



LEGACY FUND RESTORATION EVALUATION REPORT

Technical Panel Findings and Recommendations—2024



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REPORT TO THE MINNESOTA LEGISLATURE

Senate Environment and Natural Resources Finance Committee

Senate Environment and Natural Resources Policy and Legacy Finance Committee

House Environment and Natural Resources Finance and Policy Committee

House Legacy Finance Committee

Lessard-Sams Outdoor Heritage Council

Clean Water Council

Parks and Trails Legacy Advisory Committee

Submitted by the Minnesota Department of Natural Resources (DNR) and the Minnesota Board of Water and Soil Resources (BWSR)

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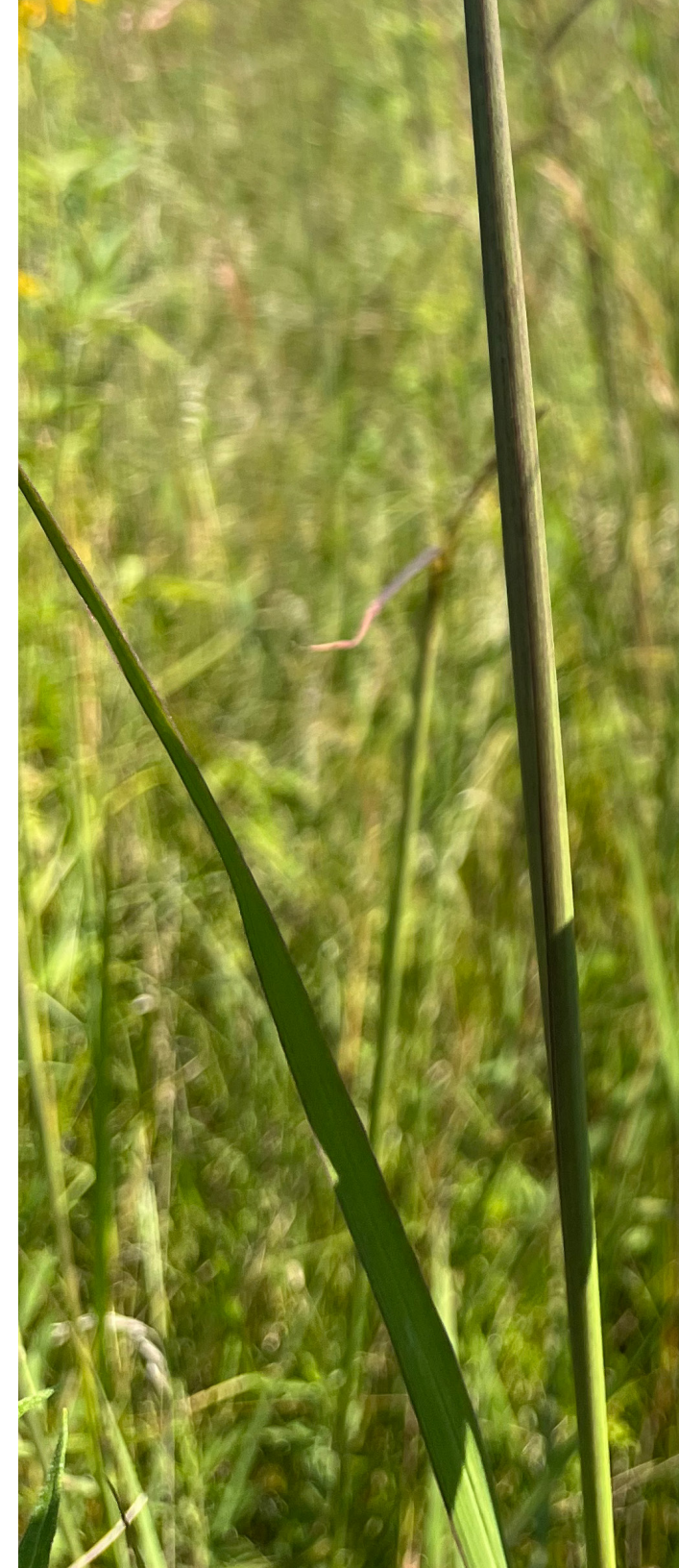
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EXECUTIVE SUMMARY



When Minnesotans passed the Clean Water, Land and Legacy Amendment in 2008, they did so with high expectations. As projects have moved forward throughout the state, so too have efforts to ensure that the projects are meeting those expectations.

