



FEMA

March 9, 2023

Environmental Assessment Scoping Document

SECTION ONE: BACKGROUND

1.1 Project Information:

Project ID: FEMA-Wisconsin- DR-4383 Project 67097
Recipient: Wisconsin Emergency Management Agency
Subrecipient: Wisconsin Department of Natural Resources (WI DNR)
Title: Gandy Dancer State Trail over Little Balsam Creek Environmental Assessment
Address: Gandy Dancer Trail
Locality: Douglas County, Wisconsin
GPS: 46.48786, -92.22790
PLSS: S10 T46N R15W

1.2 Purpose and Need:

The Public Assistance Program purpose is to provide supplemental grants to state, tribal, territorial, and local governments, and certain types of private non-profits so communities can quickly respond to and recover from major disasters or emergencies. Between June 15 and June 19, 2018, high winds and heavy rains resulted in flooding throughout the state of Wisconsin. President Trump issued disaster declaration DR-4383-WI for the State of Wisconsin on August 18, 2018, which made disaster recovery assistance available through the Federal Emergency Management Agency (FEMA). The heavy rains and high velocity flood water levels of the Little Balsam Creek during the incident period caused slope failure, severe erosion of the bank, Gandy Dancer trail and failure of a box culvert. The purpose of the proposed action is to enhance and restore Little Balsam Creek based on the recommendation from the St. Louis River Area of Concern Action Plan (SLRAOC) while continuing to provide safe and reliable recreation opportunities to WI DNR's customers.

The main purpose of the SLRAOC is to present a comprehensive plan that outlines management actions necessary for removal of beneficial use impairments. An impairment of beneficial uses (BUI) is defined as a change in the chemical, physical or biological integrity of the Great Lakes system sufficient to cause significant environmental degradation. There are fourteen identified BUIs and in this case, the Loss of Fish and Wildlife BUI is being addressed through multiple projects including habitat restoration, protection and removal of barriers to aquatic organism passage. Removing the BUIs is based on local restoration targets and the targets are established through evaluation of current conditions to determine the status of BUIs. Specifically, in 2017 within the SLRAOC, the WI DNR undertook a fish passage culvert assessment to

determine the priority site(s) for BUI removal. The Little Balsam Creek system was identified as a Tier 1 Priority Crossing.

Little Balsam Creek and tributaries is a 5.07-mile, Class 1 trout stream with brook trout as the predominant species; rainbow trout are also common. Class 1 trout streams support naturally reproducing populations of stream resident or lake-run trout and salmon, mainly because of sufficient groundwater recharge that meets the thermal requirements of coldwater fishes. The presence of diverse physical in-channel habitat features such as gravel riffles, pools, and wood material recruited from the surrounding landscape are also important to support viable fish populations in Class 1 streams. Little Balsam Creek possesses these attributes, although they are often comprised by the channel's instability at the stream crossings. Class 1 streams are subject to detailed regulatory review to protect and maintain stream integrity relative to land and water management activities.

WI DNR Fisheries considers Little Balsam Creek as one of the most important brook trout waters within Wisconsin's Nemadji River and far-western Lake Superior watersheds. Fisheries acknowledges that brook trout is a priority species in the Great Lakes Restoration Initiative Action Plan III. Current fisheries management consists only of fishing regulations, mainly because the creek throughout its length is considered unstable and therefore unsuitable for habitat enhancement projects.

Class 1 streams are considered Exceptional Resource Waters (ERW) under Chapter NR 102.11(1)(a). This is defined as *surface waters which provide valuable fisheries, hydrologically or geologically unique features, outstanding recreational opportunities, unique environmental settings, and which are not significantly impacted by human activities*. Only 18.6% of Wisconsin's stream miles qualify as Outstanding Resource Waters ORW/ERW. 4.56 miles of the main stem of Little Balsam Creek is listed as an ERW.

The Gandy Dancer Trail box culvert is now the most constrictive of the four primary stream crossings on Little Balsam Creek. All three crossings downstream from the Gandy Dancer Trail were culverts that were replaced in 2018 and 2019 to gain fish passage and increase the ability of the structures to handle flood water.

