# Environment and Natural Resources Trust Fund
# 2017 Request for Proposals (RFP)

**Project Title:** **ENRTF ID: 077-B**

Addressing Emerging Threats to Coldwater Fish Production

**Category:** B. Water Resources

**Total Project Budget: $** 1,243,059

**Proposed Project Time Period for the Funding Requested:** 1 year, July 2017 - June 2018

**Summary:**

The goal of this project is to protect hatchery fish raised for stocking in Minnesota's waters, by increasing biosecurity at Crystal Springs State Fish Hatchery.

**Name:** Paula Phelps

**Sponsoring Organization:** MN DNR

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**Location**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

**Alternate Text for Visual:**

Photos showing Crystal Springs Hatchery flooded in 2007, illustrating that organisms can move into rearing areas during high water events. Photo of fish with furunculosis, likely introduced during the flood. Map showing locations where trout from Crystal Springs Hatchery are stocked.

| | | | |
|---|---|---|---|
| _____ Funding Priorities | _____ Multiple Benefits | _____ Outcomes | _____ Knowledge Base |
| _____ Extent of Impact | _____ Innovation | _____ Scientific/Tech Basis | _____ Urgency |
| _____ Capacity Readiness | _____ Leverage | _____ TOTAL | _____% |

**PROJECT TITLE: Addressing emerging threats to coldwater fish production**

**I. PROJECT STATEMENT**

Outdated and aging coldwater fish hatchery facilities, designed before fish pathogens or water quality were a concern, put hatchery-raised trout at risk for introduction of disease. The goal of this project is to protect hatchery fish raised for stocking in Minnesota's waters, by increasing biosecurity (i.e., decreasing the risk of disease) at Crystal Springs State Fish Hatchery, which produces about 18% of the trout MNDNR stocks.

- Hatchery culture of trout is an important part of trout management around the state.
- Preventing the spread of fish pathogens is a high priority in Minnesota.
- Current research is revealing the presence of many pathogens which were not previously present in the state, many with unknown consequences to Minnesota fish.
- Climate change is increasing the number of flash flood events in the South Branch of the Whitewater River, where Crystal Springs Hatchery is located.
- As the climate changes, pathogens of concern may also change.

Disease-causing organisms are found naturally in Minnesota lakes and streams but when introduced to a hatchery setting, impacts on hatchery fish can be devastating. In the spring of 2007, the South Branch of the Whitewater River flooded, allowing wild fish to enter the Crystal Springs Hatchery, likely introducing the pathogen *Aeromonas salmoni*cida (causes the disease furunculosis). Despite multiple attempts to control the pathogen, it spread throughout the hatchery and ultimately resulted in MNDNR needing to kill all fish at the hatchery. The estimated cost of raising those fish was $454,590. Furunculosis is not the only disease of concern for Crystal Springs Hatchery, but this is a recent example illustrates how damaging pathogens can be to a hatchery. Due to limited availability of springs, re-locating the hatchery to a less flood-prone area is not possible.

The hatchery water supply at Crystal Springs is considered disease-free, as it originates from a spring onsite. Existing hatchery design cannot prevent floodwaters from entering the system. The goal of this project is protect hatchery fish to be stocked in Minnesota waters from disease by increasing the biosecurity (i.e., reducing the potential for introduction of pathogens) at Crystal Springs Hatchery. This Hatchery produces about 18% of the trout MNDNR stocks. This project we will increase our ability to control the quality of water leaving the hatchery to ensure minimal impact to the South Branch of the Whitewater River, where hatchery effluent is received. We will accomplish this goal by building a dyke around the hatchery and installing water control structures capable of isolating the hatchery from the South Branch of the Whitewater River. We will also update the effluent ponds and plumbing of the facility to ensure effective effluent treatment.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1:** Increase biosecurity at Crystal Springs Fish Hatchery **Budget: $404,153**

Climate change has increased flash flooding in the South Branch of the Whitewater River. To increase biosecurity at Crystal Springs fish hatchery, we must effectively prevent future flooding at the hatchery. To accomplish this, we will build a dyke around the hatchery and install a water control structure to separate the effluent ponds from the river. We will also install bypass valves into the system at the springhouses, which will allow for thorough cleaning and drying of the production areas, which is critical for maintaining a disease-free hatchery.

