III. Completed Research Projects

"a summary of any research project completed in the preceding biennium;"

The following documents include:

- Summaries of accomplishments of all projects completed in FY 2023 and FY 2024, by appropriation year.
- Spreadsheet of all research projects completed in FY 2023 and FY 2024, by appropriation year.

Additional information:

- Abstracts describing the general accomplishments of each completed project and links to final reports are located online at http://www.lccmr.mn.gov.
- 188 projects were completed with a total of $156,127,645.
- Legal citations for completed projects:
  1. M.L. 2022, Chapter 94, Section 2
  2. M.L. 2021, First Special Session, Chapter 6, Article 6, Section 2
  3. M.L. 2020, First Special Session, Chapter 6, Article 5, Section 2
  4. M.L. 2019, First Special Session, Chapter 4, Article, 2, Section 2
  5. M.L. 2018, Chapter 214, Article 4, Section 2
  6. M.L. 2017, Chapter 96, Section 2
  7. M.L. 2016, Chapter 186, Section 2
  8. M.L. 2015, Chapter 76, Section 2

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
1	6/30/2023	2015	06a	----	Minnesota Invasive Terrestrial Plants and Pests Center	U of MN - MITPPC	Robert Venette	$ 5,000,000	The Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) funded 20 research sub-projects through this appropriation to better protect Minnesota lands from the harmful effects of 14 priority invasive species, such as garlic mustard, soybean aphid, and oak wilt. MITPPC discoveries improved TIS management across Minnesota.
2	6/30/2023	2015	06a-01	----	Subproject 06a-01: Garlic Mustard Biocontrol: Ecological Host Range of Biocontrol Agents	U of MN - MITPPC	Roger Becker	*$ 600,000*	We were integral in the release of Ceutorhynchus scrobicollis in Canada, the first biological control agent for garlic mustard in North America. We moved closer to federal regulatory approval to release C. scrobicollis and C. constrictus in the United States. When achieved, these will offer the first viable control of garlic mustard in Minnesota woodlands.
3	6/30/2023	2015	06a-02	----	Subproject 06a-02: Mountain Pine Beetle, Phase II: Protecting Minnesota	U of MN - MITPPC	Brian Aukema	*$ 444,982*	Repeated surveys did not find mountain pine beetle in Minnesota. Scant few individuals were captured dispersing far from active infestations in western states. We found that local bark beetles and predators do not optimally recognize the insect's chemical signals, however, suggesting that such components of invasion resistance might be low.
4	6/30/2023	2015	06a-03	----	Subproject 06a-03: Biological Control of the Soybean Aphid by Aphelinus Certus	U of MN - MITPPC	George Heimpel	*$ 479,859*	Results of this study indicate that the parasitoid Aphelinus certus provides sufficient mortality of soybean aphids to substantially decrease the need to apply insecticides against this pest.
5	6/30/2023	2015	06a-04	----	Subproject 06a-04: Decreasing Environmental Impacts of Soybean Aphid Management	U of MN - MITPPC	Robert Koch	*$ 570,000*	Management of soybean aphid relies on applications of broad-spectrum insecticides. This work aimed to decrease insecticide use and ameliorate associated environmental impacts through development of aphid-resistant soybean and advancement of remote scouting.
6	6/30/2023	2015	06a-05	----	Subproject 06a-05: Optimizing Tree Injections against Emerald Ash Borer	U of MN - MITPPC	Brian Aukema	*$ 318,927*	Emerald ash borer continues to spread and devastate Minnesota's urban forests, but deploying the right types of insecticides to ash trees in the right ways can offer tree conservation and protection with minimal risk to non-target organisms such as bees that visit flowers and worms that decompose leaves.
7	6/30/2023	2015	06a-06	----	Subproject 06a-06: Distribution and Traits of the Fungal Pathogen Fusarium Virguliforme that Influence Current and Future Risk to Soybean and Other Legumes in Minnesota	U of MN - MITPPC	Dean Malvick and Kathryn Bushley	*$ 383,651*	This project has discovered factors that influence the ability of the fungus Fusarium virguliforme to become established as a destructive pathogen on crops in new areas of Minnesota. The results are foundational to understanding this pathogen and contribute to managing the diseases it causes on soybean and other crops.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
8	6/30/2023	2015	06a-07	----	Subproject 06a-07: Tools to Distinguish Native from Exotic Reed Canary Grass	U of MN - MITPPC	Neil O. Anderson	$ 263,273	This project used genetic techniques to find that most reed canarygrass in Minnesota is native to the state and not from Europe. Plant DNA was extracted from samples of reed canarygrass across the state. Due to this outcome, Tribal and State managers may choose to manage or preserve this species differently.
9	6/30/2023	2015	06a-08	----	Subproject 06a-08: Accurate Detection and Integrated Treatment of Oak Wilt (Ceratocystis fagacearum) in Minnesota	U of MN - MITPPC	Jeannine Cavender-Bares	$ 356,382	This project developed methods and approaches for better detection of oak wilt using spectroscopic technology and documented best practices to prevent spread of the disease.
10	6/30/2023	2015	06a-09	----	Subproject 06a-09: Characterizing Dispersal of Larval Gypsy Moth to Improve Quarantine Regulations	U of MN - MITPPC	Brian Aukema	$ 35,000	We conducted laboratory experiments to determine how host type and food deprivation affected movement of gypsy moth caterpillars. Results indicated risks of larvae crossing a regulatory buffer zone may increase where an outbreak results in complete defoliation of preferred hosts like oaks.
11	6/30/2023	2015	06a-10	----	Subproject 06a-10: Management Strategies for the Invasive Spotted Wing Drosophila	U of MN - MITPPC	Mary Rogers	$ 477,541	Our project developed new cost-effective methods to help growers manage damage and reduce yield loss caused by the invasive Spotted-wing drosophila in small fruit while reducing pesticide use. Additionally, we have gained basic knowledge on the behavior and flight capabilities of this pest that will contribute to future management strategies.
12	6/30/2023	2015	06a-11	----	Subproject 06a-11: Will Future Weather Favor Minnesota's Woody Invaders?	U of MN - MITPPC	Peter Reich	$ 526,000	Our findings tell the story of how exotic honeysuckle and buckthorn have invaded Minnesota forests, how and why new areas are likely to be invaded in the future, and how we may be able to mitigate invasion using native tree species.
13	6/30/2023	2015	06a-12	----	Subproject 06a-12: Developing Robust Identification Assays for Amaranthus Palmeri in Seed Mixture	U of MN - MITPPC	Don Wyse	$ 208,230	This project created a highly reliable test for detecting Palmer Amaranth, in individual plants and pools of seed. The test is expected to be commercially available and will be an important tool for Minnesota farmers, crop consultants, and agronomic specialists. Palmer amaranth can reduce corn and soybean yields by 80-90%.
14	6/30/2023	2015	06a-13	----	Subproject 06a-13: Terrestrial Invasive Species Prioritization	U of MN - MITPPC	Amy Morey	$ 71,461	This project produced written risk evaluations of 77 terrestrial invasive species requested for review by MITPPC stakeholders, and assisted with the 2020 update of the MITPPC prioritization analysis. Thorough review of species allows MITPPC to be dynamic and transparent in how it responds to emerging TIS threats and stakeholder concerns.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
15	6/30/2023	2015	06a-14	----	Subproject 06a-14: Improved Detection and Future Management of Leafy Spurge and Common Tansy using Remote Sensing, Mechanistic Species Distribution Models, and Landscape Genomics	U of MN - MITPPC	David Moller and Ryan Briscoe Runquist	$ 70,812	Cutting-edge deep learning computer models, large scale field experiment, and genomic analyses were used to improve predictions of invasive range expansion for leafy spurge and common tansy. In both species, we found substantial genetic and phenotypic evolution that may impact their invasive risk and change future strategic decision making.
16	6/30/2023	2015	06a-16	----	Subproject 06a-16: Effects of Puccinia species complex on common buckthorn (Rhamnus cathartica)	U of MN - MITPPC	Pablo Olivera Firpo	$ 26,908	Project being completed under ML 2021, First Special Session, Ch 6, Art 5, Sec 2, Subd 6a
17	6/30/2023	2015	06a-17	----	Subproject 06a-17: Studies of entomopathogenic fungi for effective biocontrol of the emerald ash borer, Phase 2	U of MN - MITPPC	Robert Blanchette	$ 33,000	Project being completed under ML 2021, First Special Session, Ch 6, Art 5, Sec 2, Subd 6a
18	6/30/2023	2015	06a-18	----	Subproject 06a-18: Incorporating adaptation into forecasts of range shifts with climate change	U of MN - MITPPC	Ryan Briscoe Runquist	$ 33,000	Project being completed under ML 2021, First Special Session, Ch 6, Art 5, Sec 2, Subd 6a
19	6/30/2023	2015	06a-19	----	Subproject 06a-19: Genetic control of invasive insect species: Phase 3	U of MN - MITPPC	Michael Smanski	$ 50,000	Project being completed under ML 2021, First Special Session, Ch 6, Art 5, Sec 2, Subd 6a
20	6/30/2023	2015	06a-20	----	Subproject 06a-20: Making revegetation as part of buckthorn management feasible in Minnesota	U of MN - MITPPC	Michael Schuster	$ 40,000	Project being completed under ML 2021, First Special Session, Ch 6, Art 5, Sec 2, Subd 6a
21	6/30/2023	2016	06a	----	Minnesota Invasive Terrestrial Plants and Pests Center - Phase III	U of MN - MITPPC	Robert Venette	$ 3,750,000	The Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) funded 10 research sub-projects through this appropriation to protect Minnesota lands from the harmful effects of 11 priority invasive species such as common buckthorn, emerald ash borer (EAB), and several knotweeds. Results from these projects were featured prominently by local media.
22	6/30/2023	2016	06a-01	----	Subproject 06a-01: Fungi in Ash Trees: Towards Protecting Trees from Emerald Ash	U of MN - MITPPC	Robert Blanchette	$ 500,000	Important new findings have been obtained about the fungi associated with the emerald ash borer (EAB). This knowledge helps better understand the biology and ecology of EAB invasion and provides new biological control agents that can be used to help manage this invasive pest.
23	6/30/2023	2016	06a-02	----	Subproject 06a-02: Understanding the Benefits and Limitations of using Goats for Invasive Plant Control	U of MN - MITPPC	Tiffany Wolf	$ 410,267	Targeted grazing by goats demonstrates some benefits for the control of invasive Rhamnus cathartica and the enhancement of native plant communities. While P. tenuis transmission to goats remains a concern during invasive plant management, co-grazing goats with waterfowl may mitigate this seasonal disease risk.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
24	6/30/2023	2016	06a-03	----	Subproject 06a-03: Genetic Control of Invasive Insect Species: Phase I	U of MN - MITPPC	Michael Smanski	$ 295,717	We have demonstrated (in lab cages) a powerful new approach to combat invasive insect pests. Genetically engineered male insects would be released to mate with wild females, who would not have offspring. This can crash a wild population, and it is applicable to any sexually reproducing insect.
25	6/30/2023	2016	06a-04	----	Subproject 06a-04: Dwarf Mistletoe Detection and Management in Minnesota	U of MN - MITPPC	Marcella Windmuller-Campione	$ 455,606	We were able to identify key considerations for the early detection of the invasive American dwarf mistletoe on jack pine, including different detection methods and the need for field-level biology and identification education for foresters and loggers.
26	6/30/2023	2016	06a-05	----	Subproject 06a-05: Developing Spatially Explicit Bio-economic Dispersal Model to Aid with the Management of Brown Marmorated Stink Bug	U of MN - MITPPC	Senait Senay	$ 329,304	We developed a high resolution, spatially explicit, agent-based dispersal model for H. halys and results were published as "Effects of Starvation, Age, and Mating Status on Flight Capacity of Laboratory-Reared Brown Marmorated Stink Bug (Hemiptera: Pentatomidae)" in Environmental Entomology Volume 50, Issue 3, June 2021.
27	6/30/2023	2016	06a-06	----	Subproject 06a-06: Management of Invasive Knotweeds	U of MN - MITPPC	Alan Smith	$ 476,723	Three distinct species of knotweeds and their hybrids were confirmed present from the sampling. Cold tolerance measures indicate all knotweeds have the potential to grow throughout Minnesota and into colder climates. Seed production is inconsistent among populations and dispersal appears to be predominantly asexual and human facilitated. These data predict seed dispersal will become more prevalent, increasing diversity and the probability of resistance to herbicides and other management practices.
28	6/30/2023	2016	06a-07	----	Subproject 06a-07: Building Mechanistic and Process based Species Distribution Models for Common Tansy and Leafy Spurge: from Landscapes to Genomes	U of MN - MITPPC	David Moller and Ryan Briscoe Runquist	$ 351,188	Cutting-edge deep learning computer models, large scale field experiment, and genomic analyses were used to improve predictions of invasive range expansion for leafy spurge and common tansy. In both species, we found substantial genetic and phenotypic evolution that may impact their invasive risk and change future strategic decision making.
29	6/30/2023	2016	06a-08	----	Subproject 06a-08: Using Plants to Control Buckthorn: an Expanded Approach	U of MN - MITPPC	Peter Reich	$ 560,000	Many of Minnesota's forests are degraded by buckthorn invasion. Management is challenging because buckthorn typically returns quickly after removal. We found seeding wild rye grasses (in areas with >10% canopy openness) or densely planting shrubs and trees following initial herbicide application reduced buckthorn re-establishment concurrent with increased native cover.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
30	6/30/2023	2016	06a-09	----	Subproject 06a-09: Genetic control of invasive insects, Phase 2	U of MN - MITPPC	Michael Smanski	$ 55,100	Genetic biocontrol provides a non-toxic approach to control invasive pests. The Smanski lab pioneered a version of this technology for relatives of spotted wing drosophila. They demonstrated the feasibility and robustness of the technology in laboratory environments and explored strategies to ensure environmental safety.
31	6/30/2023	2016	06a-10	----	Subproject 06a-10: Novel Diagnostic Tools for Rapid and Early Detection of Oak Wilt	U of MN - MITPPC	Abdennour Abbas	$ 170,637	Oak wilt is a tree disease that causes major losses to Minnesota's forests, natural resources and economy every year. One of the key solutions to fighting this disease is early detection to enable timely decision making and prevention. The research effort conducted in this project over the last two years led to a successful development of a new technology for oak wilt detection in the field. The technology will soon be used in the field to enable early detection and prevention.
32	6/30/2023	2017	03n	----	Pollinator Research and Outreach	U of MN	Daniel Cariveau	$ 500,000	We installed 20 pollinator plantings in the Minnesota tallgrass prairie regions to study the effectiveness of restorations for conserving native bees. We collected nearly 25,000 native bee specimens from approximately 156 species. We found at least three new state records. We also organized a grower-led field day.
33	6/30/2023	2017	07d	----	District Heating with Renewable Biomass at Camp Ripley Training Center	Department of Military Affairs	Jay Brezinka	$ 1,000,000	The scope of this project was to install a biomass heating plant that would service seven buildings, including mechanical and distribution systems. We received an architect estimate and the base cost for the project in total was $7,122,035. The project was therefore canceled and funds returned to ENRTF.
34	6/30/2023	2017	08k	----	Conservation Reserve Enhancement Program (CREP) Outreach and Implementation	Board of Water and Soil Resources	Dusty VanThuyne	$ 6,000,000	This project assisted farmers and landowners in enrolling in conservation practices on environmentally sensitives lands by enrolling in the MN CREP program. Through this project, locally trusted staff in 49 counties were able to promote the MN CREP program and assist landowners in permanently protecting 29,350 acres.
35	6/30/2023	2017	08l	----	Conservation Reserve Enhancement Program (CREP)	Board of Water and Soil Resources	Sharon Doucette	$ 13,500,000	MN CREP is a federal/state partnership to improve water quality and provide habitat in 54 counties in southern and western Minnesota by establishing buffers, restoring wetlands, and protecting groundwater resources. This $13.5 million ENRTF project leveraged $16.5 million from USDA to restore and protect over 3,900 acres on 74 easements.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
36	6/30/2023	2017	09h	----	Tower Trailhead Boat Landing and Habitat Improvement – Phase II	City of Tower	Nancy Larson	$ 600,000	Construction of a trailhead and kiosk, a connecting trail to the Mesabi Trail, and an accessible kayak launch, plus natural habitat development will connect existing recreational and natural resource assets on the East Two River waterway to Lake Vermilion and enhance the outdoor recreation experience for multiple users in northeast Minnesota.
37	6/30/2023	2018	03i	----	Improve Trout-Stream Management by Understanding Variable Winter Thermal Conditions	U of MN	Rebecca Swenson	$ 400,000	Conservation plans are based largely on summer dynamics between fish, food sources, and water temperatures. Yet, winter-emerging aquatic insects, primarily Chironomidae, are a locally abundant and critical resource for trout. This project provides insights about winter air and water temperatures, lifecycles of aquatic insects, and impacts on stream food webs.
38	6/30/2023	2018	05l	----	Increase Diversity in Environmental Careers to Serve Minnesota's Changing Demographics	MN DNR	Mimi Daniel	$ 550,000	The Increasing Diversity in Environmental Careers (IDEC) program fosters the next generation of environmental and natural resources professionals and enthusiasts. From 2019 to 2023, 45 students enrolled in the IDEC program learned about and gained hands-on experience in the environmental/natural resources field. As a result, as these students become professionals, they will bring diversity and innovation to natural resources management and conservation.
39	6/30/2023	2018	09h	----	Protecting North-Central Minnesota Lakes	Crow Wing Soil and Water Conservation District	Andrew Seagren	$ 750,000	A correlation between forestland protection and water quality has been identified. We provided funding to restoration practices on public lands and protected 1,982 acres of private lands via conservation programs. Land protection efforts were guided by atlases that provided a method to prioritize and target high quality parcels.
40	6/30/2023	2018	09i	----	Easement Program for Native Prairie Bank	MN DNR	Judy Schulte	$ 2,000,000	Permanently protected 249 acres of high-quality historically undisturbed native prairie, which house state threatened and special concerns species, Species in Greatest Conservation Need and a wide variety of pollinators. Prairie enhancement (903 acres), outreach, monitoring and research activities were implemented across the state to improve prairie habitat.
41	6/30/2023	2018	09j	----	Minnesota State Trail Development	MN DNR	Kent Skaar	$ 2,500,000	Pending

