



Sisson Project

# Fisheries Productivity Offsetting Plan



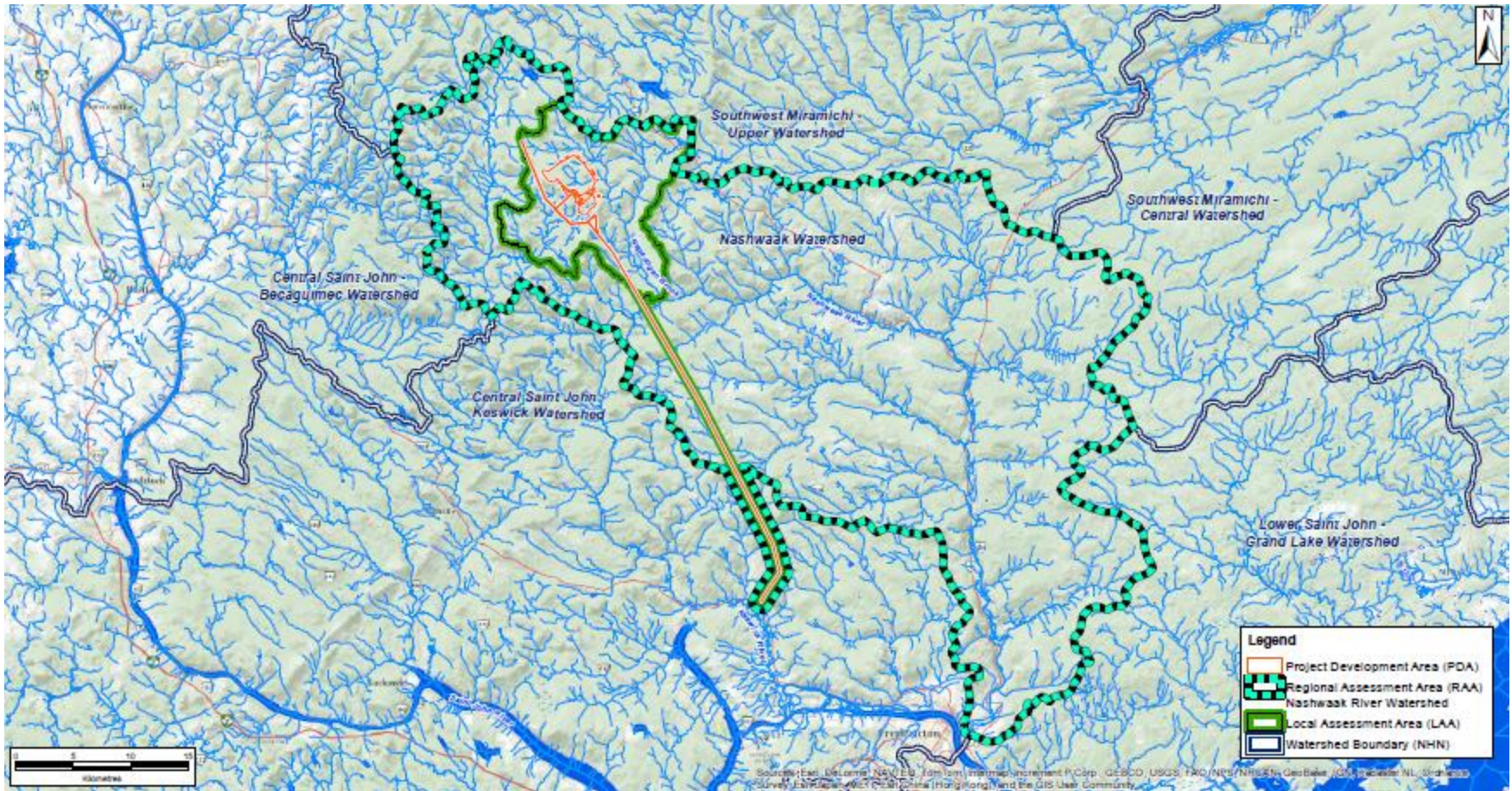
A photograph of a brown trout resting on a rocky riverbed. The trout is positioned horizontally, facing left, with its head slightly raised. It has a yellowish-brown body with numerous red and orange spots. The riverbed is composed of dark, smooth stones of various sizes. The water above is a deep green color with visible ripples.