| Outcome | Completion Date |
|---|---|
| 1. Build a dyke around Crystal Springs hatchery | June 2018 |
| 2. Install water control structures capable of separating the effluent ponds from river connection | June 2018 |
| 3. Install bypass valves at springhouses | June 2018 |

**Activity 2:** Protect fish at Crystal Springs Hatchery from emerging pathogens **Budget: $416,953**

Emerging pathogens present in the South Branch of the Whitewater River have the ability to enter Crystal Springs Hatchery through flooding. These pathogens may have detrimental effects to hatchery fish. In order to protect hatchery fish from emerging pathogens, we will construct pipes connected to all raceways and the springhouse and install valves to either manually or automatically isolate the hatchery outfalls from the river. We will also install a lift station capable of keeping the hatchery operational while isolated from the river. This will include installing a pump as well as gates and valves to be used for changing water from gravity flow to lifted use.

| Outcome | Completion Date |
|---|---|
| 1. Construct pipes and valves capable of isolating the hatchery from the South Branch of the Whitewater River. | June 2018 |
| 2. Install a lift station allowing the hatchery to operate while isolated from the river. | June 2018 |

**Activity 3:** Protect the South Branch of the Whitewater River from hatchery effluent **Budget: $421,953**

Crystal Springs Hatchery discharges directly into the South Branch of the Whitewater River. While MNDNR holds and complies with an NPDES permit from MPCA to discharge our wastewater, the hatchery does not have the ability to hold water in its effluent ponds to allow for treatment prior to release if necessary. In order to have better control the quality of water leaving the hatchery, we will reconfigure the effluent ponds to work more efficiently with the new dyke and to allow the ability to hold water for treatment prior to release. We will also install a water treatment system that will be effective in killing disease-causing organisms.

| Outcome | Completion Date |
|---|---|
| 1. Reconfigure effluent ponds | June 2018 |
| 2. Install a water treatment system | June 2018 |

## III. PROJECT STRATEGY

### A. Project Team/Partners

- Paula Phelps (Coldwater Production Supervisor, MNDNR) will lead the project.
- Luke Jadwin (Crystal Springs Hatchery Supervisor, MNDNR) will consult on specific needs for the hatchery.
- Dr. Heidi Rantala (Water Quality Consultant, MNDNR) and Amy Mustonen (National Discharge Pollution Discharge Elimination permit writer, MPCA) will collaborate, to ensure that the changes to the hatchery will be in compliance with the NPDES permit MNDNR holds from MPCA to discharge wastewater into the South Branch of the Whitewater River.
- MNDNR engineering staff will provide design and construction support.

### B. Project Impact and Long-Term Strategy

This project will help safeguard angling opportunities by ensuring that trout from Crystal Springs Fish Hatchery are healthy and available for stocking into Minnesota waters. Having disease in the hatchery reduces the overall production of the DNR trout hatcheries, as the facility needs to be disease-free for three years before fish can be stocked into Minnesota waters from the hatchery. The MNDNR Coldwater Hatchery System has 5 trout hatcheries state-wide, with finite capacity for production. Protecting the hatchery from pathogens ensures that MNDNR is able to provide diverse opportunities to Minnesota's anglers. Modifying the hatchery effluent system will also increase protection for the South Branch of the Whitewater River from hatchery effluent.

### C. Timeline Requirements

One year is sufficient to complete this project. We want to finish this project in a timely manner so that production can resume at the hatchery as soon as possible.