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
42	06/30/2023	2018	09k	----	Minnesota State Parks and State Trails	MN DNR	Shelby Kok	$ 2,500,000	Acquisition of Minnesota State Park and State Trail land provides permanent, effective and consolidated protection and management of pristine natural areas representative of diverse landscapes throughout the entire state of Minnesota for perpetual enjoyment by State Park and Trail users.
43	6/30/2023	2018	09l	----	Scientific and Natural Areas Program	MN DNR	Judy Schulte	$ 3,250,000	Volunteers and contractors with Minnesota DNR completed enhancement activities on over 1,300 acres on 73 Minnesota SNAs. The new 215-acre Little Mantrap Lake SNA with over a mile of undeveloped shoreline, 14 native plant communities and a known population of an extremely rare orchid was protected for all to benefit.
44	6/30/2023	2018	10b	----	Chronic Wasting Disease Targeted Outreach Engaging Culturally-Diverse Hunting Communities	U of MN	Tiffany Wolf	$ 270,468	Our project advances inclusive chronic wasting disease (CWD) management through collaboration with Tribal, southeast Asian, and Amish communities. Insights from surveys and interviews inform culturally-attuned CWD outreach, endorsing thriving deer populations while honoring cultural heritage. Our efforts promote community-engaged CWD response strategies to protect Minnesota deer health and community well-being.
45	6/30/2023	2019	03a	----	Minnesota Biological Survey	MN DNR	Bruce Carlson	$ 1,500,000	The Minnesota Biological Survey (MBS) collects, interprets, and delivers foundational data on native and rare plants, animals, plant communities, and functional landscapes. These data help prioritize actions to conserve, manage, and restore Minnesota's biological diversity and ecological systems.
46	6/30/2023	2019	03e	----	Spruce Grouse as Indicators for Boreal Forest Connectivity	U of MN - Raptor Center	Julia Ponder	$ 350,000	We suggest that forest management to promote dense understory structure in boreal forest may provide climate refugia for various species of early successional forest wildlife. The landscape context should also be considered in forest planning in a changing climate to ensure that landscape connectivity is managed to meet wildlife needs.
47	6/30/2023	2019	03f	----	Understanding Brainworm Transmission to Find Solutions for Minnesota Moose Decline	U of MN	Tiffany Wolf	$ 400,000	We created new knowledge regarding the ecological context of Parelaphostrongylus tenuis transmission that will aid wildlife and forest managers considering management actions as they try to conserve Minnesota's at-risk moose population.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
48	6/30/2023	2019	03h	----	Accelerated Aggregate Resource Mapping	MN DNR	Heather Arends	$ 700,000	Minnesota Department of Natural Resources completed and distributed aggregate maps for the following four counties: Sibley, Swift, Redwood, and Kandiyohi. Maps assist governments in planning and conserving of competing resources. Knowing where aggregates are located, supports resilient communities and informed land use decision-making.
49	6/30/2023	2019	03k	----	Implementing Conservation Plans for Avian Species of Concern	Audubon Minnesota	Alexandra Wardwell	$ 124,000	Audubon established benchmark survey sites, to guide future conservation activities within Important Bird Areas, for three species of conservation concern: Black Tern, Common Tern and Yellow Rail. Audubon established these important benchmark survey locations for these species, while also working closely to build increase collaboration and communication with many partners.
50	6/30/2023	2019	03l	----	Mapping Aquatic Habitats for Moose	U of MN	Joseph Bump	$ 199,000	This project mapped key water habitats used by moose in northern Minnesota, assessed relationship of moose to aquatic plant and fish diversity, and developed research & educational materials about moose ecology and conservation. The primary outcome is a better understanding of important moose habitat in Minnesota.
51	6/30/2023	2019	03s	----	Native Bee Survey	MN DNR	Jessica Petersen	$ 600,000	This project greatly expanded the conservation status of bees in the Laurentian Mixed Forest. We identified 255 species from 9,000 specimens. We made five new state records including one new record for the United States, many new county records, and new plant associations. From these data we will build a list of species in need of conservation.
52	6/30/2023	2019	03t	----	Diagnostic Test for Chronic Wasting Disease	U of MN	Peter Larsen	$ 1,804,000	We invented the world's first portable 24-hour CWD test (Minnesota-QuIC) and a 4-hour microfluidic CWD test. These tests will undergo USDA validation and will be made available to agencies tasked with controlling the spread of CWD. Our innovative CWD outreach activities and products reached over 28,000 Minnesotans.
53	6/30/2023	2019	04a	----	Determining Influence of Insecticides on Algal Blooms	U of MN	William Arnold	$ 350,000	Neonicotinoid and fipronil insecticides are present in lakes, rivers, springs, and shallow groundwater across Minnesota often at concentrations exceeding chronic toxicity thresholds for aquatic invertebrates. The compounds were detected in wastewater, stormwater, and rain/snow, indicating multiple sources to Minnesota waters. No clear association with algal blooms was found.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
54	6/30/2023	2019	04b	----	Benign Design: Environmental Studies Leading to Sustainable Pharmaceuticals	U of MN	William Arnold	$ 415,000	Insight into how fluorinated pesticides and pharmaceuticals present in Minnesota's waters degrade when exposed to sunlight was gained. Some compounds degrade to non-toxic fluoride, while others lead to fluorinated byproducts that may continue to impact the environment. The knowledge was used to help design new medically relevant fluorinated molecules.
55	6/30/2023	2019	04e	----	Improving Nitrogen Removal in Greater Minnesota Wastewater Treatment Ponds	U of MN	Paige Novak	$ 325,000	Inadequately treated wastewater in rural communities contributes to environmental/human health issues. We studied how to improve rural wastewater treatment pond performance. Our results suggested that manually increasing oxygen supply when temperatures are greater than 10°C should improve ammonia biodegradation; if temporary, total nitrogen removal should be possible, improving rural water quality.
56	6/30/2023	2019	04f	----	Improving Drinking Water for Minnesotans through Pollution Prevention	U of MN	Raymond Hozalski	$ 345,000	This project comprehensively studied the spatio-temporal occurrence of N-nitrosodimethylamine (NDMA, a potent carcinogen) precursors in the Crow River watershed as well as treatment approaches for NDMA precursor removal. The project results will aid in evaluation and mitigation of potential risks from NDMA formation during disinfection of drinking water with chloramines.
57	6/30/2023	2019	04g	----	Protecting Minnesota Waters by Removing Contaminants from Wastewater	U of MN	Matt Simcik	$ 250,000	It is possible to drive microplastics and some PFAS into the biosolids of a wastewater treatment plant using stabilized powdered activated carbon. However, the amount required may make the technology cost prohibitive, and may affect the operation of the plant. Further improvements may bring costs down and enable unencumbered operation.
58	6/30/2023	2019	04h	----	Reducing Municipal Wastewater Mercury Pollution to Lake Superior	Minnesota Pollution Control Agency	Scott Kyser	$ 250,000	This study identifies wastewater treatment technologies and mechanisms that municipalities can use to treat mercury to low-levels. Cost-effective wastewater technologies that treat solids can be leveraged to also treat mercury to low-levels and this information can be used to reduce discharged mercury which protects the environment and human health.
59	6/30/2023	2019	04j	----	Transformation of Plastic Waste into Valued Resource	U of MN	Brett Barney	$ 225,000	Our project identified prominent strains within microbial communities obtained from Minnesota waters that are able to degrade problem plastics such as polyethylene. In many cases, individual microbial strains were isolated and sequenced to provide a blueprint of strain features that enable this ability to degrade plastics.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
60	6/30/2023	2019	04l	----	Farm-Ready Cover Crops for Protecting Water Quality	Central Lakes College - Ag and Energy Ctr	Keith Olander	$ 741,000	By integrating Kura Clover and Camelina into row crop production we were able to supply producers with data about crop production and water quality impacts to influence adoption. Camelina demonstrates promise when double cropped with soybeans and Kura Clover can be an aggressive nitrogen scavenger and offer opportunities in forage production.
61	6/30/2023	2019	04q	----	Restoring Impaired Lakes through Citizen-Aided Carp Management	Carver County Water Management Organization	Andrew Dickhart	$ 106,000	This project demonstrated new innovative methods of carp management that includes local volunteer residents. The use of baited box nets and an electric guidance system produced an integrated and multi-faceted approach to long term carp management, which we know is important given the longevity of the species.
62	6/30/2023	2019	04r	----	Spring Biological Nitrate Removal to Protect Drinking Water	City of Fairmont	Tyler Cowing	$ 175,000	The city constructed a passive nitrate removal system optimized for spring low temperature treatment and partnered with the University of Minnesota to evaluate this field scale model. The results show that the concept of warming the water for early spring treatment works; however, treatment was hindered by algae growth in the greenhouse.
63	6/30/2023	2019	04s	----	Degrading Chlorinated Industrial Contaminants with Bacteria	U of MN	Paige Novak	$ 150,000	A group of bacteria exist that can “breathe” chlorinated pollutants. Naturally occurring chlorinated compounds are formed when leaves and pine needles break down. We discovered that these naturally occurring compounds can speed the rate at which chlorinated pollutants are degraded when added as an amendment.
64	6/30/2023	2019	05b	----	Connecting Students to the Boundary Waters	Friends of the Boundary Waters Wilderness	Chris Knopf	$ 450,000	This project connected over 6,000 Minnesota students to the wildlife, ecology, and history of the Boundary Waters through online resources, classroom visits, and provided opportunities for students to develop deep connections to the wilderness, leadership, and positive peer relationships through overnight wilderness trips.
65	6/30/2023	2019	06a	----	Building Knowledge and Capacity to Solve AIS Problems	U of MN - MAISRC	Nicholas Phelps	$ 4,000,000	This project continued MAISRC’s work to develop research-based solutions that can reduce the impacts of aquatic invasive species in Minnesota. Through this appropriation, MAISRC has supported 12 subprojects on many of Minnesota’s most important AIS, significantly advanced our scientific understanding and ability to manage AIS, and engaged thousands of stakeholders and partners.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
66	6/30/2023	2019	06a-21.2	----	Subproject 06a-21.2: Field Validation of Mulitbeam Sonar Zebra Mussel Detection (Year 2)	U of MN - MAISRC	Jessica Kozarek	$ 228,764	Invasive mussels are a major threat to Minnesota's aquatic ecosystems, water infrastructure, and recreation. This project tests the feasibility of using multibeam sonar to map mussel habitat and distribution over large areas. This information will greatly enhance monitoring efforts and direct management and treatment efforts.
67	6/30/2023	2019	06a-22.2	----	Subproject 06a-22.2: Assessing and Refining Copper-Based Treatment to Suppress Zebra Mussel populations	U of MN - MAISRC	Diane Waller	$ 249,056	Low-dose copper treatment can greatly reduce zebra mussel settlement at less cost and with less risk to native species compared to eradication treatments using maximum allowable copper concentration. We determined how long a mussel population is suppressed after low-dose copper treatment and the short- and long-term impacts to native species.
68	6/30/2023	2019	06a-23.2	----	Subproject 06a-23.2: AIS and Tourism - A Socio-Economic Assessment	U of MN - MAISRC	Amit Pradhananga	$ 249,088	Minnesota's businesses and visitors to key tourist destinations are concerned about the ecological impacts of aquatic invasive species, and value efforts to manage AIS. While businesses are willing to share information about AIS with customers. Programs to engage businesses in AIS management are needed.
69	6/30/2023	2019	06a-25.2	----	Subproject 06a-25.2: Examining Motivations for Illegal Baitfish Release	U of MN - MAISRC	Nicholas Phelps	$ 74,636	Minnesota anglers care about our fish and aquatic ecosystems, but don't always know the laws and practices they can do to help keep them safe from invasive species. Focused communications emphasizing shared responsibility and social norms around proper bait disposal could reduce illegal release and consequently, AIS introduction risk.
70	6/30/2023	2019	06a-28.2	----	Subproject 06a-28.2: Enzyme-Based Coatings to Suppress Priority AIS	U of MN - MAISRC	Mikael Elias	$ 187,480	Biofouling clumps all submerged structures and is a vector for aquatic invasive species. Current countermeasures are toxic. We work on some eco-friendly, protein products that could advantageously replace these chemicals and preserve our environment.
71	6/30/2023	2019	06a-33	----	Subproject 06a-33: Optimizing eDNA Monitoring for Multiple Aquatic Invasive Species	U of MN - MAISRC	Josh Dumke	$ 436,331	Environmental DNA (eDNA) is a useful tool we can use to survey waterbodies for Aquatic Invasive Species. Understanding how we can use eDNA to detect different AIS will allow us to most efficiently look for existing and new invasive species throughout Minnesota, protecting vulnerable lakes from harmful aquatic invaders.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
72	6/30/2023	2019	06a-35	----	Subproject 06a-35: Genetic Biocontrol of Invasive Species - Understanding Attitudes and Risk Perceptions	U of MN - MAISRC	David Fulton	$ 209,313	A majority of respondents perceived benefits to genetic biocontrol of AIS and expressed positive attitudes and support for the use of genetic biocontrol of Aquatic Invasive Species in general and specifically for common carp and zebra mussels. However, a majority of respondents also expressed concerns about perceived risks associated with genetic biocontrol.
73	6/30/2023	2019	06a-36	----	Subproject 06a-37: RNA-Interference Screens for Zebra Mussel Biocontrol Target Genes	U of MN - MAISRC	Daryl Gohl	$ 255,979	In this project we began to test RNA interference (RNAi) as a novel form of genetic biocontrol for zebra mussels. While we have not identified robust RNAi phenotypes, this project laid the groundwork for further research into zebra mussel genetic biocontrol by developing new tools and methods.
74	6/30/2023	2019	06a-37	----	Subproject 06a-37: Improving the Efficiency of Watercraft Inspections through Coordination and Cooperation	U of MN - MAISRC	Amy Kinsley	$ 198,241	We developed a series of models that considered state and county-level planning and how county-level collaborations could impact programming efficiency. Our results suggest that watercraft inspection plans involving collaborations between counties that share information about inspection location plans can lead to gains in efficiency when compared to non-collaborative planning.
75	6/30/2023	2019	06a-38	----	Subproject 06a-38: Evaluating Native Phragmites as a Wastewater Treatment Alternative	U of MN - MAISRC	Daniel Larkin	$ 355,122	An obstacle to invasive Phragmites (European common reed) control is its use for dewatering biosolids in wastewater treatment facilities (WWTFs). We assessed the transpiration rates of native and invasive Phragmites to find an optimal WWTF substitute. Our findings confirm invasive Phragmites remove more water than native Phragmites. For some WWTFs, native Phragmites is likely sufficient, while others will need to consider alternative technologies to transition away from invasive Phragmites.
76	6/30/2023	2019	06a-39	----	Subproject 06a-39: Increasing Effectiveness of Bigheaded Carp Deterrents by Carbon Dioxide Integration	U of MN - MAISRC	Allen Mensinger	$ 340,327	Carbon dioxide shows potential to enhance either bubble curtain or acoustic deterrents to prevent the upstream passage of invasive bigheaded carp in the Minnesota's waters.
77	6/30/2023	2019	06a-40	----	Subproject 06a-40: Enhancing Habitat and Diversity in Cattail-Dominated Shorelines	U of MN - MAISRC	Amy Schrank	$ 338,066	Our results suggest that mechanical removal of invasive, hybrid cattails has the potential to restore nearshore lake ecosystems with few negative impacts to other species. Invasive cattail removal increases dissolved oxygen and provides space for native plants to regrow, thereby restoring high quality fish habitat and benefitting lake fish communities.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
78	6/30/2023	2019	06c	----	Noxious Weed Detection and Eradication	Minnesota Department of Agriculture	Mark Abrahamson	$ 1,000,000	This project supported noxious weed management on priority species at both the State and local levels and helped to establish and build support systems that will assist noxious weed management efforts beyond the conclusion of the project.
79	6/30/2023	2019	06d	----	Emerald Ash Borer Response Grants	MN DNR	Emma Schultz	$ 300,000	Minnesota's community forests will lose 2.65 million ash trees due to the impacts of the invasive pest emerald ash borer. These funds were used to administer $300,000 in grants to local units of government for planting ecologically appropriate trees to address ash loss on public land.
80	6/30/2023	2019	07c	----	Sustainable Solar Energy from Agricultural Plant By-Products	U of MN - Morris	Ted Pappenfus	$ 185,000	New materials were developed from agricultural byproducts for use in the fabrication of printed organic solar cells that will lead to a more sustainable, low-cost, renewable energy source in Minnesota.
81	6/30/2023	2019	07d	----	Morris Energy and Environment Community Resilience Plan	City of Morris	Blaine Hill	$ 150,000	This project added capacity in west central MN and Morris to think about sustainability initiatives including clean energy, community resilience, gathering and analyzing building performance data, and community outreach and education focused on MN's changing climate and how it affects west central Minnesotans.
82	6/30/2023	2019	08b	----	Promoting and Restoring Oak Savanna Using Silvopasture	U of MN	Rebecca Montgomery	$ 750,000	We evaluated cattle grazing as an oak savanna restoration tool, compared to prescribed burning and tree thinning. Adaptive targeted grazing reduced overgrown shrubs with minimal impacts on wildlife, water quality, or soil health. We promoted this grazing strategy by developing training workshops, webinars, online resources, and a farmer-to-farmer learning network.
83	6/30/2023	2019	08d	----	Conserving and Monitoring of Minnesota's Rare Arctic Plants	U of MN - Duluth	Briana Gross	$ 135,000	Through three years of genetic and field study, we found that the rare arctic relict plants of Minnesota have retreated northward since the 1900s. They will likely decline into the future, and one species is threatened by an aggressive invasive species. Protection and education are critical to preserve these unique species.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
84	6/30/2023	2019	08e	----	Nongame Wildlife Program Acceleration	MN DNR	Kristin Hall	$ 513,000	Project outcomes for the Nongame Wildlife Program Acceleration project include: 1) improved management and delivery of foundational information on nongame species. 2) new research on declining species and increased status assessment surveys of priority nongame species. 3) increased recreational opportunities through community science, and 4) the creation of a repeatable survey to measure public support for the of the Nongame Wildlife Program.
85	6/30/2023	2019	08f	----	Lawns to Legumes	Board of Water and Soil Resources	Dan Shaw	$ 900,000	The Lawns to Legumes Program is focused on building a movement to support at-risk pollinator species. The project resulted in over 2,300 high diversity residential plantings covering, 4.3 million square feet, and a large numbers of DIY projects across Minnesota inspired and guided by the program.
86	6/30/2023	2019	09b	----	Grants for Local Parks, Trails and Natural Areas	MN DNR	Audrey Mularie	$ 3,000,000	Provide 20 matching grants to local units of government for local parks, acquisition of locally significant natural areas and trails to connect people safety to desirable community locations and regional or state facilities. Park development includes nature-based recreation facilities and does not include playgrounds, sports courts or sport fields.
87	6/30/2023	2019	09h	----	Birch Lake Recreation Area Campground	City of Babbitt	Cathy Bissonette	$ 350,000	The City of Babbitt has completed a new 22-acre campground in the Birch Lake Recreation Area that will include 49 new campsites to accommodate recreational vehicles and tents. The completion of this projects allows area residents and tourists from around the country and Canada to enjoy the unique outdoor experience of Northern Minnesota.
88	6/30/2023	2019	09k	----	Bailey Lake Trail and Fishing Pier	City of Virginia	Britt See-Benes	$ 550,000	The completion of the Baileys Lake Trail and fishing pier provides the community a safe way to enjoy outdoor recreation activities, such as biking, walking, and bird watching, within a city setting. The new pier allows for safe fishing on Baileys Lake without the need for water craft.
89	6/30/2023	2019	09p	----	Rainy Lake Recreational Access and Boat Wash Station	City of Ranier	Sherill Gautreaux	$ 200,000	A new accessible boat launch and accompanying dock was installed. A city owned property was converted into a parking lot for vehicle and trailer parking. A permanent waterless AIS boat wash station and an animal proof receptacle for disposal of bait and boater garbage were also installed.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
90	6/30/2023	2019	09q	----	Historic Bruce Mine Park and Mesabi Trailhead	St. Louis & Lake Counties Regional Railroad Authority	Bob Manzoline	$ 1,000,000	The project entailed redeveloping a former mine site into a trailhead for the Mesabi Trail and provide an interpretative center and park for the Bruce Mine Headframe Historic Site located in Chisholm, MN. A self-guided tour includes an interpretive center and plaques explaining how the relics operated in the past by using the remaining structures including the headframe, railroad track and various structural foundations. The Park serves as a trailhead for the Mesabi Trail providing parking, restrooms and information to travelers and trail users.
91	06/30/2023	2020	11	2020-008	Contract Agreement Reimbursement	MN DNR, Grants Unit	Katherine Sherman-Hoehn	$135,000	This appropriation was used to support the ENRTF contract management program, which ensured that ENRTF grantees expended grant funds in compliance with state law, session law, approved work plans, and Office of Grants Management grants policies.
92	06/30/2023	2020	05b	2020-041	Minnesota Freshwater Quest: Environmental Education On State Waterways	Wilderness Inquiry	Julie Edmiston	$500,000	Wilderness Inquiry's Freshwater Quest engaged 8,833 youth across all regions of Minnesota. Using place-based outdoor environmental education, this project inspired the next generation of stewards of Minnesota's natural resources helping to preserve our state's outdoor economy and the vibrancy and health of our environment and residents.
93	6/30/2023	2020	09v	2020-097	Birch Lake Recreation Area Campground	City of Babbitt	Robecca Jaeger	$350,000	The City of Babbitt has completed a new 22-acre campground in the Birch Lake Recreation Area that will include 49 new campsites to accommodate recreational vehicles and tents. The completion of this project allows area residents and tourists from around the country.
94	06/30/2023	2021	08b	2021-039	Restoring Mussels in Streams and Lakes - Continuation	MN DNR, Ecological and Water Resources Division	Madeline Pletta	$619,000	MDNR Center for Aquatic Mussel Programs reintroduced over 4,400 native mussels into three watersheds in southeast Minnesota, bringing our total number to over 17,000 since 2016. We completed monitoring of mussels and habitat at reintroduction sites. We disseminated information through outreach events, including facility tours, presentations, and newsletters.
95	06/30/2023	2021	08f	2021-084	Restoring Upland Forests for Birds	American Bird Conservancy, Great Lakes Program	John Haben	$193,000	American Bird Conservancy (ABC) restored 12 acres of deciduous forest in partnership with Aitkin, Beltrami and Cass Counties, utilizing science-based BMP's to rejuvenate non-commercial stands for focal wildlife species. The outcomes of this project will be shared on the ABC website.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2023
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
96	06/30/2023	2021	10a	2021-027	Contract Agreement Reimbursement	MN DNR, Grants Unit	Katherine Sherman-Hoehn	$135,000	This appropriation was used to support the ENRTF contract management program, which ensured that ENRTF grantees expended grant funds in compliance with state law, session law, approved work plans, and Office of Grants Management grants policies.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
1	6/30/2024	2018	04l	---	Lake Agnes Treatment	Alexandria Lake Area Sanitary District (ALASD)	Anne Willkinson	$ 600,000	Lakes Winona, Agnes and Henry have historically contained phosphorus levels that exceeded the State's standards. The outcomes of the alum treatment to Lake Agnes resulted in a 96% reduction in internal phosphorus loading compared to pre-treatment conditions. Common carp density in Lake Winona remains high despite two removal events.
2	6/30/2024	2018	06a	---	Minnesota Invasive Terrestrial Plants and Pests Center - Phase 4	U of MN - MITPPC	Robert Venette	$ 3,500,000	The Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) funded 12 research sub-projects through this appropriation to help protect Minnesota lands from 16 priority invasive species, such as buckthorn, corn tar spot, Dutch elm disease, and non-native Phragmites. Discoveries improved detection methods and generated new management options.
3	6/30/2024	2018	06a-01	---	Subproject 06a-01: Early Detection of Invasive Tree Pathogens Using Molecular Tools for Prevention and to Mitigate Damage	U of MN - MITPPC	Robert Blanchette	*$ 383,865*	This project effectively utilized molecular tools for early detection of invasive tree pathogens in Minnesota. Fourteen previously unreported species of Phytophthora were identified. Extensive spore trapping for Heterobasidion irregulare indicated its presence in Minnesota. This research enhanced statewide efforts to monitor, prevent, and mitigate damage to Minnesota's natural resources.
4	6/30/2024	2018	06a-02	---	Subproject 06a-02: Accurate Detection of Oak Wilt Disease at Landscape Scales for Enhanced Forest Management	U of MN - MITPPC	Jeannine Cavendar-Bares	*$ 301,941*	We developed novel methods for accurate detection of trees infected with the deadly oak wilt fungal pathogen (Bretziella fagacearum) at the leaf and canopy level, landscape level and regional level using spectral biology. Using hand-held, drone-based, airborne and spaceborne sensors to capture reflected photons from trees, we detected spectral signatures of oak wilt disease by applying a series of modeling approaches. We also established a series of oak wilt sites for long-term monitoring of the efficacy of different management approaches and disseminated our findings broadly at local, regional and national level.
5	6/30/2024	2018	06a-03	---	Subproject 06a-03: Early Detection of Invasive Tree Pathogens Using Molecular Tools for Prevention and to Mitigate Damage	U of MN - MITPPC	Benjamin Held	*$ 233,924*	This subproject identified and propagated new survivor elms from Minnesota that may have resistance to Dutch elm disease (DED). We screened elms from prior years and found most trees to have very good to partial resistance thus far. Resistant trees were planted in Minnesota landscapes where elm was once common.
6	6/30/2024	2018	06a-04	---	Subproject 06a-04: Detection and Monitoring of Invasive Phragmites	U of MN - MITPPC	Joe Knight	*$ 203,781*	Through this project, we determined that Uncrewed Aircraft Systems (UAS; "drones") can be used to map invasive Phragmites stands with high accuracy and that the potential exists to identify previously unknown Phragmites patches, and to monitor known patches, using widely available remotely sensed data such as aerial imagery and lidar.
7	6/30/2024	2018	06a-05	---	Subproject 06a-05: Improve Invasive Plant Treatment Efficacy Using Climate Based Phenology Models	U of MN - MITPPC	Rebecca Montgomery	*$ 346,211*	We developed climate-based models of key phenological events (e.g. flowering, fruiting) for scheduling treatments to control invasive Japanese knotweed and wild parsnip. We created the Pesky Plant Trackers program to house the models and to train volunteers to collect phenology data, which increased their appreciation of plant life cycles.
8	6/30/2024	2018	06a-06	---	Subproject 06a-06: Biology and Biocontrol Potential of a Rust Fungus Infecting Phalaris Arundinacea and Frangula Alnus	U of MN - MITPPC	Pablo Olivera Firpo	*$ 247,507*	The presence and distribution of Puccinia coronata var. coronata (Pcc) was confirmed, generating a detailed disease description and morphological and phylogenetic data.The host specificity was also studied. Under controlled conditions, Pcc significantly reduced reed canarygrass biomass production and glossy buckthorn seedlings.
9	6/30/2024	2018	06a-07	---	Subproject 06a-07: Managing Buckthorn with Trees: Diversity, Density, and Practicality	U of MN - MITPPC	Peter Reich	*$ 499,734*	The abundance of native tree and shrub stems (regardless of identity) is a significant predictor of buckthorn re-establishment following management. This project illustrates the value of adaptive management that leverages natural tree regeneration and augments native stem densities through strategic planting.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
10	6/30/2024	2018	06a-08	---	Subproject 06a-08: Integrated Emerald Ash Borer Management: Testing a Novel Approach to Assess Stakeholder Perceptions	U of MN - MITPPC	Ingrid Schneider	$ 436,072	Virtual reality can help recreationists visualize impacts from emerald ash borer and its management. This research on social perceptions and silvicultural strategies will help natural resource managers to be more effective in selecting and communicating forest management responses to invasive species.
11	6/30/2024	2018	06a-09	---	Subproject 06a-09: Distribution, Risks, and Management of Phyllachora Maydis, the Causal Agent of Corn Tar Spot	U of MN - MITPPC	Dean Malvick	$ 176,618	Corn tar spot develops rapidly causing significant yield loss. Researchers confirmed the spread of this invasive disease; developed a DNA-based assay to detect corn tar spot; identified the environmental conditions favorable for tar spot development; and developed a new method to study the pathogen under greenhouse conditions.
12	6/30/2024	2018	06a-10	---	Subproject 06a-10: Detecting Hybrid Barberry and Investigating its Role in Rust Epidemiology	U of MN - MITPPC	Pablo Olivera Firpo	$ 206,783	A protocol for quality DNA extraction of barberry tissue and a set of 33 cost effective PACE markers were developed that can be adopted for laboratory hybrid barberry identification.
13	6/30/2024	2018	06a-11	---	Subproject 06a-11: Confronting Soybean Aphid with Advanced Plant Breeding and Remote Sensing	U of MN - MITPPC	Robert Koch	$ 292,492	This research advanced the availability of aphid-resistant soybean lines for more effective and durable control of soybean aphids without insecticides. Additionally, a tool was built to use satellite data to accurately determine if aphid infestations in soybean fields are great enough to require insecticide application to protect yield.
14	6/30/2024	2018	06a-12	---	Subproject 06a-12: Expanding and Strengthening the Prioritization of Terrestrial Invasive Species in Minnesota	U of MN - MITPPC	Amy Morey	$ 151,601	Online tools were developed to facilitate stakeholder engagement with MITPPC's species prioritization process; the biennial update of the species prioritization was completed ; 7 additional species were evaluated; it was determined that simple estimates of climate suitability, such as plant hardiness zones, are reasonable to use for MITPPC's invasive insects evaluation.
15	6/30/2024	2018	08e	---	Restoring Forests in Minnesota State Parks	MN DNR	Edward Quinn	$ 250,000	This project restored 255 acres of open fields and a previously logged area back to forested native plant communities in four state parks, where it will permanently managed and protected.
16	6/30/2024	2019	03d	---	Minnesota Trumpeter Swan Migration Ecology and Conservation	U of MN	David Andersen	$ 300,000	We tracked the movements of trumpeter swans throughout Minnesota and the greater Midwest, demonstrating that trumpeter swans have high individual variability in their seasonal migration patterns. Our project provides important ecological information on this charismatic waterfowl species that was successfully reintroduced to Minnesota.
17	6/30/2024	2019	05d	---	Increasing Diversity in Environmental Careers	MN DNR	May Yang	$ 250,000	$250,000 the first year is from the trust fund to the commissioner of natural resources in cooperation with Conservation Corps Minnesota and Iowa to encourage a diversity of students to pursue careers in environment and natural resources through internships and mentorships with the Department of Natural Resources, the Board of Water and Soil Resources, and the Pollution Control Agency. This appropriation is available until June 30, 2024, by which time the project must be completed and final products delivered.
18	6/30/2024	2019	08a	---	Saving Endangered Pollinators through Data-Driven Prairie Restoration	Minnesota Zoo	Erik Runquist	$ 800,000	We have advanced conservation of the Dakota skipper with an intensive propagation and reintroduction program, enhanced hundreds of acres of habitat that they and other prairie wildlife depend upon, and provided key insights into the stressors on their populations and environmental factors that are needed to support their recovery.
19	6/30/2024	2019	09a	---	Minnesota Scientific and Natural Areas	MN DNR	Judy Schulte	$ 3,500,000	Protected a mix of native plant communities which house state endangered and special concerns species, Species in Greatest Conservation Need and a wide variety of other species through additions to Quarry Park SNA and Grey Cloud Dunes SNA. Over 1,980 acres across 62 SNAs had restoration and enhancement activities executed.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
20	6/30/2024	2019	09c	---	Minnesota State Parks and State Trails In-Holdings	MN DNR	Shelby Kok	$ 2,000,000	Acquisition of Minnesota State Park and State Trail land provides permanent, effective and consolidated protection and management of pristine natural areas representative of diverse landscapes throughout the entire state of Minnesota for perpetual enjoyment by State Park and Trail users.
21	6/30/2024	2019	09d	---	Minnesota State Trails Development	MN DNR	Kent Skaar	$ 5,000,000	Pending
22	6/30/2024	2019	09j	---	Preserving the Avon Hills with Reverse-Bidding Easements	Saint John's University	John Geissler	$ 1,600,000	This project permanently protected 383.03 acres of high-quality forest, wetland, and grassland habitat in the ecologically rich Avon Hills while leveraging $155,341 through landowner donation of easement value. Additionally, we restored/enhanced 321.15 acres of forest, prairie/grassland, and wetland habitat on permanently protected properties in the Avon Hills.
92	06/30/2024	2020	03a	2020-074	Geologic Atlases For Water Resource Management	U of MN, MN Geological Survey	Barbara Lusardi	$2,000,000	During this phase of the ongoing Geologic Atlas program, we have printed 7 counties, and continued work in 6 others. This is equivalent to "completing" about 5 atlases. Atlas maps and data provide foundational information that supports water management activities to the benefit of drinking water and aquatic habitat.
93	06/30/2024	2020	03b	2020-023	Expanding Minnesota Ecological Monitoring Network	MN DNR, Ecological and Water Resources Division	Holly Bernardo	$800,000	In total, 226 monitoring plots were installed in The Ecological Monitoring Network (EMN). Substantial improvements were made to the EMN database, including enhanced security and connections to DNR's Natural Heritage Information System. Preliminary findings using all 412 plots are available online for land managers, conservation practitioners and decision makers.
94	06/30/2024	2020	03c	2020-009	County Groundwater Atlas	MN DNR, Ecological and Water Resources Division	Vanessa Baratta-Person	$1,125,000	The Groundwater Atlas provides foundational, science-based, information for use and management of Minnesota groundwaters. The atlas is valuable to government, industry, and for research. The grant supported work on thirteen atlases and publication of county groundwater atlases (County Atlas Part B) for Cass and Becker counties.
95	06/30/2024	2020	03g	2020-032	Improving Pollinator Conservation By Revealing Habitat Needs	U of MN, College of Biological Sciences	Colleen Satyshur	$500,000	Our wild bees need nests to grow and overwinter, yet plants used in nest construction remain poorly understood. Alongside volunteers from all ecological sections of Minnesota, we gathered plant matter from bee nests for novel analysis by spectrometry (resins) or genetic sequencing (leaves) to identify the plants these pollinators use.
96	06/30/2024	2020	03h	2020-003	Bee Minnesota – Protect Our Native Bumblebees	U of MN, College of Veterinary Medicine	Declan Schroeder	$650,000	Our goal was to assess if Minnesota native bee pollinators were at risk of disease transmission (pathogen Spillover) from honeybees. We found that honeybees and bumblebees have distinct virus communities and while they do share the same habitat, this has not resulted in widespread transmission and infection in bumblebees.
97	06/30/2024	2020	03k	2020-027	Freshwater Sponges And AIS: Engaging Citizen Scientists	U of MN, Crookston	Venugopal Mukku	$400,000	The project elicited enthusiastic participation from citizen scientists. A species unreported from Minnesota was identified. Gas Chromatography-Mass Spectrometry analysis of sponge extracts led to an intriguing discovery. 1,3,5-triphenylcyclohexane, sometimes detected in packaged foods, was detected in the extracts of about 40 sponge specimens collected from different places.
98	06/30/2024	2020	03l	2020-016	Do Beavers Buffer Against Droughts And Floods?	National Park Service, Voyageurs National Park	Steve Windels	$168,000	Project not initiated and funds returned to the ENRTF
99	06/30/2024	2020	03o	2020-007	Conserving Black Terns And Forster's Terns In Minnesota	U of MN, Duluth - NRRI	Annie Bracey	$198,000	We surveyed 67 wetlands and lakes across Minnesota to document Black and Forster's Terns nesting locations. We suggest future monitoring efforts focus on a few dozen locations where these species reliably occur in high abundance to obtain a meaningful index for detecting changes in breeding numbers across the state.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
100	06/30/2024	2020	04a	2020-037	Managing Highly Saline Waste From Municipal Water Treatment	U of MN, College of Science and Engineering	Natasha Wright	$250,000	$250,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota to develop a cost- and energy-efficient method of managing the concentrated saline waste from a municipal water treatment plant to increase the feasibility of using reverse osmosis for centralized water softening and sulfate removal. This appropriation is subject to Minnesota Statutes, section 116P.10.
101	06/30/2024	2020	04e	2020-055	Quantifying New Urban Precipitation and Water Reality	U of MN, College of Science and Engineering	Joe Magner	$500,000	$500,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota to better guide storm water management by evaluating the groundwater and surface water interactions contributing to high water tables and damage to home basements and underground infrastructure in urban areas.
102	06/30/2024	2020	04f	2020-034	Innovative Solution for Protecting Minnesota from PFAS Contamination	Dem-Con	Bill Keegan	$250,000	Given that it is unclear when the regulatory environment will be stabilized, Dem-Con is withdrawing our current project from LCCMR and returning the funds for reallocation to other projects benefitting Minnesota.
103	06/30/2024	2020	05a	2020-059	Statewide Environmental Education Via Public Television Outdoor Series	Pioneer PBS	Cindy Dorn	$300,000	Pioneer PBS produced 26 new episodes of Prairie Sportsman, a statewide television series designed to inspire Minnesotans to connect with the outdoors and protect our valuable natural resources. Broadcast in 2022 and 2023, the two 13-episode seasons feature a wide range of topics filmed throughout the state.
93	06/30/2024	2020	05c	2020-061	Teach Science: Schools as STEM Living Laboratories	Climate Generation	Lindsey Kirkland	$250,000	In schools, the environment and infrastructure surrounding students can bring science practices to life. TeachScience teachers increased their confidence in environmental education topics and practiced effective teaching strategies proven to build stronger conservation and sustainability ethic in students. Students experienced hands-on learning opportunities; connecting environmental learning opportunities to their curriculum.
94	06/30/2024	2020	05d	2020-038	Mentoring the Next Generation of Conservation Professionals	Minnesota Valley National Wildlife Refuge Trust Inc	Deborah Loon	$500,000	"Mentoring the Next Generation of Conservation Professionals" employed 16 emerging professionals in full-time developmental positions over two years on the Minnesota Valley National Wildlife Refuge. Participants worked alongside USFWS professionals in conservation biology, visitor services, community outreach and environmental education as they learned, built skills, and explored conservation careers.
95	06/30/2024	2020	05e	2020-036	Jay C. Hormel Nature Center Supplemental Teaching Staff	City of Austin	Luke Reese	$225,000	Over three years, funding from the ENRTF through the LCCMR enabled the Jay C. Hormel Nature Center to engage over 4,500 students outside Austin and provide 50% more summer programming. Curricula designed to foster environmental ethics reached many additional families, contributing to the protection of Minnesota's natural resources.
96	06/30/2024	2020	05g	2020-069	Yes! Students Take On Water Quality Challenge II	Prairie Woods Environmental Learning Center	Kalley Pratt	$199,000	Since the start of this grant, 650 students across 35 YES Teams have completed 130 eco-action projects, impacting over 65,000 community members. Students volunteered 2,800 hours, partnering with 145 experts. Projects addressed water conservation, invasive species, and more, with over 36 workshops held statewide.
97	06/30/2024	2020	05h	2020-021	Engaging Minnesotans With Phenology: Radio, Podcasts, Citizen Science	Northern Community Radio, Inc.	Sarah Bignall	$198,000	The Engaging Minnesotans with Phenology project empowered over 89 educators and 2,500 students to connect deeply with nature. By airing 749 student reports and producing weekly podcasts, we inspired communities to engage with the outdoors, fostering a new generation of conservationists and strengthening Minnesotans' connection to their natural environment.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
98	06/30/2024	2020	05i	2020-017	Driving Conservation Behavior For Mussels And Water Quality	Minnesota Zoological Garden	Carol Strecker	$191,000	$191,000 the second year is from the trust fund to the Minnesota Zoological Garden to develop research-supported strategies to engage the public in specific conservation behaviors to improve water quality and native mussel health across the state.
