

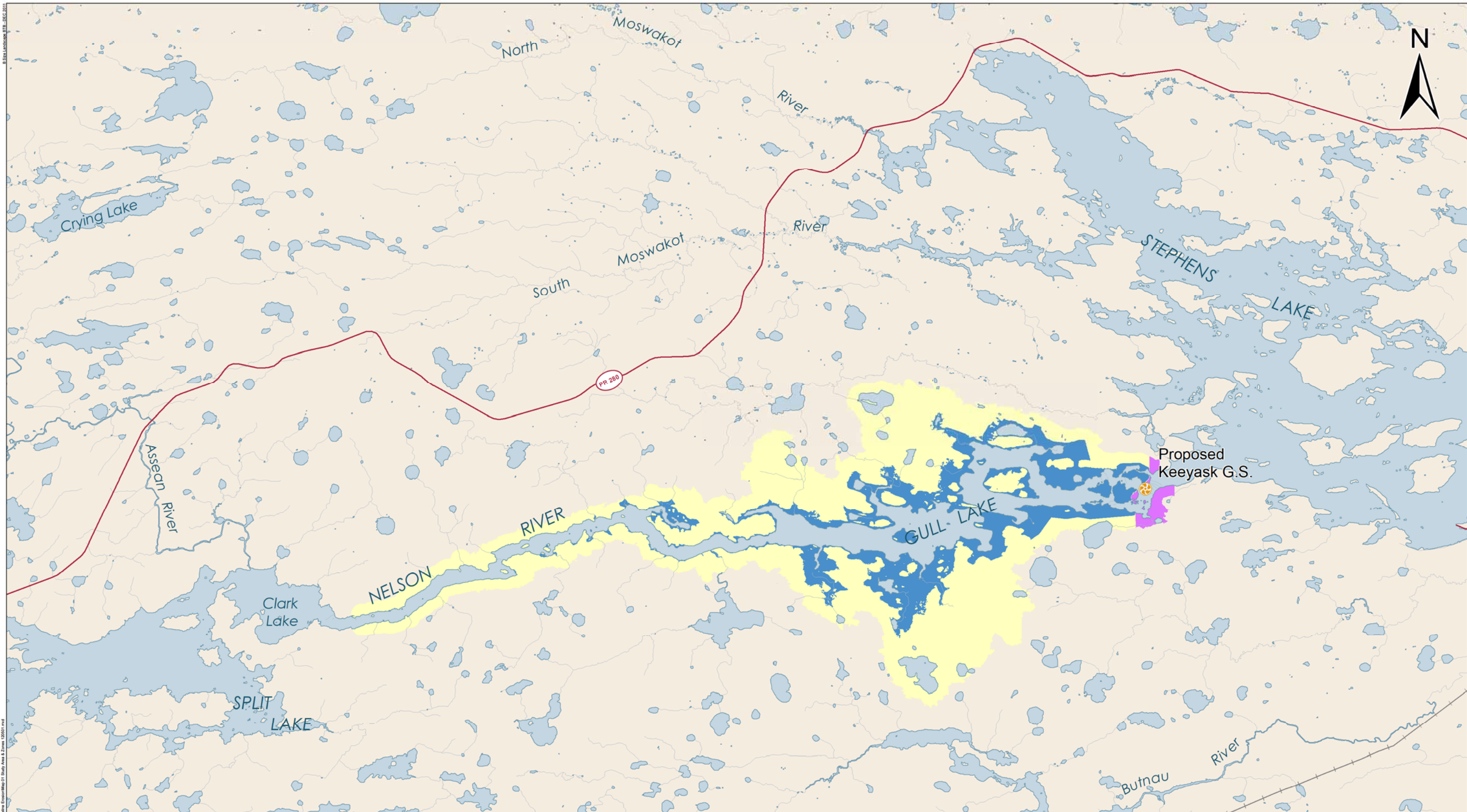


Keeyask Generation Project Environmental Impact Statement

Supporting Volume Physical Environment



June 2012



DATA SOURCE:
 Study areas - ECOSTEM Ltd.; Existing Nelson River shoreline (gull-ee-95perc-4327cms-rev3) and initial flooding (pp-95perc-4327-159-shore-rev5) - Manitoba Hydro; Water - NTS; Roads and rail - Manitoba Conservation.

CREATED BY:
 ECOSTEM Ltd.

