



**Sustainable management
of land-water interface zones
by Living Lakes Canada members**

**Alex Salki
Lake Winnipeg Foundation**

**14th International Living Lakes Conference
November 19 – 23
Nanchang, China**

WHO WE ARE

LIVING LAKES CANADA

A NETWORK, CAPACITY-

BUILDERS, ADVISORS, TRAINERS,

COLLABORATORS, PARTNERS, LEADERS, EXPERTS,

FRESHWATER LOVERS





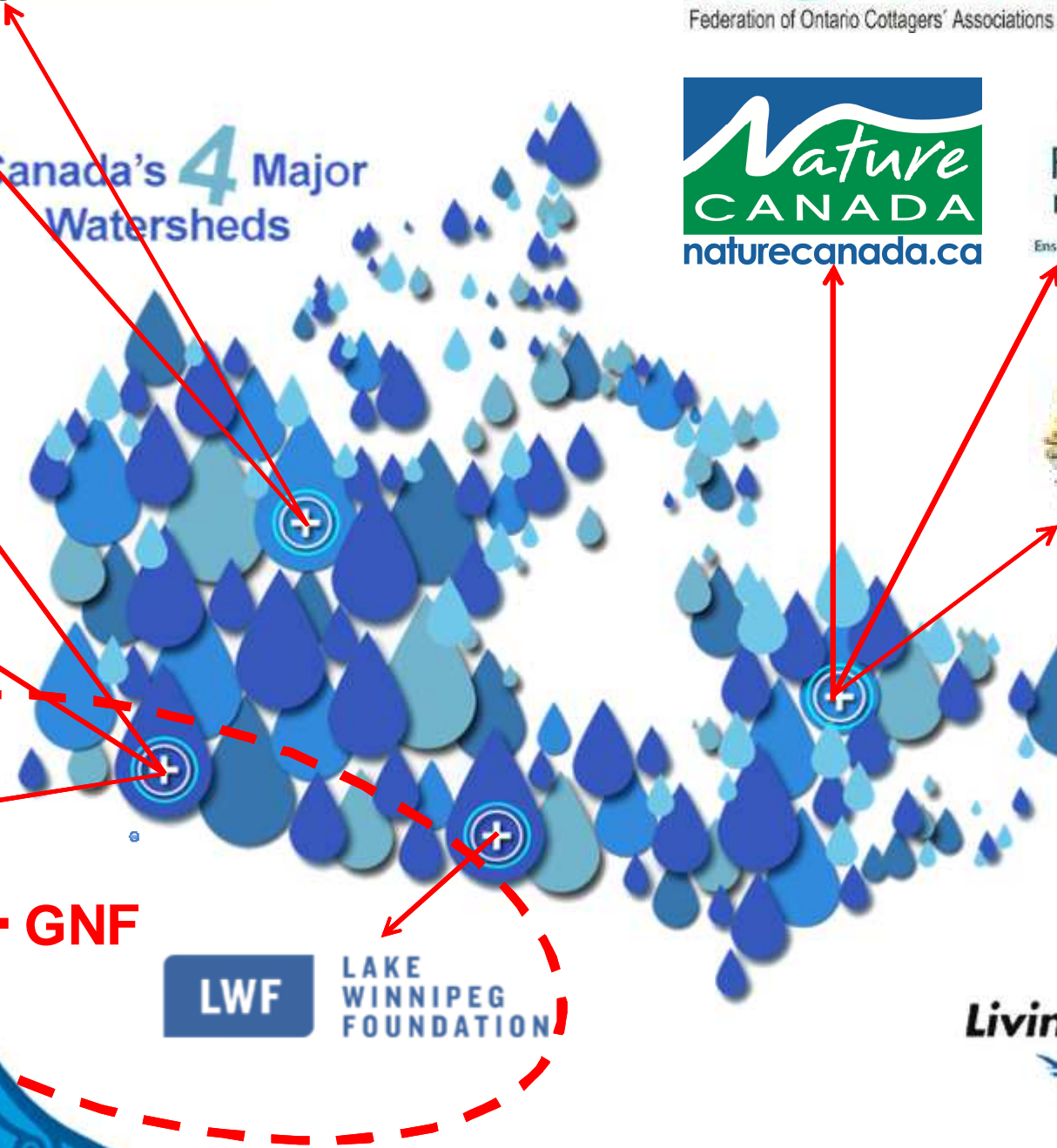
Keepers of the Athabasca



Canada's 4 Major Watersheds



+ GNF



Role of Governments in Canada



manage, regulate lakes & watersheds

WHAT LLC DOES



- 1. TRANSFER SCIENCE TO THE PUBLIC**
- 2. FOSTER STEWARDSHIP**
- 3. RAISE AWARENESS**
- 4. EDUCATE AND ENGAGE CITIZENS**
- 5. PROPOSE INNOVATIVE POLICY CHANGE**



