

Belledune Point Remediation

Brunswick Smelter

CLRA - October 16-17, 2018

Belledune Point Reclamation

Agenda

Belledune Point

- History
- Belledune Point Geomorphology
- Old Slag Pile Closure Plan
 - Phase I – Slag Removal
 - Phase II – Belledune Point Remediation
- Ecological Risk Studies

- Brunswick Smelter has operated in Belledune NB since 1966
- Environmental Rules were different in the 1960s when Belledune Point was approved for the storage and management of slag
- Slag is a chemically stable smelter byproduct/waste composed mainly of Iron, Calcium and Silica with traces of metal
- Between 1966 and 1980, approximately 1.3 million tonnes of slag were stockpiled on Belledune Point
- Stopped Slag deposition in 1980 when a new slag management area was constructed south of Highway 134

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History - Photo July 2012

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Brunswick Smelter

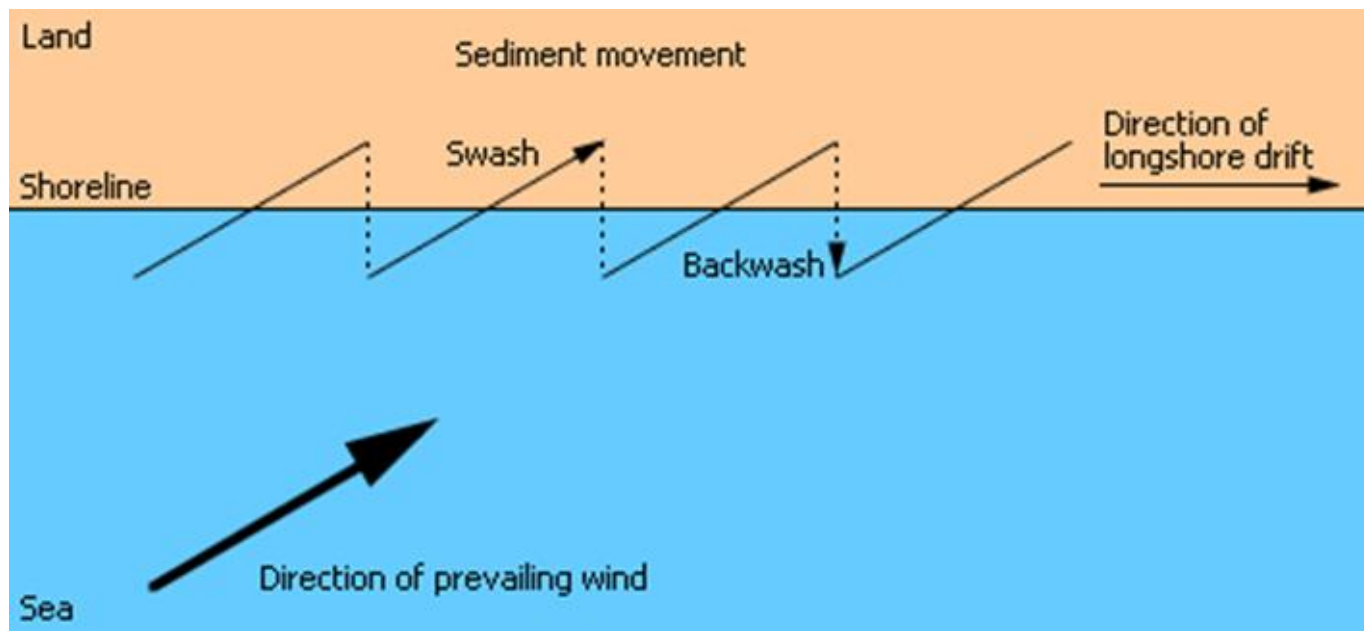
1944



1963



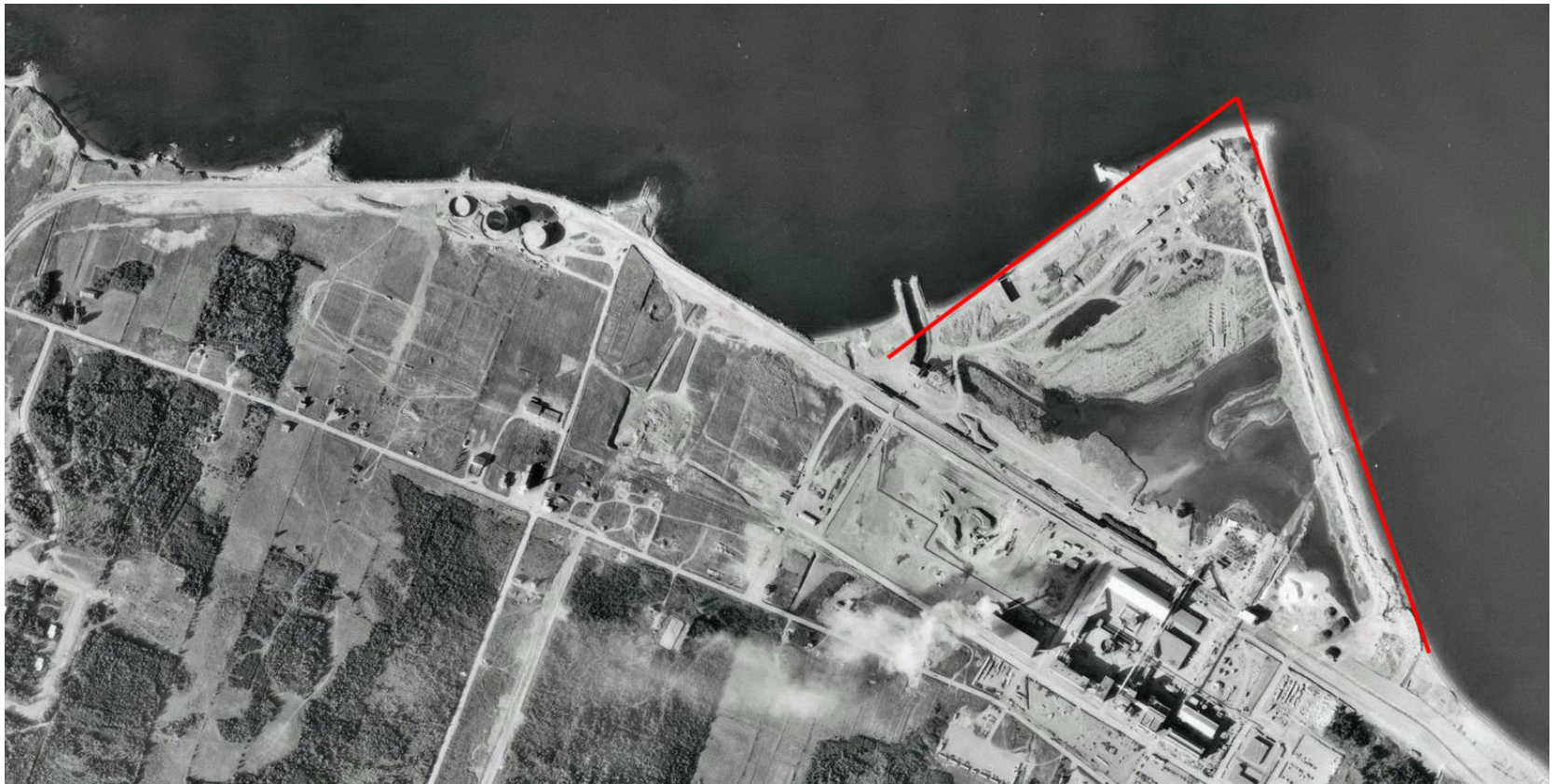
- Belledune Point is a Cuspate Foreland
- Seaward extending triangular shaped accretion of sand and shingle or pebbly rock created by long shore drift.



- Belledune Point in 1944
- Belledune Point was stable mainly due to tidal effects
- Belledune Point consists of sand and shingle and was originally stabilised with vegetation



- 1966 the Cuspate Foreland was still stable
- Slag deposition commenced in the wetland depression



- Construction of Terminal 1 in 1968 changed the Easterly Tidal Effect
- By 1974 one can already see a change in Beach stability