# Agenda

1. Sisson Project Background
2. Aquatic Effects
3. Offsetting Options
4. Offsetting Plan
5. Discussion

# **SISSON PROJECT: BACKGROUND**

# Project Watershed Location



- Situated in the Nashwaak River sub-watershed, which drains into the Saint John River

# **SISSON PROJECT: POTENTIAL AQUATIC EFFECTS**

# Sisson Project Footprint (subject to final design)

## Tailings Storage Facility:

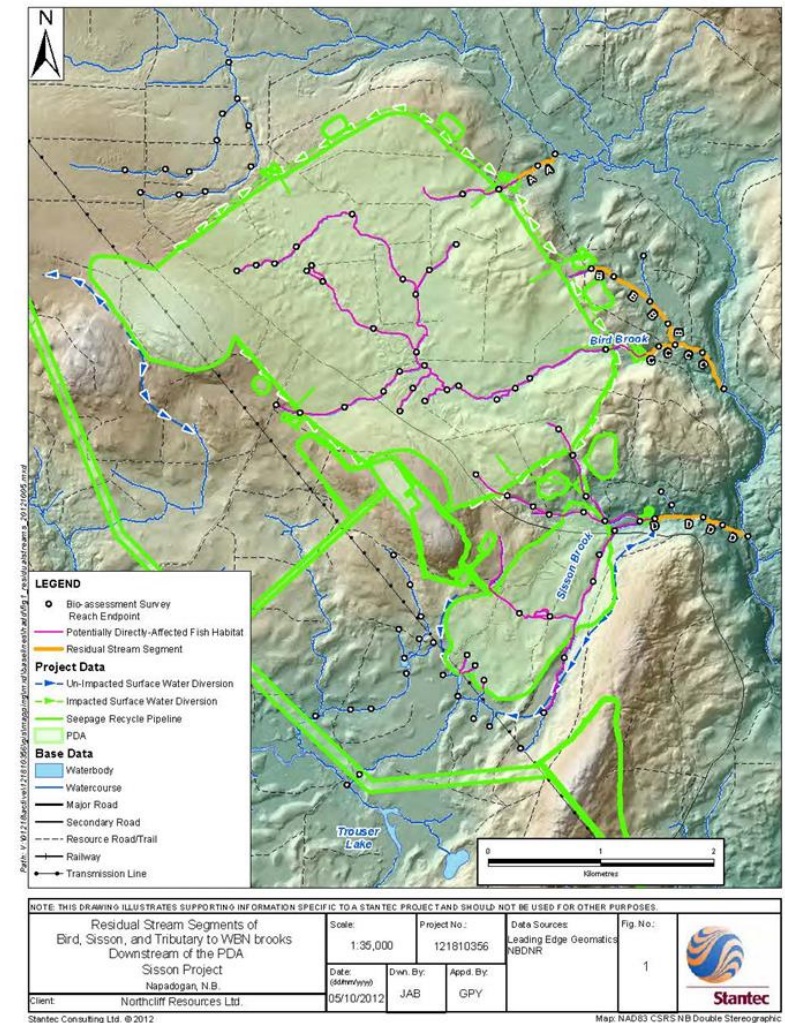
- Bird Brook
- Portion of Tributary “A” to West Branch Napadogan Brook
- Portion of Sisson Brook
- *Regulated under MMER/Fisheries Act*

## Open Pit:

- Sisson Brook
- McBean Brook
- *Regulated under Fisheries Act*

## Indirect Effect:

- Lower Napadogan Brook
- Residual segments of Sisson Brook and Trib. “A”
- *Regulated under Fisheries Act*



