Cranberry Lake, Highway 103, HADD Compensation Project (DFO HADD Authorization 03-W8-303): 2009 Vegetation Monitoring: September 14, 2009 Year 5, Final

Diane LaRue, Vegetation Consultant
Environmental Services, NSTIR
October 2009


Native Vegetation Undisturbed by Construction
Outflow ↓
Native Wetland Vegetation
2008 photo

Vegetation Installed 2003, 2004, 2005

PHOTO: September 14, 2009

West to East

Slope: Specialty Topsoil and Seeded in 2005 →

Clumps of ←Plants Salvaged During Construction, 2004

Purpose of Transplanting Clumps of Native Vegetation at Toe of Slope with Topsoiling and Hydro-seeding Embankment

- To protect Cranberry Lake from slope erosion and soil loss;
- To help protect water quality through use of high organic topsoil; and
- To provide habitat with native ecosystems.

Objectives of Monitoring

- Determine if there is erosion or loss of soil into the lake;
- Identify vegetative cover versus bare soil;
- Determine if native shrub and tree cover is being restored; and
- For future work, determine if techniques used were appropriate.

Monitoring Technique

- Stakes placed at top of slope, every 20 m, and at the toe of the slope;
- Stake numbering from construction stations;
- Visual observation for soil loss or erosion;
- Photo monitoring of vegetation: photos from top at stake, towards water;
- Vegetative cover estimated by percent of slope vegetated vs. bare soil;
- Percent of grasses, wildflowers and shrubs and trees estimated within an estimated 2 – 3 meter band from stake towards water;
- Other photos taken as examples of vegetative cover;
- Photos from west to east and east to west;
- GPS coordinates recorded September 14, 2009.

GPS Coordinates for Each Station

Station	N	W
At HW sign	44° 40.030'	063° 46.443'
Sta + 680	44° 40.230'	063° 46.428'
Sta +660	44° 40.018'	063° 46.416'
Sta +640	44° 40.013'	063° 46.405'
Sta +620	44° 40.008'	063° 46.391'
Sta +600	44° 40.002'	063° 46.379'
Sta +580	44° 39.995'	063° 46.366'
Sta +560	44° 39.991'	063° 46.353'
Sta +540	44° 39.935'	063° 46.340'
Sta +520	44° 39.979'	063° 46.329'
Sta +500	44° 39.974'	063° 46.315'
Sta +480	44° 39.967'	063° 46.304'
Sta +460	44° 39.963'	063° 46.288'
Sta +440	44° 39.956'	063° 46.276'
Sta +420	44° 39.949'	063° 46.264'
Sta +400	44° 39.944'	063° 46.246'
Sta +380	44° 39.939'	063° 46.239'
Sta +360	44° 39.933'	063° 46.224'

West to East Views of Monitored Slope and Shoreline

Slope is now (2009) vegetated in native wildflowers and introduced ‘weed’ species

West of Station + 680; West End of Lake

- Native Red Osier Dogwood successfully established.
- Installed Fall 2005 from pre-rooted mat.

Station + 680

Slope: 90% cover

- Grasses gone
- Wildflowers (Asters, Goldenrods)
- Introduced ‘weed’ species.

Bottom:

- Mostly Cattails, some grasses, some Sweet Gale.

Station + 660

- Slope 90% cover
- Grasses gone
- 90% native Asters
- 10% introduced ‘weed’ species.

- Bottom:
- Cattails mostly in mud at bottom
- Some Sweet Gale
- Some grasses.

Station + 640

Photo unavailable

- Slope: 80% cover
  - Exposed ground, erosion control netting visable
  - Introduced ‘weeds’ (Wild Carrot, Coltsfoot)
  - Occasional Clover
- Bottom:
  - Goldenrods, Aster, Cattail, Sweet Gale, Leatherleaf
  - Plus: Red Osier Dogwood introduced from dormant stake.

Between
+ 640 and + 620

- Red Osier Dogwood successfully established from dormant stake
- Red Maple growing from transplant salvaged from wetland number 2
- Mullein noted in 2008 is gone.

Station + 620

- Slope 90% cover
  - No grass
  - Mostly introduced ‘weed’ species (Thistle, Knapweeds)
  - Native wildflowers (Goldenrod spp., Aster).
- Meadowsweet to left established from original clump transplant.

Station + 600

- Slope 95% cover
  - No grass
  - Introduced ‘weeds’ and native wildflowers (Aster, Goldenrod).
- Bottom:
  - Goldenrods, Aster, Wild Carrot
  - Meadowsweet
  - Soft Rush.

Station + 580

- Slope 90% cover
  - No grass
  - Mostly Aster
  - And some introduced ‘weed’ species.
- Transplanted clump at shoreline of native Black Chokeberry, Leatherleaf, Cranberry, Sweet Gale and unidentified shrub.
- Also, Aster, Jewelweed, and Knapweed.


Station + 580 Shrub clump at bottom

Between Stations + 580 and 560

- Large Multiflora Rose from clump transplanted during construction
- NOTE: may now be considered an invasive shrub.