National Issues

- Loss of natural habitat and biodiversity
- Excess phosphorus in surface waters
- Blue-Green Algae Blooms and Toxins
- Spread of Aquatic Invasive Species
- Extensive Shoreline Development
- Impervious urban surfaces
- Extensive rural drainage networks
- Climate Change related flooding
- Weakened National Environmental Policies
- Weakened Environmental Science Capacity



Case Study: Windermere



Case Study: Windermere

Tool: Sensitive Habitat Inventory Mapping

- Federal protocol developed by Fisheries and Oceans Canada
- Assesses shoreline habitat for fish and wildlife
- Includes Archaeological Overview Assessment which incorporates Traditional Ecological Knowledge
- Develops Shoreline Management Guidelines to direct shoreline modifications such as docks, retaining walls and marinas in a manner that protects key habitats



Case Study: Windermere

Tool: Canadian Aquatic Biomonitoring Network (CABIN)

1. Federal stream monitoring protocol developed by Environment Canada
2. Living Lakes Canada only ENGO certified to train individuals to use CABIN protocol
3. Used to assess impacts to watershed such as mine tailings spill, sedimentation from climate change, and other pollution events



Case Study: Lake Winnipeg

Lake health and shoreline management



Lake Winnipeg

- 10th largest in world
- Surface Area 25,000 km²
(6th largest in Canada)
- Watershed area 1x10⁶ km²
(2nd in Canada)
- Watershed Area 40 X
Lake Area



Global Nature Fund shocked over state of Lake Winnipeg **February 08, 2013**



FOR IMMEDIATE RELEASE

Lake Winnipeg named world's most threatened lake this year

A provincial distinction, a national black-eye

Winnipeg, MB – On World Wetland Day, Global Nature Fund recognized Lake Winnipeg with the dubious distinction of “Threatened Lake of the Year” for 2013. The nomination put forward by Living Lakes Canada, focused on the compounding issues facing the world’s 10th largest freshwater lake.