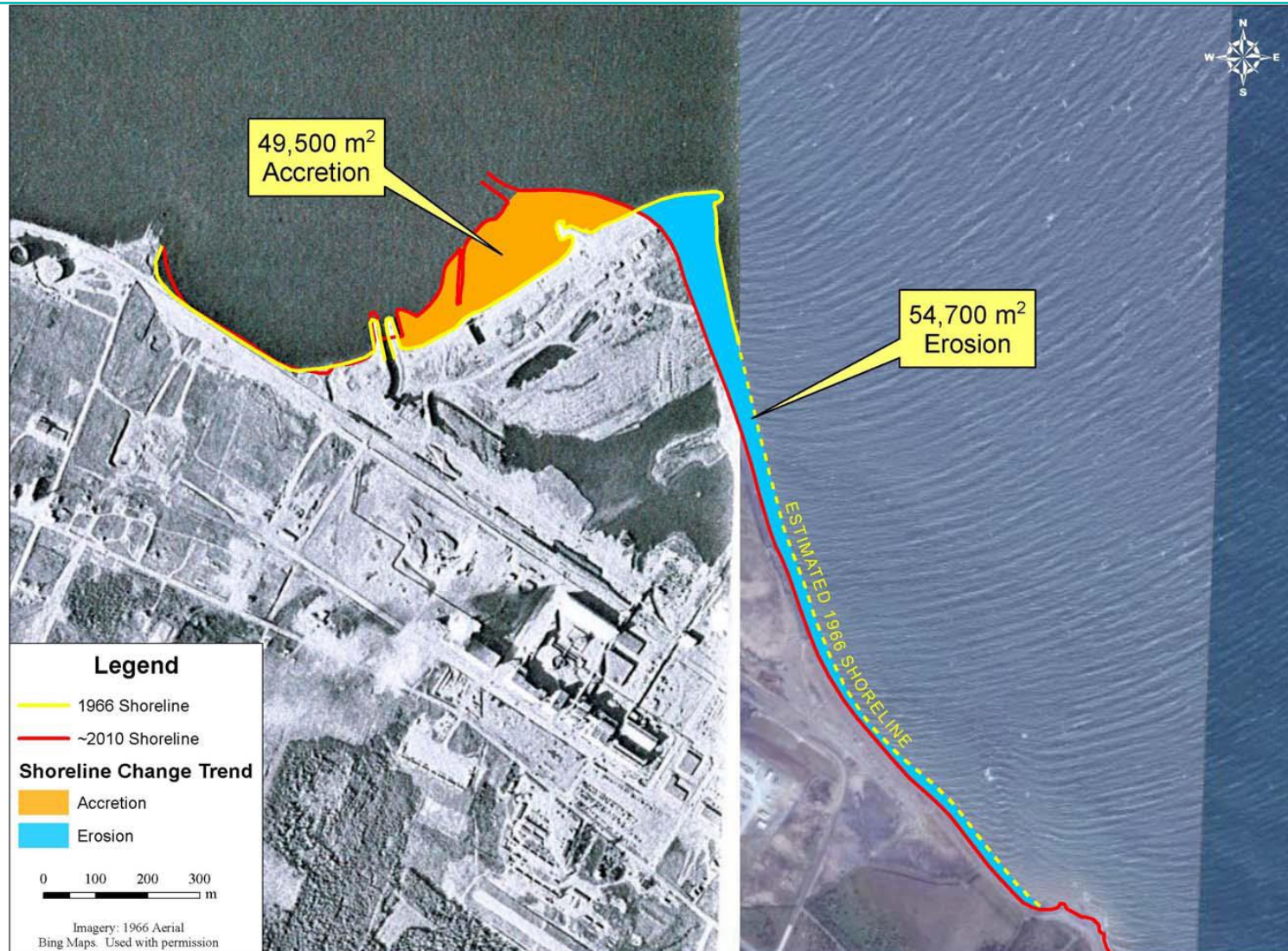
- By 1997, Belledune Point had become rounded
- Early 2000s Brunswick needed to Dredge Saltwater Intake



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Geomorphology – Beach width from 80 m to <10 m



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Old Slag Pile Management

- Pile was Capped and Vegetated in the mid 1980s
- Due to erosion concerns, in 2001 a wall was constructed to reduce the risk of storm affects
- Belledune Point Included in Smelter Closure Plan 2007
- **Dec. 6th, 2010:** North East NB Experienced a 1:200 year storm
- Clean up was Significant and to prevent a reoccurrence it was decided to advance final closure



- Design Criteria developed for Closure Options
- Extreme Water Level and Wave Run-up Analysis for Belledune Point
 - Storm Surge estimates for several return periods
 - Climate Change Sea Level Rise and Land Subsidence
 - Maximum Sea Level
 - All Combined to develop the Extreme Wave Propagation and Run-up Criteria
- Basic Engineering Costs - Trade Off Study

Old Slag Pile Tradeoff Study	
Option No.	Description
Option 1	LEAVE ALL SLAG IN PLACE AND CONSTRUCT PROTECTIVE WORKS
Option 2	REMOVE ALL THE SLAG EXCEPT FOR THE LARGE MOUND ON THE WEST: PROTECT THE LARGE MOUND
Option 3	REMOVE ALL THE SLAG FROM THE SITE