- Total Fish Habitat Lost ~ 54,400 m<sup>2</sup>

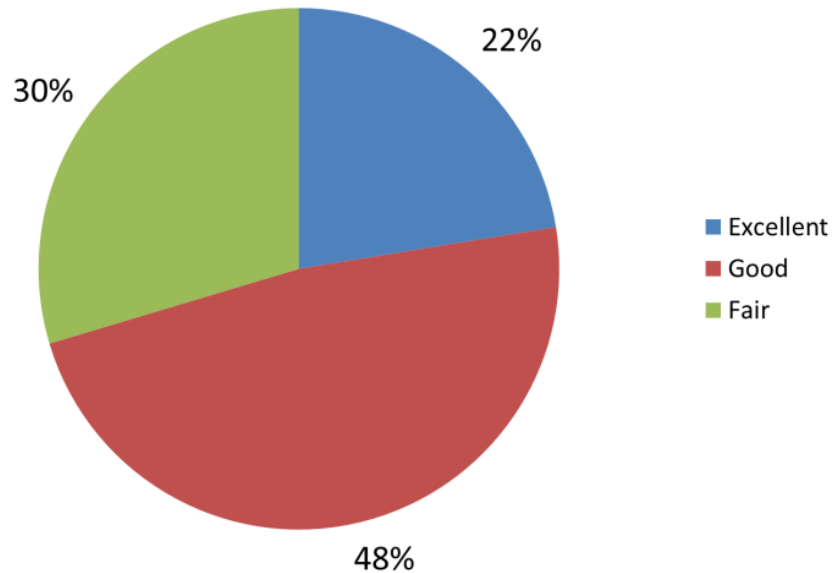
# Sisson Project Mitigation

1. Tailings storage facility (TSF) site selection and design
2. Mine waste and water management system
3. Construction methods and timing
4. Fish relocation plan
5. Fisheries productivity offsetting plan

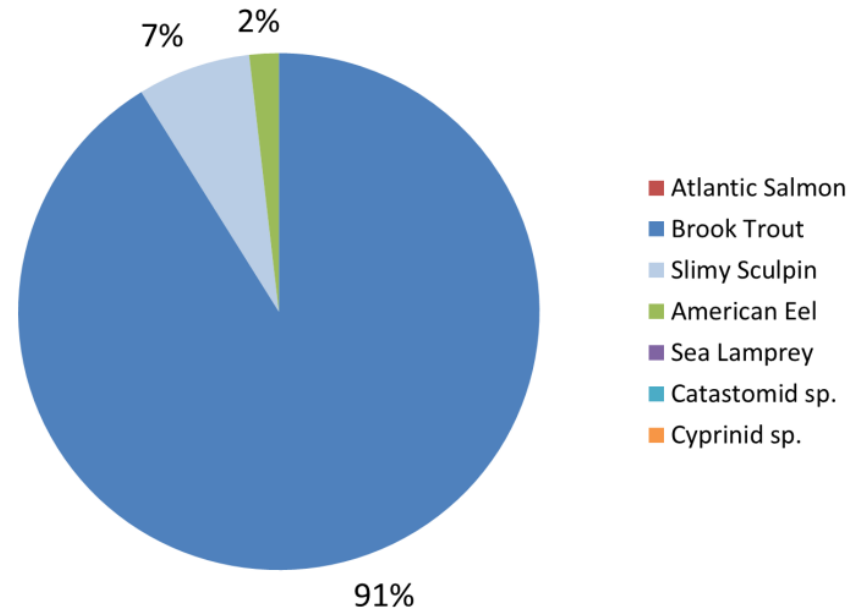


# Bird Brook Fish and Fish Habitat

Bird Brook - Habitat Quality for Brook Trout



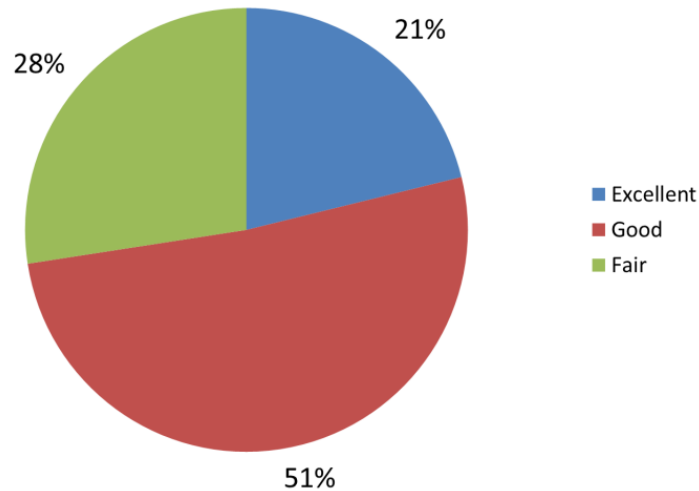
Bird Brook - Fish Abundance



- Patchy fish habitat
- Brook trout, slimy sculpin, American eel, and Atlantic salmon captured