World Water Day

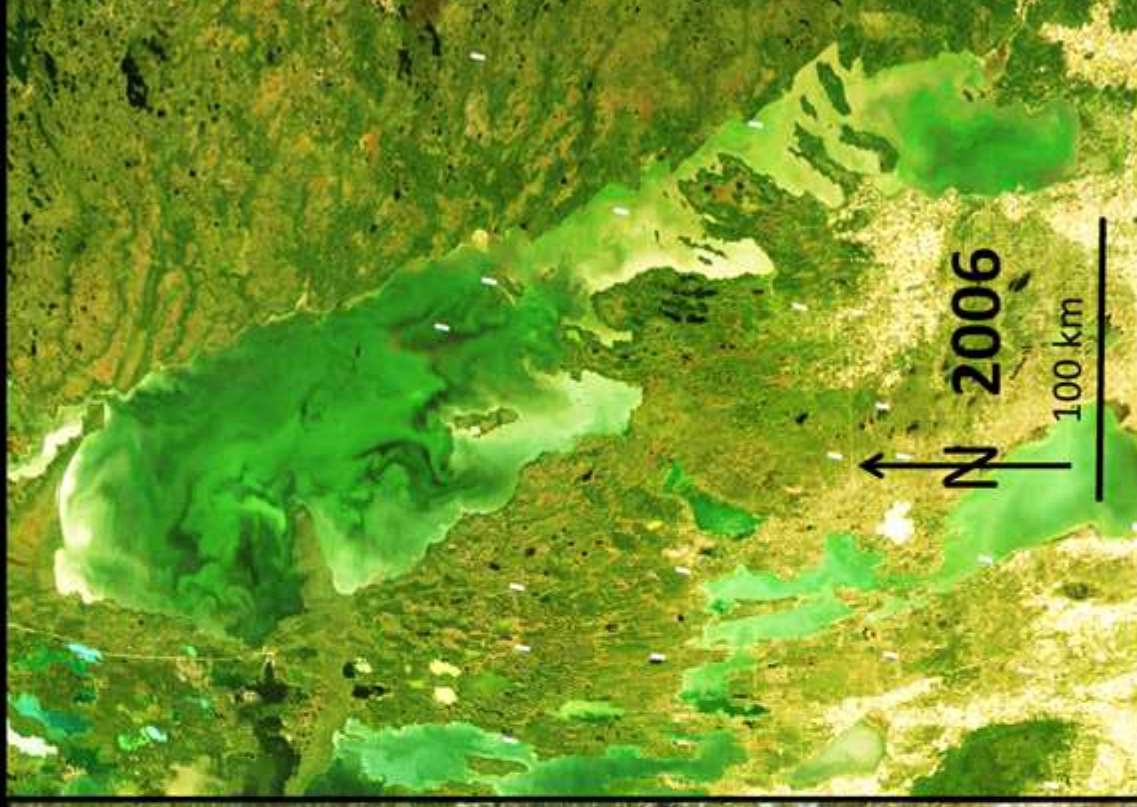
March 22, 2013

**LAKE WINNIPEG FOUNDATION
receives COUNCIL OF FEDERATION
EXCELLENCE IN WATER STEWARDSHIP AWARD**

March 2014

**LAKE FRIENDLY ACCORD OFFICIALLY SIGNED BY
FEDERAL AND PROVINCIAL GOVERNMENTS,
SOUTH BASIN MAYORS AND REEVES**





On L Erie ~ 4,000 sq km

On L Winnipeg >13,000 sq km

Largest recorded blooms on Lakes Winnipeg and Erie

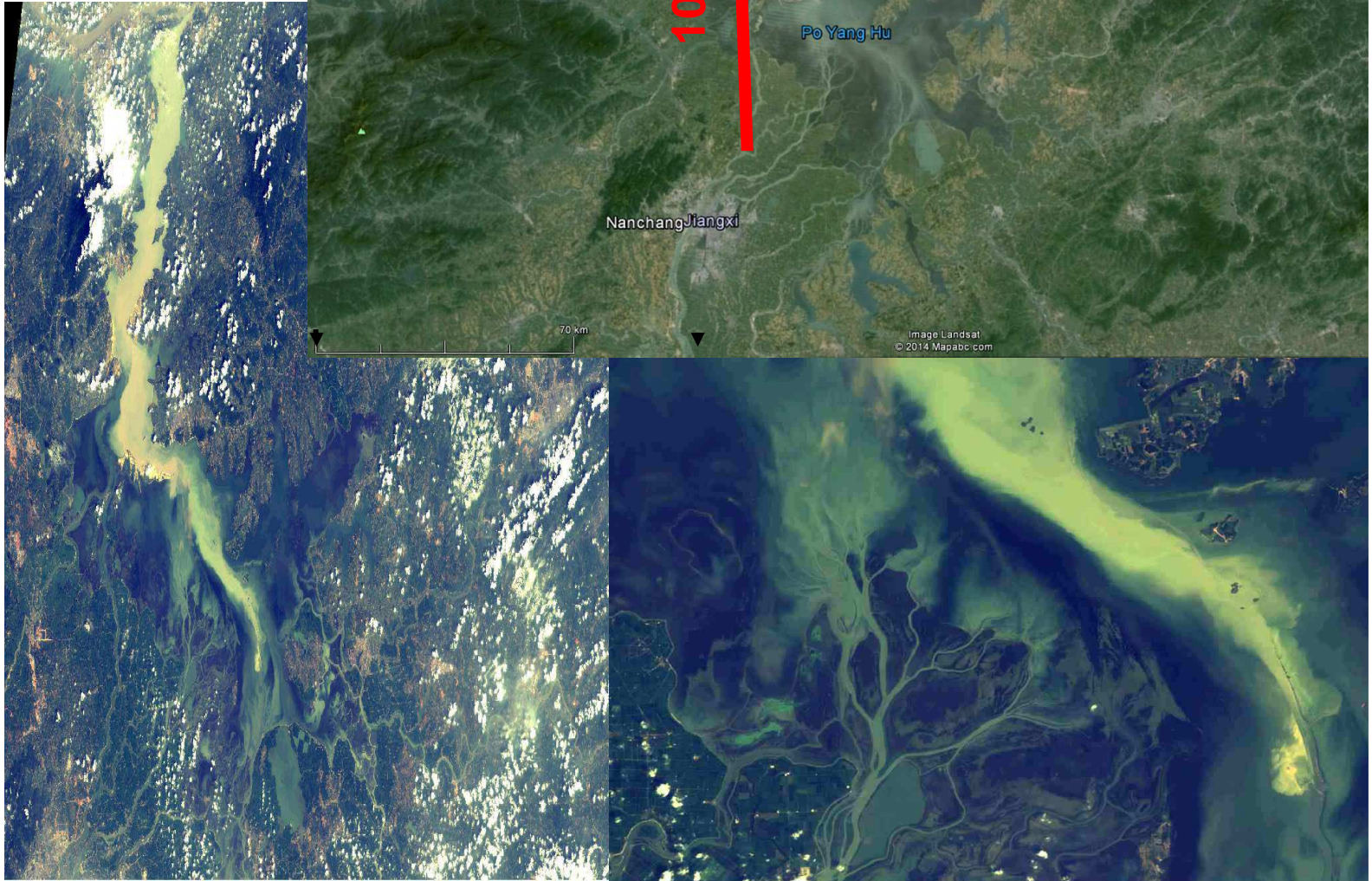
Blue-Green Algae on East Shore Lake Winnipeg 2011



