare case that an inadequate amount of Type I habitat is available in a given stream, Type II habitat will be sampled following the guidelines established for sampling Type I habitat. Plots are electrofished at a rate of 90 seconds per one square meter of habitat.

The smallest dimension (length or width) on any plot is 0.3 m. A plot may consist of less than 15 m² of type I habitat when encountering either of the following circumstances:

- When historical survey and treatment data indicate that larval densities are expected to exceed 5/m², the plot size can be reduced to 5 m² or;
- When field personnel have electrofished all Type I habitat within 400 m from the beginning of the site. In this case, the plot is equal to the amount of available Type I habitat (less than 15 m²). If less than one m² of Type I habitat is encountered, the entire plot can be obtained in the opposite direction adjacent to the other plot. If less than one m² of Type I habitat is encountered next to the adjacent plot, the plot is moved to the next sampling access site (new access site not previously chosen).

The main goal is to collect a minimum of 100 lampreys age 1 and older from each reach. Young of year lamprey are counted and measured but are not included with the density calculation. If

100 individuals are not collected, additional randomly selected sites are chosen up to a maximum of 10 total sites (20 plots) for the reach or until 100 larval lampreys are collected.

Additional plots are determined at the discretion of the crew leader based on the number and size structure of larvae collected. If there are low numbers of larvae, the crew leader can decide not to sample additional sites. When additional sites are sampled, sites are randomly selected from a list of all access sites in each reach where lamprey are present.

f) Interpretation and Analysis

Predictions for sea lamprey production potential followed these procedures.

- A gear correction factor of 2.08 multiplied by total native lamprey catches estimates potential populations in each reach. This factor sets electrofishing sampling equipment at 48% efficiency.
- Larval lamprey populations are estimated by multiplying the Type I and Type II habitat area by mean larval density within each infested reach. These estimates combine to generate a total population estimate.
- Adjusted length-frequency distribution estimates uses an average daily growth rate to determine end of season growth for each reach. Average daily growth rates are estimated using the number of days remaining in the growing season after capture. Growing seasons vary depending on geographic location of the stream. End of season dates are previously established for sea lamprey producing tributaries with the substitution of values from adjacent watersheds used when not available for a given stream.
- Probability of transformation curves, developed for both the Upper and Lower Great Lakes, estimate the number of larvae, based on size, that will transform the year following. Transformation curves use a maximum likelihood binary logistical regression model. Model inputs are the numbers and size of larvae and transformers observed in all non-original historical treatment collections from a given geographic region. The appropriate curve applies to the length-frequency distribution of the estimated population in each reach. This results in an estimate of the number of transformers in each reach.
- When quantitative surveys occur in more than one reach of a tributary, individual population estimate calculations are based on the adjusted catch, adjusted density, and total habitat area within each infested reach. Larvae are 'grown' and the estimated number of transformers in each reach are calculated. Respective estimates of larvae and transformers for streams with more than one reach are calculated as the sum of estimates for each reach.

g) Cost Estimate for Treatment

The Sea Lamprey Control Unit compiles data necessary to estimate the total cost associated with the treatment of a stream using staff effort and lampricide usage. Staff days are recorded for all hours worked while conducting activities associated with stream treatment are reported as staff days. The lampricide 3-trifluoromethyl-4-nitrophenol (TFM) use is recorded in Kg while

TFM bars are recorded as total number of bars used. Formulations of Bayluscide are reported as Kg product. Data on lampricide use are compiled from treatment summaries on the basis of the following:

- If three or more treatments from 1990 to present, use average
- If one 1990 treatment and not typical, use only 1980 data factored by 0.75
- If one 1990 treatment, average with 1980 or 1970 data by 0.75
- If no 1990 treatments use average of 1980 treatments factored by 0.75

Treatment supervisors provide the most accurate estimate possible when no data or insufficient data exist, or when averaging treatments with and without application of Bayluscide formulations. Data from currently treated streams is used to estimate the lampricide treatment cost for rivers with no previous treatments. If available, lampricide costs are estimated using water gauging stations throughout a river system. The labor estimate, measured in staff days, is made by comparing similar-sized streams that are currently treated with a similar drainage area and tributaries. The minimum lethal concentration (mlc) to calculate lampricide usage is taken from similar lake basin streams that are currently treated for sea lampreys.

III. Results

a) **Barrier Inspection Data**

There are no other dams upstream of Horlick Dam on the Root River which would serve as a sea lamprey blocking structure. The Horlick Dam was last inspected by the Program in 2018. The dam appears structurally sound, but the concrete has substantial spalling on the surfaces. There are no metal structures such as gates or valves which could serve as routes of escapement. The dam has a single stop log bay which has leakage between the logs, but given the small diameter of the gaps and the velocity of the exiting water, they shouldn't allow sea lamprey to move through. Overall, the Horlick Dam appears to be a reliable structure to block migrating adult sea lamprey.

b) **Production Potential Estimates**

Using the most recent available data (2021) for production potential estimates, reach specific populations are calculated using Microsoft Excel. Each reach is separated by habitat type and uses the native lamprey catches to estimate sea lamprey populations. Throughout the entire Root River drainage system, preferred habitat is readily available.

No larval sea or native lampreys have been found in the watershed despite the abundance of preferred habitat. Reach four has the most preferred combination of Type I and Type II habitat (365,521 m²) available (Table 4). Reach three has a high combination of Type I and Type II habitat (349,172 m²) (Table 4). Reaches three and four are found on the main stem of the Root River which is the final destination for suspended materials to settle from upstream tributaries. The deposition of sediment in the main stem creates ideal habitat for lamprey. Reach five and six have a high combination of preferred Type I and Type II habitat available (29,441 m² and

243,322 m²). Reduced stream velocities and lower gradients in these reaches provide ideal habitat for lamprey.

c) **Transformers**

Calculations, using Microsoft Excel, estimated the probability of native lamprey metamorphosis into transformers. Length data, total growing days, and the gear corrected factor estimate the metamorphosis probability. With the lack of larval sea and native lamprey captures, transformer metamorphosis data is unavailable (Table 4).

d) **Treatment Cost**

Due to the lack of historical treatments in the Root River drainage, treatment costs were derived using expert opinion based on total stream length and morphology, spring flow, and staff days. Treating the Root River drainage upstream of Horlick Dam would require 1176 kg of TFM, totaling \$65,732 in chemical cost. This treatment would require approximately 180 staff days to complete, totaling around \$252,000 in staff costs. Between chemical and staff costs, the total cost to treat the Root River would be approximately \$318,000. Treatments would occur every three or four years depending on the number of sea lamprey in the system.

Table 3: Root River production potential population estimates after removal of Horlick Dam. No native lamprey were collected in the system. Preferred habitat is readily available in all reaches.

Reach	Observed Catch	Gear Corrected Catch	Type I Habitat (m ²)	Type II Habitat (m ²)	Gear Cor. Larval Population (N)	Probability of Transformation (%)	Est. Transformer Population (N)
3 – Horlick Dam to Jct. Root River Canal	0	0	70,660	278,513	0	0	0
4 – Above Jct. Root River Canal	0	0	154,951	210,571	0	0	0
5 – Hoods Creek	0	0	4,032	25,408	0	0	0
6 – Root River Canal	0	0	13,311	230,011	0	0	0
Total	0	0	226,759	680,897	0	0	0

IV. Discussion

Sea lamprey are a destructive invasive species and cause significant damage to the Great Lakes ecosystem and economy. Sea lamprey population maintenance and control is crucial for protecting a valuable natural resource like the Great Lakes. Dams and barriers are great management tools that prevent lamprey from accessing preferred spawning habitat upstream of these barriers. Should the system become infested, Horlick Dam would prevent sea lamprey from accessing more than 97 miles of habitat for spawning adults and larval sea lamprey.