- All three options were in the same order of Magnitude (\$3-4M)
- Final Closure Decision was to Remove the Slag from Belledune Point and Rehabilitate the Area

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Slag Pile Closure Development 2011-12

- Applications for Belledune Point Rehabilitation Project:
 - E&LG Coastal Marine Management
 - E&LG Water Course Alterations
 - E&LG Approvals Branch
 - Department of Fisheries and Oceans
 - Canadian Wildlife Service
 - Energy and Mines (Coastal Morphology)
- Phase I – Slag Removal
- Phase II – Rehabilitation to Encourage Natural Restoration of Saltwater Lagoon & Wetland



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Slag Pile Closure Development 2011-12

Phase I:

- Fall 2011 excavated 150,000 m³ to create 30 m setback for storm protection
- Summer 2012 excavated slag back to clean beach sand (400,000 m³)

Phase II - Rehabilitation Activities

Summer 2013



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Phase I Slag Removal - Dec 16, 2010

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Phase I Slag Removal - Nov 8, 2011 – 30 meter bench



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Phase I Slag Removal - Nov 7, 2011 – 30 meter bench



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Phase I Slag Removal - July 12, 2012

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Phase I Slag Removal - Sept 18, 2012

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Phase I Slag Removal – Oct 31, 2012 Complete



Rehabilitation strategy designed to meet appropriate local coastal zone land use, ongoing beach morphology and regulatory concerns

1. To facilitate the conversion of the lagoon to a salt water lagoon/marsh a channel connecting the lagoon to the bay was constructed;
2. Placed soil containing organics around the shallow tidal area at the South East corner of the lagoon;
3. Tern Island – In April of 2013 the Smelter excavated a portion of the peninsula north of the tidal lagoon creating a small island.
(Although not favoured by the Terns the island became a popular hangout for a variety of other riffraff including herons, gulls and cormorants)



Figure 6, 1963 Area Photo of Belledune Point

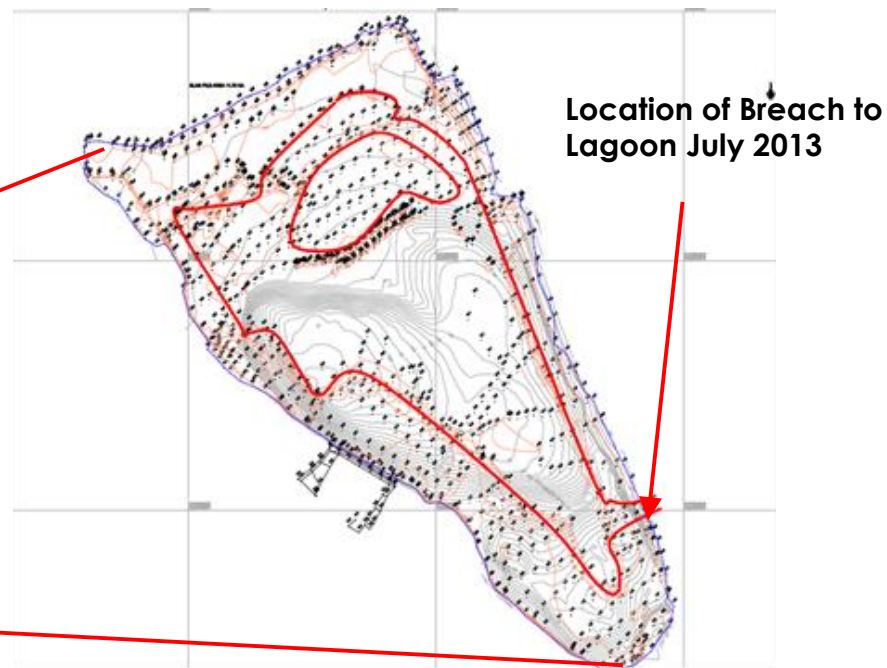


Figure 7, July 2013 Configuration of Belledune Point

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Phase II Slag Removal – Rehabilitation