Poyang-hu Lake

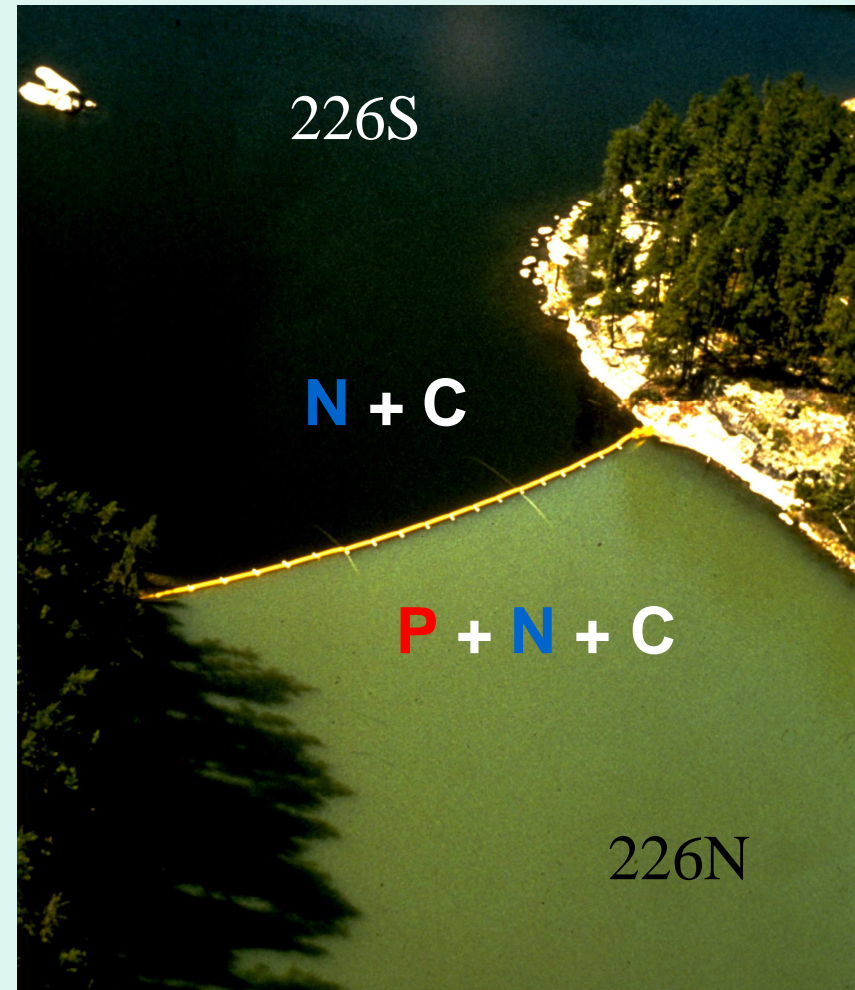
Landsat TM8

6 Sept 2014.



Known impact of excess phosphorus – blue-green algae growth

**ELA Lake 226
Eutrophication Experiment
1973 – 1974**



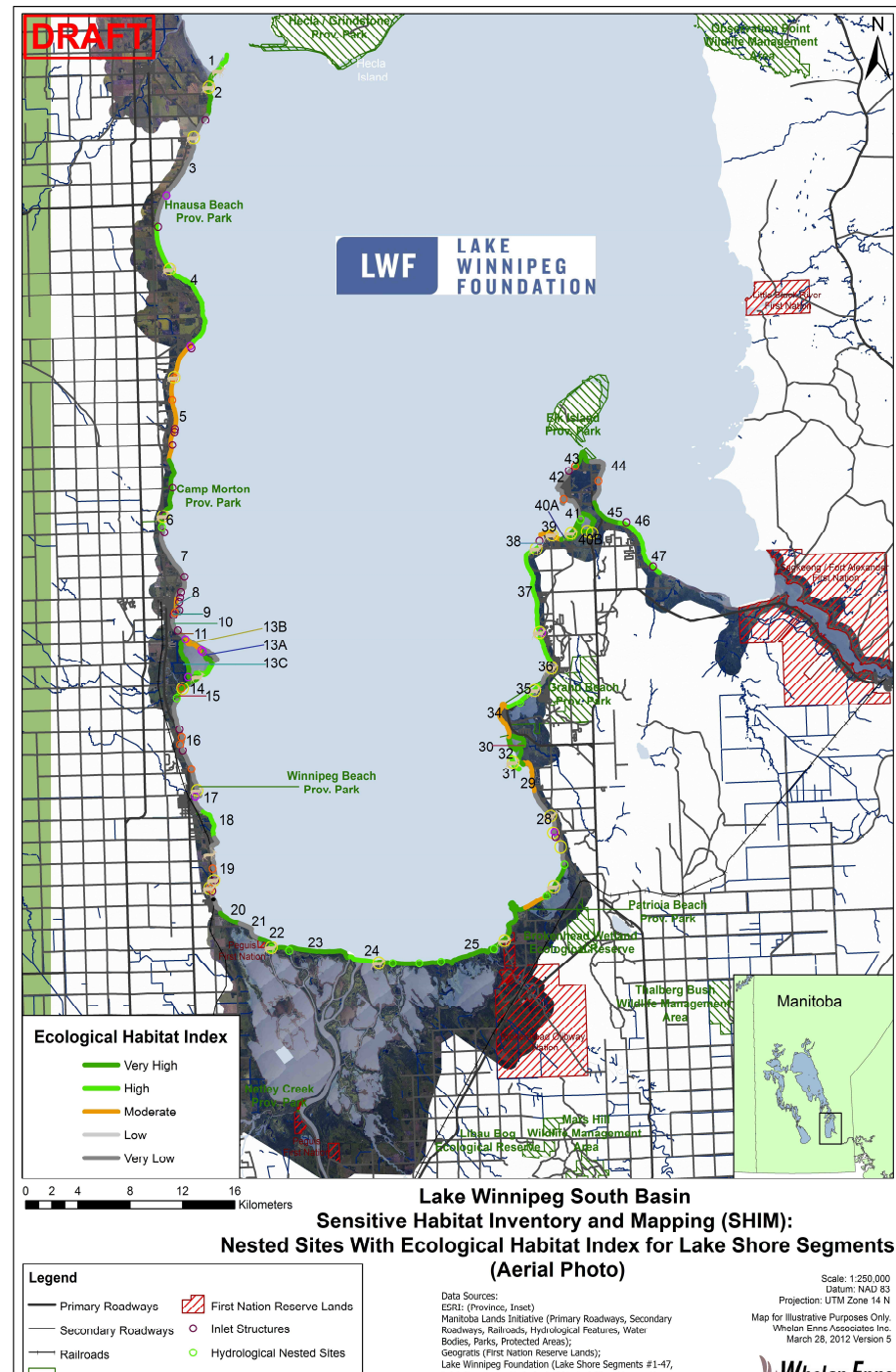
Case Study: Lake Winnipeg

Shoreline management

Tool: Sensitive Habitat Inventory and Mapping (SHIM)



South Basin shoreline divided into 50 segments on basis of dominant shoretype, land-use, modification, or level of impact.



Inventory and Mapping August 2011

Shore_Type

- Sand
- Gravel
- Wetland
- Other
- Stream Mouth
- Rocky Shore



Sand



Gravel



Wetland

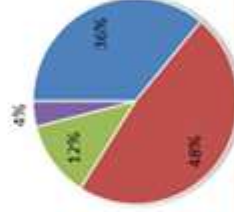


Rocky



Stream Mouth

- None
- Road
- Other
- Marina_barge (20+)