Habitat throughout all reaches in the Root River is favorable to rearing sea lamprey. The amount of preferred larval habitat available is a high concern for the Program, though the risk of sea lamprey infestation is low. Sea lamprey and native lamprey prefer similar habitats. By using native lamprey populations as a surrogate, we attempted to estimate sea lamprey populations in the Root River and its tributaries. However, with no native lamprey captures in the Root River, despite readily available preferred habitat, we were unable to calculate a sea lamprey population estimate. The lack of native lamprey populations in the Root River may be influenced by other environmental factors which affect their ability to survive in the system.

Horlick Dam is the primary blocking structure on the Root River and the removal could pose an additional threat to the Program. However, a preferred alternative action to protect the Root River from future sea lamprey infestation could be modifications of the Root River Steelhead Facility. These modifications could act as a seasonal blocking structure to migrating adults in search of spawning habitat. This would allow fish passage upstream of the facility during non-sea lamprey spawning periods.

Root River Barrier QAS Survey Sites - 2021

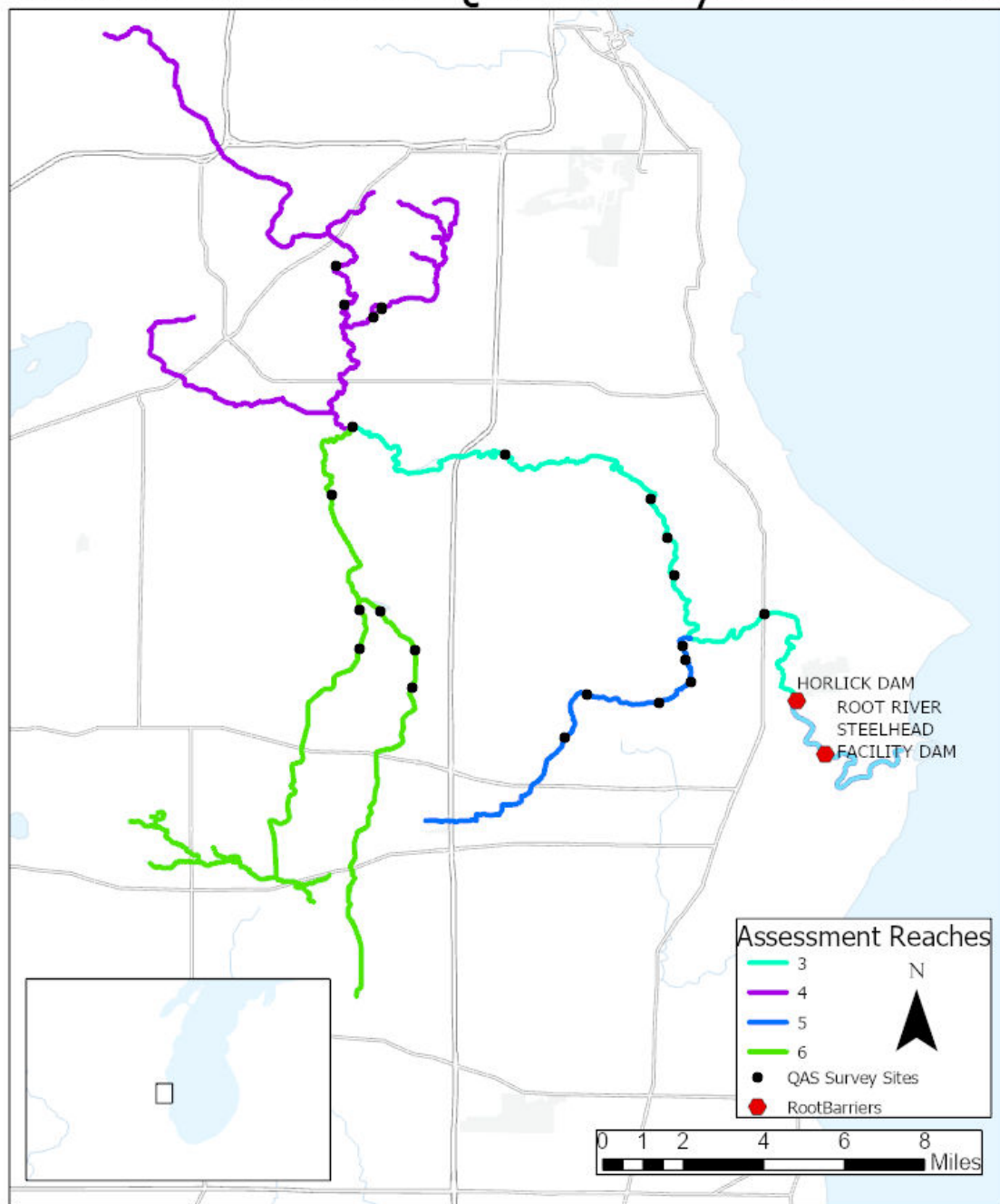


Figure 1: Barrier QAS assessment sites located on the Root River and its tributaries. Barrier QAS reaches display unique sections of river.

V. References

- Administrative Operating Procedure (AOP):014.0. Estimating Treatment Costs LCTF's Standard Operating Procedures Manual.
- Dodd, H., Hayes, D., Baylis, J., Carl, L., Goldstein, J., Mclaughlin, R., Noakes, D., Porto, L., and Jones, M. 2003. Low-head Sea Lamprey Barrier Effects on Stream Habitat and Fish Communities in the Great Lakes Basin. *J. Great Lakes Res.* 29: 386-402.
- Fisheries and Oceans Canada. 2016. Adult Sea Lamprey Assessment Protocol Using Traps in the Great Lakes.
- Larval Assessment Task Force of the Sea Lamprey Control Program. 2018. Larval Assessment Sampling Protocol the AbP-2 Backpack Electrofisher in Great Lakes Streams.
- Lavis, D., Hallett, A., Koon, E., and Mcauley, T. 2003. History of and Advances in Barriers as an Alternative Method to Suppress Sea Lamprey in the Great Lakes. *J. Great Lakes Res.* 29: 362-372.
- Lawrie, A. 1970. The Sea Lamprey in the Great Lakes. *Trans. Amer. Fish. Soc.* Vol 4: 766-775.
- Sea Lamprey Dam Removal/Modification Consultation. 2014.
- Sea Lamprey Production Potential Evaluation Protocol.
- US Army Corps of Engineers. 2020. Horlick's Dam Fish & Habitat Restoration Federal Interest Determination.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793 Fax: (952) 646-2873



In Reply Refer To:
Project Code: 2023-0084008
Project Name: Horlick's Dam Removal

May 19, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Please refer to our [Section 7 website](#) for guidance and technical assistance, including [step-by-step instructions](#) for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A [demonstration video](#) showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect.” In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
 2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain [Life History Information for Listed and Candidate Species](#) on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
-

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats

Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

This species hibernates in caves or mines only during the winter. In Minnesota and Wisconsin, the hibernation season is considered to be November 1 to March 31. During the active season (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:

- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No**

Effect determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the range-wide northern long-eared bat D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/ Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys help to determine if prohibited take might occur and, if not, will generate an automated verification letter.

Please note: On November 30, 2022, the Service published a proposal final rule to reclassify the northern long-eared bat as endangered under the Endangered Species Act. On January 26, 2023, the Service published a 60-day extension for the final reclassification rule in the Federal Register, moving the effective listing date from January 30, 2023, to March 31, 2023. This extension will provide stakeholders and the public time to preview interim guidance and consultation tools before the rule becomes effective. When available, the tools will be available on the Service's northern long-eared bat website (<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>). Once the final rule goes into effect on March 31, 2023, the 4(d) D-key will no longer be available (4(d) rules are not available for federally endangered species) and will be replaced with a new Range-wide NLEB D-key (range-wide d-key). For projects not completed by March 31, 2023, that were previously reviewed under the 4(d) d-key, there may be a need for reinitiation of consultation. For these ongoing projects previously reviewed under the 4(d) d-key that may result in incidental take of the northern long-eared bat, we recommend you review your project using the new range-wide d-key once available. If your project does not comply with the range-wide d-key, it may be eligible for use of the Interim (formal) Consultation framework (framework). The framework is intended to facilitate the transition from the 4(d) rule to typical Section 7 consultation procedures for federally endangered species and will be available only until spring 2024. Again, when available, these tools (new range-wide d-key and framework) will be available on the Service's [northern long-eared bat website](#).