This report summarizes annual work to evaluate Legacy Fund restorations. This effort is intended to support project partners in maximizing the impact of Minnesotan's investment. The Minnesota Department of Natural Resources (DNR), Minnesota Board of Water and Soil Resources (BWSR) (agencies), and the restoration evaluation panel (panel), continue to work together to improve restorations throughout the state. The panel is composed of experts from state and other resource agencies and academic institutions.

This report summarizes evaluations of 28 projects done in 2024, and panel recommendations based on 301 evaluations conducted since 2012. Projects evaluated in 2024 are largely on track to meet stated goals and utilizing current science. However, the panel did identify areas for improvement including:

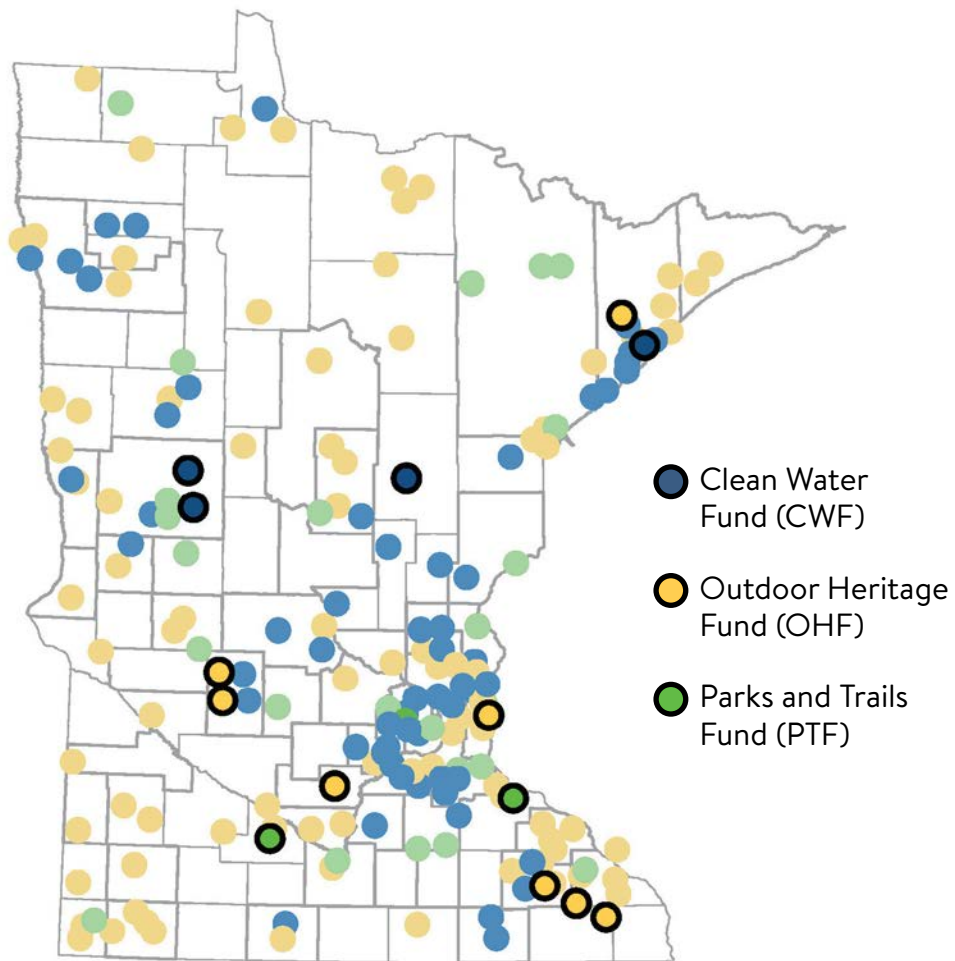
- Detailed restoration project documentation.
- Review by technical experts.
- Best practices for goat browsing.
- Minimum design criteria for lakeshore projects.

New and ongoing recommendations from the panel are presented in the Recommendations section. These recommendations are promoted by program staff through reports, presentations, and targeted trainings.

PROJECTS EVALUATED

PROJECTS EVALUATED IN 2024

Dots may represent more than one project site. Circled dots represent projects evaluated in 2024; plain dots represent projects evaluated in previous years. Project evaluations from 2024 are available in Appendix A Program Process and Project Evaluations.