Station + 560

- Slope 95% cover
  - Sparse grass
  - Mostly introduced ‘weed’ species (Thistle, Vetch)
  - Native wildflowers (Goldenrod spp., Aster)
  - Sparse Clover.

Station + 540

- Slope 90% cover
  - Sparse grass
  - Mostly Thistle and other introduced ‘weed’ species
  - Some Goldenrod, Aster, Horseweed.
- Several stems installed near here - None alive
- Bottom:
  - Soft Rush.

Station + 520

- Slope 90% cover
  - Sparse grass
  - Clover
  - Introduced ‘weeds’ (Thistle, Wild Carrot, Dock, Mullein seedlings, knapweed)
  - Horseweed
  - Native Goldenrods, Aster.

Station + 500

- Slope: 50 % ‘cover is dead grass
  - Introduced ‘weeds’ (Dock, Knapweed, Thistle)
  - Native wildflowers (Aster, Goldenrod)
  - Raspberry.
- Bottom:
  - 60% Cattail
  - 20% grasses
  - 20% native shrubs (Leatherleaf, Sweet Gale).


East of Station + 500
Large patch of Coltsfoot

Between Stations +480 and + 500

- Willows established from dormant stakes
- Shore clumps established from vegetation salvaged during construction.

Station + 480

- Slope: 80% live cover (20% dead grass)
  - Mostly Aster with occasional Goldenrod
  - Occasional introduced ‘weed’ species (Thistle)
  - Raspberry
- Shore (transplanted at construction):
  - Mostly Cattail (90%)
  - Sweet Gale, Leather-leaf, Bulrush, Soft Rush.

Station + 460

- Slope: 80% live cover (20% dead grass)
  - No grass observed
  - Introduced ‘weed’ species (Thistle, Groundsel, Dock)
  - Native Asters
  - Raspberry.
- Shore Mostly Cattail
  - Also Sweet Gale, Bulrush, Aster, and Soft Rush.

Station + 440

- Slope 100% cover
  - Sparse grass
  - Introduced ‘weeds’ (Thistles)
  - Native wildflowers (Aster, Narrow Leaf Goldenrod)
  - To left, several Mullein seedlings.
- Shore:
  - Mostly Cattail
  - Bulrush
  - Sweet gale
  - Water Lily in water.

Station + 420

- Slope 90% cover
  - Sparse grass
  - Introduced ‘weeds’ (Thistle, Sweetclover – 1st, 2nd year plants, Groundsel)
  - Native wildflowers (Goldenrod, Aster).
- Shore
  - Some Cattail at water’s edge
  - Grasses, Goldenrods, Bulrushes
  - Maple, natural regeneration.

Station + 420

- Young Red Maple, naturally regenerating

Station + 400

- Slope 100% cover
  - No bare soil
  - Sparse grass and Clover
  - Chickweed (live and dead)
  - Other introduced ‘weed’ species (Wild carrot, Groundsel)
  - Native Goldenrods and Asters
  - Horseweed.
- Shore
  - Cattails
  - Meadow-sweet
  - Bulrush, grasses
  - Sweet Gale
  - Pickerel Weed, Water Lily.

