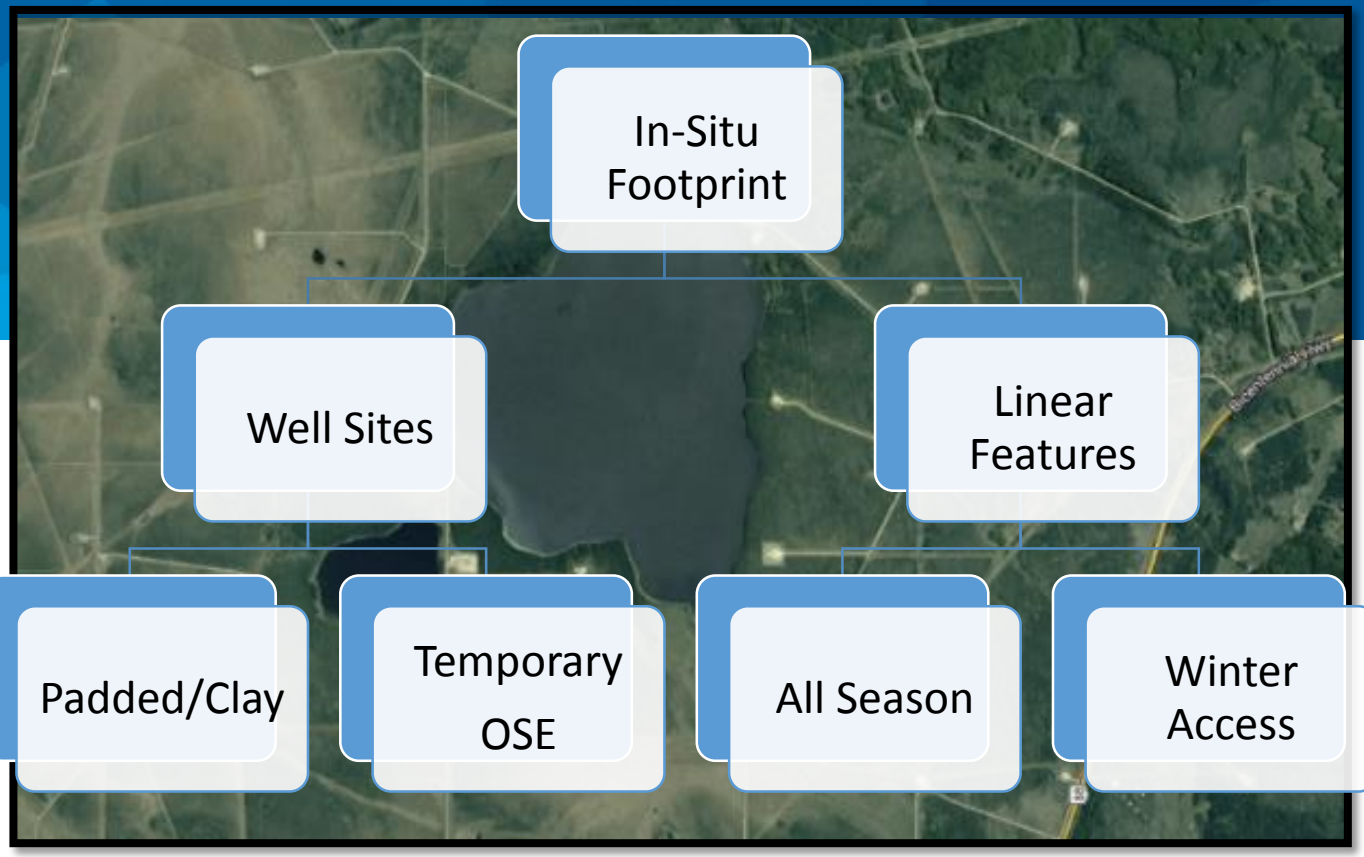
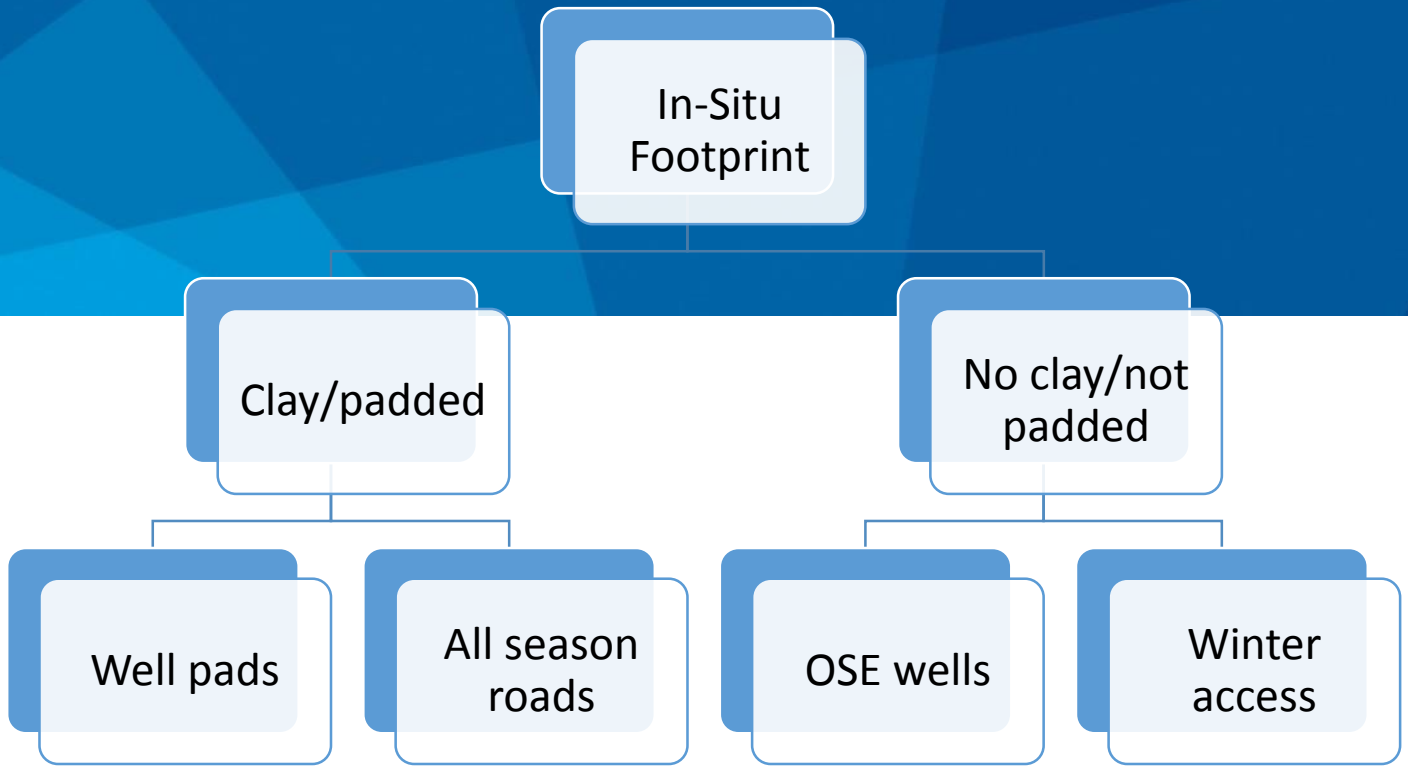
Removing In-Situ Footprint in Boreal Peatlands

