



Lessard-Sams Outdoor Heritage Council

Protecting Upper Mississippi River from Invasive Carp
Laws of Minnesota 2024 Accomplishment Plan

General Information

Date: 06/06/2024

Project Title: Protecting Upper Mississippi River from Invasive Carp

Funds Recommended: \$12,000,000

Legislative Citation: ML 2024, Ch. 106, Art. 1, Sec. 2, Subd. 5(aa)

Appropriation Language: \$12,000,000 the second year is to the commissioner of natural resources to fund activities to protect the Upper Mississippi River from invasive carp. Activities within this appropriation include agreements with federal partners, such as the United States Fish and Wildlife Service, to design, construct, and begin the operation and maintenance of a structural deterrent for invasive carp at Lock and Dam No. 5 on the Mississippi River to protect Minnesota's aquatic habitat through an adaptive management approach. Deterrent design must be fully completed within two years of the date of this appropriation. Deterrent installation must be completed by June 30, 2029. Funds not spent or obligated for design installation and operation of the deterrent may be used for testing technologies to support the future effectiveness of the deterrent. A detailed accomplishment plan must be submitted to and approved by the Lessard-Sams Outdoor Heritage Council prior to release of funds. This appropriation is available until June 30, 2029.

Manager Information

Manager's Name: Kelly Pennington

Title: Invasive Species Unit Supervisor

Organization: DNR

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Location Information

County Location(s): Winona.

Eco regions in which work will take place:

- Southeast Forest

Activity types:

- Other : invasive carp deterrent
- Enhance

Priority resources addressed by activity:

- Habitat

Narrative**Abstract**

Invasive carp pose a threat to the ecology, economy, and natural resources of Minnesota. This proposal will include design, installation, and assessment of invasive carp deterrent and removal technologies at Lock and Dam 5 (LD5) on the Mississippi River and test new methods to support and enhance effectiveness of a lock deterrent. This LD5 invasive carp prevention and management program will be further developed in collaboration with partners, including the U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS), and U.S. Army Corps of Engineers (USACE), and will include evaluation of the program's effectiveness.

Design and Scope of Work

This project will be accomplished in phased Activities.

ACTIVITY 1 – Interagency project plan

DNR and partners including the U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS), and U.S. Army Corps of Engineers (USACE), create an interagency project team and detailed project timeline. DNR project manager will facilitate planning with partners in activity 1 and 2.

ACTIVITY 2 - Scoping

Analyze options for an invasive carp deterrent in the lock at Lock and Dam 5 (LD5) and scope technologies to support the future effectiveness of the deterrent. Identify methods to assess effectiveness of the lock deterrent, including telemetry and other methods identified during scoping, to support adaptive management of the project. Sound-based invasive carp deterrents currently include the underwater acoustic deterrent system (uADS) temporarily installed at Lock and Dam 19 on the Mississippi River, and the BioAcoustic Fish Fence (BAFF) being tested at Barkley Lock and Dam on the Cumberland River in Kentucky. Certain flow and sound conditions are required for operation of either type of acoustic deterrent. The lock approach will need to be assessed for constraints such as flow, depth, sound interference, and the available space for installation of a deterrent to determine which deterrent would be most appropriate at LD5.

Two sub-activities will begin during scoping:

Activity 2.1: Operations and maintenance planning: Estimate ongoing operations and maintenance costs for the deterrent, plan for roles and responsibilities for operations and maintenance, and secure funding as appropriate. Develop a plan for removal of the deterrent system and related structures, and restoration of LD5.

Activity 2.2: Scoping technologies to support the effectiveness of the deterrent: technologies to support the effectiveness of the deterrent may include: downstream removal to reduce the number of invasive carp passing upstream and reduce risk of reproduction occurring at LD5; a system to trap, sort, and remove invasive carp that approach the lock deterrent; dam gate deterrents to prevent passage through the dam during open river conditions; addressing other potential pathways for movement around LD5 such as culverts; and gate manipulations or other methods to further reduce upstream passage of invasive carp.