Whooping Crane

Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "[Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States](#)."

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the

mortality of migratory birds whenever possible and we encourage implementation of [recommendations that minimize potential impacts to migratory birds](#). Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed [voluntary guidelines for minimizing impacts](#).

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to [guidelines](#) developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's [Wind Energy Guidelines](#). In addition, please refer to the Service's [Eagle Conservation Plan Guidance](#), which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination

While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.

Minnesota

[Minnesota Department of Natural Resources - Endangered Resources Review Homepage](#)

Email: Review.NHIS@state.mn.us

Wisconsin

[Wisconsin Department of Natural Resources - Endangered Resources Review Homepage](#)

Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
 - USFWS National Wildlife Refuges and Fish Hatcheries
 - Migratory Birds
 - Wetlands
-

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office

3815 American Blvd East

Bloomington, MN 55425-1659

(952) 858-0793

PROJECT SUMMARY

Project Code: 2023-0084008

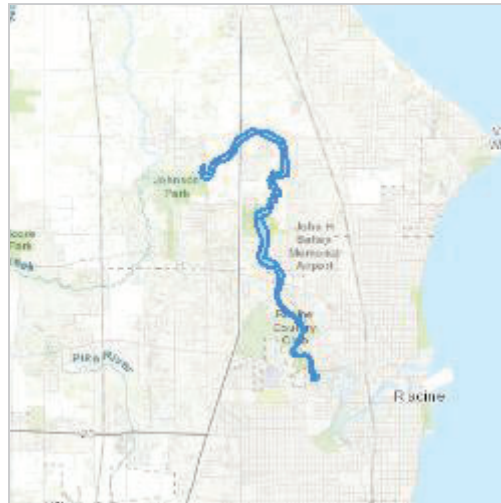
Project Name: Horlick's Dam Removal

Project Type: Dam - Removal

Project Description: The Racine County Public Works (RCPW) requested that the Chicago District, United States Army Corps of Engineers (USACE) initiate a study under the Great Lakes Fishery & Ecosystem Restoration Section 506 of WRDA 2000 (as amended) to ascertain the feasibility of restoring important connectivity and riverine habitat for fishes, mussels and wildlife along a stretch of the Root River. The project involves the removal of the Horlick's Dam at river mile 6 on the Root River in 2022.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.7581912,-87.82957944867955,14z>



Counties: Racine County, Wisconsin

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Red Knot <i>Calidris canutus rufa</i> There is proposed critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate
Rusty Patched Bumble Bee <i>Bombus affinis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9383 General project design guidelines: https://ipac.ecosphere.fws.gov/project/GMLPDAAU5ZBXFANLKDA67E6NAY/documents/generated/5967.pdf	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover <i>Pluvialis dominica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31

NAME	BREEDING SEASON
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Cerulean Warbler <i>Dendroica cerulea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 21 to Jul 20
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Ruddy Turnstone <i>Arenaria interpres morinella</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

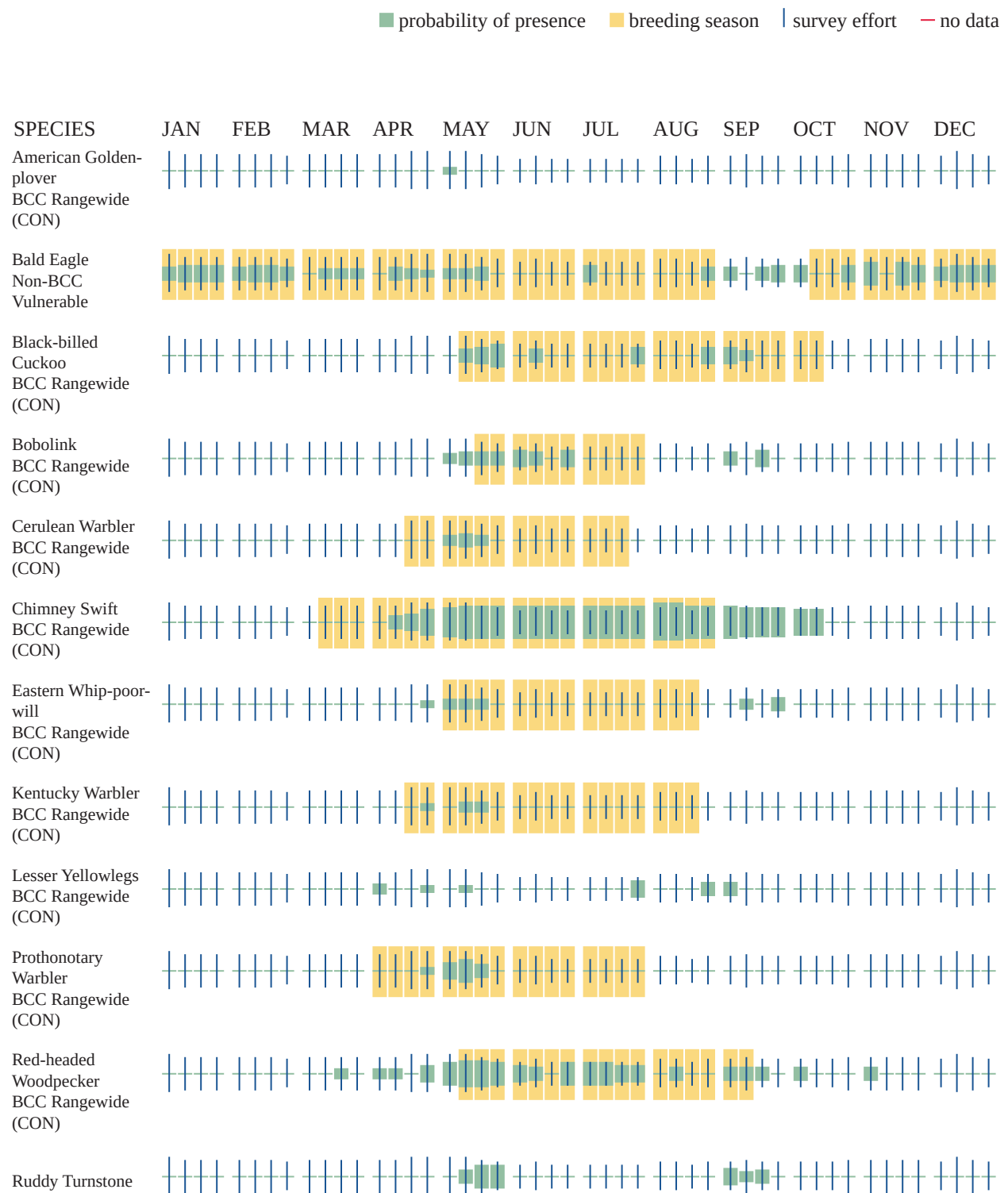
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (—)

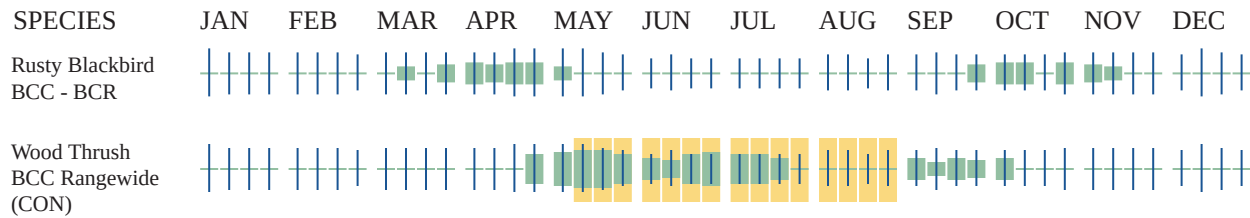
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