2024 EVALUATIONS SUMMARY



EVALUATED PROJECTS

Projects were completed using three Legacy Funds:

- Clean Water Fund (CWF)
- Outdoor Heritage Fund (OHF)
- Parks and Trails Fund (PTF)

	CWF	OHF	PTF	All Funds
Project sites in evaluation program pool	573	9,510	1,437	11,520
Project sites evaluated in 2024	10	15	3	28
Project sites evaluated to date 2012 - 2024	117	145	39	301

STATUTE CHARGE

As statute directs, projects are evaluated relative to the law, current science and stated goals. Statute also directs the panel to determine any problems with the implementation and provide recommendations on improving future restorations. Detailed project evaluations are provided in Appendix A Program Process and Project Evaluations.

STATED GOALS

Most projects evaluated to date (76%) were on track to meet or exceed their stated goals. Ongoing monitoring and maintenance are generally required for these projects to provide habitat and other benefits into the future.

Projects goals include:

- Allowing tree seedlings to establish above browse height.
- Increase forest stand diversity, structure and natural regeneration.
- Increase pollinator habitat.
- Remove invasive woody vegetation in grassland habitat.

- Maintain open grassland and oak savanna habitat. Release oak trees from competition.
- Support wildlife during all seasons.
- Slow runoff and sediment erosion to lakes.
- Reduce density of woody shrubs in bluff prairie and oak woodland with goat browsing.
- Increase abundance and diversity of native plants in oak savanna and woodlands.
- Restore remnant prairie by reducing cover of woody vegetation.
- Establish 50 prairie plant species to benefit pollinators and other wildlife.
- Reduce invasive shrubs to less than 25% cover.
- Convert cropland to native prairie cover.
- Thin tree canopy to allow oak regeneration and native groundcover establishment.

CURRENT SCIENCE

Most projects evaluated to date (85%) utilized best practices within the range of current science. However, the panel identified opportunities to improve the use of current science. These opportunities for improvement include:

- Retention of installed plants and seed lists.
- Effective treatment of invasive plants in site preparation and management.

PROBLEMS WITH IMPLEMENTATION

Restoration projects take place in dynamic and complex landscapes. Most projects to date (70%) were implemented without problems. While not all problems can be predicted or prevented, the panel identified situations where problems arose that could be avoided in the future.

Problems with implementation include:

- Lack of site-specific restoration plans.
- Installed trees not appropriate for hydrology.
- Issues with maintaining goats on site.
- Insufficient treatment of invasive species.



RESTORATION EVALUATION PANEL RECOMMENDATIONS

A critical component of restoration evaluations is identifying issues and providing guidance to project managers to improve future restorations.

Statute directs the panel to determine
...any problems with the implementation of restorations, and if necessary, recommendations on improving restorations.

The emphasis of reporting is also directed in statute

...the report shall be focused on improving future restorations.



ONGOING PANEL RECOMMENDATIONS



Improved Documentation - *Expanded in this report.*

Documentation is critical for planning, tracking, and achieving successful restorations.

Improved Project Review by Technical Experts - *Expanded in this report.*

Utilize technical experts in the review and planning of complex projects.

Improved Design Criteria for Lakeshore Projects - *Expanded in this report.*

Utilize minimum design criteria to mimic shoreline's natural structure and vegetation.

Improved Project Teams

More comprehensive project teams should be used to improve ecological outcomes.

Improved Restoration Training

Continued development and implementation of training is essential to promote science-based practices.

Improved Planning for Stream Projects

Detailed project planning and consistent implementation will produce the best outcomes in stream restoration.

Improved Vegetation for Stream Projects

Well established vegetation is critical for the long-term success of stream projects.

Phased Approach for Buckthorn Management

A phased approach to buckthorn management that incorporates the timing and sequencing of actions is needed to achieve effective, long-term control.

Improved Seed Selection and Implementation

Guidance during early planning for seed mix selection and implementation is needed to support more consistent planting success.

Climate Change Contingency Planning

Contingency plans for variable weather conditions are an important part of restoration planning in a changing climate, especially for native vegetation establishment.

Improved Alum Treatment Approach

Consider lake characteristics, longevity of treatment and specific monitoring needs.

Improved Implementation of Common Carp Barriers

Utilize integrated pest management plans, site specific designs and pair with other management efforts.