99	06/30/2024	2020	05j	2020-079	Workshops and Outreach to Protect Raptors from Lead Poisoning	U of MN, Raptor Center	Julia Ponder	$133,000	$133,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota, Raptor Center, in cooperation with the Department of Natural Resources and other conservation partners, to provide hunters with outreach and workshops on alternatives to lead hunting ammunition, including copper ammunition as an alternative, and to promote voluntary selection of nontoxic ammunition to protect raptors and other wildlife in Minnesota from accidental lead poisoning caused by ingestion of ammunition fragments.
100	06/30/2024	2020	06d	2020-002	Applying New Tools And Techniques Against Invasive Carp	MN DNR, Fish and Wildlife Division	Brian Nerbonne	$478,000	$478,000 the second year is from the trust fund to the commissioner of natural resources to apply new monitoring, outreach, and removal techniques and to continue work with commercial anglers to protect Minnesota waters from invasive carp.
101	06/30/2024	2020	06f	2020-063	Testing Effectiveness of Aquatic Invasive Species Removal Methods	U of MN, Duluth - NRRI	Valerie Brady	$110,000	Dirty boat interiors can spread invasive species. The single most-effective tool to clean boat interiors was a vacuum while hand-picking debris. Clean livewells with a water-rinse or towel-wipeout followed by blowing compressed air down the drain tubing. Decoys and waders can be effectively cleaned with a water-rinse or vacuum.
102	06/30/2024	2020	06g	2020-035	Invasive Didymosphenia Threatens North Shore Streams	Science Museum of Minnesota, St. Croix Watershed Research Station	Mark Edlund	$197,000	Didymo or rocksnot has invaded our North Shore. Two years of sampling showed eight streams whose future recreational opportunities, stream ecologies, and local economies may be threatened. We've informed resource managers, the public, stakeholders, colleagues, even kids about the threat of this aquatic invasive species and how we will respond.
103	06/30/2024	2020	07a	2020-073	Storing Renewable Energy In Flow-Battery For Grid Use	U of MN, Morris	Bryan Herrmann	$250,000	The project storing renewable energy in a rural area is demonstrating the use of advanced battery chemistries to focus use cases around load leveling, peak shaving, and market services. Expansion of the solar PV system and efforts to enhance grid stability and a foundation for renewable energy implementation in Minnesota.
104	06/30/2024	2020	07b	2020-018	Eco-Friendly Plastics From Cloquet Pulp-Mill Lignin	U of MN, College of Food, Agricultural and Natural Resource Sciences	William Tai Yin Tze	$193,000	Plastic pollution has a dire impact on Minnesota's water, land and many natural resources. This project contributes to better environmental stewardship by converting surplus lignin from Sappi mill in Cloquet to eco-friendly plastics. Several promising plastics formulations were developed. They can potentially replace non-biodegradable plastics such as polystyrene.
105	06/30/2024	2020	07c	2020-014	Diverting Unsold Food From Landfills, Reducing Greenhouse Gases	Second Harvest Heartland	Lindsey Ochmanek	$130,000	During the grant period, we collected over 400,000 pounds of prepared and perishable foods that helped to serve our partners and diverted food waste from landfills. We enrolled 150 new donors to the program and 29 agencies that can receive donations.
106	6/30/2025	2020	08a	2020-050	Pollinator Central: Habitat Improvement with Citizen Monitoring	Great River Greening	Rebecca Tucker	$750,000	Pollinator Central: Habitat Improvement with Citizen Monitoring established native habitat on 408 acres at 15 project sites and directly engaged 575 volunteers and 224 citizen scientists, enhancing the natural environment of both urban and rural areas as well as connecting people with plants, pollinators, and their local communities.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
107	06/30/2024	2020	08c	2020-077	Lignin-Coated Fertilizers for Phosphate Control	U of MN, Duluth - NRRI	Eric Singsaas	$250,000	$250,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota for the Natural Resources Research Institute in Duluth to test a new, natural, slow-release fertilizer coating made from processed wood to decrease phosphorus runoff from farmland while also storing carbon in soils. This appropriation is subject to Minnesota Statutes, section 116P.10.
108	06/30/2024	2020	08h	2020-048	Peatland Restoration in the Lost River State Forest	Roseau River Watershed District	Tracy Halstensgard	$135,000	Pending
109	06/30/2024	2020	08i	2020-052	Prescribed Burning For Brushland-dependent Species-Phase II	U of MN, College of Food, Agricultural and Natural Resource Sciences	Rebecca Montgomery	$147,000	$147,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota to compare the effects of spring, summer, and fall burns on birds and vegetation and to provide guidelines for maintaining healthy brushland habitat for a diversity of wildlife and plant species.
110	06/30/2024	2020	08l	2020-078	Restoring Turf to Native Pollinator Gardens Across Metro	Wilderness in the City	Maryann Passe	$197,000	The Turf to Pollinator Gardens Project transformed six areas of turf grass into diverse pollinator plantings in parks across the metro. The gardens serve as demonstration sites to inspire park visitors to restore some of their home yards to pollinator beneficial native plantings.
111	06/30/2024	2020	08m & 20b	2020-076	Lawns To Legumes Program Phase 2	Board of Water and Soil Resources	Dan Shaw	$1,040,000	The Lawns to Legumes Program is focused on building a movement to support at-risk pollinator species. The project resulted in nearly 3000 high diversity residential plantings covering, 4.6 million square feet, and a large numbers of DIY projects across Minnesota inspired and guided by the program.
112	06/30/2024	2020	09a	2020-015	DNR Scientific and Natural Areas	MN DNR, Ecological and Water Resources Division	Judy Schulte	$3,000,000	Protected Dry Mesic Oak (Red Maple) Forest with exposed granite outcrops home to several state Species in Greatest Conservation Need and a wide variety of other species. Restored and enhanced over 1,111 acres across 58 SNAs. Co-hosted the 2022 Natural Areas Conference with over 300 attendees from 32 states.
113	06/30/2024	2020	09d	2020-028	Grants for Local Parks, Trails, and Natural Areas	MN DNR, State Parks and Trails Division	Jenni Bubke	$2,400,000	$2,400,000 the second year is from the trust fund to the commissioner of natural resources to solicit, rank, and fund competitive matching grants for local parks, trail connections, and natural and scenic areas under Minnesota Statutes, section 85.019. This appropriation is for local nature-based recreation, connections to regional and state natural areas, and recreation facilities and may not be used for athletic facilities such as sport fields, courts, and playgrounds.
114	06/30/2024	2020	09f	2020-042	Minnesota Hunter Walking Trails, Public Land Recreational Access	Ruffed Grouse Society	scott johnson	$300,000	The Ruffed Grouse Society/American Woodcock Society (RGS) successfully worked with fifteen public forest land administrators to assess needs of the existing approximately 1000 miles of hunter walking trails; secured contract and supply needs; and finalized and implemented trailhead (171 sites) and trail (75.3 miles) enhancements on 146 trails.
115	06/30/2024	2020	09h	2020-072	Metropolitan Regional Parks System Land Acquisition- Phase 6	Metropolitan Council	Jessica Lee	$1,000,000	The Metropolitan Council worked with Dakota County, Washington County, Ramsey County, and Three Rivers Park District to acquire land for the Metropolitan Regional Parks and Trails System. Over 100 acres of undeveloped land was acquired to protect high-quality natural resources in the metro area and to provide nature-based recreational opportunities.
116	06/30/2024	2020	09i	2020-045	Minnesota State Trails Development	MN DNR, State Parks and Trails Division	Kent Skaar	$994,000	$994,000 the second year is from the trust fund to the commissioner of natural resources to expand high-priority recreational opportunities on Minnesota's state trails by rehabilitating, improving, and enhancing existing state trails. The high-priority trail bridges to be rehabilitated or replaced under this appropriation include, but are not limited to, those on the Taconite, Great River Ridge, and C. J. Ramstad/Northshore State Trails.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
117	06/30/2024	2020	09j	2020-019	Elm Creek Restoration - Phase IV	City of Champlin	Heather Nelson	$500,000	Elm Creek Restoration Phase IV was an in-stream habitat restoration project that included 5,300 linear feet of stream bank restoration upstream of Mill Pond in the City of Champlin. The project spanned from the Josephine Nunn pedestrian bridge to just passed the Elm Creek Crossings Bridge.
118	06/30/2024	2020	09k	2020-060	Superior Hiking Trail As Environmental Showcase	Superior Hiking Trail Association	Lisa Luokkala	$450,000	$450,000 the second year is from the trust fund to the commissioner of natural resources for an agreement with the Superior Hiking Trail Association to rebuild damaged and dangerous segments and create a new trail segment of the Superior Hiking Trail to minimize environmental impacts, make the trail safer for users, and make the trail more resilient for future use and conditions.
119	06/30/2024	2020	09m	2020-068	Whiskey Creek & Mississippi River Water Quality/Habitat/Recreation	Mississippi Headwaters Board	Tim Terrill	$500,000	Thirteen acres were acquired by the city of Baxter to develop a stormwater pond that will capture 400 acres of drainage from Hwy. 371 and surrounding impervious surfaces. ENRTF funds were used for acquisition and Clean Water Funds were used to build the pond.
120	06/30/2024	2020	09n	2020-049	Perham to Pelican Rapids Regional Trail (West Segment)	Otter Tail County	Kevin Fellbaum	$2,600,000	Otter Tail County with the help of funding provided by LCCMR were able to build a 7.02-mile multi-modal trail system that connects the city of Pelican Rapids and residents of Otter Tail County to Maplewood State Park. This infrastructure allows people to get outside and enjoy the natural environment.
121	6/30/2024	2020	09o	2020-011	Crow Wing County Community Natural Area Acquisition	Crow Wing County	Tom Strack	$400,000	We acquired nearly 70 acres of private land adjacent to our historic fire tower county park, protecting and buffering the park from nearby development as well as providing additional area for the park to be expanded and protecting the natural resources in the area.
122	06/30/2024	2020	09p	2020-057	Rocori Trail - Phase III	Rocori Trail Construction Board	Pete Weber	$1,200,000	The Rocori Trail Phase III project successfully constructed a 2.3-mile-long bituminous surfaced trail segment that is safe, efficient, ADA-compliant, and scenic. This new segment completes the final connection between the cities of Richmond, Cold Spring, and Rockville, providing access to numerous natural features, attractions, and parks in the area.
123	06/30/2024	2020	09u	2020-058	Sportsmen's Training And Developmental Learning Center	Minnesota Forest Zone Trappers Association	Ray Sogard	$85,000	The Minnesota Trappers Association used these funds to complete a site evaluation, master plan, and cost estimate for constructing and outfitting a Sportsmen's Training and Developmental Learning Center located on a 38 acre parcel owned by the Minnesota Forest Zone Trappers Association in Hibbing, MN.
94	6/30/2024	2020	20a1	2020-070	Unprecedented Change Threatens Minnesota's Pristine Lakes	Science Museum of Minnesota, St. Croix Watershed Research Station	Mark Edlund	$482,000	We completed a summer of monthly water quality monitoring, a year of continuous buoy and dustfall measurements, and sediment core analysis to study recent unprecedented changes in eight wilderness lakes. We show climate-driven changes in lake behavior are leading to increased incidence of extensive harmful cyanobacterial blooms in mid-depth lakes.
95	06/30/2024	2020	20a2	2020-084	Wastewater Pond Optimization Implementation	Minnesota Pollution Control Agency	Joel Peck	$700,000	It is clear that sites using the Steady State Primary Method are achieving better treatment for phosphorus as compared to the baseline sites which were not interested or unable to implement this method. On average, sites using the Steady State Primary Method have 2.25 mg/L less effluent phosphorus.
96	06/30/2024	2020	20a3	2020-083	Minerals and Water: Demonstration of Three Sulfate Reduction Technology Applications	U of MN, Duluth - NRRI	Meijun Cai	$300,000	This project developed three sulfate reduction technologies—biological reduction, chemical precipitation, and ion exchange—through lab and field pilot testing. These methods reduce sulfate levels in industrial and municipal wastewater from 150 to over 3,000 mg/L to below 10 mg/L, protecting Minnesota's wild rice and ensuring environmental.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
97	06/30/2024	2020	20a4	2020-086	Chloride Pollution Reduction	Minnesota Pollution Control Agency	Brooke Asleson	$500,000	The appropriation in Laws 2019, First Special Session chapter 4, article 2, section 2, subdivision 8, paragraph (c), Sauk River Dam Removal and Rock Rapids Replacement, in the amount of $2,768,000, no longer needed for its original purpose is transferred as follows: (4) $500,000 is transferred to the commissioner of the Pollution Control Agency for activities, training, and grants that reduce chloride pollution. Of this amount, $250,000 is for grants for upgrading, optimizing, or replacing water softener units. Priority for grants must be given to facilities needing improvements to comply with chloride water quality standards; (d) Transfers and Availability The transfers under this subdivision are effective June 30, 2021, and the transferred amounts are available until June 30, 2023.
98	06/30/2024	2020	20a5	2020-087	CWD Prion Research in Soils	U of MN, College of Veterinary Medicine	Tiffany Wolf	$336,000	This project successfully initiated a groundbreaking line of environmental prion research at MNPRO, University of Minnesota, validating RT-QuIC for detecting chronic wasting disease prions in soils. Notably, it marked the first testing of prion contamination in Minnesota soils from Beltrami County, stemming from infected carcass materials.
99	06/30/2024	2020	20c-1	2020-099	Emerging Issues Reducing Turtle Mortality	Minnesota Department of Transportation	Christopher Smith	$249,000	This project is building small animal exclusionary fencing on a MnDOT Right of Way to reduce turtle mortality caused by animal-vehicle collisions where Highway 61 crosses the Cannon River near Red Wing, MN.
100	06/30/2024	2020	20c-2	2020-098	Emerging Issues Haskell Street CE acquisition	Dakota County	Lisa West	$104,000	A 0.5-acre permanent natural area conservation easement was acquired by Dakota County from Haskell Street Conservation LLC on June 27, 2024, in West St. Paul that includes large oak trees and grassland areas that will be restored to permanent native vegetation and provide a desired neighborhood open space.
101	06/30/2024	2021	03a	2021-032	What's Bugging Minnesota's Insect-Eating Birds?	U of MN, Duluth - NRRI	Alexis Grinde	$199,000	$199,000 the first year is from the trust fund to the Board of Regents of the University of Minnesota for the Natural Resources Research Institute to examine the relationship between insect abundance, timing of insect availability, and breeding success for multiple bird species across land-use intensities to develop comprehensive guidelines to conserve bird and insect diversity.
102	06/30/2024	2021	03f	2021-118	Groundwater Contamination Mapping Project - Phase II	Minnesota Pollution Control Agency	Brittney Schuller	$800,000	The Minnesota Pollution Control Agency (MPCA) created an online portal that compiles groundwater and environmental data from various MPCA programs. The public can access the data through the Groundwater Atlas and other access points. The MPCA believes the system will be extensible to other state agencies in the future.
103	06/30/2024	2021	03h	2021-140	Redwood County Reinvest in Minnesota Easement Evaluation and Public Outreach	Redwood Soil & Water Conservation District	Nick Brozek	$197,000	We surveyed vegetation and pollinators across 21 RIM/CREP easements and 3 Prairie Bank Easements and analyzed change in canopy cover across 125 easements in Redwood County. Results afford state agencies, SWCDs, and landowners new insight to improve existing and new easements to provide high-quality habitat for wildlife and pollinators.
104	06/30/2024	2021	03i	2021-159	Collaborative State and Tribal Wild Rice Monitoring Program	MN DNR, Ecological and Water Resources Division	Josh Knopik	$644,000	$644,000 the first year is from the trust fund to the commissioner of natural resources to work with Tribal partners to create a collaborative and comprehensive monitoring program to conserve wild-rice waters, develop remote sensing tools for statewide estimates of wild rice coverage, and collect consistent field data on wild rice health and abundance.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
105	06/30/2024	2021	03j	2021-238	Morrison County Performance Drainage and Hydrology Management II	Morrison Soil and Water Conservation District	Shannon Wettstein	$197,000	Morrison SWCD documented the location, elevations, and condition of culverts throughout the 28 townships in the county. This culvert data provides an understanding of drainage features for watershed analysis and protection, will prevent wetlands from being drained due to improperly placed culverts and presents opportunities for habitat and wildlife restoration.
106	06/30/2024	2021	03k	2021-278	Exploring Minnesota's Wetlands: Our Resource for Future Medicine	U of MN, Crookston	Brian Dingmann	$210,000	Project outcomes include cataloging bog microbial diversity across Minnesota's ecoregions, creating DNA libraries, and advancing antimicrobial research. Over 150 students were trained in molecular techniques, and their findings were presented at major conferences. This work fosters student retention in STEM fields and contributes to public health, sustainability, and best management.
107	06/30/2024	2021	03l	2021-289	A Biodiversity Checkup for Minnesota's Big Woods	U of MN, College of Food, Agricultural and Natural Resource Sciences	Lee Frelich	$109,000	In the Big Woods Region of Minnesota, species richness of vascular plants and carbon accumulation are similar in second growth and old-growth sugar maple forests, indicating that second growth forests are currently healthy. However, jumping worm invasion is an emerging threat to diversity and productivity of Big Woods forests.
108	06/30/2024	2021	03m	2021-321	Microbiome in Raptors: A New Tool for Conservation	U of MN, Raptor Center	Julia Ponder	$129,000	This project (1) provided knowledge on the impacts to Minnesota's wildlife treated in rehabilitation facilities relative to antimicrobial resistance and gut microbiome changes, (2) found no increased risk of antibiotic resistance during wildlife rehabilitation treatment and (3) documented a need for standardized guidelines for antimicrobial use in wildlife rehabilitation.
109	06/30/2024	2021	04b	2021-115	Novel Nutrient Recovery Process from Wastewater Treatment Plants	U of MN, College of Food, Agricultural and Natural Resource Sciences	Bo Hu	$200,000	A novel three-stage process improves phosphorus recovery and biogas production in wastewater treatment plants by integrating thermophilic acid digestion, phosphorus precipitation and recovery, and high-rate anaerobic digestion. This method enhances P recovery, improves bioenergy generation, and reduces operational costs, offering a more efficient alternative to conventional sludge treatment.
110	06/30/2024	2021	04c	2021-121	Monitoring Emerging Viruses in Minnesota's Urban Water Cycles	U of MN, College of Biological Sciences	Sebastian Behrens	$416,000	We studied the longevity of viruses in wastewater and found that enveloped viruses were more rapidly degraded in wastewater than non-enveloped viruses. Degradation rates depended on virus sorption to biosolids. Sorption behavior varies as water chemistry changes during treatment. Some viruses might be released with water effluent to the environment.
111	06/30/2024	2021	04f	2021-358	Assessing Membrane Bioreactor Wastewater Treatment Efficacy	Minnesota State Colleges and Universities, St. Cloud State University	Heiko Schoenfuss	$419,000	By comparing traditional secondary treatment of municipal wastewater with membrane bioreactor treatment, we have determined that both are excellent options for reducing the overall contaminant load of wastewater. Membrane bioreactor treatment has the added benefit of requiring a smaller physical footprint while reducing microbial loads in the final discharged effluent.
112	06/30/2024	2021	04g	2021-364	Evaluating Coronavirus and Other Microbiological Contamination of Drinking Water Sources from Wastewater	U of MN, College of Science and Engineering	Timothy LaPara	$594,000	$594,000 the first year is from the trust fund to the Board of Regents of the University of Minnesota to survey public and private wells to identify sources of and evaluate solutions to microbiological contamination of drinking water sources by wastewater, including from the virus that causes COVID-19.
113	06/30/2024	2021	04h	2021-376	St. James Pit Water-Level Control Study	City of Aurora	Lucas Heikkila	$259,000	Through groundwater study and modeling, our project provided vital information necessary to help understand and mitigate the effects of anticipated water level rise of the St. James Pit on water quality and quantity, as well as aquatic ecosystems and human infrastructure in the vicinity of the pit.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
114	06/30/2024	2021	04i	2021-384	Long-Term Nitrate Mitigation by Maintaining Profitable Kernza Production	Stearns County Soil and Water Conservation District	Dennis Fuchs	$485,000	Kernza can improve agricultural sustainability by reducing nitrate leaching into groundwater - similar to levels achieved by a native prairie - while generating nutritious grain. Monitoring Kernza fields over multiple years, provided valuable insights into the crop's long-term impact on water quality and its potential to contribute to sustainable agriculture.
115	06/30/2024	2021	04j	2021-390	Antibiotic Resistance and Wastewater Treatment: Problems and Solutions	University of St. Thomas	Justin Donato	$432,000	We tracked and quantified antibiotic resistance genes (ARGs) through the municipal wastewater treatment process at full-scale treatment facilities. This analysis was conducted at multiple time points, generating a comprehensive picture of the dynamic changes in abundance and diversity of ARGs for assessment of the potential for their environmental spread.
116	06/30/2024	2021	05b	2021-131	Pollinator Education in the Science Classroom	U of MN, College of Food, Agricultural and Natural Resource Sciences	Elaine Evans	$366,000	Pollinators in the Science Classroom trained 59 Minnesota grade 6-12 science/agriculture teachers to increase their knowledge of pollinator biology, diversity, habitat, and conservation by sharing expert-guided information and action steps. Collectively, teachers self-reported using pollinator curriculum resources and Pollinator Toolkits with over 6,300 students in 18 counties.
117	06/30/2024	2021	05c	2021-132	Minnesota Freshwater Quest: Environmental Education for Youth	Wilderness Inquiry	Meg Krueger	$699,000	The Minnesota Freshwater Quest engaged more than 15,000 Minnesota youth through in-person and virtual environmental education, meeting a critical need for interactive online learning during the COVID-19 pandemic. Throughout the state students explored public lands and waterways, and learned to preserve ecosystems close to where they call home.
118	06/30/2024	2021	05d	2021-175	Minnesota Master Naturalist: Nature for New Minnesotans	U of MN, College of Food, Agricultural and Natural Resource Sciences	Robert Blair	$293,000	Nature for New Minnesotans collaborated with seven English Learning Centers in the Twin Cities to help them teach their students both English and the natural history of Minnesota. To date, over 360 residents have learned more about where they live and how to talk about it.
119	06/30/2024	2021	05e	2021-186	The Voyageurs Classroom Initiative	Voyageurs Conservancy	Christina Hausman Rhode	$348,000	The future of Minnesota’s water, land, and wildlife depends on today’s efforts to engage our communities and youth in conservation. Voyageurs Conservancy programs inspired 6,600 students with hands-on environmental education, connected 4,800 community members to nature through immersive programming, and launched 22 young professionals into conservation careers.
120	06/30/2024	2021	05f	2021-320	Restoring Land and Reviving Heritage: Conservation Through Indigenous Culture	Belwin Conservancy	Hannah Smith	$420,000	We have successfully restored over 18 acres of wetlands, prairie and woodlands in Afton, MN while reconnecting over 1000 Indigenous students and families to traditional lifeways. Collaboratively, our multi-generational restoration approach has set the foundation for the next generation of Indigenous leaders in land stewardship with specific cultural focus.
121	06/30/2024	2021	05g	2021-323	Expanding Access to Environmental Education for Underserved Communities	U of MN, Raptor Center	Victoria Hall	$178,000	The Raptor Center's “Expanding Access to Environmental Education for Underserved Communities” project expanded environmental literacy by delivering 303 programs to underserved schools, engaging 16,317 students with raptor-focused curricula. Through these efforts, we raised public awareness, fostering a greater understanding and appreciation for Minnesota's natural resources and wildlife conservation.
122	06/30/2024	2021	06a	2021-017	Starch Allocation Patterns of Invasive Starry Stonewort Harvested from Lake Koronis	Minnesota State Colleges and Universities, Minnesota State University Mankato	Ryan Wersal	$101,000	Starry stoneworts allocate the majority of its energy to bulbils. Bulbils are easy to transport and can be long-lived in the sediment allowing for the spread and proliferation of this species in MN lakes. Management efforts need interrupt carbohydrate movement and to limit starch accumulation in bulbils.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
123	06/30/2024	2021	06c	2021-162	Oak Wilt Suppression at the Northern Edge - Phase II	Morrison Soil and Water Conservation District	Shannon Wettstein	$423,000	Morrison SWCD partnered with DNR Forest Health Specialists and local DNR Foresters to suppress oak wilt at 37 sites and 50 pockets within Morrison County through mechanical means. These sites are the northern-most occurrences of oak wilt in the state through on the edge of healthy state forest habitats.
124	06/30/2024	2021	06d	2021-164	Biocontrol of Invasive Species in Bee Lawns and Parklands	U of MN, College of Food, Agricultural and Natural Resource Sciences	Vera Krischik	$425,000	The outcome of this project is to reduce insecticides used to manage Japanese beetle (JB) that also kill pollinators. In Northeastern states Japanese beetles are managed by the native soil-inhabiting pathogen called Ovavesicula. Surveys were performed to determine pathogen distribution and ways to distribute the pathogen to new sites.
125	06/30/2024	2021	06f	2021-217	Evaluating Minnesotas Last Best Chance to Stop Carp	U of MN, College of Food, Agricultural and Natural Resource Sciences	Peter Sorensen	$424,000	This study used fish tracking to show that invasive carp typically pass Lock and Dam 5 via its lock and an engineering evaluation to demonstrate that a lock deterrent could be installed. Learning of this work, the legislature funded a carp lock deterrent to protect the river and its fisheries.
126	06/30/2024	2021	07a	2021-010	Enhanced Thermo-Active Foundations for Space Heating in Minnesota	U of MN, Duluth	Alison Hoxie	$312,000	$312,000 the first year is from the trust fund to the Board of Regents of the University of Minnesota, Duluth, to design and optimize cost-competitive thermally enhanced heat exchanger systems for use in building foundations to improve energy efficiency and conservation of natural resources in Minnesota's cold climate.
127	06/30/2024	2021	07c	2021-191	Agrivoltaics to Improve the Environment and Farm Resiliency	U of MN, WCROC	Bradley Heins	$646,000	$646,000 the first year is from the trust fund to the Board of Regents of the University of Minnesota, West Central Research and Outreach Center, Morris, to model and evaluate alternative solar energy system designs to maximize energy production while providing other benefits to cattle and farmers.
128	06/30/2024	2021	07d	2021-294	Behavioral Response of Bald Eagles to Acoustic Stimuli	U of MN, St. Anthony Falls Laboratory	Christopher Feist	$261,000	$261,000 the first year is from the trust fund to the Board of Regents of the University of Minnesota, St. Anthony Falls Laboratory, to protect wildlife by designing and implementing an acoustic deterrence protocol to discourage bald eagles from entering hazardous air space near wind energy installations.
129	06/30/2024	2021	07e	2021-344	Create Jobs Statewide by Diverting Materials from Landfills	Better Futures Minnesota	Jason Allen	$2,244,000	The aim of the project was to minimize the effects of human activity that might alter Minnesota's ecological balance by diverting reusable materials from the waste stream. The partners documented the reclaimed materials and measured Green House Gas emissions sequestered along with the environmental impact and benefits of the project.
130	06/30/2024	2021	07f	2021-402	Strengthening Minnesota's Reuse Economy to Conserve Natural Resources	Reuse Minnesota	Emily Barker	$334,000	A large portfolio of work was completed including hiring two staff, producing two conferences, an impact report of reuse, a business needs assessment, the creation of a resale business training, a survey of secondhand shoppers, a rebate for repair program, and ongoing support for reuse and related benefits in Minnesota.
95	06/30/2024	2021	08c	2021-058	Pollinator Central II: Habitat Improvement With Community Monitoring	Great River Greening	Rebecca Tucker	$631,000	Pollinator Central II: Habitat Improvement with Community Monitoring established native habitat on 116 acres at 10 project sites and directly engaged 883 volunteers and 122 citizen scientists, enhancing the natural environment of both urban and rural areas as well as connecting people with plants, pollinators, and their local communities.
96	06/30/2024	2021	08d	2021-062	Preserving Minnesota's Only Ball Cactus Population	U of MN, Landscape Arboretum	David Remucal	$103,000	This first phase of work protecting the only population of ball cactus in Minnesota has been a resounding success, with almost 500 plants in three new locations planted over 2022 and 2023 and nearly 80% first-year survival for individuals planted in 2022. This success will continue to be reinforced.
97	06/30/2024	2021	08e	2021-065	Phase 2 - Prescribed-Fire Management For Roadside Prairies	Minnesota Department of Transportation	Nathan Johnson	$217,000	This project allowed MnDOT to better protect biodiversity and enhance pollinator habitat by increasing the capacity to carry out roadside prescribed burns.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
96	06/30/2024	2021	08g	2021-097	Minnesota Green Schoolyards	The Trust for Public Land	Anna Callahan	$250,000	Trust for Public Land piloted the Minnesota Community Schoolyards program, including a demonstration project at Jefferson Elementary in Faribault, MN. This showed a replicable model for transforming underutilized schoolyards into restored native habitat, expanded tree canopy, and enhanced outdoor educational spaces; and engaging the next generation of environmental champions.
97	06/30/2024	2021	08h	2021-137	Plumbing the Muddy Depths of Superior Hiking Trail	Superior Hiking Trail Association	Lisa Luokkala	$187,000	$187,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with the Superior Hiking Trail Association to install and implement water management practices to prevent erosion and improve access to the Superior Hiking Trail.
98	06/30/2024	2021	08i	2021-212	Reducing Plastic Pollution with Biodegradable Erosion Control Products	Agricultural Utilization Research Institute	Matthew Leiphon	$200,000	Erosion control products are important in protecting Minnesota's soil and water during construction, but they often contain plastic that can pollute the environment. Hemp fiber offers a locally grown, renewable, biodegradable alternative. Effective hemp-based prototypes successfully developed and tested in Minnesota offer a path toward more sustainable erosion control options.
99	06/30/2024	2021	08k	2021-229	Woodcrest Trail Expansion	Foundation for Healthcare Continuums, Woodcrest of Country Manor	Kevin Harguth	$16,000	Existing trails on the property were extended into undeveloped areas to allow community members to safely walk the trails and gain an appreciation for native plants and wildlife of this local area.
100	06/30/2024	2021	08l	2021-231	Urban Pollinator and Native American Cultural Site Restoration	Friends of the Mississippi River	Alex Roth	$213,000	This project exceeded our original acreage goal of 62 and ultimately enhanced 64 acres of grassland and forest habitat for pollinators and wildlife, as well as created management plans to guide longterm maintenance at Bruce Vento Nature Sanctuary in St. Paul and Applewood and Carver Additional Preserves in Maplewood.
101	06/30/2024	2021	08n	2021-308	Creating Cost-Effective Forage and Management Actions for Pollinators	U of MN, College of Food, Agricultural and Natural Resource Sciences	Daniel Cariveau	$198,000	We examined how seed mix design and land management influenced floral resources for native bees. Our findings will help reduce the cost of pollinator seed mixes. We also developed a seed mix tool enabling land managers in Minnesota to input seed mixes to maximize forage for native bees.
102	06/30/2023	2021	08o	2021-322	Shoreline Stabilization, Fishing, and ADA Improvements at Silverwood Park	Three Rivers Park District	Jonathan Vlaming	$200,000	This project serves as a model on how to improve water quality through shoreline stabilization in combination with shoreline fishing and ADA fishing access improvements on the island in Silver Lake within Silverwood Park, St. Anthony MN.
103	06/30/2024	2021	08p	2021-337	Lawns to Legumes Program - Phase II	Board of Water and Soil Resources	Dan Shaw	$993,000	The Lawns to Legumes Program is focused on building a movement to support at-risk pollinator species. The project resulted in nearly 3000 high diversity residential plantings covering, 4.6 million square feet, and a large numbers of DIY projects across Minnesota inspired and guided by the program.
104	06/30/2023	2021	08q	2021-375	Reintroducing Bison to Spring Lake Park Reserve	Dakota County	Tom Lewanski	$560,000	This project will increase biodiversity, landscape heterogeneity, and ecosystem resiliency through the reintroduction of the primary historic prairie grazer in Minnesota, the American plains bison (Bison bison). By introducing bison, the 150 acres of prairie will become more diverse and will likely enhance ecosystem function and overall stability.
105	06/30/2024	2021	08r	2021-377	Elm Creek Habitat Restoration Final Phase	City of Champlin	Heather Nelson	$521,000	Elm Creek Restoration Final Phase was an in-stream habitat restoration project that included 2,500 linear feet of stream bank restoration downstream of Hayden Lake and upstream of Mill Pond in the City of Champlin. The project spanned from just upstream of the Elm Creek Crossing bridge to Hayden Lake.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
106	06/30/2024	2021	09a	2021-012	Perham to Pelican Rapids Regional Trail (McDonald Segment)	Otter Tail County	Kevin Fellbaum	$2,245,000	Otter Tail County with the help of the funding provided by LCCMR was able to build a 5.760-mile multi-modal trail system that serves as the missing connection between two trail segments connecting the City of Perham and Maplewood State Park.
107	06/30/2024	2021	09b	2021-028	Mesabi Trail Csah 88 to Ely	St. Louis & Lake Counties Regional Railroad Authority	Robert Manzoline	$1,650,000	The County State Aid Highway 88 to Ely Mesabi Trail Segment has been completed. This new paved segment is approximately 2.8 miles-long and connects to the existing Mesabi Tral from the West and traverses Easterly to the city of Ely, MN.
108	06/30/2023	2021	09c	2021-029	Southwest Minnesota Single-Track Trail	Jackson County	Jeremy Bartosh	$190,000	A single track mountain bike trails have been created at Belmont Park just North of Jackson, MN! The grant allowed us to build 4-1/2 miles of natural surface biking trails in the unique terrain setting near the Des Moine River. Bikers riding the trails are pumped and thankful!!
109	06/30/2024	2021	09d	2021-043	Local Parks, Trails, and Natural Areas Grant Programs	MN DNR, State Parks and Trails Division	Jenni Bubke	$2,250,000	$2,250,000 the first year is from the trust fund to the commissioner of natural resources to solicit and rank applications for and fund competitive matching grants for local parks, trail connections, and natural and scenic areas under Minnesota Statutes, section 85.019. Priority must be given to funding projects in the metropolitan area or in other areas of southern Minnesota. For purposes of this paragraph, southern Minnesota is defined as the area of the state south of and including St. Cloud. This appropriation is for local nature-based recreation, connections to regional and state natural areas, and recreation facilities and may not be used for athletic facilities such as sport fields, courts, and playgrounds.
110	06/30/2024	2021	09f	2021-069	Sauk Rapids Lions Park Riverfront Improvements	City of Sauk Rapids	Todd Schultz	$463,000	This project has occurred on the banks of the Mississippi River in Sauk Rapids. This project enhanced access and expanded users experience in the park while protecting natural features. All of the elements added or improved with the LCCMR grant have both improved the quality/usage of this park.
111	06/30/2024	2021	09g	2021-092	City of Brainerd - Mississippi Landing Trailhead	City of Brainerd	Jessie Dehn	$2,850,000	The completed park project includes implementation of trailhead, canoe/kayak launch, river overlook, natural playscape, and other facilities, serve as a connection point for the public to trails and the Mississippi River while preserving and enhancing natural habitats through stormwater treatment, pollinator-friendly plantings and landscapes, and riverbank restoration.
112	06/30/2024	2021	09i	2021-109	Moose Lake - Trunk Highway 73 Trail	City of Moose Lake	Ellissa Owens	$330,000	The completion of this project has provided tourists and residents access to additional non-motorized trails in northern Minnesota. It connects Willard Munger Trailhead Facilities, Moose Lake State Park, Moosehorn River water access and Moose Lake Campground while allowing access to trails from Duluth to Hinckley.
113	06/30/2024	2021	09k	2021-154	Precision Acquisition For Restoration, Groundwater Recharge, and Habitat	Shell Rock River Watershed District	Courtney Phillips	$467,000	The Shell Rock River Watershed District purchased a perpetual conservation easement on 42 acres of previous agricultural ground. Restoration efforts then included wetland establishment of roughly 20 acres for groundwater recharge and approximately 22 acres of natives were planted for pollinator habitat.
114	06/30/2024	2021	09l	2021-222	Lake Brophy Single-Track Trail Expansion	Douglas County Parks	Brad Bonk	$100,000	Outcomes of the project were a return trail for the jump line area, a yet to be named black downhill trail on the east side of the park, and the blue trail named the Brand Bomber. The trails are typically open April - November during daylight hours.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
115	06/30/2024	2021	09m	2021-325	Veterans On The Lake	Veterans on the Lake	Eric Mayranen	$553,000	Activity 1.Construction Engineering - The Cabin engineering and blueprints were completed in the summer of 2021. Activity 2. Paving project complete summer of 2022, Trails project completed the Spring of 2022. Activity 3 Cabin renovation was completed the fall and winter of 2022 and spring on 2023.
116	06/30/2024	2021	09o	2021-330	Brookston Campground, Boat Launch, and Outdoor Recreational Facility Planning	City of Brookston	Kaycee Melin	$425,000	$425,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with the city of Brookston to design a campground, boat launch, and outdoor recreation area on the banks of the St. Louis River in northeastern Minnesota. A fiscal agent must be approved in the work plan before any trust fund dollars are spent.
117	06/30/2024	2021	09p	2021-332	Moose and Seven Beaver Multiuse Trails Upgrade	City of Hoyt Lakes,	Becky Lammi	$900,000	$900,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with the city of Hoyt Lakes, in partnership with the Ranger Snowmobile and ATV Club, to design and construct upgrades and extensions to the Moose and Seven Beaver multiuse trails to enhance access for recreation use and connect to regional trails.
118	06/30/2024	2021	09q	2021-338	Above the Falls Regional Park Acquisition	Minneapolis Park and Recreation Board,	Adam Arvidson	$950,000	The Minneapolis Park and Recreation Board was unable to successfully negotiate with owners of either of the two candidate parcels and is therefore unable to expend LCCMR funds for land acquisition. Both parcels changed hands during the life of the grant, which complicated negotiations.
119	06/30/2024	2021	09r	2021-339	Silver Lake Trail Improvement Project	City of Virginia,	Britt See-Benes	$1,071,000	The completion of the Silver Lake Trail provides greater accessibility to outdoor activities, within a city setting, that can be enjoyed by all residents and visitors. The completed trail provides a non-motorized alternative for access to a wide variety of locations within the city to promote active, healthy living.
120	06/30/2024	2021	09v	2021-380	Accessible Fishing Piers and Shore Fishing Areas	MN DNR, State Parks and Trails Division	Nancy Stewart	$340,000	Seven new fishing piers and a two new shore fishing stations will be available to anglers thanks to the Environment and Natural Resources Trust Fund. All projects are accessible and improve fishing opportunities for people of all ages and abilities.
97	06/30/2024	2021	10c-1	2021-468	Emerging Issues Benjamin CE Acquisition	Dakota County,	Lisa West	$185,000	A 31.7-acre permanent natural area conservation easement was acquired by Dakota County from the Benjamins on June 27, 2024, in Nininger Township, that includes a five-acre restored native prairie, 23 additional acres that will be restored to native prairie, and about nine wooded acres that will also be restored.
98	06/30/2024	2021	19	2021-463	Forest Health: Development and Demonstration of Biochar Opportunities	U of MN, Duluth - NRRI	Eric Singsaas	$340,000	This project will provide a foundation for new types of products made from Minnesota's natural resources, which have a high fixed carbon content to store atmospheric carbon dioxide in soils or are used in environmentally relevant industries, such as in soil and water remediation and energy systems. This equipment will be used by NRRI and University of Minnesota researchers to support the R&D needed to deploy these materials with the help of industry, agency, and NGO partnerships.
99	06/30/2024	2022	08f	2022-188	PFAS Fungal-Wood Chip Filtering System	U of MN, College of Food, Agricultural and Natural Resource Sciences	Jiwei Zhang	$189,000	$189,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota to identify, develop, and field-test various types of waste wood chips and fungi to sequester and degrade PFAS leachate from contaminated waste sites. This appropriation is subject to Minnesota Statutes, section 116P.10.