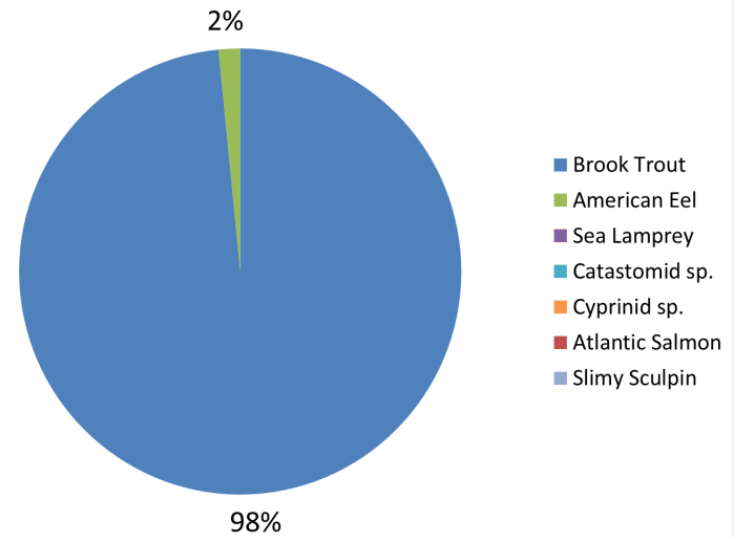
# Sisson Brook Fish and Fish Habitat

Sisson Brook - Habitat Quality for Brook Trout



- Natural waterfall barriers
- American eel, brook trout captured

Sisson Brook - Fish Abundance



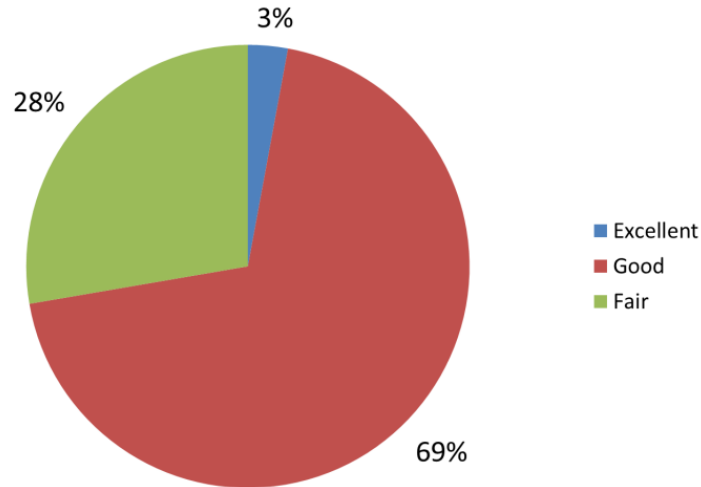
# Tributary “A” Fish and Fish Habitat



- Brook trout, slimy sculpin captured

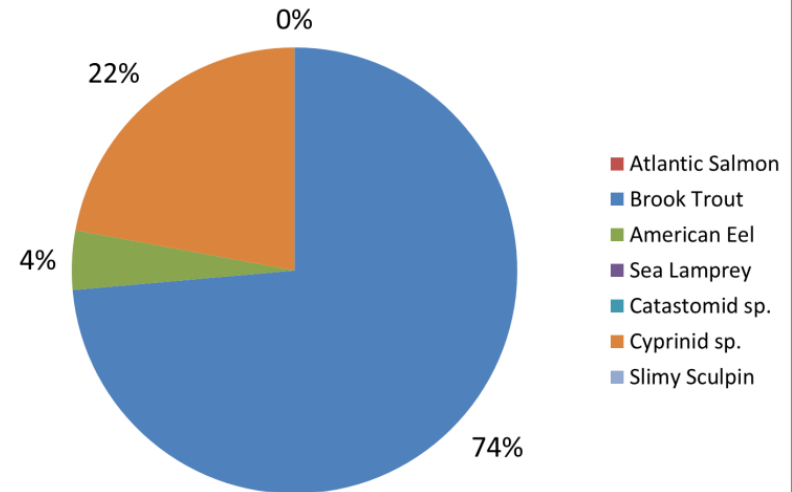
# McBean Brook Fish and Fish Habitat

McBean Brook - Habitat Quality for Brook Trout