BCC - BCR



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list

of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical](#)

[Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- [PSS1C](#)
- [PFO1/EM1C](#)
- [PFO1/SS1C](#)
- [PFO1C](#)
- [PSS1/EM1C](#)

RIVERINE

- [R2UBH](#)
- [R4SBC](#)
- [R5UBH](#)

FRESHWATER POND

- [PUBG](#)
- [PUBHx](#)

FRESHWATER EMERGENT WETLAND

- [PEM1C](#)
-

IPAC USER CONTACT INFORMATION

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, CHICAGO DISTRICT
231 SOUTH LASALLE STREET, SUITE 1500
CHICAGO IL 60604

May 9, 2023

Environmental & Cultural Resources Section
Planning Branch

SUBJECT: Federal Consistency Determination for the Horlick Dam: Root River
Restoration Racine, Wisconsin

Kathleen Angel
Federal Consistency and Coastal Hazards Coordinator
Wisconsin Coastal Management Program
101 E. Wilson Street, 9th Floor
P.O. Box 8944
Madison, WI 53708

Dear Ms. Angel,

The U.S. Army Corps of Engineers, Chicago District (Corps) has prepared a Draft Integrated Feasibility Report and Environmental Assessment on the effects associated with restoring stream habitat for fish and wildlife on the Root River in Racine, Wisconsin as part of the Section 506 Great Lakes Fishery and Ecosystem Restoration authority. Racine County Public Works partnered with the Corps to reestablish natural stream hydrology and hydraulics, flowing stream habitat, substrate transport and sorting, and riverine organism passage on the Root River via the removal of the Horlick Dam. The Corps has evaluated the proposed action and the following provides our determination pursuant to the Coastal Zone Management Act.

PROJECT DESCRIPTION

The project area is within the immediate vicinity of the Horlick Dam on the Root River in Racine, Wisconsin. The Horlick Dam is located on the Root River 5.3 miles upstream of Lake Michigan. The impoundment is on the north side of Northwestern Avenue between Old Mill Drive to the west and Green Bay Road to the east. The current project area consists of the stream channel and impoundment as depicted in Enclosure 1.

The following is a description of general project activities:

- 1) Full dam removal with staged dewatering – Dam removal procedures start with dewatering of the sediment impoundment, creating a shallow notch at the top of the dam to slowly draw the water down, then removing of the stop logs. Once the stop logs are removed, dismantling of the structure can begin.

- a. Passive Sediment Management – A staged drawdown will use the existing stoplogs within the dam to slowly draw down the impoundment levels and allow a new channel to form. It will allow the sediment to be transported downstream at a relatively gradual pace.
- b. Remove the remaining concrete structure – The top portion of the dam will be removed first rather than chipping away at the base. The dam will be removed down to at least 2 feet below the existing channel bed unless bedrock is encountered first. Remnant material from the previous, upstream dam structure will be removed.
- c. The edge of the dam will be left intact on both sides to buttress the existing retaining walls with the option to add riprap if necessary. At least an 80-foot wide opening will be removed to match the anticipated new channel width.

The removal of the Horlick Dam will result in the restoration of natural riverine processes and aquatic habitat in the Root River. The proposed project will also contribute to improving water quality and recreational opportunities in the area.

COASTAL ZONE MANAGEMENT ACT (CZMA) of 1972

Since the proposed work is a federal project, the Corps is required to evaluate whether the activity will affect any coastal use or resource under the CZMA. The proposed habitat restoration activities action would occur within Racine County, an identified county of Wisconsin's coastal zone boundary established under the State of Wisconsin's Coastal Management Program. The proposed habitat restoration does not include the placement of fill or dredged material within Waters of the U.S. The proposed action would have a beneficial effect on aquatic habitat within the coastal zone. The removal of Horlick Dam would restore the natural flow of the Root River, improving the water quality and creating better habitat for fish and aquatic organisms. Additionally, fish passage would be improved allowing unimpeded connectivity throughout the Root River watershed. Since the proposed action would have an overall beneficial effect on aquatic habitat and fish passage in the coastal zone, the determination is that the proposed action will have beneficial effects on coastal resources. However, 15 CFR 930.33(a)(1) states, "Federal agencies shall, in making determination of effects, review relevant management program enforceable policies as part of determining effects on any coastal use or resources." Therefore, in addition to making the above determination applicable specific state coastal policies were reviewed for consistency.

SPECIFIC STATE COASTAL POLICIES

The Corps reviewed the list of coastal policies from Appendix C "Specific State Coastal Policies, "Wisconsin Coastal Management Program: A Strategic Vision for the Great Lakes, dated October 2007. Below is a list of the policies that appear to be applicable to the proposed restoration of the Root River through the removal of the

Horlick Dam. In addition, each identified policy includes an evaluation of the proposed habitat management action for consistency with the State of Wisconsin Coastal Management Program.

Coastal Water Quality and Quantity and Coastal Air Quality

Policy 1.2: An interim goal is the protection and propagation of fish and wildlife and the maintenance of water quality to allow recreation in and on the water to be achieved. (See Wis. Stats. § 283.001(1)(b))

Consistency of Project: The restoration of the Root River with the removal of the Horlick Dam would restore the natural flow of the river, improving water quality and creating lotic habitat for fishes, and allow natural fish passage to occur throughout the Root River watershed. Additionally, the project would enhance recreational opportunities for kayaking, canoeing, and fishing.

Policy 1.15.1: No person may conduct an activity for which the Wisconsin Department of Natural Resources denies a required water quality certification. No person may violate a condition imposed by the department in a water quality certification. (See Wis. Stats. § 281.17(10))

Consistency of Project: The restoration of the Root River with the removal of the Horlick Dam do not include the placement of dredged material or fill into Waters of the United States. The sedimentation build-up behind the dam would be slowly released through passive sediment management with a staged drawdown. This management method allows sediments to naturally flow downstream over time as to not smother downstream habitat.

Coastal Natural Areas, Wildlife Habitat and Fisheries

Policy 2.15: The Wisconsin Department of Natural Resources shall preserve, protect, restore, and manage the state's wetland communities to be sustainable, diverse, and interspersed with healthy aquatic and terrestrial communities. Department actions must be consistent with the goal of maintaining, protecting, and improving water quality. The administrative rules regarding wetlands shall be applied in such a manner as to avoid or minimize the adverse effects on wetlands due to actions over which the department has regulatory or management authority and to maintain, enhance and restore wetland functions and values. (See Wis. Stats. §§ 281.12(1) and 281.11, and Wis. Admin. Code NR 1,95, NR 299, NR 103 and NR 353. See also managed use #1, 2, 3, 4, 5, 6, 7, 8, 9, 17, 18, 19, 21, 22)

Consistency of Project: The restoration of the Root River with the removal of the Horlick Dam would have negligible impacts to forested wetlands adjacent to the Root River as the hydrology would change from a lentic system to a natural lotic system with fewer inundation events for the forested wetlands. However, there is the possibility of the creation of new wetlands in the newly exposed areas where the

restored hydrology may promote sedge and other wetland plant growth.

Policy 2.19: Unless the Wisconsin Department of Natural Resources has issued a permit or the legislature has granted authorization, no person may change the course of or straighten a navigable stream (See Wis. Stats. §§ 30.195)

Consistency of Project: The restoration of the Root River with the removal of the Horlick Dam would remove the existing lake-like impoundment and would return the Root River to a flowing lotic system. The river is anticipated to return to a more historic stream channel that meanders as it reaches dynamic equilibrium.

Community Development

Policy 4.18: No owner of any dam may abandon or remove or alter the dam without first obtaining a permit from the Wisconsin Department of Natural Resources. No person may transfer ownership of a dam or the ownership of the specific piece of land on which a dam is physically located without first obtaining a permit from the department. As a prerequisite to the granting of a permit, the department may require the applicant to comply with conditions as it deems reasonably necessary in the particular case to preserve public rights in navigable waters, to promote safety, and to protect life, health and property. (See Wis. Stats. §§ 31.185(1) and (5))

Consistency of Project: As part of the restoration of the Root River with the removal of the Horlick Dam, the appropriate permits for dam removal will be obtained from the Wisconsin Department of Natural Resources.