Environment and Natural Resources Trust Fund (ENRTF)
Projects completing in FY2024
Data as of 1/16/25

	Appropriation End Date	RFP Year	Subd.	Proposal ID #	Project Title w/link to Final Report	Organization	Project Manager	Amount Appropriated	Soundbite of Outcomes
100	06/30/2024	2022	09i	2022-008	The Missing Link: Gull Lake Trail, Fairview Township	Fairview Township	Marla Yoho	$1,394,000	This project created 3.1 miles of safe access to the natural and scenic environment and an easy way to introduce activity to every age and ability. Using the road right-of-way reduced environmental impact. Additionally, environmentally friendly alternative transportation, such as e-bikes, use it to access local attractions and businesses.
101	06/30/2025	2022	10b	2022-296	Leaded Gasoline Contamination Analysis	City of Paynesville	Tariq Al-Rifai	$200,000	The basis of this report was to determine if the actions and remedies applied by the MPCA to four contaminated sites in Alexandria, Blaine, Foley and Paynesville were adequate to address the issues and give further recommendations if needed.
102	06/30/2024	2022	11	2022-121	ML 2022 Contract Agreement Reimbursement	MN DNR, Grants Unit	Katherine Sherman-Hoehn	$210,000	Activities included management of 155 active grants, pre-award financial review and monitoring activities on selected projects in coordination with LCCMR staff, and execution of COVID-related amendments to prior-year projects.