The dimensions of the Gandy Dancer Trail box culvert are significantly inconsistent with the width, structure, and slope (i.e., dimension, pattern, and profile) of the natural channel and therefore is unstable relative to sediment transport, fish passage, and wood transport. By comparison, the stream's natural bank full width is 28.7 feet. Maintaining or increasing this constriction by retaining the box culvert will continue to constrict the channel by a minimum of 19.1 feet over a 200-foot distance. This is expected to increase the water velocity within the box culvert and reduce fish passage, namely by brook trout. Sustainable swimming speeds vary with species, size and life stage of the fish. Stream temperature and oxygen requirements motivate upstream and downstream migration in addition to spawning behaviors. WI DNR Fisheries staff measured water velocity within the box culvert as 1.57 feet per second (average between the inlet velocity of 1.88 and outlet velocity of 1.26 feet per second). In flume studies, Tudor et al. 2011 found the optimal swimming speed for brook trout as 0.82 feet per second in a flume that could be comparable to the existing box culvert. As such, the box culvert has strong potential to be a velocity barrier to fish passage. The maximum culvert water velocity should be based on the slowest sustainable swimming speed for the fish in the

stream. The minimum water depth must be adequate for fish to be completely immersed and not scraping the bottom. A 6-inch minimum water depth or 10-20% of the culvert diameter (whichever is greater) is recommended by *Fish Friendly Culverts* publication (UW Extension and WI DNR). Deeper placement may be necessary on high-gradient streams to allow sediment to reach equilibrium inside the pipe and establish a more "natural" slope. Bridges are preferred on high-value streams.

A reconditioned or repaired culvert will cause sediment deposition at the upstream end of the culvert and channel scour at the downstream end. A reconditioned or repaired culvert will also be subject to plugging during high river flow periods, as the constriction reduces wood transport efficiency that often results in jams and debris dams that cause excessive backwatering and increases the potential to damage the earthen embankment and the new bottomless structures downstream.

WI DNR Fisheries recommends a bridge at the Gandy Dancer Trail to restore channel stability and natural geomorphic evolution relative to its dimension, pattern, and profile. WI DNR Fisheries considers a bridge as a more cost-effective crossing than a reconditioned or repaired box culvert, taking into account the maintenance and replacement costs along with risk to fishery, should the culvert fail.

This project is a partnership between the WI DNR Parks and Recreation (PRM) Department and the WI DNR Office of Great Waters (OGW). The project is needed to minimize future risk and reduce maintenance of the trail, revert the stream to its natural state, remove a barrier for fish passage, and to reestablish this reach of Little Balsam Creek as a Class 1 trout stream. The results will also protect investments (\$1.2 million) made by the local community, FEMA and OGW that have replaced three downstream culverts.

In 2019, WI DNR requested that Cedar Corporation perform a comprehensive assessment of the existing box culvert to determine its structural integrity, damages, and alternatives for repair or replacement. During the assessment the OGW proposed returning the stream to a natural condition to align with the efforts of the SLRAOC. Cedar Corporation inspected the box culvert and debris catching structures, reviewed associated documentation, and prepared a detailed study and analysis to evaluate the crossing structure for economical solutions and environmental concerns. A summary of existing conditions from the assessment follows, which illustrates the need for the project.

Upstream Debris Containment Structure: The upstream debris containment structure is approximately 65-feet in length and consists of a left and right wall with cross beams approximately 12-feet on center. The upstream containment structure shows spalling at the upstream end of the structure with exposed reinforcement on the walls and beams. The walls are also spalled at the waterline and extend approximately 4 to 6-inches deep. The walls exhibit vertical cracking with efflorescence and areas of previous patching.

The left wall under and around the fifth beam shows the worst deterioration. There is a section of the lower wall that has spalled completely through the wall for approximately 4 to 6 foot of length. In addition, the wall at this location is cracked completely through the wall with spalling up to 4- inches deep and exposed rebar. This section of wall has failed from a structural standpoint.