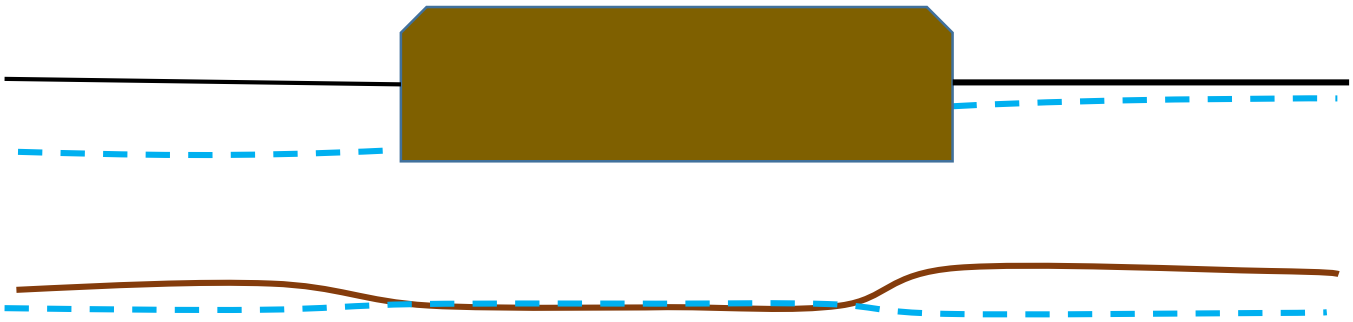
Bin Xu

NAIT Boreal Research Institute

Jan. 21, 2016


In-Situ Footprint
Well Sites
Linear Features
Padded/Clay
Temporary OSE
All Season
Winter Access