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2015	06a	n/a	Minnesota Invasive Terrestrial Plants and Pests Center	U of MN - MITPPC	Robert Venette	$ 5,000,000
2015	06a-01	----	*Subproject 06a-01: Garlic Mustard Biocontrol: Ecological Host Range of Biocontrol Agents*	*U of MN - MITPPC*	*Roger Becker*	*$ 600,000*
2015	06a-02	----	*Subproject 06a-02: Mountain Pine Beetle, Phase II: Protecting Minnesota*	*U of MN - MITPPC*	*Brian Aukema*	*$ 444,982*
2015	06a-03	----	*Subproject 06a-03: Biological Control of the Soybean Aphid by Aphelinus Certus*	*U of MN - MITPPC*	*George Heimpel*	*$ 479,859*
2015	06a-04	----	*Subproject 06a-04: Decreasing Environmental Impacts of Soybean Aphid Management*	*U of MN - MITPPC*	*Robert Koch*	*$ 570,000*
2015	06a-05	----	*Subproject 06a-05: Optimizing Tree Injections against Emerald Ash Borer*	*U of MN - MITPPC*	*Brian Aukema*	*$ 318,927*
2015	06a-06	----	*Subproject 06a-06: Distribution and Traits of the Fungal Pathogen Fusarium Virguliforme that Influence Current and Future Risk to Soybean and Other Legumes in Minnesota*	*U of MN - MITPPC*	*Dean Malvick and Kathryn Bushley*	*$ 383,651*
2015	06a-07	----	*Subproject 06a-07: Tools to Distinguish Native from Exotic Reed Canary Grass*	*U of MN - MITPPC*	*Neil O. Anderson*	*$ 263,273*
2015	06a-08	----	*Subproject 06a-08: Accurate Detection and Integrated Treatment of Oak Wilt (Ceratocystis fagacearum) in Minnesota*	*U of MN - MITPPC*	*Jeannine Cavender-Bares*	*$ 356,382*
2015	06a-09	----	*Subproject 06a-09: Characterizing Dispersal of Larval Gypsy Moth to Improve Quarantine Regulations*	*U of MN - MITPPC*	*Brian Aukema*	*$ 35,000*
2015	06a-10	----	*Subproject 06a-10: Management Strategies for the Invasive Spotted Wing Drosophila*	*U of MN - MITPPC*	*Mary Rogers*	*$ 477,541*
2015	06a-11	----	*Subproject 06a-11: Will Future Weather Favor Minnesota's Woody Invaders?*	*U of MN - MITPPC*	*Peter Reich*	*$ 526,000*
2015	06a-12	----	*Subproject 06a-12: Developing Robust Identification Assays for Amaranthus Palmeri in Seed Mixture*	*U of MN - MITPPC*	*Don Wyse*	*$ 208,230*