Road



Marina

Shoreline Modification

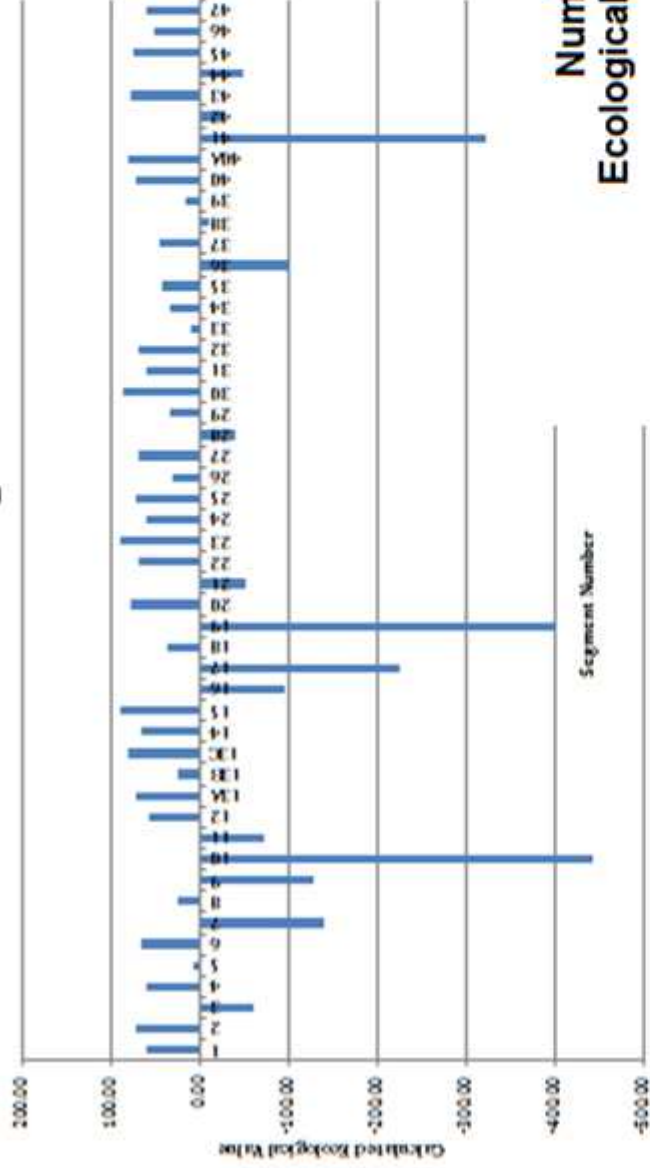


Other
Concrete Breakwater

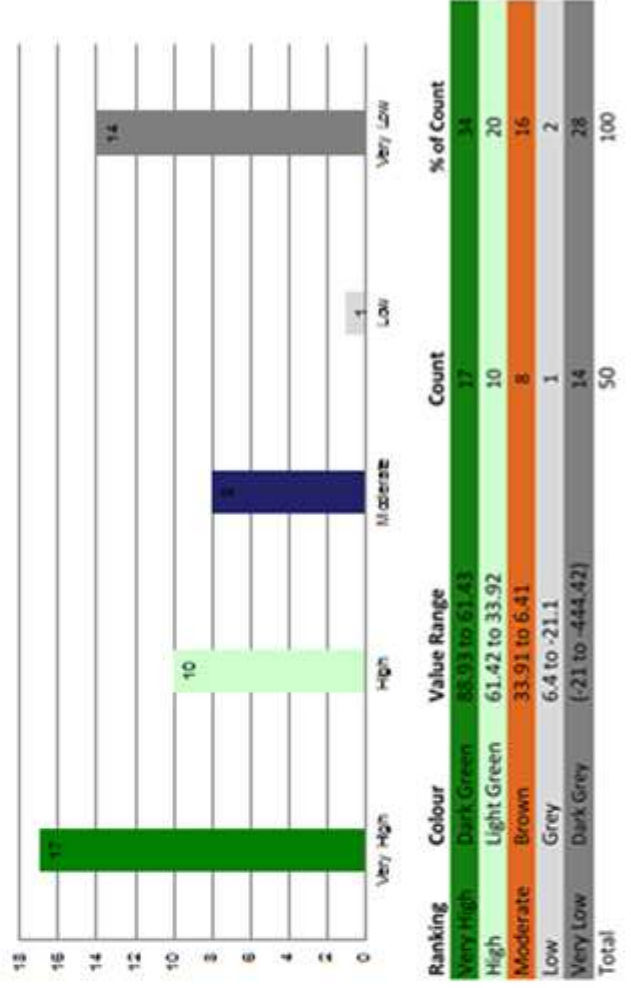


Other
Metal Groyne

Ecological Habitat Index Shoreline Segment



Number of Segments in Ecological Habitat Index Categories



Case Study: Lake Winnipeg

Netley-Libau Marsh Restoration



Netley-Libau Marsh
10,000 ha

- Significant P and N loads through Red River
- NLM not functioning as a healthy coastal wetland