# 2017 Detailed Project Budget

**Project Title: Addressing emerging threats to coldwater fish production**

**IV. TOTAL ENRTF REQUEST BUDGET *1* year**

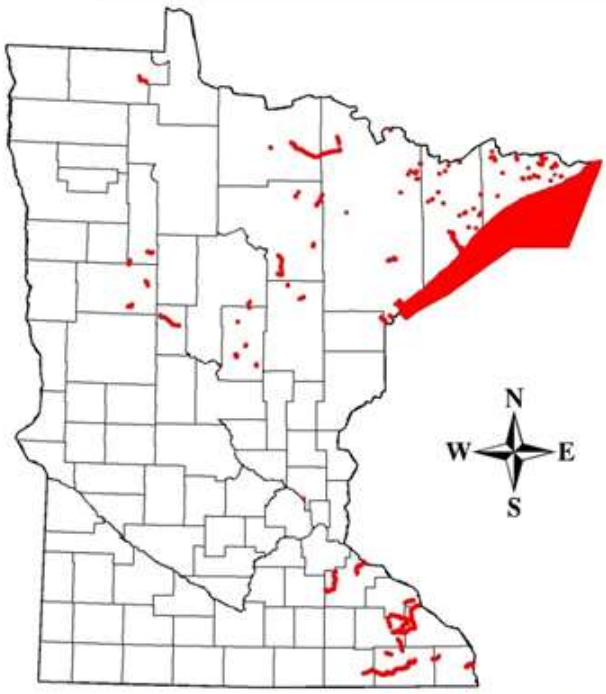
| BUDGET ITEM | AMOUNT | |
|---|---|---|
| **Personnel:** | $ | - |
| **Professional/Technical/Service Contracts:** | $ | - |
| A. engineering and design (25%) | $ 188,812.50 | |
| B. contingency (25%) | $ 75,525 | |
| C. admin and permitting (10%) | $ 203,917.50 | |
| **Equipment/Tools/Supplies:** | | |
| A. clay and common Fill | $ 16,200 | |
| B. sheet pile | $ 24,000 | |
| C. water containment system equipment | $ 16,000 | |
| D. water containment system structure | $ 15,000 | |
| E. outfall pipe | $ 16,000 | |
| F. liner | $ 68,000 | |
| G. excavation and embankment | $ 54,000 | |
| H. 3ph electric pump, 2000 gpm @ 20 ft head | $ 15,000 | |
| I. 48-inch conc lift sta sump and equipment | $ 10,000 | |
| J. 12 x 12 pre-fab building with foundation | $ 40,000 | |
| K. electrical | $ 15,000 | |
| L. gates and equipment | $ 15,000 | |
| M. 30-inch manifold | $ 90,000 | |
| N. connecting pipes all sizes | $ 90,000 | |
| O. manholes and access structures | $ 35,000 | |
| P. valves and gates | $ 10,000 | |
| Q. site grading and drainage plan | $ 40,000 | |
| R. erosian control | $ 10,000 | |
| S. seeding and establishment | $ 5,000 | |
| T. hardscape and paving | $ 20,000 | |
| U. construction contingency (25%) | $ 151,050 | |
| **Acquisition (Fee Title or Permanent Easements):** | $ | - |
| **Travel:** | $ | - |
| **Additional Budget Items:** | | |
| A. MNDNR Direct and Necessary costs - People Support ($0), Safety Support ($0), Financial Support ($17,129), Communication Support ($1,316), IT Support ($0), Planning Support ($912), Procurement Support ($197) | $ 19,554 | |
| **TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =** | $ | 1,243,059 |

**V. OTHER FUNDS**

| SOURCE OF FUNDS | AMOUNT | Status |
|---|---|---|
| **Other Non-State $ To Be Applied To Project During Project Period:** | NA | |
| **Other State $ To Be Applied To Project During Project Period:** | NA | |
| **In-kind Services To Be Applied To Project During Project Period:**<br>*Paula Phelps, MNDNR salary, .05 FTE per year, salary plus fringe, 1 year ($4,450.50)*<br>*Heidi Rantala, MNDNR salary, .05 FTE per year, salary plus fringe, 1 year ($4,047.90)*<br>*Luke Jadwin, MNDNR salary, .2 FTE per year, salary plus fringe, 1 year ($15,458.15)* | $ 23,956.55 | *Secured* |
| **Funding History:** | NA | |
| **Remaining $ From Current ENRTF Appropriation:** | NA | |

# How can increasing biosecurity at Crystal Springs Hatchery reduce fish disease?


During high water events, organisms can currently move into fish rearing areas.




Crystal Springs hatchery provides trout to waters across the state.

Furunculosis was likely introduced to the hatchery during flooding.

**Project Manager:**

Paula Phelps is the Coldwater Fish Production Supervisor for the Minnesota Department of Natural Resources, Division of Fish and Wildlife, Section of Fisheries. Paula received her B.S. in biology from the College of St. Catherine in 2006. Prior to her current position, Paula has served in other roles for the MN DNR over the past 10 years, including Aquaculture and Fish Health Consultant and Bacteriologist.

**Organizational Description:**

The mission of the Minnesota Department of Natural Resources (DNR) is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. Within the DNR, the division of Fish and Wildlife bears primary responsibility for managing, protecting, and regulating the State's fisheries and wildlife resources. As a part of the Division's mission, it will promote habitat protection and development of private and public lands. The DNR has extensive experience administering and coordinating projects funded by the ENRTF.

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