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2015	06a-13	----	*Subproject 06a-13: Terrestrial Invasive Species Prioritization*	*U of MN - MITPPC*	*Amy Morey*	*$ 71,461*
2015	06a-14	----	*Subproject 06a-14: Improved Detection and Future Management of Leafy Spurge and Common Tansy using Remote Sensing, Mechanistic Species Distribution Models, and Landscape Genomics*	*U of MN - MITPPC*	*David Moller and Ryan Briscoe Runquist*	*$ 70,812*
2015	06a-16	----	*Subproject 06a-16: Effects of Puccinia species complex on common buckthorn (Rhamnus cathartica)*	*U of MN - MITPPC*	*Pablo Olivera Firpo*	*$ 26,908*
2015	06a-17	----	*Subproject 06a-17: Studies of entomopathogenic fungi for effective biocontrol of the emerald ash borer, Phase 2*	*U of MN - MITPPC*	*Robert Blanchette*	*$ 33,000*
2015	06a-18	----	*Subproject 06a-18: Incorporating adaptation into forecasts of range shifts with climate change*	*U of MN - MITPPC*	*Ryan Briscoe Runquist*	*$ 33,000*
2015	06a-19	----	*Subproject 06a-19: Genetic control of invasive insect species: Phase 3*	*U of MN - MITPPC*	*Michael Smanski*	*$ 50,000*
2015	06a-20	----	*Subproject 06a-20: Making revegetation as part of buckthorn management feasible in Minnesota*	*U of MN - MITPPC*	*Michael Schuster*	*$ 40,000*
2016	06a	n/a	Minnesota Invasive Terrestrial Plants and Pests Center - Phase III	U of MN - MITPPC	Robert Venette	$ 3,750,000
2016	06a-01	----	*Subproject 06a-01: Fungi in Ash Trees: Towards Protecting Trees from Emerald Ash*	*U of MN - MITPPC*	*Robert Blanchette*	*$ 500,000*
2016	06a-02	----	*Subproject 06a-02: Understanding the Benefits and Limitations of using Goats for Invasive Plant Control*	*U of MN - MITPPC*	*Tiffany Wolf*	*$ 410,267*
2016	06a-03	----	*Subproject 06a-03: Genetic Control of Invasive Insect Species: Phase I*	*U of MN - MITPPC*	*Michael Smanski*	*$ 295,717*
2016	06a-04	----	*Subproject 06a-04: Dwarf Mistletoe Detection and Management in Minnesota*	*U of MN - MITPPC*	*Marcella Windmuller-Campione*	*$ 455,606*