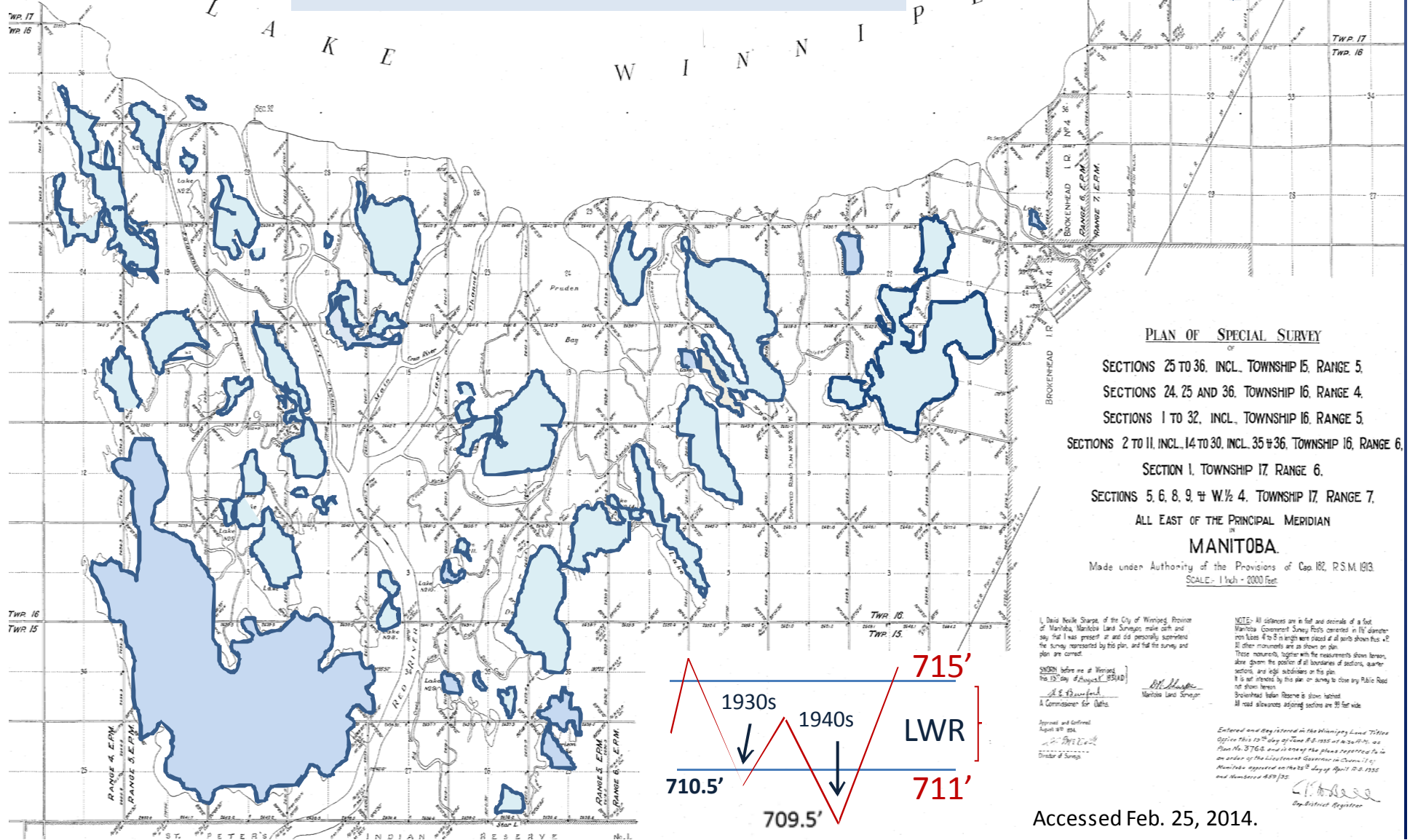


Red River Inflow



The Marsh Lakes In 1934

(habitat and marsh birds abounded)



PLAN OF SPECIAL SURVEY
 OF
 SECTIONS 25 TO 36, INCL., TOWNSHIP 15, RANGE 5,
 SECTIONS 24, 25 AND 36, TOWNSHIP 16, RANGE 4,
 SECTIONS 1 TO 32, INCL., TOWNSHIP 16, RANGE 5,
 SECTIONS 2 TO 11, INCL., 14 TO 30, INCL., 35 #36, TOWNSHIP 16, RANGE 6,
 SECTION 1, TOWNSHIP 17, RANGE 6,
 SECTIONS 5, 6, 8, 9, # W 1/2 4, TOWNSHIP 17, RANGE 7,
 ALL EAST OF THE PRINCIPAL MERIDIAN