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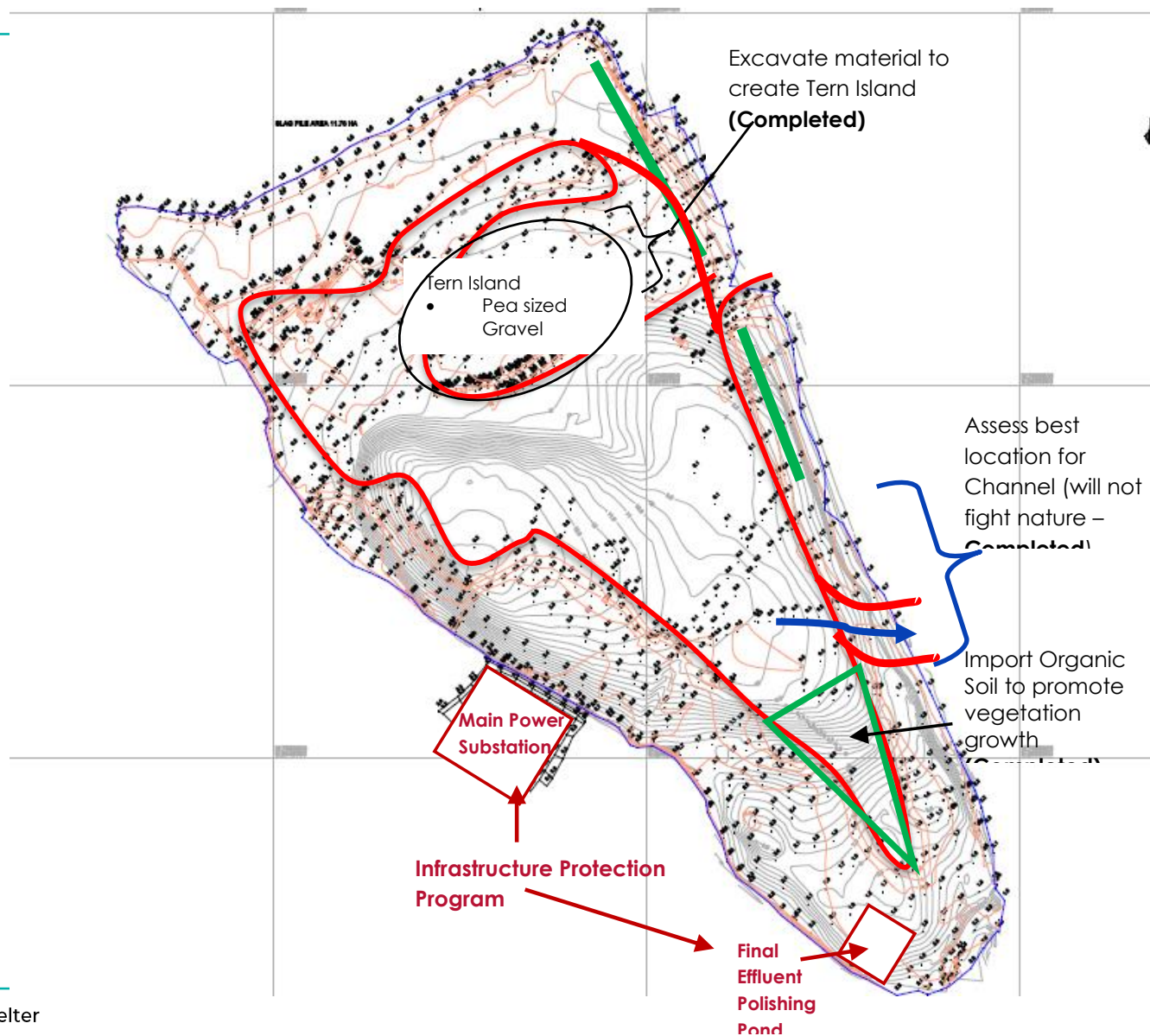


Figure 8, Rehabilitation activities on Belledune Point

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Phase II Slag Removal – Rehabilitation - Oct 2012



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Phase II Slag Removal – Rehabilitation June 27, 2016