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2016	06a-05	----	*Subproject 06a-05: Developing Spatially Explicit Bio-economic Dispersal Model to Aid with the Management of Brown Marmorated Stink Bug*	*U of MN - MITPPC*	*Senait Senay*	*$ 329,304*
2016	06a-06	----	*Subproject 06a-06: Management of Invasive Knotweeds*	*U of MN - MITPPC*	*Alan Smith*	*$ 476,723*
2016	06a-07	----	*Subproject 06a-07: Building Mechanistic and Process based Species Distribution Models for Common Tansy and Leafy Spurge: from Landscapes to Genomes*	*U of MN - MITPPC*	*David Moller and Ryan Briscoe Runquist*	*$ 351,188*
2016	06a-08	----	*Subproject 06a-08: Using Plants to Control Buckthorn: an Expanded Approach*	*U of MN - MITPPC*	*Peter Reich*	*$ 560,000*
2016	06a-09	----	*Subproject 06a-09: Genetic control of invasive insects, Phase 2*	*U of MN - MITPPC*	*Michael Smanski*	*$ 55,100*
2016	06a-10	----	*Subproject 06a-10: Novel Diagnostic Tools for Rapid and Early Detection of Oak Wilt*	*U of MN - MITPPC*	*Abdennour Abbas*	*$ 170,637*
2018	06a	n/a	Minnesota Invasive Terrestrial Plants and Pests Center - Phase 4	U of MN - MITPPC	Robert Venette	$ 3,500,000
2019	06a-21.2	----	*Subproject 06a-21.2: Field Validation of Mulitbeam Sonar Zebra Mussel Detection (Year 2)*	*U of MN - MAISRC*	*Jessica Kozarek*	*$ 228,764*
2019	06a-22.2	----	*Subproject 06a-22.2: Assessing and Refining Copper-Based Treatment to Suppress Zebra Mussel populations*	*U of MN - MAISRC*	*Diane Waller*	*$ 249,056*
2019	06a-23.2	----	*Subproject 06a-23.2: AIS and Tourism - A Socio-Economic Assessment*	*U of MN - MAISRC*	*Amit Pradhananga*	*$ 249,088*
2019	06a-25.2	----	*Subproject 06a-25.2: Examining Motivations for Illegal Baitfish Release*	*U of MN - MAISRC*	*Nicholas Phelps*	*$ 74,636*
2019	06a-28.2	----	*Subproject 06a-28.2: Enzyme-Based Coatings to Suppress Priority AIS*	*U of MN - MAISRC*	*Mikael Elias*	*$ 187,480*
2019	06a-33	----	*Subproject 06a-33: Optimizing eDNA Monitoring for Multiple Aquatic Invasive Species*	*U of MN - MAISRC*	*Josh Dumke*	*$ 436,331*