ACTIVITY 3 - Design

Contract with architectural and engineering firm(s) to complete design of deterrent at Lock and Dam 5 sufficient to inform permitting activity. The lock deterrent will be designed to work in concert with other technologies and

methods critical for deterrence to be effective at LD5. A design for the deterrent will be complete by July 1, 2026, per the appropriation language. DNR contracts manager will support awarding of contracts for activities 3 and 5.

ACTIVITY 4 – Permitting

The USACE will need to review any proposal to modify LD5, or any of its other navigation structures, and to approve those proposals prior to installation. Obtain other permits and complete environmental review as needed.

ACTIVITY 5 – Installation and Construction

Construction at LD5 and installation of an invasive carp deterrent at LD5 by June 30, 2029, per the appropriation language.

Explain how the plan addresses habitat protection, restoration, and/or enhancement for fish, game & wildlife, including threatened or endangered species conservation

The goal of this proposal is to protect Minnesota’s aquatic habitats from invasive carp by installing a deterrent on the Mississippi River and testing technologies to support the effectiveness of the deterrent. Installation of a lock deterrent at Lock and Dam 5 would be expected to reduce upstream passage of invasive carp through the lock; however, a lock deterrent will not have an impact on invasive carp passage at the dam gates, and a deterrent will not reduce abundance or the risk of reproduction of invasive carp downstream from the deterrent.

Preliminary data from the uADS and BAFF deterrents suggests that they are approximately 50% effective at preventing upstream passage of silver carp through a lock chamber. Deterrents do not kill or remove invasive carp. Because deterrents do not reduce invasive carp abundance and indeed could lead to more invasive carp accumulating at this location, and deterrents cannot prevent reproduction from occurring,, continued removal of invasive carp downstream of the deterrent will be needed to maximize its efficacy and the habitat enhancement benefits of this project.

Invasive carp are defined in Minnesota to include bighead (*Hypophthalmichthys nobilis*), black (*Mylopharyngodon piceus*), grass (*Ctenopharyngodon idella*), and silver (*Hypophthalmichthys molitrix*) carp. Invasive carp have the potential to impact native aquatic communities, local economies, and Minnesota’s outdoor heritage. Grass carp were first captured in Minnesota in 1977, bighead carp in 1996, and silver carp in 2008. The primary pathway of concern for invasive carp spread in Minnesota is fish swimming into the state through connected waters. Bighead and silver carp eat plankton, and can compete with native mussels, larval fishes, gizzard shad, bigmouth buffalo, and forage fish for food. Silver carp can jump up to 10 feet out of the water when startled, which can endanger boaters, personal watercraft operators, and water skiers. Grass carp eat aquatic vegetation, which can reduce fish habitat and harm water quality. Black carp have not yet been detected in Minnesota, but they eat mollusks, which could be detrimental to Minnesota’s imperiled species of freshwater mussels.

What are the elements of this plan that are critical from a timing perspective?

This project is time sensitive due to the progressive upstream migration of invasive carp into Minnesota. To accomplish lock deterrent installation by June 30, 2029, scoping and further design of the deterrent, with partners is time critical so that the deterrent can be designed to avoid interference with the USACE navigation project and to obtain permits and agreements required for deterrent installation. It is also critical that the project partners scoping technologies to support the effectiveness of the deterrent early on so that the deterrent is designed to work with those complementary technologies, and they can be in place as soon as possible because a lock deterrent alone will not fully realize the potential habitat enhancement value of this program.

Describe how the plan expands habitat corridors or complexes and/or addresses habitat fragmentation:

Preliminary data from both the BAFF and uADS installations suggest that sound-based invasive carp deterrents have little impact on native fish passage. These are the primary deterrent types to be evaluated for installation in

the lock at LD5. However, data are limited and effects may vary with location. Monitoring both invasive carp and native fish passage before and after installation of the deterrent will be needed to assess deterrent effectiveness and impacts. This project will incorporate telemetry and/or other technologies to assess passage, to be determined during scoping.