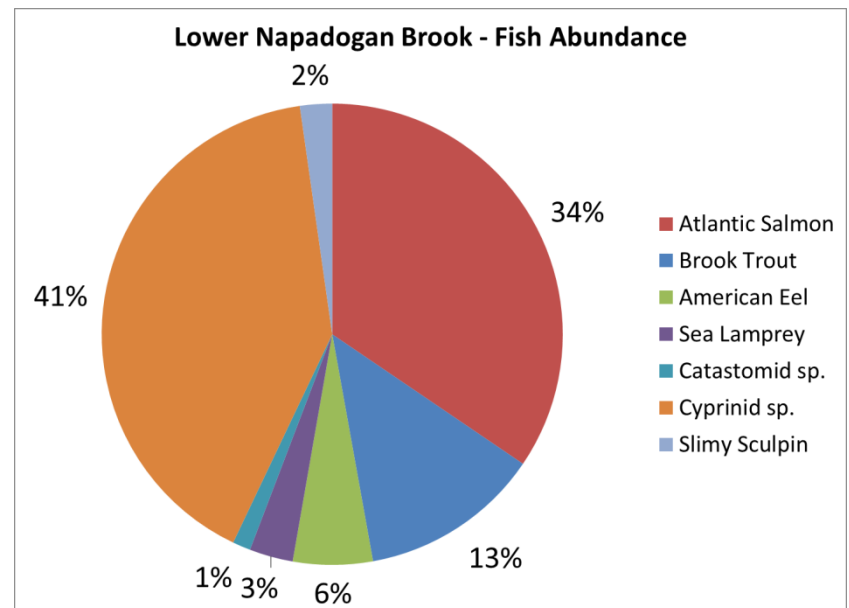
- American eel, brook trout, sea lamprey, longnose sucker, and 4 cyprinid species captured

McBean Brook - Fish Abundance



# Napadogan Brook Fish and Fish Habitat

- Atlantic salmon, American eel, brook trout, slimy sculpin, sea lamprey, white sucker, and blacknose dace captured
- Increasingly diverse fish community
- Species more tolerant of warmer water temperatures.
- Brook trout abundance is low