Details regarding Ongoing Panel Recommendations are available on the evaluation program website:

www.dnr.state.mn.us/legacy/restoration-evaluation.html

NEW PANEL RECOMMENDATIONS



BEST PRACTICES FOR GOAT BROWSING

Strategic prescribed goat browsing is an effective and efficient restoration practice when paired with other ongoing management actions. Goats can be effective for suppressing sprouts of woody invasives such as buckthorn, bush honeysuckle and sumac at a scale that may be cost prohibitive or inaccessible for hand control and herbicide treatment methods. However, goats provide only temporary

suppression of invasives and can potentially have impacts to desirable species and plant communities.

Legacy Fund restorations reviewed to date that utilize goat browsing have generally applied appropriate planning, specifications and management to achieve restoration goals. The panel identified a set of key considerations and practices needed to effectively integrate goat browsing in a restoration process:

GOAT GUIDANCE FOR PROJECT MANAGERS

- Establish a phased, sequential approach in site restoration plans that strategically incorporates goats.
- Create a sound rotational grazing plan indicating goat breed, age and numbers, operator requirements for paddock size/location, grazing days, rest periods, fencing, as well as quantifiable measures for modifying browse intensity.
- Identify potential impacts to non-target species and sensitive sites, erosion etc. and establish thresholds for modifying.

- Monitor frequently to guide adaptive management of herd size, timing and frequency.
- Create metrics and triggers to guide decision making e.g. percent of site denuded of vegetation triggers moving off paddock.
- Establish clear direction for operators and flexibility in contracts to allow for adaptive management e.g. increase/decrease number of goats based on performance.
- Use herds that are effective at managing target species.
- Goat herd operators can encourage goats to focus on target species e.g. buckthorn, sumac, by introducing these prior to arriving on site.
- Include sheep as needed to target ground level species.
- Seeding with early successional native cool-season species may be needed to create competition for invasives and fuel for prescribed fire. Prescribed fire is typically an important follow-up management strategy.



Washington County

ROLE OF FUNDING ORGANIZATIONS

- Establish criteria for project managers to identify, plan and manage appropriate goat browse projects.

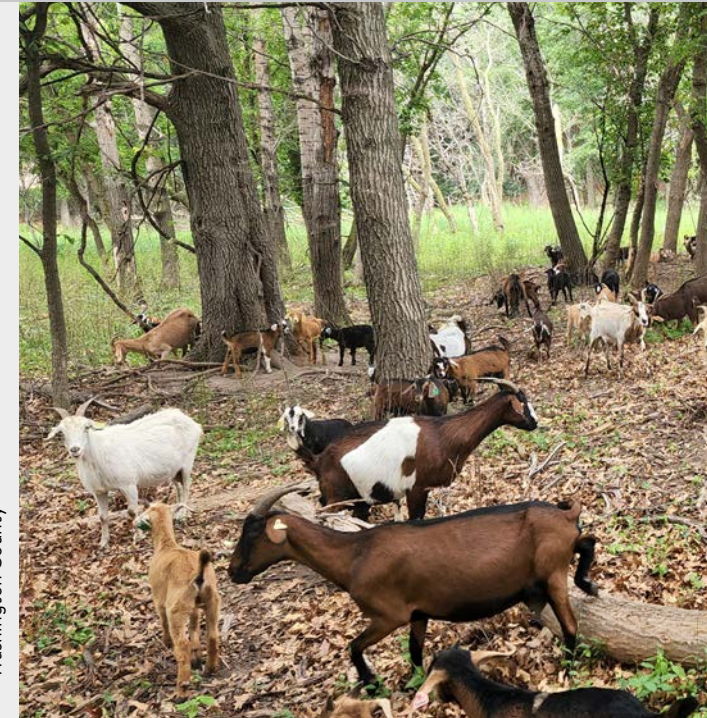
ROLE OF STATE AGENCIES

- Provide technical expertise on considerations for land managers proposing and developing plans for utilizing goats.

CONTINUED LEARNING

Ongoing research on the use of goats in restoration continues to inform management:

mitppc.umn.edu/research/research-projects/goat-grazing-invasive-plant-control



Washington County



Washington County

ONGOING PANEL RECOMMENDATIONS

CONTINUED RECOMMENDATION FOR IMPROVED REVIEW BY TECHNICAL EXPERTS

The panel re-emphasized the recommendation that project managers utilize technical experts in the review and planning of complex projects. Project outcomes will benefit from this review by incorporating current science and best practices more consistently across the state.