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July 24, 2018

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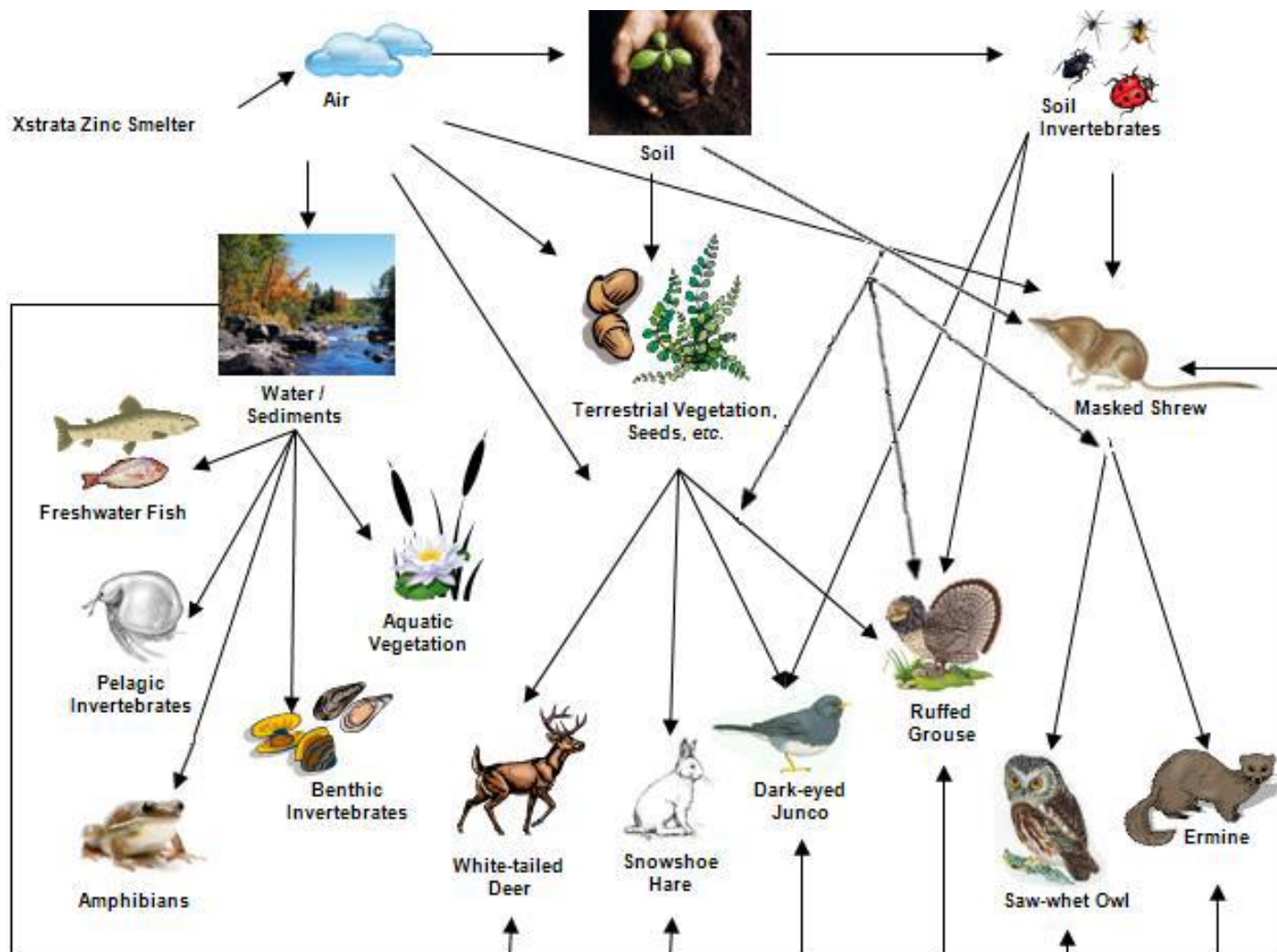
Belledune Point Ecological Risk Study 2008-2012

- Risk was assessed using computer modelling of exposures and field-based studies (breeding bird survey; small mammal survey, etc.), as well as information presented in the scientific literature.
- Conclusions were drawn based on weighing the evidence of the various studies conducted

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Belledune Point Ecological Risk Study

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Belledune Point Ecological Risk Study

- Based on the outcomes of the study, risks associated with exposures to metals and SO₂ on Belledune Point are considered to be low to negligible for the terrestrial, freshwater and marine environments.
- Separate Common Tern Health Risk Assessment - risk potential to the common tern colony is considered low.



Summary

- In 2011-2012 Brunswick Moved 1.3 million tones of Slag from Belledune Point (52,000 trucks)
- 2013 Brunswick implemented a Rehabilitation Plan for Belledune Point with the goal to facilitated its ecological recover
- Part of the Closure Plan assessed the Ecological Risks of its operations on Flora and Fauna living on Belledune Point – Risks are assessed as Low
- Final Project Cost \$3 Million
- We continue to log the biodiversity identified on the Point
- Belledune Point's eastern beach will continue to erode, due to longshore drift, transporting sediments north toward the Port



● **Thank You,
Questions?**