

**Flat Lake, Highway 103,  
HADD Compensation Project  
(DFO HADD Authorization 03-G8-068):  
2010 Vegetation Monitoring –  
Year 5 Final**



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Monitored September 2, 2010

# HISTORY:

## Portion of Flat Lake In-filled in 2005

- Large rock then common fill used to in-fill
  - 1:1 slope to 2:1 slope
- Slope topped with previously stockpiled grubblings
- Clumps of salvaged vegetation nestled into the grubblings and pressed into place with excavator bucket
- NS Highway Seed Mix spread by hand
- Bare soil covered with hay by hand
- Watered after installation with pumped lake water

# Purpose of Vegetating Slope

- To protect Flat Lake from erosion and soil loss
- To protect water quality of Flat Lake
- To provide habitat with native ecosystems
  - Insects, Arachnids
  - Birds
  - Small Mammals
  - Wildlife Corridor

# Yearly Monitoring (2006-2010):

- Slope erosion or soil loss into lake
- Replacement/restoration of native shrub and tree cover by percent cover
- Note dominant species occupying most of vegetative cover



# Monitoring Technique

- Stakes placed at top of slope, every 20 m
- Visual monitoring for soil loss or erosion
- Photo monitoring: photo from top at stake, towards water
- Vegetative cover estimated by percent of slope vegetated versus bare soil (or hay only)
- Percent of grasses, wildflowers, and shrubs and trees estimated within an estimated 2 – 3 metre band from stake to water
- Other photos taken as examples of vegetative cover
- Photos from east to west and west to east and from far side of lake

# GPS Coordinates for Each Stake

Stake		N		W	
1	44 <sup>0</sup>	42.078'	063 <sup>0</sup>	51.073'	Photos
2	44 <sup>0</sup>	42.080'	063 <sup>0</sup>	51.087'	
2b	44 <sup>0</sup>	42.080'	063 <sup>0</sup>	51.088'	Photos
3	44 <sup>0</sup>	42.082'	063 <sup>0</sup>	51.103'	Photos
4	44 <sup>0</sup>	42.084'	063 <sup>0</sup>	51.118'	Photos
5	44 <sup>0</sup>	42.085'	063 <sup>0</sup>	51.133'	Photos
6	44 <sup>0</sup>	42.086'	063 <sup>0</sup>	51.145'	Photos
7	44 <sup>0</sup>	42.088'	063 <sup>0</sup>	51.163'	Photos
8	44 <sup>0</sup>	42.090'	063 <sup>0</sup>	51.176'	Photos

## Examples of Common Native (Pioneer) Wildflowers



- Goldenrod species
- Narrow leafed goldenrod
- White topped aster
- Purple aster
- Pearly everlasting



**East to West**  
**September 2, 2010**



# Stake 1:

100% Cover



- 5% Grass species
- 90% Wildflowers including:
  - Goldenrod spp.
  - Evening primrose
  - Pearly everlasting
- 5% Sweetfern; Trees along shore were left during construction
- Lupines at shoulder

# Stake 2:

100% Cover



- 20% Grasses
- 40% Wildflowers and Ferns, including
  - Goldenrod spp.
  - White asters
  - Bracken fern
- 40% Trees and Shrubs, including
  - Meadowsweet
  - Alder
  - Pin cherry
  - Bush honeysuckle
  - Red maple
  - Sweetfern
  - Birch
  - Willow

# Stake 3: 100% Cover



- 5% Grasses
- 35% Wildflowers including
  - Goldenrod spp.
  - Aster spp.
  - Pearly everlasting
- 60% Shrubs and Trees, including
  - Birch
  - Sweetfern
  - Raspberry
  - Wild rose
  - Red maple
  - Willow
  - Alder
  - Pin cherry
  - Bush honeysuckle
  - Poplar

# Stake 4:

100% Cover



- 10% Grasses and Wildflowers (e.g. Goldenrods, Asters)
- 90% Shrubs and Trees, including
  - Birch
  - Sweetfern
  - Bush honeysuckle
  - Alders
  - Raspberry
  - Pin cherry
  - Meadowsweet
  - Wild strawberry