Box Culvert: The reinforced concrete box culvert is approximately 215 feet long. There have been numerous wall patches completed previously to repair wall spalling from the floor elevation up approximately 4 to 5-feet. Some of these patches appear to have repaired significant spalling issues and in some locations full depth spalling. There are also numerous areas of wall spalling that have not been repaired and vary in depth of 2-inches to full depth. One patch on the left wall approximately 135-feet downstream of the inlet appears to be displaced inward as evidenced by wall cracking.

The top slab of the box exhibits numerous cracks, spalling and exposed rebar. The deterioration is not as prevalent as on the walls of the box.

The box floor appears to be spalled for the full length and width of the box with exposed rebar throughout. When originally constructed there were 1-foot by 1-foot chamfers at the corners similar to the chamfers at the top of the box. These lower chamfers have been almost completely spalled away with only small areas remaining.

Downstream Training Structure: The downstream training structure has pulled away from the box culvert. In addition, the entire structure has collapsed and/or displaced to the point that it is no longer effective.

Some of the deficiencies noted above are due to the age of the structure. The deficiencies that can be attributed to the 2018 flood event area the wall cracking of the upstream debris containment structure under the fifth beam. This area had deteriorated over the years and spalling had occurred over time but the full depth crack at this section could be attributed to the debris pile up and water pressure during the flood event.

The box culvert wall displacement at 135-feet downstream of the inlet could have been a result of the flood event considering the pressure and debris that would have been, traveling down the culvert.

In addition, the entire downstream debris containment structure failure can be attributed to the 2018 flood event. It appears that the large amount of water that transferred through the box culvert caused a large scour hole at the downstream end of the structure. The scour hole undermined the outlet structure and caused the complete failure.

Streambed Condition: The streambed condition on the upstream end of the culvert appears to have returned to normal conditions. The streambed and banks consist of sands and small cobbles. There is a large amount of downed timber in the streambed and on the floodplain upstream of the structure. Another large storm event most likely would produce the transportation of the downed timber to the entrance of the culvert.

The streambed immediately downstream of the culvert shows large scouring of the surrounding embankments. The area remains littered with timber and scoured as a result of the 2018 flooding.

Rehabilitation or replacement of the structure is needed to address mitigating potential future disaster potential, to bring the area into compliance with planning efforts and address necessary upgrades or repairs for safety of recreational users. The project anticipates a useful life of at least 75 years with scheduled maintenance.

SECTION TWO: ALTERNATIVE ANALYSIS

The National Environmental Policy Act (NEPA) requires FEMA to evaluate alternatives to the proposed project and describe the environmental impacts of each alternative. NEPA also requires an evaluation of the No Action alternative, which is the future condition without the project. This section describes the No Action alternative, the Proposed Action, and reviews the alternatives that were previously considered but dismissed.

2.1 Alternative 1 –No Action Alternative

The No Action Alternative is used as a baseline for comparison to estimate the benefits and impacts presented in the Proposed Action Alternative. Under the No Action Alternative, the existing box culvert would not be modified and would remain in its current state. Considering the deficiencies identified by WI DNR and consultants, this alternative would result in an unacceptable risk to public safety for the users of the Gandy Dancer State Trail and health of the stream in the Little Balsam Creek System. The No Action Alternative specifically would not address the Loss of Fish the Loss of Fish and Wildlife BUI which includes habitat restoration, protection and removal of barriers to aquatic organism passage.

2.2 Alternative 2—Proposed Action

The proposed action consists of the removal of the existing box culvert and debris catching structures, construction of a 140-ft. long single-span, prestressed I girder bridge structure, and grading the adjacent surrounding area back to a more natural condition. This action will result in a clear span over Little Balsam Creek with approximately thirty feet from estimated highwater elevation to the bottom of the low chord of the bridge structure. The creek would be restored to its natural condition as a Class 1 trout stream and the impediment to upstream spawning will be removed. Removing the concrete structure installed during the initial railroad construction will return approximately 576 feet of re-built natural streambed to the environment. Returning this area to a more natural condition will require disturbance to approximately 2.2 acres of land including tree and brush removal in an area that was previously filled.