 IN
MANITOBA.
 Made under Authority of the Provisions of Cap. 182, R.S.M. 1913.
 SCALE: 1 inch = 2000 feet.

I, David Neville Sharpe, of the City of Winnipeg, Province of Manitoba, Manitoba Land Surveyor, make oath and say that I was present or was duly personally supervised the survey represented by this plan, and that the survey and plan are correct.

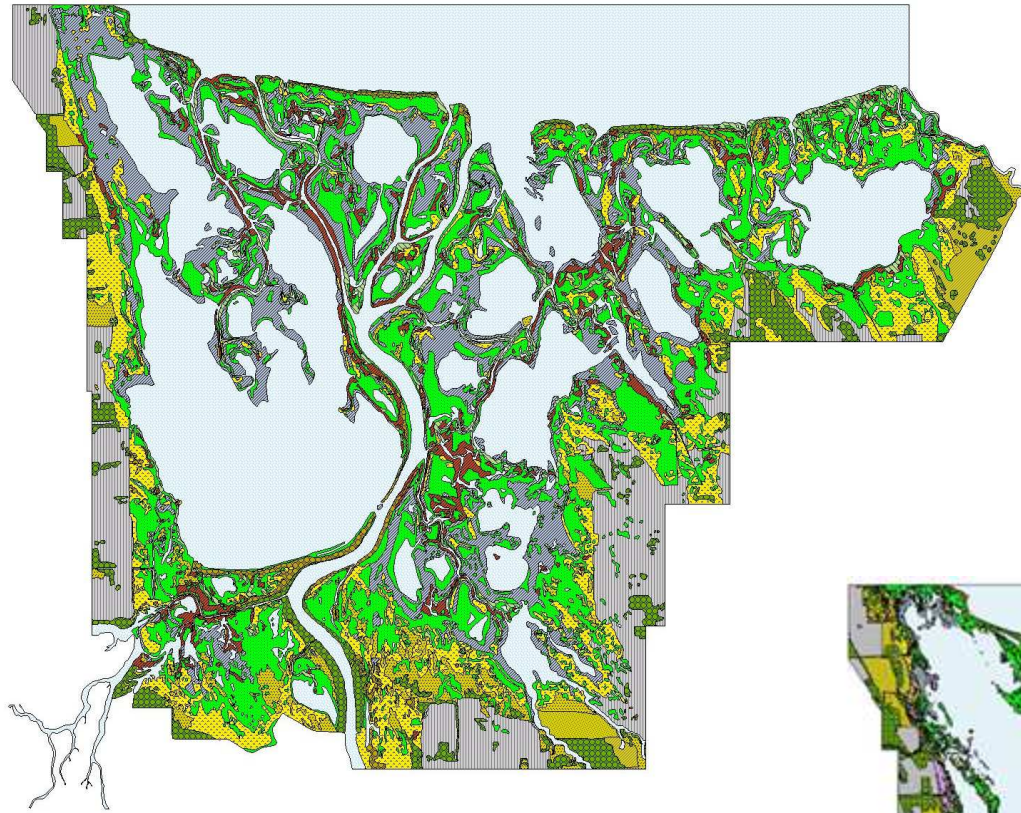
SWORN before me at Winnipeg this 13th day of August, 1934.
 A. S. Bruneau
 A Commissioner for Oaths.