ROLE OF PROJECT MANAGERS/ PARTNERS

- Identify projects early where technical capacity is needed for planning and implementation.
- Engage state agency, local government units, and technical experts early in the planning phase.

ROLE OF FUNDING ORGANIZATIONS

- Request project managers identify technical capacity needs in their request.
- Identify and refer project managers to the appropriate resources and staff to fit those needs.
- Develop processes to promote technical review throughout the project process, including concept development, funding application, planning, design, and oversight of completion as planned.

ROLE OF STATE AGENCIES

- Provide technical experts to add capacity to complex projects during planning and implementation.
- Consult with project managers regarding design solutions and technical specifications.
- Improve networks for technical assistance and collaboration with partners such as University of Minnesota Extension.



CONTINUED RECOMMENDATION FOR IMPROVED DOCUMENTATION

Documentation is an essential component through all stages of a restoration project. Well documented projects have these attributes and benefits:

- Clear project goals linked directly to desired outcomes provide managers and stakeholders with consistent assumptions.
- Easily observable, quantifiable measures of success allow for the effective tracking of progress towards desired outcomes and directing future actions.
- Facilitate improved communication of lessons learned to benefit future projects.
- Provide a basis to evaluate outcomes and determine if projects are strategic conservation investments.

Consistent documentation of planning and implementation data is a prerequisite of effective projects. While many Legacy Fund restoration projects have included thorough documentation, the Restoration Evaluation Panel have noted gaps in achieving a consistent level of documentation across all funded projects.

Most commonly, project plans have been deficient in providing clear goals and quantifiable measures of success. Implemented actions are often well documented but not explicitly linked to the overall goal(s) of the funded project. There are also instances of installed lists of plants and seed being unavailable.

ROLE OF PROJECT MANAGERS/ PARTNERS

- Consistently document restoration project data in a simple accessible format.
- Designate one project partner to permanently store project data.
- Collect and retain installed plant material information to understand how plant species selection and origin affects restoration outcomes to inform future work.
- Ensure that details of implemented actions are recorded and coupled with the initial plan. This includes actual materials used and lists of installed planted and seeded species.

ROLE OF FUNDING ORGANIZATIONS

- Provide targeted training and grant guidance for project managers.
- Develop checklist of key project data to be archived by project partners, including reporting that connects stated goals with achieved outcomes.

BWSR's Native Vegetation Establishment and Enhancement Guidelines provides further guidance on key aspects of vegetation planning and management: bwsr.state.mn.us/node/8806

ONGOING PANEL RECOMMENDATIONS



CONTINUED RECOMMENDATION FOR IMPROVED REVIEW FOR LAKESHORE PROJECTS

Utilize minimum design criteria to mimic shoreline's natural structure and vegetation

The Panel observed instances where the benefits of lakeshore restoration projects were minimal. The Panel recommends that project managers establish consistent minimum design criteria as guidance for lakeshore projects. Lakeshore projects that achieved greater ecological benefits shared the following attributes:

- Designed at a scale to provide significant water quality and habitat benefits based on current science.
- Sited based on a clear need (gully erosion, bank erosion) and/or strategically positioned in the landscape (to intercept an appreciable area of upland runoff with a disturbed landcover type, several times larger than the property or project site).

Existing local government programs have effectively used minimum design criteria and achieved successful outcomes and abundant participation. Implementation of minimum criteria, such as a native vegetation buffer of at least 75% of the

shoreline length and at least 25 feet landward of the Ordinary High Water Level, provide a more appropriate example for promoting social adoption of natural shoreline practices and a greater support for achieving larger restoration goals. Bioengineering practices that rely primarily on vegetation and natural materials for shoreline stabilization should also be considered priority techniques. Design criteria should be established by project managers to accommodate specific project types, such as upland runoff buffer or shoreline habitat restorations. Adaptability to specific conditions and constraints is vital to ensuring effective design guidance.

ROLE OF PROJECT MANAGERS

Establish minimum design criteria based on programmatic goals and local conditions; integrate with existing direction for shoreline restoration from Total Maximum Daily Load or local water plan.