The proposed action is beneficial to the environment, addresses resilience and is based on best science for climate adaptative for future flooding events. The proposed action is beneficial to addresses the Loss of Fish the Loss of Fish and Wildlife BUI which includes habitat restoration, protection and removal of barriers to aquatic organism passage. The Little Balsam Creek system was identified as a Tier 1 Priority Crossing. The proposed action implements management actions to address the BUI, is based on an assessment of implemented management action, proposes BUI removal as the removal of the box culvert illustrates that beneficial use is restored, and as part of the process public comments are addressed.

Real estate agreements are already in place for grading activities on the adjacent private property.

The major components of this action are listed below:

1. Remove the existing box culvert and upstream and downstream debris capture structures.
2. Lower the trail grade as much as possible while conforming to ADA standards. This will minimize the bridge span and disturbance footprint.

3. Construct a bridge to span the stream. The single-span structure will eliminate the need for intermediate supports in the creek and will shorten construction time frames.
4. Grade adjacent area back to a more natural stream and bank condition.

2.3 Alternatives Considered and Eliminated from Further Analysis

Several other alternatives were analyzed to determine the best outcome aligned with the goals of the WI DNR and OGW. Some alternatives resulted in similar overall environmental impacts. Due to their similarities, alternatives were further considered and eliminated based on key variations to the project scope. The overall least cost alternative for the project included repairing the debris capture systems at the inlet and outlet.

Repair Alternatives Not Selected

Repair alternatives that were considered but not selected included repairing the debris capture systems and lining the existing box culvert. With the walls deteriorating on the existing box culvert a culvert pipe (liner pipe) would be inserted into the existing barrel. Once the liner pipe is in place, the void area between the pipe and box culvert would be grouted solid. The liner pipe could be corrugated metal, concrete, or plastic. A hydraulic study would be required to verify that the new pipe could pass the required flood flows since the hydraulic area would be reduced. A series of weirs could be constructed inside the pipe to allow for fish passage.

This alternative was eliminated due to not addressing similar future flooding events, debris build-up, and stream restoration issues.

Replacement Alternatives Not Selected

Replacement alternatives that were considered but ultimately not chosen, included removing the existing structure and implementing an “in-kind” replacement. The “in-kind” replacement would require substantial earthwork and construction of a similar box culvert structure. This alternative would address the structural integrity but not the flooding, potential for debris build-up, or stream/habitat restoration.

This alternative was eliminated due to not addressing debris build-up, stream/habitat restoration and the construction method would require removal of the fill, then construction of the new box culvert and then replacement of that fill. If fill is needed to be removed, it should stay removed to create the natural channel again.

Removal Alternatives Not Selected

Removal alternatives that were considered but not selected included removal of the existing box culvert structure and debris capture structures and relocation of the trail. This alternative would restore the creek to its natural condition but would require the Gandy Dancer Trail to be re-routed on a new alignment that practically would involve another crossing of this stream in a different location.

This alternative was eliminated due to the unknown costs and efforts involved in re-establishing the trail along a new alignment. Re-establishing of the trail could involve real estate acquisitions and disruption of the natural environment to an unknown extent.

Bridge Alternatives Not Selected

In addition to the Proposed Action, two other bridge options were considered. A two or three span structure with the possibility of leaving the box culvert and debris capture structures in place to naturally degrade and let the creek bed find its way around the structure.

These alternatives were eliminated due to increased costs for intermediate substructure units as well as interference with the creek and the possibility of debris capture in between these units. Leaving the box culvert in-place would also lead to increased debris catchment and possibly more erosion during storm events. These alternatives would also not provide to a varying degree optimal habitat and stream restoration goals.