COORDINATE SYSTEM: UTM NAD 1983 Z15N	DATE CREATED: 23-MAY-12	REVISION DATE: 23-MAY-12
VERSION NO.: 1.0	QA/QC: APPROVED	

Legend

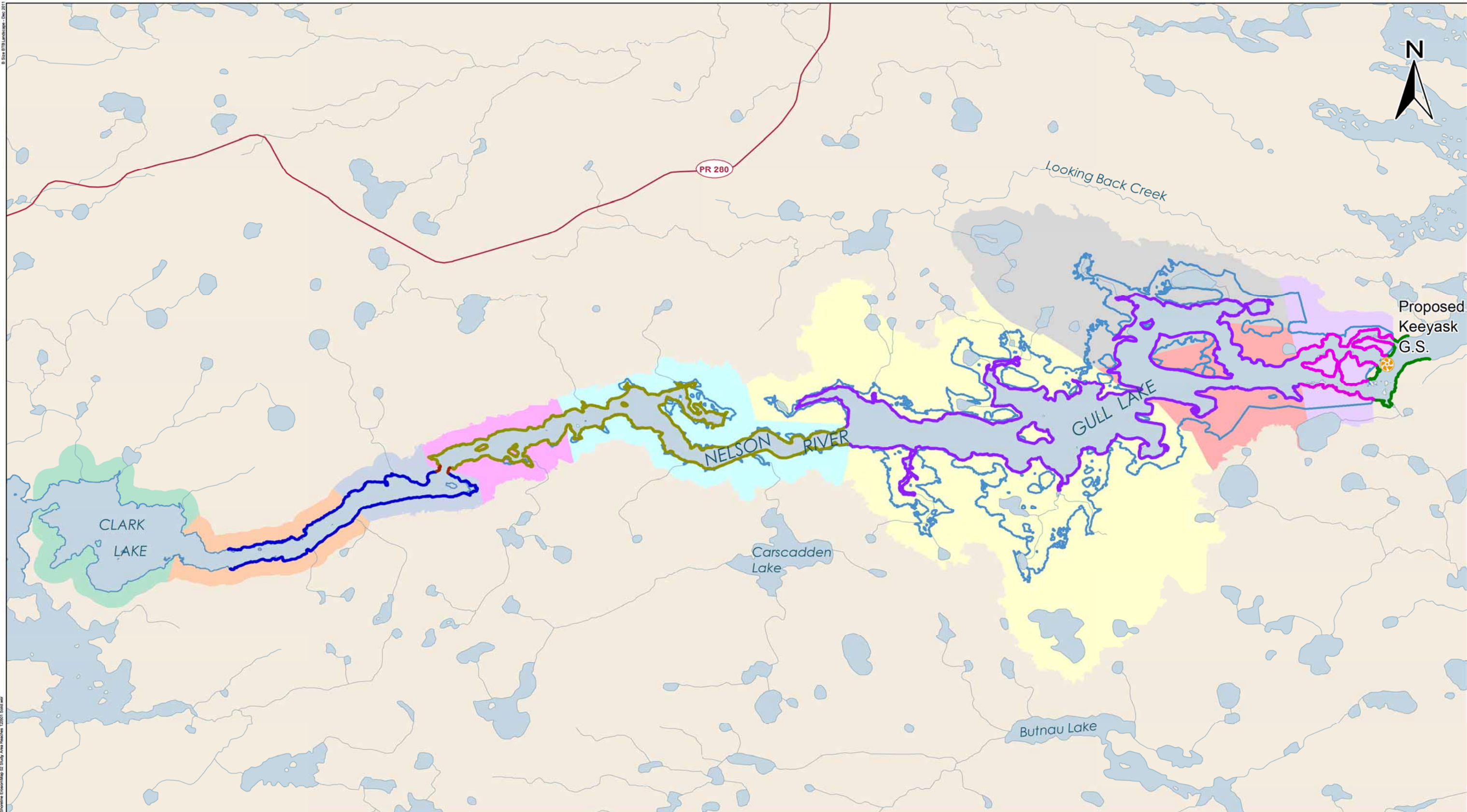
Study Area Zones

- Downstream
- Upstream

Initial Flooded Area (159 m)

- Flooded Area

Shoreline Erosion Study Area and Zones



DATA SOURCE:
 Reaches - North/South Consultants Inc.; Existing Nelson River shoreline (gull-ee-95perc-4327cms-rev3) and initial flooding (pp-95perc-4327-159-shore-rev5) - Manitoba Hydro; Existing environment - J D Mollard and Associates Limited; Water - NTS; Roads and rail - Manitoba Conservation.