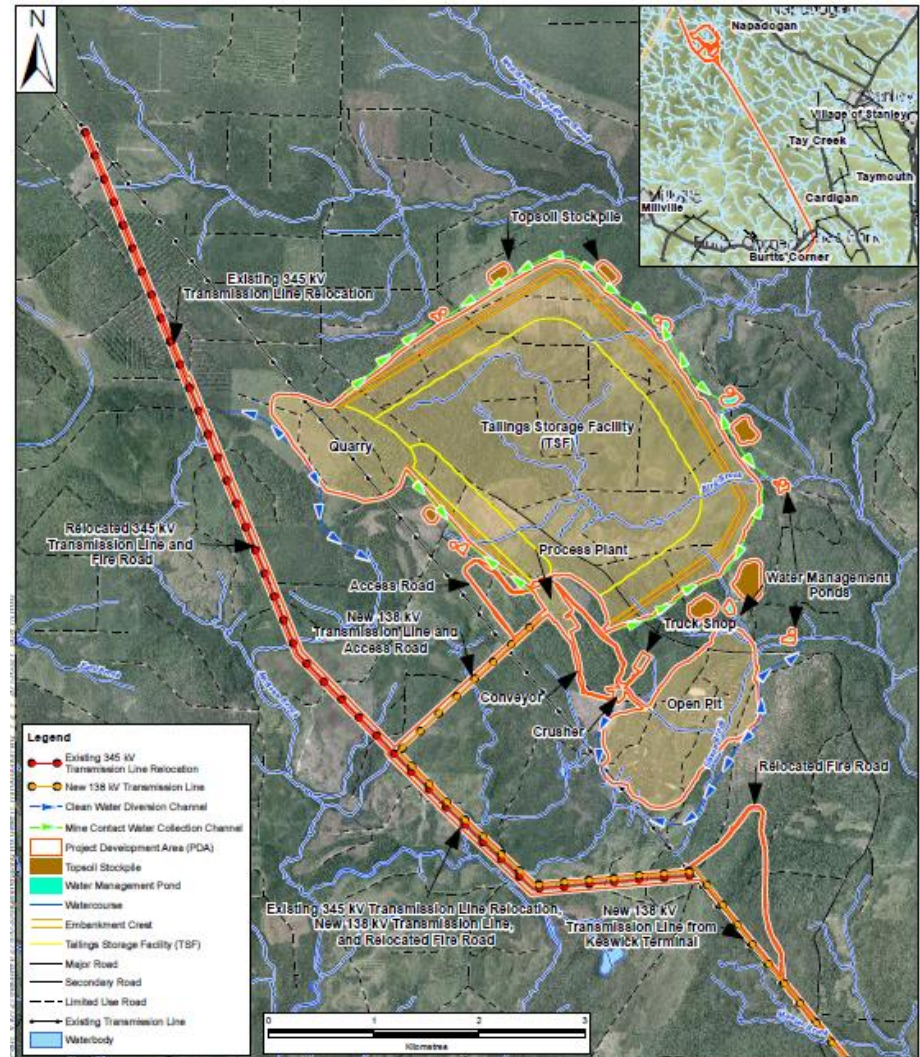
# **SISSON PROJECT: FISHERIES PRODUCTIVITY OFFSETTING OPTIONS**

# Fisheries Productivity Offsetting

## Fisheries Act:

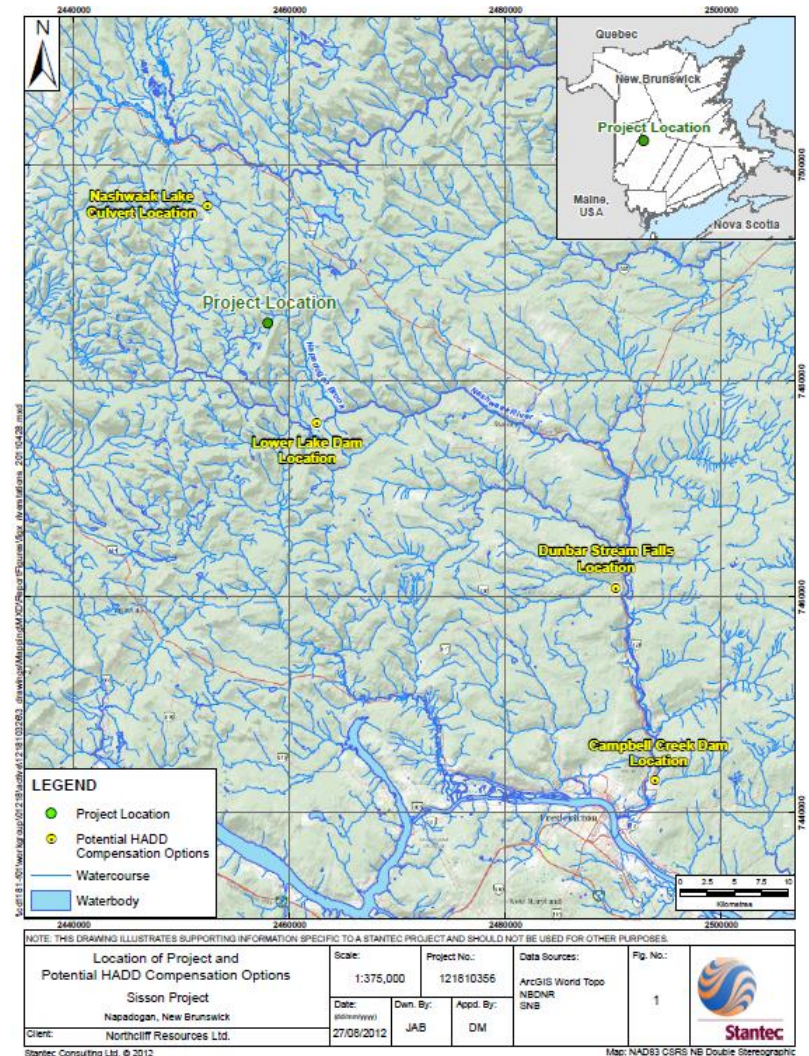
**Serious harm:** the death of fish, the permanent alteration to fish habitat, or the destruction of fish habitat at a scale that may result in population level effects

**Offsetting:** to counterbalance unavoidable serious harm to fish and the loss of fisheries productivity resulting from a project