SECTION THREE: AFFECTED ENVIRONMENT

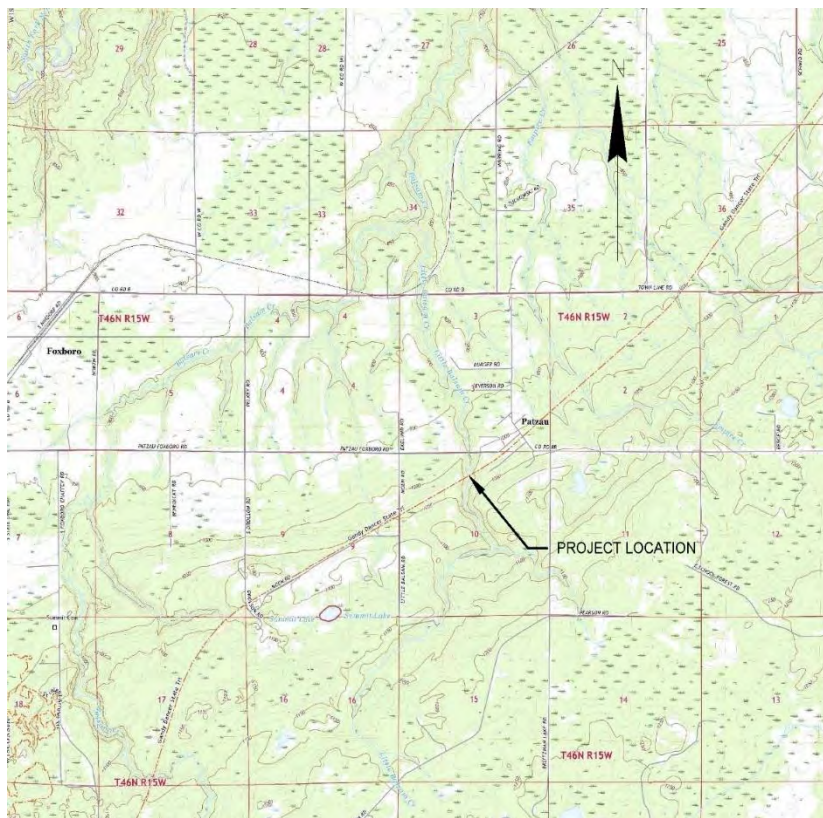
The proposed project restores Little Balsam Creek to its natural state and allows fish passage to upstream reaches as well as maintaining the Gandy Dancer State Trail for recreational purposes. The portion of the Gandy Dancer State Trail where the proposed project would occur is in an environment of both natural areas, previously altered natural areas and maintained infrastructure.

The project is within the Pattison Moraines Landscape type (LTA) of the Northwest Lowlands Ecological Landscape. The characteristic landform pattern of the Pattison Moraines is rolling collapsed moraine with forested lowlands as a common habitat type. Soils consist of well drained sandy loam over loamy sand till. The project area is located along a section of Gandy Dancer Trail, a rail to trail conversion. Specifically, the project is located along a section of the existing trail and within a deep ravine formed by Little Balsam Creek. The majority of the project area consists of slopes that exceed 15 percent. Wetland types consist of riverine with small portions of freshwater emergent and freshwater forested shrub. The area is mapped as Special Flood Hazard Area, Zone A, which has a 1% annual risk of a major flood. Vegetation consists of secondary forest growth due to fill from prior railroad construction with large live trees, dead trees (snags), fallen trees, trees of varying ages, sizes and species, with a forest floor of patches of young trees, shrubs and grasses.

Exhibit 1: General Project Location Aerial



Exhibit 2: Specific Area of Gandy Dancer Box Culvert Project Location Topographic Map



3.1 Preliminary Screening of Assessment Categories:

The alternatives listed above are likely to result in impacts governed by the federal laws and executive orders listed below. Checked items will require closer coordination with the appropriate agencies to identify and mitigate potentially significant impacts.

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| ☒ Clean Water Act (CWA) | ☒ Executive Order 12898 – Environmental Justice for Low Income & Minority Populations |
| ☐ Clean Air Act (CAA) | |
| ☐ Coastal Barrier Resources Act (CBRA) | ☒ Executive Order 13112 – Invasive Species |
| ☒ Coastal Zone Management Act (CZMA) | ☐ Farmland Protection Policy Act (FPPA) |
| ☒ Endangered Species Act (ESA) | ☒ Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments |
| ☒ Executive Order 11988 – Floodplains | |
| ☒ Executive Order 11990 – Wetlands | ☐ Migratory Bird Treaty Act (MBTA) |
| | ☒ National Historic Preservation Act (NHPA) |

3.2 Reasonably Foreseeable Future Actions

At this time, there are no reasonably foreseeable future actions to the Gandy Dancer State Trail over Little Balsam Creek.