# Stake 5:

100% Cover



- 10% Grasses and Wildflowers, including
  - Goldenrod spp.
  - Aster spp.
  - Pearly everlasting
- 90% Shrubs and Trees, including
  - Alder
  - Meadowsweet
  - Willow
  - Raspberry
- Shoulder: Wild strawberry and Coltsfoot

# From Stake 5 Towards West



# From Stake 5 Towards East



# Stake 6: 100% Cover



- 15% Grass
- 15% Wildflowers and Ferns including:
  - Goldenrod spp.
  - Aster spp.
  - Pearly everlasting
  - Bracken fern
- 70% Shrubs and Trees, including:
  - Meadowsweet
  - Alder
  - Black huckleberry
  - Black chokeberry
  - Pin cherry
  - Blackberry
  - Wild strawberry



# Stake 6: Examples of Plant Community



- Meadowsweet
- White topped aster
- Goldenrods
- Red maple

- Goldenrods
- Sweetfern
- Grasses



# Stake 7:

100% Cover



- 10% Grasses
- 10% Wildflowers and Ferns, including:
  - Goldenrod spp.
  - Pearly everlasting
  - Aster spp.
  - Bracken fern
- 80% Shrubs and Trees, including:
  - Wild raisin
  - Raspberry
  - Alder
  - Red maple
  - Birch
  - Bush honeysuckle
  - Pin cherry
  - Blackberry
  - Willow

# Stake 8:

100% Cover



- 5% Grasses, Ferns and Wildflowers, including:
  - Goldenrod spp.
  - Aster spp.
  - Bracken fern
- 95% Shrubs and Trees, including:
  - Wild rose
  - Wild raisin
  - Black huckleberry
  - Birch
  - Raspberry
  - Sweetfern
  - Pin cherry
  - Meadowsweet
  - Alder at shoulder

# From Stake 8:

Red elderberry



White pine thriving from  
transplanted clump



# From Stake 8

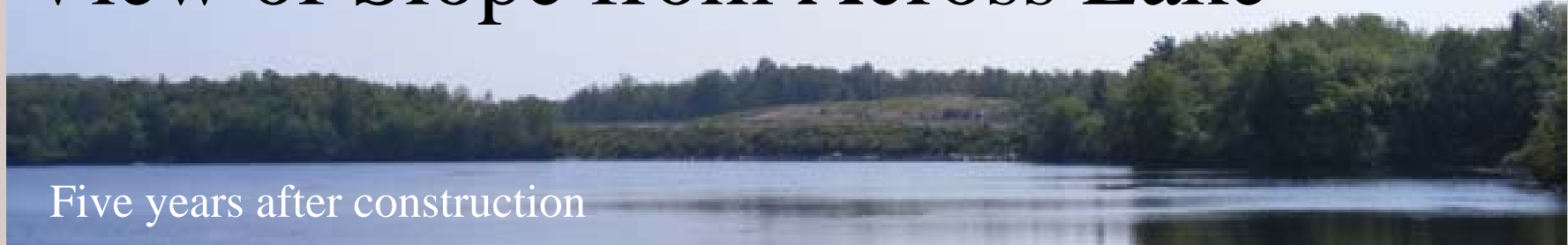


- Towards west and Exit 5

- Towards east



# View of Slope from Across Lake



Five years after construction

Example: No transplanted clumps = poor vegetative coverage



Highway

**Native shrubs and trees well established from transplanted clumps**

# **SUMMARY**

- **Slope vegetation is successfully protecting lake from surface soil erosion**
  - **No indication of slope failure or soil loss to lake**
- **100% vegetation cover**
  - **Grass has been replaced by native wildflowers and increasingly by shrubs and trees**
- **Vegetation and soil (from grubblings) is successfully allowing native trees and shrubs to establish**
- **Native species and ecosystem are successfully re-establishing from transplanted clumps**
  - **Native species have survived and are spreading**
  - **Riparian and forest habitats are re-establishing**