One of the technologies to support the effectiveness of the lock deterrent that we propose implementing as part of this project is a trap-and-sort system. The deterrent could guide fish to a trap where fish could be sorted and the invasive carp removed, preventing them from repeatedly challenging the lock deterrent and crowding the lock approach while potentially decreasing downstream abundance of invasive carp. This would require assessment of the available options, siting, design, and building a trap to capture, sort, and remove invasive carp – ideally, using technology with fish identification software to sort fish and minimize staffing requirements. Because this would be the first application of such a facility in combination with a lock deterrent, evaluation and adaptive management would be required. If such a system were able to distinguish between invasive carp and native fish, this system could pass native fish species over the dam, thereby reducing the impacts of habitat fragmentation from that dam on the Mississippi River.

Which top 2 Conservation Plans referenced in MS97A.056, subd. 3a are most applicable to this project?

- Other : Minnesota Invasive Carp Action Plan
- Upper Mississippi River and Great Lakes Region Projects Joint Ventures Plan

Explain how this plan will uniquely address habitat resilience to climate change and its anticipated effects on game, fish & wildlife species utilizing the protected or restored/enhanced habitat this proposal targets.

Climate change trends in Minnesota have been observed to include increased average precipitation and more intense precipitation; heavy rains are now more common in Minnesota and more intense than at any time on record. The USACE will open dam gates during periods of high water, which allow fish to pass unimpeded past the dam, and a deterrent at the lock will not reduce fish passage when dam gates are open. Technologies to support the future effectiveness of the deterrent that we propose testing as part of this project include intermittent use of sound, carbon dioxide, or other deterrents during those open river conditions to prevent invasive carp passage through dam gates, and gate manipulations to minimize invasive carp passage.

Which LSOHC section priorities are addressed in this program?

Southeast Forest

- Protect, enhance, and restore habitat for fish, game, and nongame wildlife in rivers, cold-water streams, and associated upland habitat

Outcomes

Programs in southeast forest region:

- Other ~ *Outcome for this project will be installation of a lock deterrent for invasive carp at Lock and Dam No. 5; depending on availability of funds not spent or obligated for design, installation, and operation of the deterrent, technologies to support the effectiveness of the deterrent will have outcomes including further reducing invasive carp passage at LD5, measuring and evaluating the effectiveness of the deterrent at reducing passage of invasive carp and reducing impacts of invasive carp.*

Per MS 97A.056, Subd. 24, Please explain whether the request is supplanting or is a substitution for any previous funding that was not from a legacy fund and was used for the same purpose.

These funds are not supplanting any previous funding that was not from a legacy fund and was used for the same purpose.

How will you sustain and/or maintain this work after the Outdoor Heritage Funds are expended?

A lock deterrent at Lock and Dam 5 will have ongoing operations and maintenance costs which are currently uncertain. In addition, technologies to support the effectiveness of the LD5 invasive carp program will need to be implemented and supported through the life of the deterrent. A plan and funds for removal of the deterrent system and restoration of the site will also be needed per USACE permitting requirements. Monitoring the effectiveness of the LD5 invasive carp program will be ongoing to support adaptive management. Funding for ongoing implementation of this work will need to be identified and secured during the later phases of this project and could include future proposals to the Outdoor Heritage Fund to continue the work.

Actions to Maintain Project Outcomes

Year	Source of Funds	Step 1	Step 2	Step 3
FY2029-2033	Unknown; would explore OHF, other state funds, federal grants	Operations and maintenance of deterrent; cost estimates TBD	-	-
FY2029-2033	Unknown; would explore OHF, other state funds, federal grants	Continued testing and implementation of technologies to support efficacy of LD5 invasive carp program and continued monitoring of LD5 invasive carp program; cost estimates TBD	-	-
FY2029-2033	Unknown; would explore OHF, other state funds, federal grants	Removal of deterrent system and restoration of site; cost ~\$1.5 M	-	-

Provide an assessment of how your program celebrates cultural diversity or reaches diverse communities in Minnesota, including reaching low- and moderate-income households:

The Minnesota DNR has adopted advancing diversity, equity and inclusion (DEI) as a key priority in its 2020-22 strategic plan. The plan focuses on increasing the cultural competence of our staff, creating a workforce that is reflective of Minnesota, continuing to strengthen tribal consultation and building partnerships with diverse communities. DNR’s OHF projects aim to serve all Minnesotans. This project, by reducing the impacts of invasive carp upstream of LD5 on the Mississippi River, will help to protect Minnesota’s cultural heritage and protect urban fishery resources that are accessible to large numbers of Minnesotans, including those who may not have easy access to other natural spaces.