# Offsetting Plan Options Evaluated

1. Campbell Creek Dam
2. Dunbar Stream Falls
3. Lower Lake Dam
4. Nashwaak Lake Culvert (proposed)



# Offsetting Option 1: Campbell Creek Dam

- Complete barrier to fish passage
- Atlantic salmon, brook trout and American eel habitat above barrier
- Insufficient habitat gains



# Offsetting Option 2: Dunbar Stream Falls

- Natural barrier to fish passage (3.35 m)
- Habitat above falls would be suitable for salmon
- Not historically salmon habitat



# Offsetting Option 3: Lower Lake Dam

- Partial barrier to fish passage – some species under some conditions, some parts of the year
- Insufficient offsetting option



# Offsetting Option 4: Nashwaak Lake Culvert

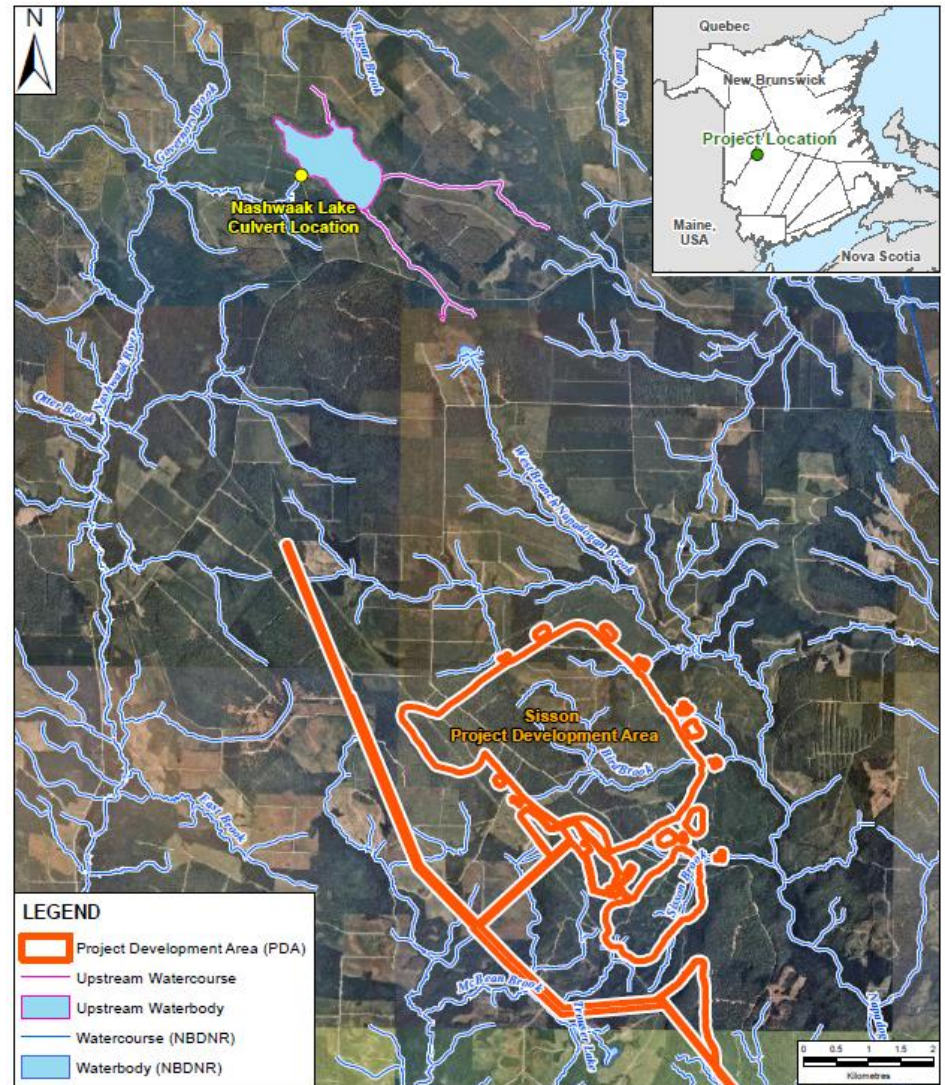


- Block to passage for most fish species



# Offsetting Option 4: Nashwaak Lake Culvert

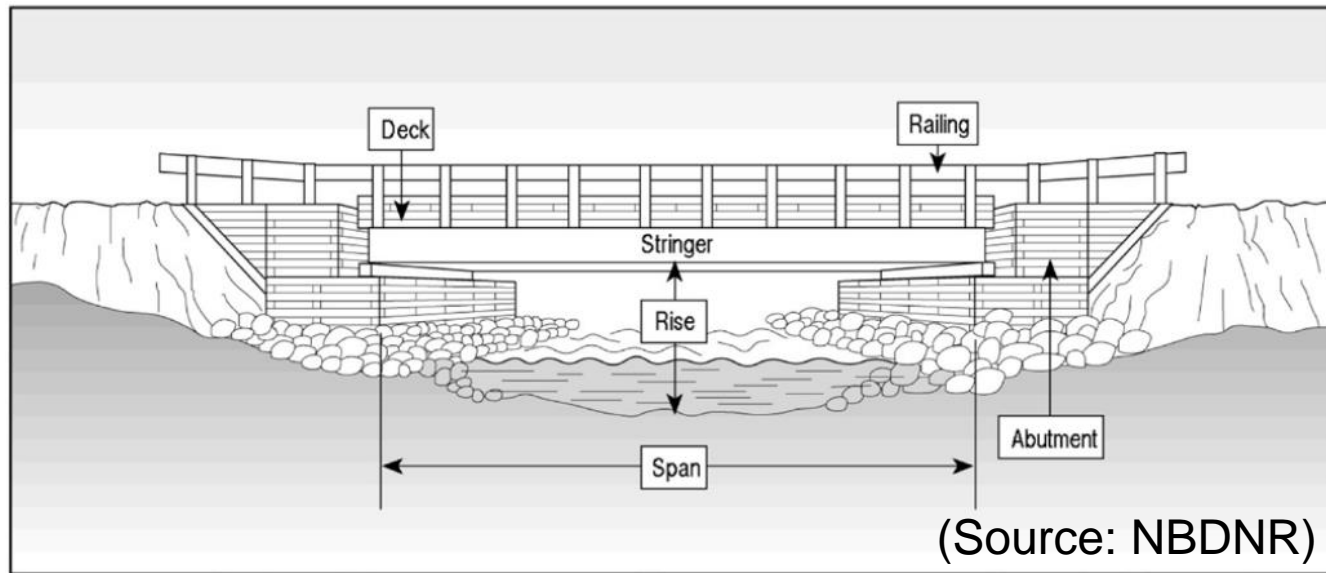
- Potential habitat for adult brook trout and spawning habitat for alewife and blueback herring (gaspereau) above culvert



The map displays the Nashwaak River watershed, which is a network of watercourses flowing into Nashwaak Lake. The lake is highlighted in light blue. The watershed area is outlined in pink. The map includes an inset map in the top left corner showing the location of the project within the context of