In accordance with 15 CFR Part 930.36(a), based on the evaluation of the applicable enforceable policies contained in Appendix C of the State of Wisconsin Coastal Management Program, the Corps has determined that the proposed restoration of the Root River with the removal of the Horlick Dam complies with the policies of Wisconsin's approved Coastal Management Program and will be conducted in a manner consistent with such policies.

We request your concurrence with this determination within 60 days in accordance with the CZMA. Wisconsin's concurrence will be presumed if its response is not received by the Corps within 60 days plus any extension, if requested, as applicable pursuant to 15 CFR 940.41(b). Please contact Ms. Samantha Belcik at samantha.d.belcik@usace.army.mil or 312-846-5467 if you have any questions or need any additional information regarding this Corps' Coastal Zone Management Act federal consistency determination.

Sincerely,

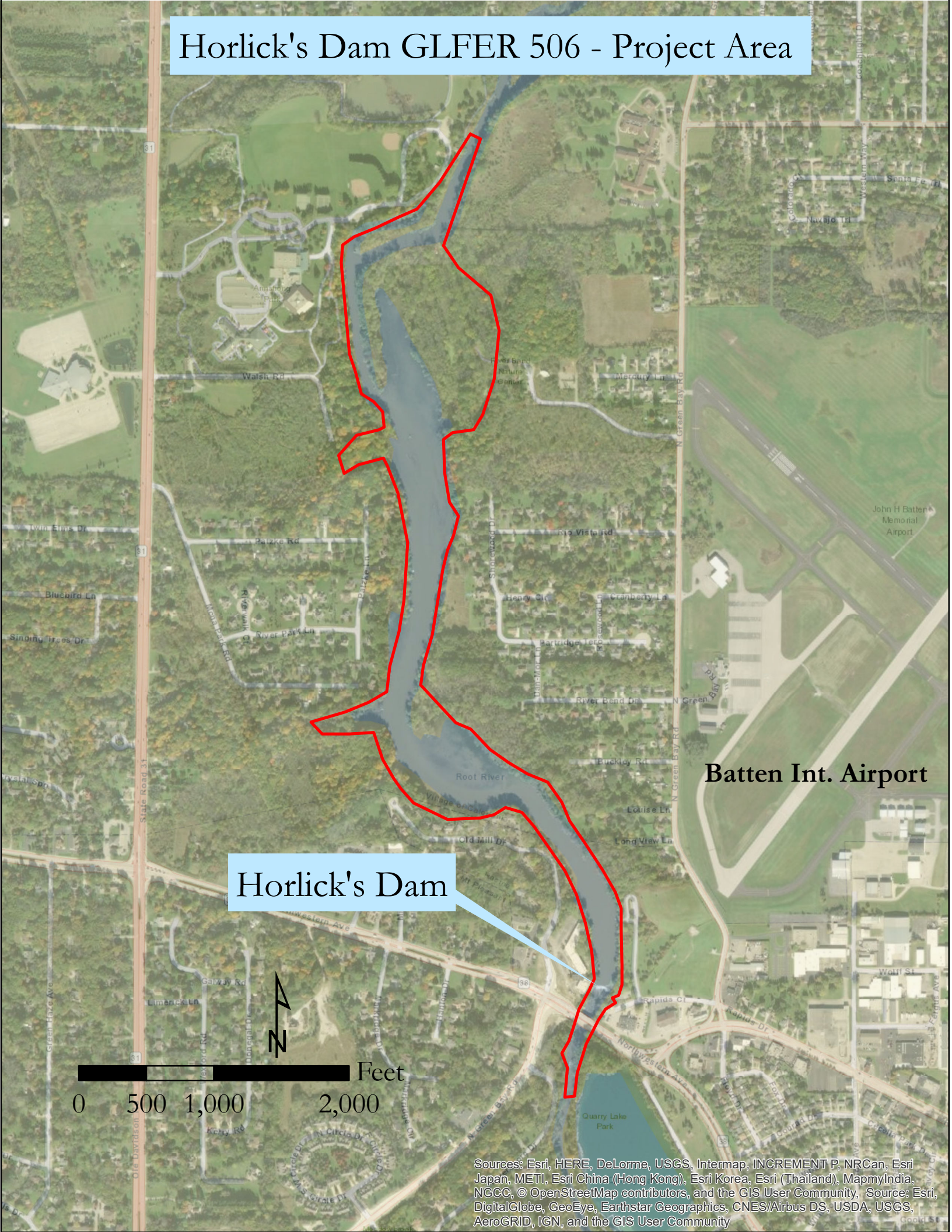
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Alex Hoxsie
Chief, Environmental & Cultural Resources

Enclosures:
Enclosure 1 – Project Site

Horlick's Dam GLFER 506 - Project Area



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Plan Formulation

Annualized Cost for "Combo"

6/30/2021

7:05:31AM

Initial terms:

Discount rate %: 2.5 Period of analysis: 50 Capital recovery factor: 0.035258 Avg annual cost: \$191,128.38

Total initial cost:

Construction \$4,406,286.0 + Real Estate \$131,000.00 + Monitoring \$200,000.00 + Other \$0.00 = \$5,137,286.00

Total Investment cost:

Total Initial Cost \$5,137,286.00 + PED \$400,000.00 + IDC \$283,556.55 = \$5,420,842.55

Initial investment:

Total Investment Cost \$5,420,842.5 PV Factor 1.000000 Present Value = \$5,420,842.55

Year	Cost	PV Factor	Present Value
2022	\$0.00	0.9877	\$0.00
2023	\$0.00	0.9636	\$0.00
2024	\$0.00	0.9401	\$0.00
2025	\$0.00	0.9172	\$0.00
2026	\$0.00	0.8948	\$0.00
2027	\$0.00	0.8730	\$0.00
2028	\$0.00	0.8517	\$0.00
2029	\$0.00	0.8309	\$0.00
2030	\$0.00	0.8107	\$0.00
2031	\$0.00	0.7909	\$0.00
2032	\$0.00	0.7716	\$0.00
2033	\$0.00	0.7528	\$0.00
2034	\$0.00	0.7344	\$0.00
2035	\$0.00	0.7165	\$0.00
2036	\$0.00	0.6990	\$0.00
2037	\$0.00	0.6820	\$0.00
2038	\$0.00	0.6654	\$0.00
2039	\$0.00	0.6491	\$0.00
2040	\$0.00	0.6333	\$0.00
2041	\$0.00	0.6179	\$0.00
2042	\$0.00	0.6028	\$0.00
2043	\$0.00	0.5881	\$0.00
2044	\$0.00	0.5737	\$0.00
2045	\$0.00	0.5597	\$0.00
2046	\$0.00	0.5461	\$0.00
2047	\$0.00	0.5328	\$0.00
2048	\$0.00	0.5198	\$0.00
2049	\$0.00	0.5071	\$0.00
2050	\$0.00	0.4947	\$0.00
2051	\$0.00	0.4827	\$0.00
2052	\$0.00	0.4709	\$0.00
2053	\$0.00	0.4594	\$0.00
2054	\$0.00	0.4482	\$0.00
2055	\$0.00	0.4373	\$0.00
2056	\$0.00	0.4266	\$0.00
2057	\$0.00	0.4162	\$0.00
2058	\$0.00	0.4060	\$0.00
2059	\$0.00	0.3961	\$0.00
2060	\$0.00	0.3865	\$0.00
2061	\$0.00	0.3771	\$0.00
2062	\$0.00	0.3679	\$0.00
2063	\$0.00	0.3589	\$0.00
2064	\$0.00	0.3501	\$0.00

Annualized Cost for "Combo"