- Utilize guidance from state agencies and area technical assistance staff to identify appropriate criteria.
- Specify minimum design criteria in lakeshore BMP agreements (between LGU project managers and landowners).
- Evaluate potential projects for minimum design criteria and identify pathways to ensure criteria are met before moving forward.







LAKE ELMO PARK RESERVE WASHINGTON COUNTY PARKS

RESTORING POLLINATOR AND SAVANNA HABITAT

Eighty percent of the more than 2,000 acre Lake Elmo Park Reserve is set aside for preservation and restoration of forests, lakes and grasslands. The Park Natural Resource Management Plan details the resources and provides direction for desired conditions, and specific prioritized management actions. With this direction, Washington County Parks received Outdoor Heritage Fund, Conservation Partners Legacy (CPL) grants to implement ongoing prairie and savanna restoration.

One of these grants focused on creating prairie habitat for the endangered rusty patched bumble bee. Managers utilized guidance from US Fish and Wildlife Service and Xerces Society to direct plant species selection and create measurable monitoring goals. Measurable goals such as establishing greater than 50% cover of appropriate foraging habitat provide managers with consistent tools to monitor and adapt practices.

CPL project sites near Eagle Point Lake focused on restoring oak savanna structure and plant communities where it had become overgrown with weedy species such as buckthorn and honeysuckle. Managers used a phased approach to achieve project goals including:

1. Mechanical removal of undesirable trees and shrubs.
2. Strategic forestry mowing and goat browse of weedy species resprouts.
3. Selective herbicide treatment.
4. Seeding of early successional grass species to enable prescribed fire for future management.

Monitoring shows the measurable goals for these sites has been achieved or exceeded. Ongoing monitoring and management by Washington County Parks indicate lasting habitat benefits from these restoration actions.

RESTORATION HIGHLIGHTS

- Rusty patched bumble bee habitat restoration guidance used to direct methods and seeded species.
- Goat browsing used strategically and adapted as needed.
- Detailed documentation of actions, materials used and timeline.
- Planned and documented measurable restoration goals.
- Measures for achieving goals are continually assessed through ongoing monitoring.

Rusty patched bumble bee on a mint flower



Jessica Peterson



IMPROVING FUTURE RESTORATIONS

Maximizing the benefits of Legacy Funded restorations requires evaluating projects to learn what's working, engaging experts to promote current science, and communicating recommendations so they can be implemented.



EVALUATING PROJECTS

In 2024, we evaluated 28 projects. In addition to visiting several lakeshores, prairies, forests and savanna project sites, we visited projects in new counties completed by a variety of project managers. Combining these evaluations with previously completed site visits provides a broader view of the implementation of Legacy Funds, the benefits they are providing, and opportunities to maximize the benefits of the funds for Minnesotans.

ENGAGING EXPERTS

A goal of the Legacy Fund Restoration Evaluation Program is to facilitate the technical exchange between restoration experts and practitioners. This begins in the field with state or contracted site assessors and project managers discussing implemented restoration practices and shared experience on the ground. Program staff and site assessors then draft site evaluation reports. These reports are presented to the panel annually by site assessors and program staff to discuss challenges and successes across Legacy Funded restoration projects. This technical exchange forms the recommendations for the Annual Report and future communications to stakeholders.

PROGRAM ACTIVITIES

2012-2024

301

PROJECTS EVALUATED
(ALL HABITAT TYPES)

317

EXPERTS
ENGAGED

COMMUNICATING WITH STAKEHOLDERS

For panel recommendations to make a difference, they need to be communicated to the stakeholders engaged in planning, funding, and implementing restorations in the state.

One way our program is meeting this goal is collaborating with the University of Minnesota Extension on a continuing webinar series focused on improving restoration practices. Since 2021 we have organized and held 16 webinars featuring more than 30 experts presenting and engaging participants on topics related to the evaluation panel's recommendations for improvement, including climate change, invasives management and documenting restoration planning and management.

MORE THAN
6,000
STAKEHOLDERS
REACHED

ADDITIONAL RESOURCES

RESTORATION EVALUATION PROGRAM WEBSITE

dnr.state.mn.us/legacy/restoration-evaluation.html

APPENDIX A PROGRAM PROCESS AND PROJECT EVALUATIONS

leg.state.mn.us/edocs/edocs?oclcnumber=823766285





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