Activity Details

Requirements

If funded, this program will meet all applicable criteria set forth in MS 97A.056?

Yes

Will restoration and enhancement work follow best management practices including MS 84.973 Pollinator Habitat Program?

No

Explain why the work will not follow best management practices:

Not applicable to this project; work for this project will take place in the Mississippi River and on already developed Lock and Dam infrastructure on the River.

Is the restoration and enhancement activity on permanently protected land per 97A.056, Subd 13(f), tribal lands, and/or public waters per MS 103G.005, Subd. 15 or on lands to be acquired in this program?

Yes

Where does the activity take place?

- Public Waters

Land Use

Will there be planting of any crop on OHF land purchased or restored in this program, either by the proposer or the end owner of the property, outside of the initial restoration of the land?

No

Will insecticides or fungicides (including neonicotinoid and fungicide treated seed) be used within any activities of this program either in the process of restoration or use as food plots?

No

Timeline

Activity Name	Estimated Completion Date
ACTIVITY 1 – Interagency project plan	January 31, 2025
ACTIVITY 2 - Scoping	July 1, 2025
Activity 2.1: Operations and maintenance planning	June 30, 2026
Activity 2.2: Scoping technologies to support the effectiveness of the deterrent	June 30, 2025
ACTIVITY 3 - Design	July 1, 2026, as per the appropriation language
ACTIVITY 4 – Permitting	January 31, 2027
ACTIVITY 5 - Installation	June 30, 2029, as per the appropriation language

Date of Final Report Submission: 11/01/2029

Availability of Appropriation: Subd. 7.

Availability of Appropriation

(a) Money appropriated in this section may not be spent on activities unless they are directly related to and necessary for a specific appropriation and are specified in the accomplishment plan approved by the Lessard-Sams Outdoor Heritage Council. Money appropriated in this section must not be spent on indirect costs or other institutional overhead charges that are not directly related to and necessary for a specific appropriation. Money appropriated for fee title acquisition of land may be used to restore, enhance, and provide for public use of the land acquired with the appropriation. Public-use facilities must have a minimal impact on habitat in acquired lands.

(b) Money appropriated in this section is available as follows:

(1) money appropriated for acquiring real property is available until June 30, 2028;

(2) money appropriated for restoring and enhancing land acquired with an appropriation in this section is available for four years after the acquisition date with a maximum end date of June 30, 2032;

(3) money appropriated for restoring or enhancing other land is available until June 30, 2029;
(4) notwithstanding clauses (1) to (3), money appropriated for a project that receives at least 15 percent of its funding from federal funds is available until a date sufficient to match the availability of federal funding to a maximum of six years if the federal funding was confirmed and included in the original approved draft accomplishment plan; and (5) money appropriated for other projects is available until the end of the fiscal year in which it is appropriated.

Budget

Budget reallocations up to 10% do not require an amendment to the Accomplishment Plan.

Totals

Item	Funding Request	Leverage	Leverage Source	Total
Personnel	\$1,000,000	-	-	\$1,000,000
Contracts	\$5,996,000	-	-	\$5,996,000
Fee Acquisition w/ PILT	-	-	-	-
Fee Acquisition w/o PILT	-	-	-	-
Easement Acquisition	-	-	-	-
Easement Stewardship	-	-	-	-
Travel	\$9,000	-	-	\$9,000
Professional Services	\$2,880,000	-	-	\$2,880,000
Direct Support Services	\$105,000	-	-	\$105,000
DNR Land Acquisition Costs	-	-	-	-
Capital Equipment	\$2,000,000	-	-	\$2,000,000
Other Equipment/Tools	-	-	-	-
Supplies/Materials	\$10,000	-	-	\$10,000
DNR IDP	-	-	-	-
Grand Total	\$12,000,000	-	-	\$12,000,000