6/30/2021

7:05:31AM

Initial terms:

Discount rate %: 2.5 Period of analysis: 50 Capital recovery factor: 0.035258 Avg annual cost: \$191,128.38

Total initial cost:

Construction \$4,406,286.0 + Real Estate \$131,000.00 + Monitoring \$200,000.00 + Other \$0.00 = \$5,137,286.00

Total Investment cost:

Total Initial Cost \$5,137,286.00 + PED \$400,000.00 + IDC \$283,556.55 = \$5,420,842.55

Initial investment:Total Investment Cost \$5,420,842.5 PV Factor 1.000000 Present Value = \$5,420,842.55

Year	Cost	PV Factor	Present Value
2065	\$0.00	0.3416	\$0.00
2066	\$0.00	0.3333	\$0.00
2067	\$0.00	0.3251	\$0.00
2068	\$0.00	0.3172	\$0.00
2069	\$0.00	0.3095	\$0.00
2070	\$0.00	0.3019	\$0.00
2071	\$0.00	0.2946	\$0.00
<hr/>			
Net Totals:	<u>Cost:</u> \$5,420,842.55	<u>Present Value:</u> \$5,420,842.55	<u>Avg Annual Cost:</u> \$191,128.38

Annualized Cost for "By Pass Channel"

6/29/2021

10:12:27AM

Initial terms:

Discount rate %: 2.5

Period of analysis: 50

Capital recovery factor: 0.035258

Avg annual cost: \$83,202.73

Total initial cost:

Construction \$1,727,643.0 + Real Estate \$71,000.00 + Monitoring \$100,000.00 + Other \$0.00 = \$2,248,643.00

Total Investment cost:

Total Initial Cost \$2,248,643.00 + PED \$350,000.00 + IDC \$111,178.70 = \$2,359,821.70

Initial investment:

Total Investment Cost \$2,359,821.7 PV Factor 1.000000 Present Value = \$2,359,821.70

Year	Cost	PV Factor	Present Value
2023	\$0.00	0.9877	\$0.00
2024	\$0.00	0.9636	\$0.00
2025	\$0.00	0.9401	\$0.00
2026	\$0.00	0.9172	\$0.00
2027	\$0.00	0.8948	\$0.00
2028	\$0.00	0.8730	\$0.00
2029	\$0.00	0.8517	\$0.00
2030	\$0.00	0.8309	\$0.00
2031	\$0.00	0.8107	\$0.00
2032	\$0.00	0.7909	\$0.00
2033	\$0.00	0.7716	\$0.00
2034	\$0.00	0.7528	\$0.00
2035	\$0.00	0.7344	\$0.00
2036	\$0.00	0.7165	\$0.00
2037	\$0.00	0.6990	\$0.00
2038	\$0.00	0.6820	\$0.00
2039	\$0.00	0.6654	\$0.00
2040	\$0.00	0.6491	\$0.00
2041	\$0.00	0.6333	\$0.00
2042	\$0.00	0.6179	\$0.00
2043	\$0.00	0.6028	\$0.00
2044	\$0.00	0.5881	\$0.00
2045	\$0.00	0.5737	\$0.00
2046	\$0.00	0.5597	\$0.00
2047	\$0.00	0.5461	\$0.00
2048	\$0.00	0.5328	\$0.00
2049	\$0.00	0.5198	\$0.00
2050	\$0.00	0.5071	\$0.00
2051	\$0.00	0.4947	\$0.00
2052	\$0.00	0.4827	\$0.00
2053	\$0.00	0.4709	\$0.00
2054	\$0.00	0.4594	\$0.00
2055	\$0.00	0.4482	\$0.00
2056	\$0.00	0.4373	\$0.00
2057	\$0.00	0.4266	\$0.00
2058	\$0.00	0.4162	\$0.00
2059	\$0.00	0.4060	\$0.00
2060	\$0.00	0.3961	\$0.00
2061	\$0.00	0.3865	\$0.00
2062	\$0.00	0.3771	\$0.00
2063	\$0.00	0.3679	\$0.00
2064	\$0.00	0.3589	\$0.00
2065	\$0.00	0.3501	\$0.00

Annualized Cost for "By Pass Channel"

6/29/2021

10:12:27AM

Initial terms:

Discount rate %: 2.5 Period of analysis: 50 Capital recovery factor: 0.035258 Avg annual cost: \$83,202.73

Total initial cost:

Construction \$1,727,643.0 + Real Estate \$71,000.00 + Monitoring \$100,000.00 + Other \$0.00 = \$2,248,643.00

Total Investment cost:

Total Initial Cost \$2,248,643.00 + PED \$350,000.00 + IDC \$111,178.70 = \$2,359,821.70

Initial investment:

Total Investment Cost \$2,359,821.7 PV Factor 1.000000 Present Value = \$2,359,821.70

Year	Cost	PV Factor	Present Value
2066	\$0.00	0.3416	\$0.00
2067	\$0.00	0.3333	\$0.00
2068	\$0.00	0.3251	\$0.00
2069	\$0.00	0.3172	\$0.00
2070	\$0.00	0.3095	\$0.00
2071	\$0.00	0.3019	\$0.00
2072	\$0.00	0.2946	\$0.00
<hr/>			
Net Totals:	<u>Cost:</u> \$2,359,821.70	<u>Present Value:</u> \$2,359,821.70	<u>Avg Annual Cost:</u> \$83,202.73

Annualized Cost for "Instream Habitat LWD C"

6/29/2021

10:29:58AM

Initial terms:

Discount rate %: 2.5

Period of analysis: 50

Capital recovery factor: 0.035258

Avg annual cost: \$79,994.24

Total initial cost:

Construction \$1,727,643.0 + Real Estate \$60,000.00 + Monitoring \$120,000.00 + Other \$0.00 = \$2,157,643.00

Total Investment cost:

Total Initial Cost \$2,157,643.00 + PED \$250,000.00 + IDC \$111,178.70 = \$2,268,821.70

Initial investment:

Total Investment Cost \$2,268,821.7 PV Factor 1.000000 Present Value = \$2,268,821.70

Year	Cost	PV Factor	Present Value
2023	\$0.00	0.9877	\$0.00
2024	\$0.00	0.9636	\$0.00
2025	\$0.00	0.9401	\$0.00
2026	\$0.00	0.9172	\$0.00
2027	\$0.00	0.8948	\$0.00
2028	\$0.00	0.8730	\$0.00
2029	\$0.00	0.8517	\$0.00
2030	\$0.00	0.8309	\$0.00
2031	\$0.00	0.8107	\$0.00
2032	\$0.00	0.7909	\$0.00
2033	\$0.00	0.7716	\$0.00
2034	\$0.00	0.7528	\$0.00
2035	\$0.00	0.7344	\$0.00
2036	\$0.00	0.7165	\$0.00
2037	\$0.00	0.6990	\$0.00
2038	\$0.00	0.6820	\$0.00
2039	\$0.00	0.6654	\$0.00
2040	\$0.00	0.6491	\$0.00
2041	\$0.00	0.6333	\$0.00
2042	\$0.00	0.6179	\$0.00
2043	\$0.00	0.6028	\$0.00
2044	\$0.00	0.5881	\$0.00
2045	\$0.00	0.5737	\$0.00
2046	\$0.00	0.5597	\$0.00
2047	\$0.00	0.5461	\$0.00
2048	\$0.00	0.5328	\$0.00
2049	\$0.00	0.5198	\$0.00
2050	\$0.00	0.5071	\$0.00
2051	\$0.00	0.4947	\$0.00
2052	\$0.00	0.4827	\$0.00
2053	\$0.00	0.4709	\$0.00
2054	\$0.00	0.4594	\$0.00
2055	\$0.00	0.4482	\$0.00
2056	\$0.00	0.4373	\$0.00
2057	\$0.00	0.4266	\$0.00
2058	\$0.00	0.4162	\$0.00
2059	\$0.00	0.4060	\$0.00
2060	\$0.00	0.3961	\$0.00
2061	\$0.00	0.3865	\$0.00
2062	\$0.00	0.3771	\$0.00
2063	\$0.00	0.3679	\$0.00
2064	\$0.00	0.3589	\$0.00
2065	\$0.00	0.3501	\$0.00