New Brunswick, Maine, USA, and Nova Scotia. The legend in the bottom left corner defines the symbols used: a pink line for 'Upstream Watercourse', a light blue box for 'Upstream Waterbody', a blue box for 'Watercourse (NBQNR)', and a darker blue box for 'Waterbody (NBQNR)'. A scale bar in the bottom right corner indicates distances in kilometers (0, 0.5, 1.5). A north arrow is located in the top right corner.

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- NASHWAAK LAKE**  
 St. John Drainage  
 Aberdeen Parish  
 Carleton County  
 New Brunswick  
 Area: 251 Acres  
 map by J.R.
- Legend:  
 B/L W/L  
 L/S Y/P  
 T/O P/C  
 B/T H/P  
 A/C D/R  
 S/S L/W  
 R/W
- To J.D. Irving  
 Pulp Road
- 0 1000 2000  
 Feet  
 0 300 600
- COPYRIGHT © DEPARTMENT  
 NATURAL RESOURCES AND ENERGY

# Offsetting Option 4: Nashwaak Lake Culvert



- Replace existing timber box culvert with a standard woods road bridge
- Substantial net gain in available habitat

# Next Steps

1. Assess fish passage for non-salmonids of two remnant dam structures downstream of the Nashwaak culvert
2. Provide river profile elevation information - current and proposed
3. Design a follow-up fish passage monitoring study
4. Obtain Licence of Occupation required by New Brunswick





## Questions?



Trout Unlimited Canada