Station + 380

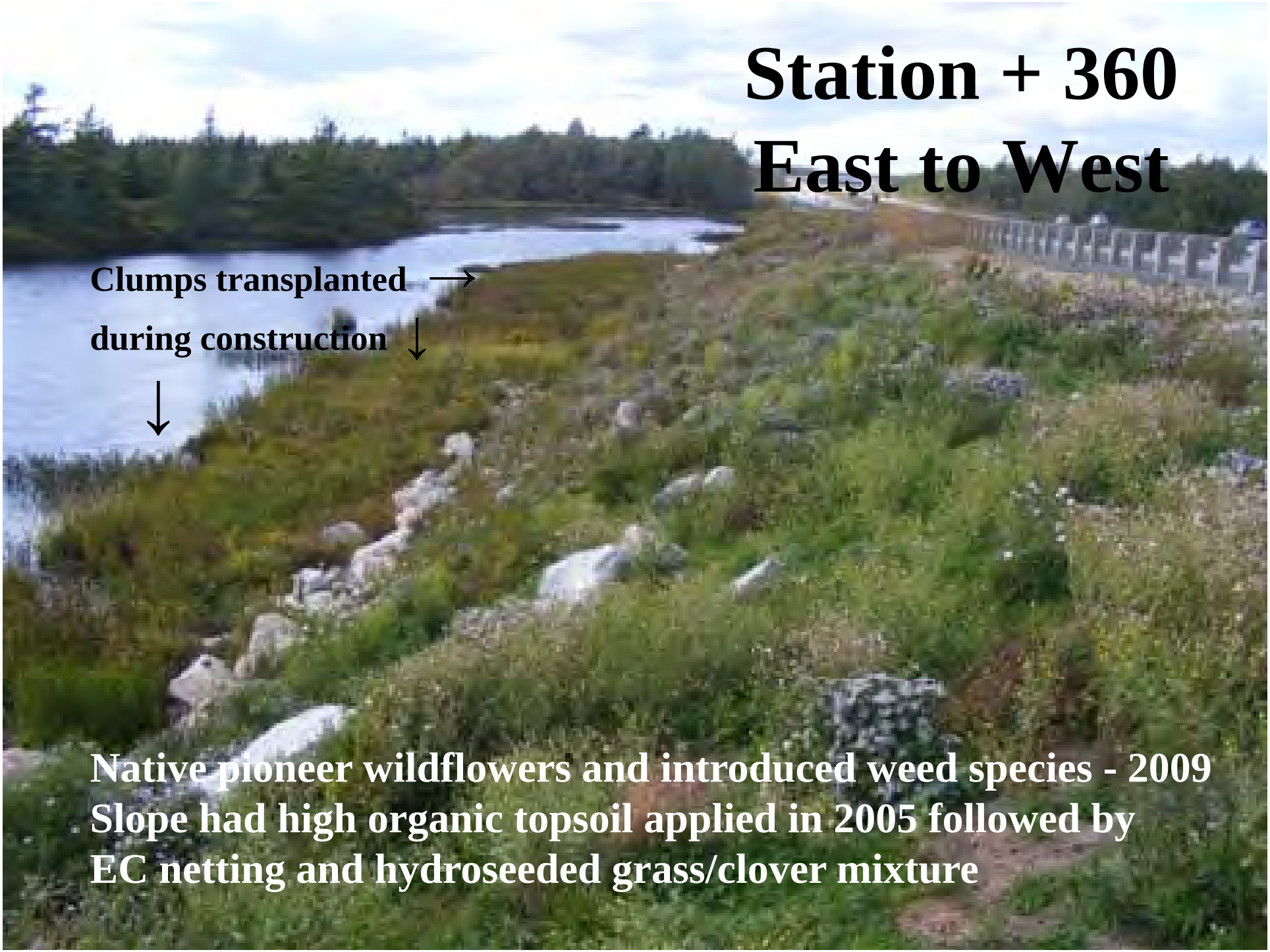
- Slope: 80%
  Live Cover
  - Sparse grass
  - Introduced ‘weeds’ (Groundsel, Vetch)
  - Clover
  - Native Asters, Goldenrod.

Station + 380

- Bottom of slope:
  - 100% cover of recovering native forest vegetation in undisturbed area.

Station + 360

- Slope: 100% cover
  - 50% live (clumps of grass, Groundsel, occasional Clover, occasional Asters).
- Bottom: 100% cover
  - Recovering forest vegetation.


Station + 360
East to West
Clumps transplanted →
during construction ↓
↓
Native pioneer wildflowers and introduced weed species - 2009
Slope had high organic topsoil applied in 2005 followed by
EC netting and hydroseeded grass/clover mixture

East to West
2008 and 2009

- Grass dying out
- Replaced with introduced ‘weed’ species and native wildflowers.

Both photos taken in mid-September

Erosion Control Netting

- Still strong and intact
- Sparse vegetation in some areas
- Moss providing some cover
- Some bare soil.

Summary of Slope Vegetation Observations 2004 to 2009

- Dense turf cover resulted from hydro-seeding onto specialty topsoil amended with compost in 2005;
- Guardrail construction exposed gravel on slope, which had filled in with introduced ‘weed’ species by 2008, station 640);
- By 2009: live grass is sparse; most of slope has filled in with introduced ‘weed’ species and native pioneer wildflowers (mostly Asters and Goldenrods);
- Slope cover has decreased at most stations from 100% to 90 – 95%, with occasional patches of bare soil;
- Alsike clover was dense, then mostly disappeared by 2008; 2009 it is sparse;
- Transplanted clumps of vegetation along toe of slope had poor success probably due to drying out before ‘planting’; some species introduced survived and established (Meadowsweet, Soft Rush);
- Red Osier Dogwood successfully established at toe of slope from dormant stakes and a pre-vegetated mat; and
- A few of the individual salvaged transplants from Wetland Number 2 survived and are growing.

Summary of Shoreline Vegetation Observations 2004 to 2009

- Shoreline and aquatic vegetation transplanted in clumps during infilling construction in 2004 has successfully established with no decrease in habitat;
- Native species (Cattails, Sweet Gale, Leatherleaf, grasses, Water Lily, Pickerel Weed) continue to thrive; and
- Willows have successfully established from dormant stakes inserted into shoreline mud in spring of 2005.

Conclusions

- Transplanting clumps of native shoreline and wetland vegetation during construction is a successful technique helping to maintain habitat for insects, birds, other animals;
- Transplanting clumps of vegetation communities at the toe of the slope might have been more successful if they had not dried out for several weeks between lifting and placing;
- Native willows and Red Osier Dogwood can be successfully established from dormant stakes;
- Individual transplants salvaged from construction sites can successfully establish;
- There is very little natural regeneration of shrubs or trees on the slope during this five year period;
- It is not obvious if the specialty topsoil designed for protection of water quality from highway runoff has met the goal;
- There is no sign of erosion or loss of soil from the slope to the lake; and
- RECOMMEND: Introduce native tree species e.g., Spruce, at the west end in particular, to help protect lake water from roadside spray.