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Existing Environment and Future Without Project Reaches

- Lacustrine at Gull Lake
- Riverine downstream of Gull Rapids
- Riverine at Birthday Rapids
- Riverine at Gull Rapids
- Riverine downstream of Birthday Rapids to the inlet of Gull Lake
- Riverine Upstream of Birthday Rapids

Initial Flooded Area (159 m)
 Flooded Area

Future With Project Reaches

1	4	7
2	5	8
3	6	9

Shoreline Erosion and Aquatic Reaches



DATA SOURCE: Shore material and Nelson River shoreline - ECOSTEM Ltd.; Water - NTS; First Nation Reserves - Natural Resources Canada; Roads and rail - Manitoba Conservation; Photos - J D Mollard and Associates Ltd. and ECOSTEM Ltd.		
CREATED BY: ECOSTEM Ltd.		
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Shore Material

- Bedrock
- Coarse Mineral
- Fine Mineral
- Mineral Overlain By Peat
- Peat
- Shore At Least 3m High

Nelson River Bank Material Type and Segments With High Banks in Western Upstream Reaches

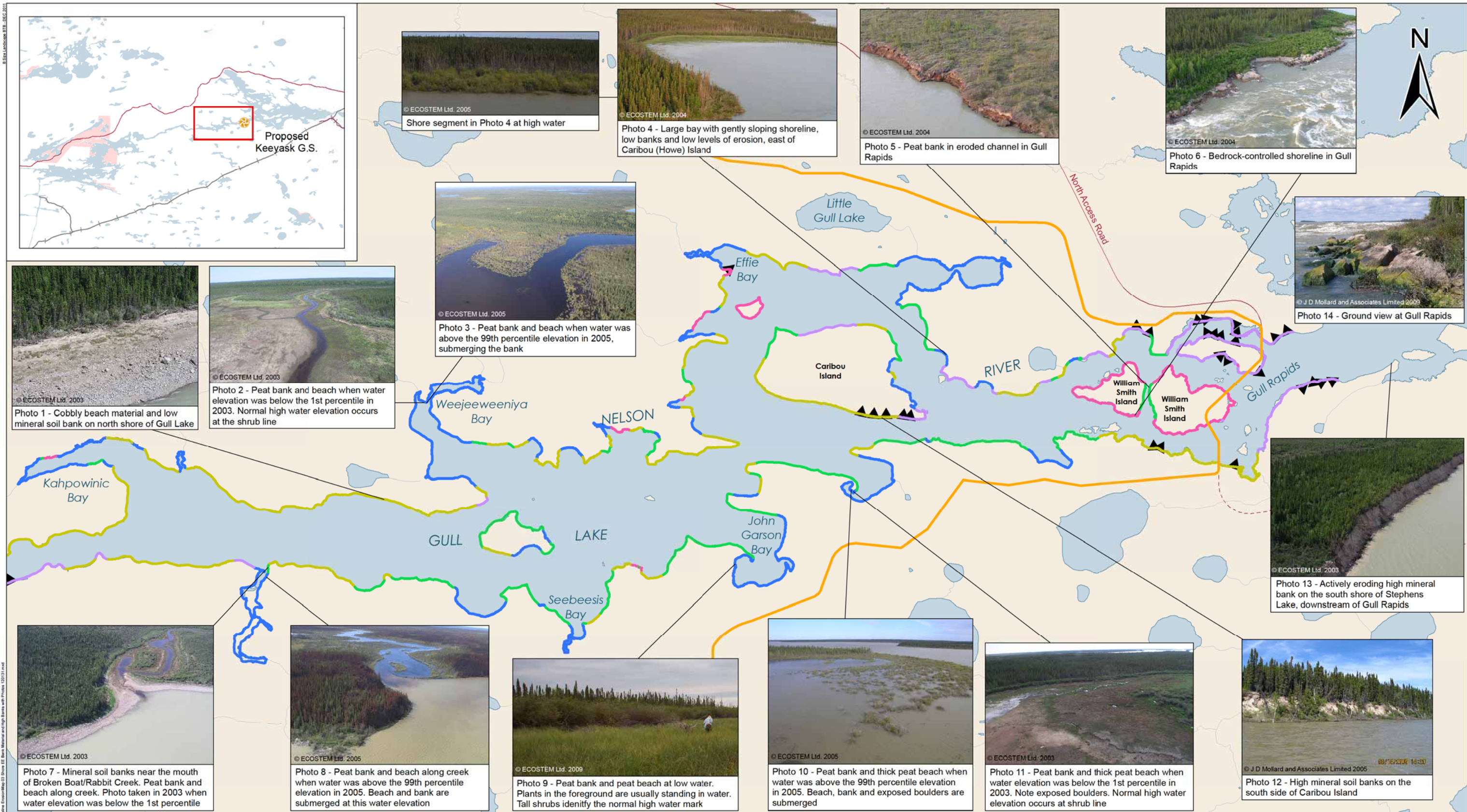


Photo 1 - Cobble beach material and low mineral soil bank on north shore of Gull Lake