Personnel

Position	Annual FTE	Years Working	Funding Request	Leverage	Leverage Source	Total
Project Manager - to manage partnerships, timelines, and communications	1.0	5.0	\$500,000	-	-	\$500,000
Contracts Specialist - to manage contract and professional services awards efficiently and in compliance with policies and procedures	1.0	5.0	\$500,000	-	-	\$500,000

Capital Equipment

Item	Funding Request	Leverage	Leverage Source	Total
Deterrent	\$2,000,000	-	-	\$2,000,000

Amount of Request: \$12,000,000

Amount of Leverage: -

Leverage as a percent of the Request: 0.0%

DSS + Personnel: \$1,105,000

As a % of the total request: 9.21%

Easement Stewardship: -

As a % of the Easement Acquisition: -

How will this program accommodate the reduced appropriation recommendation from the original proposed requested amount?

Not applicable

Does this project have the ability to be scalable?

No

Personnel

Has funding for these positions been requested in the past?

No

Contracts

What is included in the contracts line?

Contracts will include funding for deterrent installation, construction, operation and maintenance related costs, and other necessary contracts.

Professional Services

What is included in the Professional Services line?

- Design/Engineering
- Surveys

Travel

Does the amount in the travel line include equipment/vehicle rental?

No

Explain the amount in the travel line outside of traditional travel costs of mileage, food, and lodging

Travel will include mileage, food, and lodging.

I understand and agree that lodging, meals, and mileage must comply with the current MMB Commissioner Plan:

Yes

Direct Support Services

How did you determine which portions of the Direct Support Services of your shared support services is direct to this program?

Direct Support Services is determined by a standard DNR process taking into account the amount of funding and the number of allocations made with that funding.

Federal Funds

Do you anticipate federal funds as a match for this program?

No

Output Tables

Acres by Resource Type (Table 1)

Type	Wetland	Prairie	Forest	Habitat	Total Acres
Restore	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	2	2
Total	-	-	-	2	2

Total Requested Funding by Resource Type (Table 2)

Type	Wetland	Prairie	Forest	Habitat	Total Funding
Restore	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	\$12,000,000	\$12,000,000
Total	-	-	-	\$12,000,000	\$12,000,000

Acres within each Ecological Section (Table 3)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Acres
Restore	-	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-	-
Protect in Easement	-	-	-	-	-	-
Enhance	-	-	2	-	-	2
Total	-	-	2	-	-	2

Total Requested Funding within each Ecological Section (Table 4)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Funding
Restore	-	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-	-
Protect in Easement	-	-	-	-	-	-
Enhance	-	-	\$12,000,000	-	-	\$12,000,000
Total	-	-	\$12,000,000	-	-	\$12,000,000

Average Cost per Acre by Resource Type (Table 5)

Type	Wetland	Prairie	Forest	Habitat
Restore	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-
Protect in Easement	-	-	-	-
Enhance	-	-	-	\$6,000,000

Average Cost per Acre by Ecological Section (Table 6)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest
Restore	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	\$6,000,000	-	-

Target Lake/Stream/River Feet or Miles

Parcels

Parcel Information

Sign-up Criteria?