NOTE: All distances are in feet and decimals of a foot. Manitoba Government Survey Posts certified in 1/4 diameter iron base 4 to 8 in length are shown at all points shown plus +. If other monuments are as shown on plan. These monuments, together with the measurements shown hereon, show the position of all boundaries of sections, quarter sections, and 1/4 sections on this plan. It is not intended by this plan or survey to close any Public Road but shown hereon. Brokenhead Indian Reserve is shown hereon. All road allowances adjoining sections are 33 feet wide.

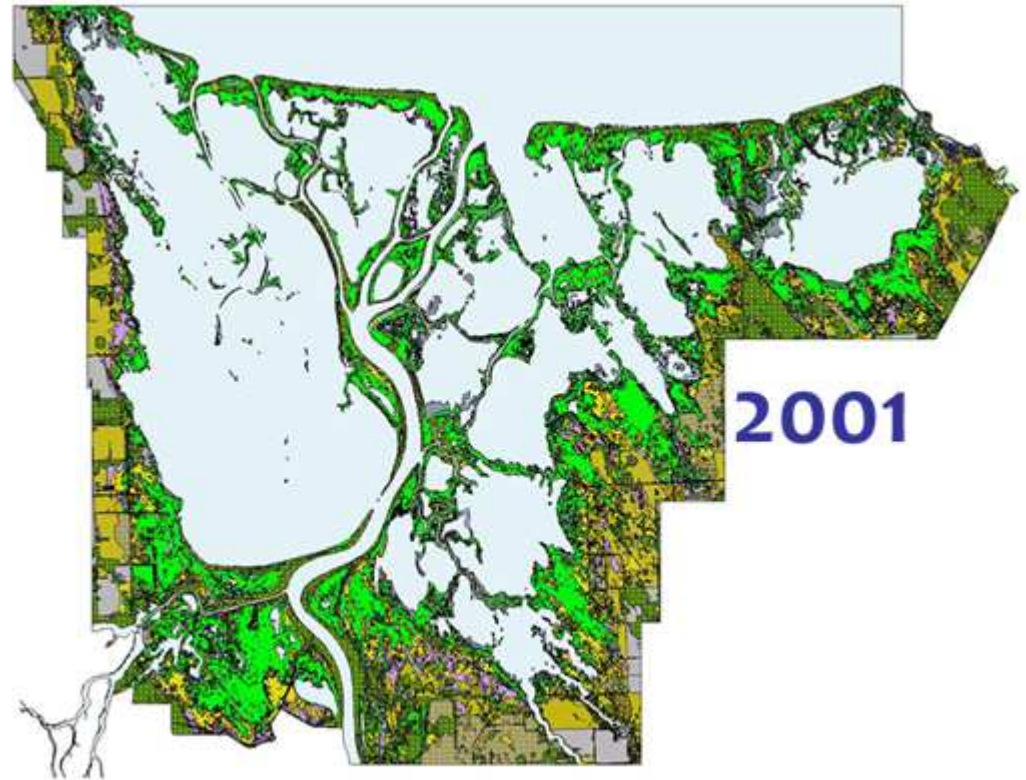
Entered and Registered in the Planning Land Titles Office this 13th day of June, 1934, in accordance with Plan No. 376-B and in 1940 of the plan registered in an order of the Lieutenant Governor in Council, Manitoba, approved on the 25th day of April, 1935 and numbered 459/35.

Approved and Certified August 19th 1934.
 Director of Surveys.

Accessed Feb. 25, 2014.



1979



2001

Pre 1923



Netley Cut, 1923



Netley Cut, 2003



Netley Cut - 15 April 2009



Case Study: Lake Winnipeg

Tool: Blue-Green Algae Mapping

1. Citizen science approach to identifying presence of blue-green algae
2. Understand extent of blue-green algae occurrence in Lake Winnipeg watershed in order to prioritize Phosphorus reduction initiatives
3. Expand project Canada-wide



Thank you.