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2019	06a-35	----	*Subproject 06a-35: Genetic Biocontrol of Invasive Species - Understanding Attitudes and Risk Perceptions*	*U of MN - MAISRC*	*David Fulton*	*$ 209,313*
2019	06a-36	----	*Subproject 06a-37: RNA-Interference Screens for Zebra Mussel Biocontrol Target Genes*	*U of MN - MAISRC*	*Daryl Gohl*	*$ 255,979*
2019	06a-37	----	*Subproject 06a-37: Improving the Efficiency of Watercraft Inspections through Coordination and Cooperation*	*U of MN - MAISRC*	*Amy Kinsley*	*$ 198,241*
2019	06a-38	----	*Subproject 06a-38: Evaluating Native Phragmites as a Wastewater Treatment Alternative*	*U of MN - MAISRC*	*Daniel Larkin*	*$ 355,122*
2019	06a-39	----	*Subproject 06a-39: Increasing Effectiveness of Bigheaded Carp Deterrents by Carbon Dioxide Integration*	*U of MN - MAISRC*	*Allen Mensinger*	*$ 340,327*
2019	06a-40	----	*Subproject 06a-40: Enhancing Habitat and Diversity in Cattail-Dominated Shorelines*	*U of MN - MAISRC*	*Amy Schrank*	*$ 338,066*
2019	03d	n/a	Minnesota Trumpeter Swan Migration Ecology and Conservation	U of MN	David Andersen	$ 300,000
2019	03e	n/a	Spruce Grouse as Indicators for Boreal Forest Connectivity	U of MN - Raptor Center	Julia Ponder	$ 350,000
2019	03f	n/a	Understanding Brainworm Transmission to Find Solutions for Minnesota Moose Decline	U of MN	Tiffany Wolf	$ 400,000
2019	03l	n/a	Mapping Aquatic Habitats for Moose	U of MN	Joseph Bump	$ 199,000
2019	04a	n/a	Determining Influence of Insecticides on Algal Blooms	U of MN	William Arnold	$ 350,000
2019	04e	n/a	Improving Nitrogen Removal in Greater Minnesota Wastewater Treatment Ponds	U of MN	Paige Novak	$ 325,000
2019	04f	n/a	Improving Drinking Water for Minnesotans through Pollution Prevention	U of MN	Raymond Hozalski	$ 345,000

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2019	04g	n/a	Protecting Minnesota Waters by Removing Contaminants from Wastewater	U of MN	Matt Simcik	$ 250,000
2019	04h	n/a	Reducing Municipal Wastewater Mercury Pollution to Lake Superior	Minnesota Pollution Control Agency	Scott Kyser	$ 250,000
2019	04j	n/a	Transformation of Plastic Waste into Valued Resource	U of MN	Brett Barney	$ 225,000
2019	04l	n/a	Farm-Ready Cover Crops for Protecting Water Quality	Central Lakes College - Ag and Energy Ctr	Keith Olander	$ 741,000
2019	06a	n/a	Building Knowledge and Capacity to Solve AIS Problems	U of MN - MAISRC	Nicholas Phelps	$ 4,000,000
2018	06a-01	---	*Subproject 06a-01: Early Detection of Invasive Tree Pathogens Using Molecular Tools for Prevention and to Mitigate Damage*	*U of MN - MITPPC*	*Robert Blanchette*	*$ 383,865*
2018	06a-02	---	*Subproject 06a-02: Accurate Detection of Oak Wilt Disease at Landscape Scales for Enhanced Forest Management*	*U of MN - MITPPC*	*Jeannine Cavendar-Bares*	*$ 301,941*
2018	06a-03	---	*Subproject 06a-03: Early Detection of Invasive Tree Pathogens Using Molecular Tools for Prevention and to Mitigate Damage*	*U of MN - MITPPC*	*Benjamin Held*	*$ 233,924*
2018	06a-04	---	*Subproject 06a-04: Detection and Monitoring of Invasive Phragmites*	*U of MN - MITPPC*	*Joe Knight*	*$ 203,781*
2018	06a-05	---	*Subproject 06a-05: Improve Invasive Plant Treatment Efficacy Using Climate Based Phenology Models*	*U of MN - MITPPC*	*Rebecca Montgomery*	*$ 346,211*
2018	06a-06	---	*Subproject 06a-06: Biology and Biocontrol Potential of a Rust Fungus Infecting Phalaris Arundinacea and Frangula Alnus*	*U of MN - MITPPC*	*Pablo Olivera Firpo*	*$ 247,507*
2018	06a-07	---	*Subproject 06a-07: Managing Buckthorn with Trees: Diversity, Density, and Practicality*	*U of MN - MITPPC*	*Peter Reich*	*$ 499,734*

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2018	06a-08	---	*Subproject 06a-08: Integrated Emerald Ash Borer Management: Testing a Novel Approach to Assess Stakeholder Perceptions*	*U of MN - MITPPC*	*Ingrid Schneider*	*$ 436,072*
2018	06a-09	---	*Subproject 06a-09: Distribution, Risks, and Management of Phyllachora Maydis, the Causal Agent of Corn Tar Spot*	*U of MN - MITPPC*	*Dean Malvick*	*$ 176,618*
2018	06a-10	---	*Subproject 06a-10: Detecting Hybrid Barberry and Investigating its Role in Rust Epidemiology*	*U of MN - MITPPC*	*Pablo Olivera Firpo*	*$ 206,783*
2018	06a-11	---	*Subproject 06a-11: Confronting Soybean Aphid with Advanced Plant Breeding and Remote Sensing*	*U of MN - MITPPC*	*Robert Koch*	*$ 292,492*
2018	06a-12	---	*Subproject 06a-12: Expanding and Strengthening the Prioritization of Terrestrial Invasive Species in Minnesota*	*U of MN - MITPPC*	*Amy Morey*	*$ 151,601*
2019	07c	n/a	Sustainable Solar Energy from Agricultural Plant By-Products	U of MN - Morris	Ted Pappenfus	$ 185,000
2019	08a	n/a	Saving Endangered Pollinators through Data-Driven Prairie Restoration	Minnesota Zoo	Erik Runquist	$ 800,000
2019	08d	n/a	Conserving and Monitoring of Minnesota's Rare Arctic Plants	U of MN - Duluth	Briana Gross	$ 135,000
2020	03h	2020-003	Bee Minnesota – Protect Our Native Bumblebees	U of MN, College of Veterinary Medicine	Declan Schroeder	$ 650,000
2020	03k	2020-027	Freshwater Sponges And AIS: Engaging Citizen Scientists	U of MN, Crookston	Venugopal Mukku	$ 400,000
2020	03l	2020-016	Do Beavers Buffer Against Droughts And Floods?	National Park Service, Voyageurs National Park	Steve Windels	$ 168,000
2020	03o	2020-007	Conserving Black Terns And Forster's Terns In Minnesota	U of MN, Duluth - NRRI	Annie Bracey	$ 198,000
2020	04a	2020-037	Managing Highly Saline Waste From Municipal Water Treatment	U of MN, College of Science and Engineering	Natasha Wright	$ 250,000

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2020	04d	2020-013	Developing Strategies To Manage PFAS In Land-Applied Biosolids	Minnesota Pollution Control Agency	Summer Streets	$ 1,404,000
2020	04e	2020-055	Quantifying New Urban Precipitation and Water Reality	U of MN, College of Science and Engineering	Joe Magner	$ 500,000
2020	04f	2020-034	Innovative Solution for Protecting Minnesota from PFAS Contamination	Dem-Con	Bill Keegan	$ 250,000
2020	06f	2020-063	Testing Effectiveness of Aquatic Invasive Species Removal Methods	U of MN, Duluth - NRRI	Valerie Brady	$ 110,000
2020	06g	2020-035	Invasive Didymosphenia Threatens North Shore Streams	Science Museum of Minnesota, St. Croix Watershed Research Station	Mark Edlund	$ 197,000
2020	07a	2020-073	Storing Renewable Energy In Flow-Battery For Grid Use	U of MN, Morris	Bryan Herrmann	$ 250,000
2020	07b	2020-018	Eco-Friendly Plastics From Cloquet Pulp-Mill Lignin	U of MN, College of Food, Agricultural and Natural Resource Sciences	William Tai Yin Tze	$ 193,000
2020	08c	2020-077	Lignin-Coated Fertilizers for Phosphate Control	U of MN, Duluth - NRRI	Eric Singsaas	$ 250,000
2020	08i	2020-052	Prescribed Burning For Brushland-dependent Species-Phase II	U of MN, College of Food, Agricultural and Natural Resource Sciences	Rebecca Montgomery	$ 147,000
2020	20a1	2020-070	Unprecedented Change Threatens Minnesota’s Pristine Lakes	Science Museum of Minnesota, St. Croix Watershed Research Station	Mark Edlund	$ 482,000
2021	03a	2021-032	What's Bugging Minnesota's Insect-Eating Birds?	U of MN, Duluth - NRRI	Alexis Grinde	$ 199,000
2021	03k	2021-278	Exploring Minnesota’s Wetlands: Our Resource for Future Medicine	U of MN, Crookston	Brian Dingmann	$ 210,000

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2021	03l	2021-289	A Biodiversity Checkup for Minnesota's Big Woods	U of MN, College of Food, Agricultural and Natural Resource Sciences	Lee Frelich	$ 109,000
2021	03m	2021-321	Microbiome in Raptors: A New Tool for Conservation	U of MN, Raptor Center	Julia Ponder	$ 129,000
2021	04b	2021-115	Novel Nutrient Recovery Process from Wastewater Treatment Plants	U of MN, College of Food, Agricultural and Natural Resource Sciences	Bo Hu	$ 200,000
2021	04c	2021-121	Monitoring Emerging Viruses in Minnesota's Urban Water Cycles	U of MN, College of Biological Sciences	Sebastian Behrens	$ 416,000
2021	04f	2021-358	Assessing Membrane Bioreactor Wastewater Treatment Efficacy	Minnesota State Colleges and Universities, St. Cloud State University	Heiko Schoenfuss	$ 419,000
2021	04g	2021-364	Evaluating Coronavirus and Other Microbiological Contamination of Drinking Water Sources from Wastewater	U of MN, College of Science and Engineering	Timothy LaPara	$ 594,000
2021	04j	2021-390	Antibiotic Resistance and Wastewater Treatment: Problems and Solutions	University of St. Thomas,	Justin Donato	$ 432,000
2021	06a	2021-017	Starch Allocation Patterns of Invasive Starry Stonewort Harvested from Lake Koronis	Minnesota State Colleges and Universities, Minnesota State University Mankato	Ryan Wersal	$ 101,000
2021	06d	2021-164	Biocontrol of Invasive Species in Bee Lawns and Parklands	U of MN, College of Food, Agricultural and Natural Resource Sciences	Vera Krischik	$ 425,000
2021	06f	2021-217	Evaluating Minnesotas Last Best Chance to Stop Carp	U of MN, College of Food, Agricultural and Natural Resource Sciences	Peter Sorensen	$ 424,000
2021	07a	2021-010	Enhanced Thermo-Active Foundations for Space Heating in Minnesota	U of MN, Duluth	Alison Hoxie	$ 312,000

Environment and Natural Resources Trust Fund (ENRTF)

Research projects completed between July 1, 2022 and June 30, 2024

Outcome summaries are included in Section III. Completed Research Projects

RFP Year	Subd.	Proposal ID #	Project Title	Organization	Project Manager	Amount Appropriated
2021	07c	2021-191	Agrivoltaics to Improve the Environment and Farm Resiliency	U of MN, WCROC	Bradley Heins	$ 646,000
2021	07d	2021-294	Behavioral Response of Bald Eagles to Acoustic Stimuli	U of MN, St. Anthony Falls Laboratory	Christopher Feist	$ 261,000
2021	08i	2021-212	Reducing Plastic Pollution with Biodegradable Erosion Control Products	Agricultural Utilization Research Institute	Matthew Leiphon	$ 200,000
2021	08n	2021-308	Creating Cost-Effective Forage and Management Actions for Pollinators	U of MN, College of Food, Agricultural and Natural Resource Sciences	Daniel Cariveau	$ 198,000
2022	08f	2022-188	PFAS Fungal-Wood Chip Filtering System	U of MN, College of Food, Agricultural and Natural Resource Sciences	Jiwei Zhang	$ 189,000