Annualized Cost for "Instream Habitat LWD C"

6/29/2021

10:29:58AM

Initial terms:

Discount rate %: 2.5 Period of analysis: 50 Capital recovery factor: 0.035258 Avg annual cost: \$79,994.24

Total initial cost:

Construction \$1,727,643.0 + Real Estate \$60,000.00 + Monitoring \$120,000.00 + Other \$0.00 = \$2,157,643.00

Total Investment cost:

Total Initial Cost \$2,157,643.00 + PED \$250,000.00 + IDC \$111,178.70 = \$2,268,821.70

Initial investment:

Total Investment Cost \$2,268,821.7 PV Factor 1.000000 Present Value = \$2,268,821.70

Year	Cost	PV Factor	Present Value
2066	\$0.00	0.3416	\$0.00
2067	\$0.00	0.3333	\$0.00
2068	\$0.00	0.3251	\$0.00
2069	\$0.00	0.3172	\$0.00
2070	\$0.00	0.3095	\$0.00
2071	\$0.00	0.3019	\$0.00
2072	\$0.00	0.2946	\$0.00
<hr/>			
Net Totals:	<u>Cost:</u> \$2,268,821.70	<u>Present Value:</u> \$2,268,821.70	<u>Avg Annual Cost:</u> \$79,994.24

Annualized Cost for "Full Dam Removal"

6/29/2021

10:23:11AM

Initial terms:

Discount rate %: 2.5

Period of analysis: 50

Capital recovery factor: 0.035258

Avg annual cost: \$76,448.05

Total initial cost:

Construction \$1,727,643.0 + Real Estate \$65,000.00 + Monitoring \$60,000.00 + Other \$0.00 = \$2,102,643.00

Total Investment cost:

Total Initial Cost \$2,102,643.00 + PED \$250,000.00 + IDC \$65,600.44 = \$2,168,243.44

Initial investment:

Total Investment Cost \$2,168,243.4 PV Factor 1.000000 Present Value = \$2,168,243.44

Year	Cost	PV Factor	Present Value
2023	\$0.00	0.9877	\$0.00
2024	\$0.00	0.9636	\$0.00
2025	\$0.00	0.9401	\$0.00
2026	\$0.00	0.9172	\$0.00
2027	\$0.00	0.8948	\$0.00
2028	\$0.00	0.8730	\$0.00
2029	\$0.00	0.8517	\$0.00
2030	\$0.00	0.8309	\$0.00
2031	\$0.00	0.8107	\$0.00
2032	\$0.00	0.7909	\$0.00
2033	\$0.00	0.7716	\$0.00
2034	\$0.00	0.7528	\$0.00
2035	\$0.00	0.7344	\$0.00
2036	\$0.00	0.7165	\$0.00
2037	\$0.00	0.6990	\$0.00
2038	\$0.00	0.6820	\$0.00
2039	\$0.00	0.6654	\$0.00
2040	\$0.00	0.6491	\$0.00
2041	\$0.00	0.6333	\$0.00
2042	\$0.00	0.6179	\$0.00
2043	\$0.00	0.6028	\$0.00
2044	\$0.00	0.5881	\$0.00
2045	\$0.00	0.5737	\$0.00
2046	\$0.00	0.5597	\$0.00
2047	\$0.00	0.5461	\$0.00
2048	\$0.00	0.5328	\$0.00
2049	\$0.00	0.5198	\$0.00
2050	\$0.00	0.5071	\$0.00
2051	\$0.00	0.4947	\$0.00
2052	\$0.00	0.4827	\$0.00
2053	\$0.00	0.4709	\$0.00
2054	\$0.00	0.4594	\$0.00
2055	\$0.00	0.4482	\$0.00
2056	\$0.00	0.4373	\$0.00
2057	\$0.00	0.4266	\$0.00
2058	\$0.00	0.4162	\$0.00
2059	\$0.00	0.4060	\$0.00
2060	\$0.00	0.3961	\$0.00
2061	\$0.00	0.3865	\$0.00
2062	\$0.00	0.3771	\$0.00
2063	\$0.00	0.3679	\$0.00
2064	\$0.00	0.3589	\$0.00
2065	\$0.00	0.3501	\$0.00

Annualized Cost for "Full Dam Removal"

6/29/2021

10:23:11AM

Initial terms:

Discount rate %: 2.5 Period of analysis: 50 Capital recovery factor: 0.035258 Avg annual cost: \$76,448.05

Total initial cost:

Construction \$1,727,643.0 + Real Estate \$65,000.00 + Monitoring \$60,000.00 + Other \$0.00 = \$2,102,643.00

Total Investment cost:

Total Initial Cost \$2,102,643.00 + PED \$250,000.00 + IDC \$65,600.44 = \$2,168,243.44

Initial investment:

Total Investment Cost \$2,168,243.4 PV Factor 1.000000 Present Value = \$2,168,243.44

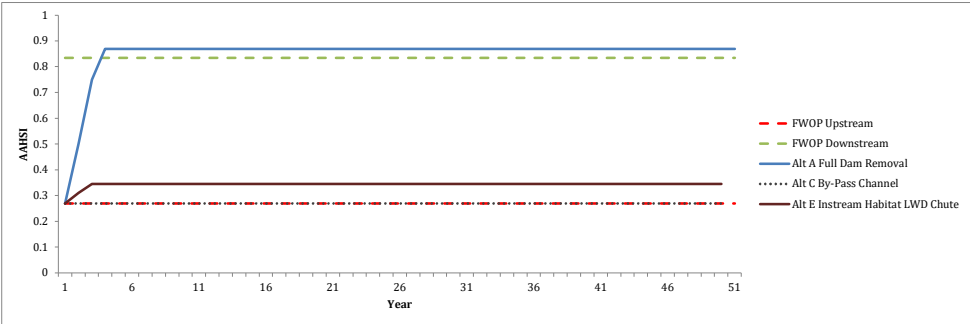
Year	Cost	PV Factor	Present Value
2066	\$0.00	0.3416	\$0.00
2067	\$0.00	0.3333	\$0.00
2068	\$0.00	0.3251	\$0.00
2069	\$0.00	0.3172	\$0.00
2070	\$0.00	0.3095	\$0.00
2071	\$0.00	0.3019	\$0.00
2072	\$0.00	0.2946	\$0.00
<hr/>			
Net Totals:	<u>Cost:</u> \$2,168,243.44	<u>Present Value:</u> \$2,168,243.44	<u>Avg Annual Cost:</u> \$76,448.05

Existing Future Without Project Habitat Unti Calculations

Future With-Project Net Average Annual Habitat Unit Calculations

Description	Alternative	Length Units	HSI _{FWP}	HSI _{FWP}	AAHU _{FWP}	AAHU _{FWP}	NAAHU
FWOP	Upstream Reach	33.1	0.27		8.9		
	Downstream Reach	15.2	0.84		12.7		
	FWOP Total	48.3			21.6		
Action / FWP							
	(A) Upstream Reach	33.1		0.86	28.5	15.8	
	(A) Downstream Reach	15.2		0.87	13.2	0.5	
	(A) Total	48.3			41.7	16.3	
	(C) Upstream Reach	33.1		0.27	8.9	0.0	
	(C) Downstream Reach	15.2		0.84	12.7	0.0	
	(C) Total	48.3			21.6	0.0	
	(E) Upstream Reach	33.1		0.34	11.3	2.4	
	(E) Downstream Reach	15.2		0.84	12.7	0.0	
	(E) Total	48.3			24.0	2.4	

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
Upstream	0.27	0.5	0.75	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Downstream	0.835	0.835	0.835	0.835	0.85	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Upstream	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27			
Downstream	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	
Upstream	0.27	0.27	0.31	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	
Downstream	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835