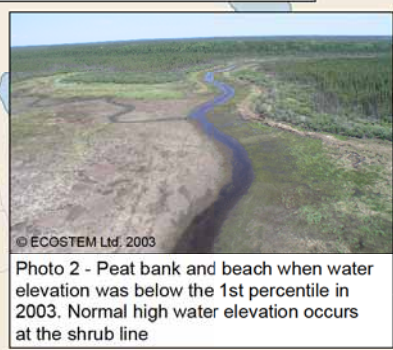


Photo 2 - Peat bank and beach when water elevation was below the 1st percentile in 2003. Normal high water elevation occurs at the shrub line

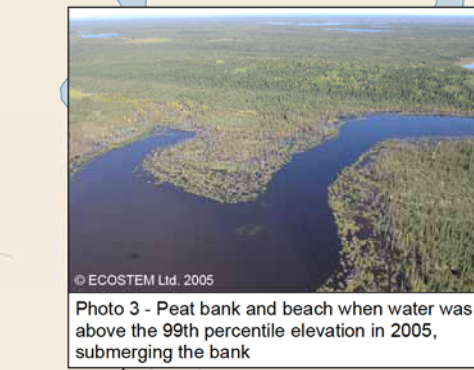


Photo 3 - Peat bank and beach when water elevation was above the 99th percentile elevation in 2005, submerging the bank



Shore segment in Photo 4 at high water



Photo 4 - Large bay with gently sloping shoreline, low banks and low levels of erosion, east of Caribou (Howe) Island

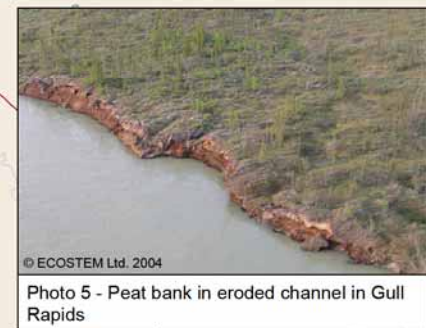


Photo 5 - Peat bank in eroded channel in Gull Rapids



Photo 6 - Bedrock-controlled shoreline in Gull Rapids



Photo 14 - Ground view at Gull Rapids



Photo 13 - Actively eroding high mineral bank on the south shore of Stephens Lake, downstream of Gull Rapids



Photo 7 - Mineral soil banks near the mouth of Broken Boat/Rabbit Creek. Peat bank and beach along creek. Photo taken in 2003 when water elevation was below the 1st percentile



Photo 8 - Peat bank and beach along creek when water was above the 99th percentile elevation in 2005. Beach and bank are submerged at this water elevation



Photo 9 - Peat bank and peat beach at low water. Plants in the foreground are usually standing in water. Tall shrubs identify the normal high water mark



Photo 10 - Peat bank and thick peat beach when water was above the 99th percentile elevation in 2005. Beach, bank and exposed boulders are submerged

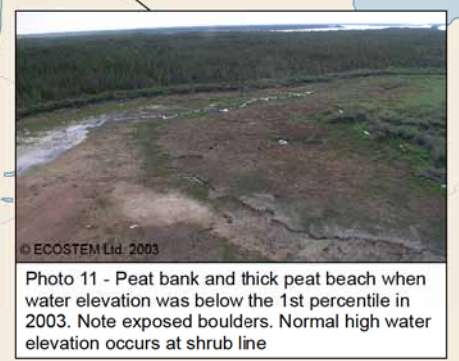


Photo 11 - Peat bank and thick peat beach when water elevation was below the 1st percentile in 2003. Note exposed boulders. Normal high water elevation occurs at shrub line



Photo 12 - High mineral soil banks on the south side of Caribou Island



DATA SOURCE:
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0 0.9 1.8 Kilometres
0 0.4 0.8 Miles

- Legend**
- Shore Material**
- Bedrock
 - Coarse Mineral
 - Fine Mineral
 - Mineral Overlain By Peat
 - Peat
- Bank At Least 3m High**
- Keeyask Principal Structures**

Nelson River Bank Material Type and Segments With High Banks in Eastern Upstream Reaches