No

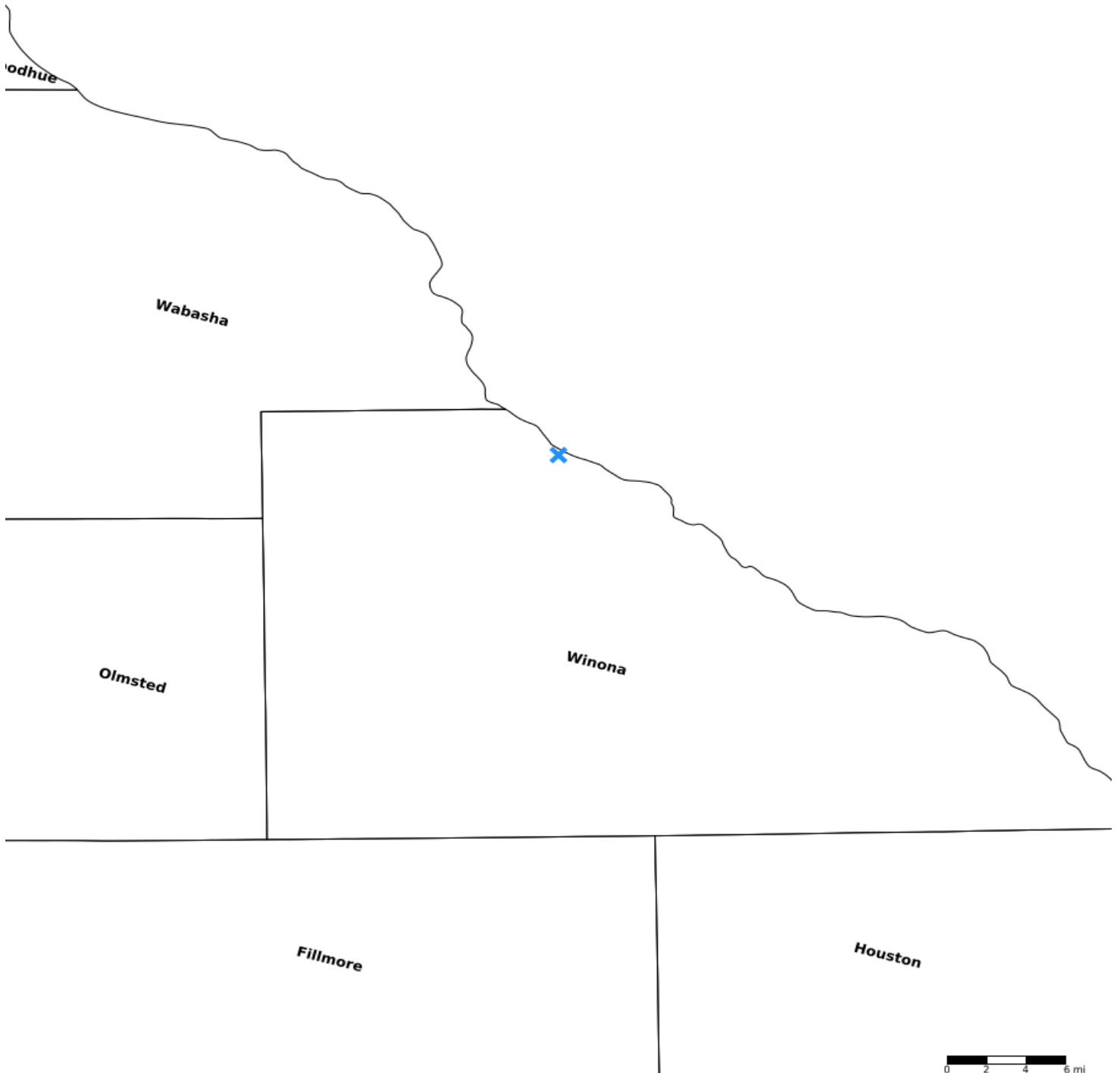
Explain the process used to identify, prioritize, and select the parcels on your list:

Lock and Dam 5 has been identified as a location for a lock deterrent based on feasibility studies that have found, for example, that while Lock and Dam 5 has gates that are opened during high flows, these conditions are relatively less frequent at Lock and Dam 5 compared to Locks and Dams 2-8.

Restore / Enhance Parcels

Name	County	TRDS	Acres	Est Cost	Existing Protection	Description
Adjacent to Lock and Dam 5 on the Mississippi River	Winona	10808017	2	\$12,000,000	Yes	Invasive carp deterrent at Lock and Dam 5

Parcel Map



- Protect in Easement
- ▲ Protect in Fee with PILT
- Protect in Fee W/O PILT
- ★ Restore
- ✕ Enhance
- ⊕ Other