Plan Formulation / Alternative Screening Criteria Qualitative Scoring

Evaluation Criteria	Quality Score	Qualifiers
Completeness		
The extent to which a given alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects. To establish the completeness of a plan, it is helpful to list those factors beyond the control of the planning team that are required to make the plan's effects (benefits) a reality.	4	Fully Complete
	3	Mostly Complete
	2	Moderately Complete
	1	Mostly Incomplete
	0	Incomplete
Effectiveness (Problems, Opportunities, Objectives, Constraints)		
The extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities. An effective plan is responsive to the identified needs and makes a significant contribution to the solution of some problem or to the realization of some opportunity. It also contributes to the attainment of planning objectives; the most effective alternatives make significant contributions to all the planning objectives. Alternatives that make little or no contribution to the planning objectives can be rejected because they are relatively ineffective. Another factor that can impact the effectiveness of an alternative is whether there is substantial risk and uncertainty associated with the alternative. If the functioning or success of an alternative is uncertain, or less certain than another alternative, its effectiveness may be compromised and should be discussed.	4	POOCs Met
	3	POOCs Mostly Met
	2	POOCs Half Way Met
	1	POOCs Somewhat Met
	0	POOCs Not Met
Efficiency		
The extent to which an alternative plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the Nation's environment (P&G Section VI.1.6.2(c)(3)).	4	High Efficiency
	3	Medium Efficiency
	2	Low Efficiency
	1	Same as Other Alts
	0	Other Alts More Efficient
Acceptability		
The workability and viability of the alternative plan with respect to acceptance by Federal and non-Federal entities and the public and compatibility with existing laws, regulations, and public policies. Two primary dimensions to acceptability are implementability and satisfaction. Implementability means that the alternative is feasible from technical, environmental, economic, financial, political, legal, institutional, and social perspectives. The second dimension to acceptability is the satisfaction that a particular plan brings to government entities and the public. The extent to which a plan is welcome or satisfactory is a qualitative judgment that can help planners evaluate whether to carry forward or screen out alternative plans.	4	Highly Acceptable
	3	Acceptable
	2	Moderately Acceptable
	1	Barely Acceptable
	0	Not Acceptable
Natural Resources		
The generalized effects to physical, biological, cultural and man-made resources, whether beneficial or adverse. This includes concepts of impact magnitudes, significance thresholds, and the quality/condition of the resources in both the existing and future with and without conditions.	4	Highly Beneficial
	3	Moderately Beneficial
	2	Limited Benefits
	1	No Effects
	0	Adverse Effects
Sustainability / O&M		
The amount of maintenance required to keep the alternative functional and operating throughout the project life. Sustainability concepts are included for the Staged Greenway and other nature based features.	4	High Sustain / Low O&M
	3	
	2	Mod Sustain / Mod O&M
	1	
	0	Low Sustain / High O&M

Plan Formulation Alternative Screening Matrix

Alt #	Alternative & Measure Components	Score/Ave	Completeness	Screening Logic Matrix							Sustainability / O&M		
				Effectiveness (POOCs)	Efficiency (cost vs output magnitudes)	Acceptability							Natural Resources
0	No Action Assumes FWOP		Would not provide or support plan completeness.	Would not solve problems or address objectives.	Would not expend federal dollars.	Unacceptable to stakeholders, as well as regional and state agencies with missions/goals for ecosystem improvements. May be acceptable to some types of angling groups.				There would be no improvements to habitat and native species richness.	There would be no viable native habitats to sustain.		
A	Full Dam Removal Demolition Grading Adaptive Mangement BMPs	23 3.8	Would not leave out any components critical to establishing sustainable riverine habitat and would connect surface waters.	Would be highly effective at addressing study problems, achieving quality objective and supporting connectivity objective.	Would be efficient as there really is no other effective way to efficiently restore such a long reach of river.	Would be acceptable to federal, state and municipal agencies. Highly acceptable to the non-Federal sponsor. May be unacceptable to some types of angling groups.	4	4	3	4	Would induce the highest response in terms of biological recovery via restoring processes that riverine species adapted and evolved to.	Would have the highest level of sustainability with minimal to no O&M requirements.	4
B	Full Dam Removal w/ Sediment Removal Demolition Excavation Grading Adaptive Mangement BMPs	22 3.7	Would not leave out any components critical to establishing sustainable riverine habitat and would connect surface waters.	Would be highly effective at addressing study problems, achieving quality objective and supporting connectivity objective.	Would be efficient as there really is no other effective way to efficiently restore such a long reach of river. Some additional costs for sediment removal and disposal, but benefits remain the same.	Would be acceptable to federal, state and municipal agencies. Highly acceptable to the non-Federal sponsor. May be unacceptable to some types of angling groups.	3	4	3	4	Would induce a moderate to high response in terms of biological recovery via mimicking habitat structure and geomorphology created by fluvialgeomorphic processes.	Would have the highest level of sustainability with minimal to no O&M requirements.	4
C	By pass Channel Excavation Grading Native Rock Structures Adaptive Mangement BMPs	9 1.5	Would leave out all components critical to establishing sustainable riverine habitat, but would provide moderate connection surface waters.	Would be moderately effective at meeting connectivity objective, but would not achieve quality objective.	Would be efficient at providing moderate connectivity benefits, but not habitat quality benefits.	Would not be acceptable to federal, state and municipal agencies. Would not be acceptable to the non-Federal sponsor. May be unacceptable to some types of angling groups, as the dam traps fish for unchallenged angling.	2	1	1	2	Would not provided any natural resource recovery. Would only provide moderate passage of certain groups of fish.	Would have a low level of sustainability with high amounts of O&M requirements to keep the feature functional.	1
D	Fish Ladder Fish Ladder Adaptive Mangement BMPs	5 0.8	Would leave out all components critical to establishing sustainable riverine habitat, but would provide minimal connection surface waters.	Would be minimally effective at meeting connectivity objective, but would not achieve quality objective	Would be efficient at providing moderate connectivity benefits, but not habitat quality benefits.	Would not be acceptable to federal, state and municipal agencies. Would not be acceptable to the non-Federal sponsor. May be unacceptable to some types of angling groups, as the dam traps fish for unchallenged angling.	1	1	1	1	Would not provided any natural resource recovery. Would only provide moderate passage of certain species of large bodied, powerful swimming fishes.	Would have a very low level of sustainability with very high amounts of O&M requirements to keep the feature functional.	0
E	Instream Habitat Native Rock Structures Large Woody Debris Adaptive Mangement	16 2.7	Would support other plans, but wouldn't stand alone to achieve a complete plan.	Would be effective at addressing some of the study problems, doesn't support connectivity objectives, and would support quality objectives.	Would be efficient as would only require a limited amount of riffle and large woody debris structures.	Would be acceptable to federal, state and some municipal agencies. Would be acceptable to the the non-Federal sponsor in terms of management goals.	3	4	4	1	Would support restoration of natural resources by providing instream habitats; however, the stream is already natural bedrock with natural sediment transport and LWD inputs, so improvements may be minimal.	Would have a high level of sustainability with minimal to no O&M required.	4
F	Riparian Zone Plantings Invasive Species Removal Native Plantings Native Community Establishment Adaptive Mangement	19 3.2	Would support other plans, but wouldn't stand alone to achieve a complete plan.	Would be effective at addressing some of the study problems, doesn't support connectivity objectives, and would support meet quality objectives.	Would be highly efficient at providing a large riparian zone for connectivity and native plant community habitats.	Would be acceptable to federal, state and some municipal agencies. Would be acceptable to the the non-Federal sponsor in terms of management goals.	4	4	4	4	Would induce a high response in terms of biological recovery via providing native riparian communities for fish, wildlife and migratory birds.	Would have a high level of sustainability with minimal to moderate O&M requirements due to invasive species pressures. Unlikely real estate could be acquired to sustain riparian habitats restored.	3