SECTION FOUR: REFERENCES

Fish Passage Culvert Assessment in the St. Louis River Area of Concern in Wisconsin. Final Report, September 27, 2017. Prepared for Matthew Steiger, St. Louis River AOC Coordinator, Wisconsin Department of Natural Resources and Madeleine Roberts, Water Resources Management Specialist, Wisconsin Department of Natural Resources, Prepared by Amy Eliot, Assistant Scientist, UW-Superior Lake Superior Research Institute. EPA GLRI Grant #: GL-00E01474_SLR1602_Fish_Pass.

Gandy Dancer State Trail. Repair and Replace Box Culvert Under Trail Design Report Appendix. Cedar Corporation. February 2, 2022.

Great Lakes Restoration Initiative Action Plan III, 2020-2024. October 2019. [GLRI Action Plan III - October 2019 \(epa.gov\)](#).

Little Balsam Creek Gandy Dancer Trail Crossing Summary Information. September 30, 2019.

St. Louis River Area of Concern 2021 Remedial Action Plan. Reflects Amendments to 2019 RAP. The collaborating agencies include the Minnesota Pollution Control Agency (MPCA), the Minnesota Department of Natural Resources (MNDNR), the Wisconsin Department of Natural Resources (WDNR), and the Fond du Lac Band of Lake Superior

Chippewa (FdL), along with the AOC's designated Citizen Action Committee (CAC), the St. Louis River Alliance (SLR) Pg. 47-54.

Tudorache, C., R.A. O'Keefe, and T.J. Benfey. 2011. Optimal swimming speeds reflect preferred swimming speeds of brook charr (*Salvelinus fontinalis* Mitchell, 1874). *Fish Physiology and Biochemistry*, 37(2): 307-315. 2011 Jun;37(2):307-15. doi: 10.1007/s10695-011-9498-8. Epub 2011 May 11. PMID: 21559796; PMCID: PMC3107438.

University of Wisconsin-Extension in Cooperation with the Wisconsin Department of Natural Resources. No Date. Fish Friendly Culverts. Proper Design, installation, and maintenance can protect both roadways and fish.

Wisconsin State Legislature, NR 102.11(1)(a) Water Quality Standards for Wisconsin Surface Waters, Exceptional Water Resources.

SECTION FIVE: AGENCY CONSULTATION

The Federal, State and local Agencies and other interested parties including local officials and organizations listed below have been provided a copy of this document.

Town of Summit, Douglas County
Douglas County, Land Conservation
Douglas County, Forestry, Parks and Recreation
Douglas County, Trail Partner and Maintainer
Amnicon Drift Dodgers Snow Mobile Club
SWORDS ATV Club
Friends of Gandy Dancer
US Environmental Protection Agency Region 5
US Fish and Wildlife Service
US Army Corps of Engineers, St. Paul Regulatory District
Wisconsin Department of Natural Resources, Bureau of Environmental Analysis and Sustainability
Wisconsin Department of Natural Resources, Office of Great Waters
Wisconsin Department of Natural Resources, Transportation Liaison
Wisconsin Department of Administration, Coastal Management Program

The following were notified of this project through FEMA Region 5 Standard consultation procedures as directed under individual Environmental laws and Executive Orders.

Wisconsin State Historic Preservation Office
Bad River Band of Lake Superior Tribe of Chippewa Indians
Fond du Lac Band of Lake Superior Chippewa
Grand Portage Band of Lake Superior Chippewa
Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin
Lac du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin
Lac Vieux Desert Band of Lake Superior Chippewa Indians
Leech Lake Band of Ojibwe
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Mille Lacs Band of Ojibwe Indians

Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
White Earth Band of Ojibwe

SECTION SIX: FEMA CONTACT INFORMATION

Anyone interested in providing comment on this document may respond as noted below before April 10, 2023. Be sure to provide your name and contact information along with your comments.

Respond by Mail or Phone:

Federal Emergency Management Agency, Region 5
c/o Duane Castaldi, Regional Environmental Officer
536 South Clark Street, 6th Floor
Chicago, IL 60605-1521
312-408-5549

Respond by Email:

Send comments to fema-r5-environmental@fema.dhs.gov.