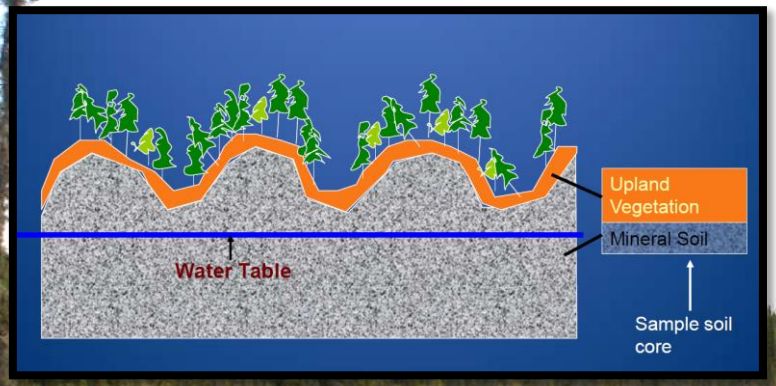

In-Situ Footprint
Clay/padded
No clay/not padded
Well pads
All season roads
OSE wells
Winter access

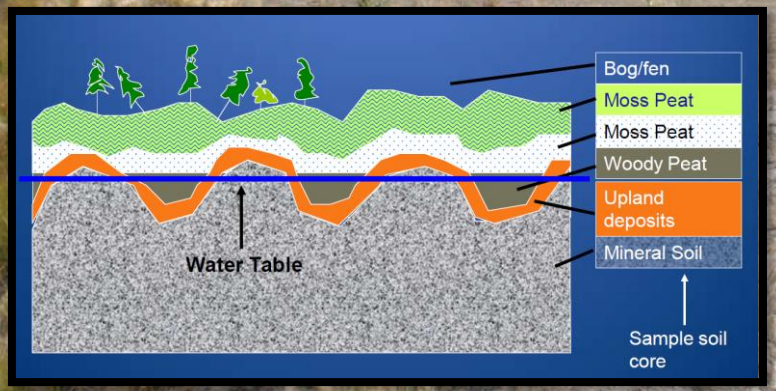


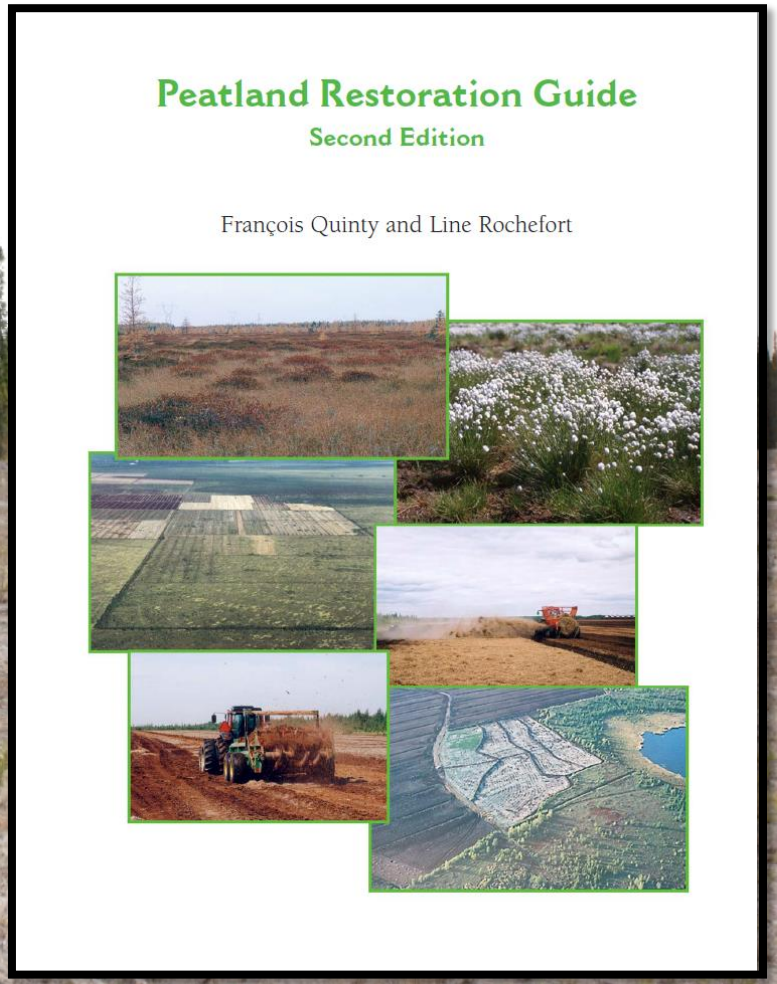
- Altered hydrology/water flow
- Changes in physical and chemical properties
- Loss of vegetation/productivity
- Loss of value and functions

- Integration of hydrology
- Creating suitable soil/substrate
- Establishment of appropriate vegetation

- Peatland initiation on rewetted mineral soil-Dr. Vitt et al. (SIUC)
- The North American approach to the restoration of *Sphagnum* dominated peatlands – Dr. Rochefort et al. (PERG)







Paludification – Peatland initiation on wet mineral soil

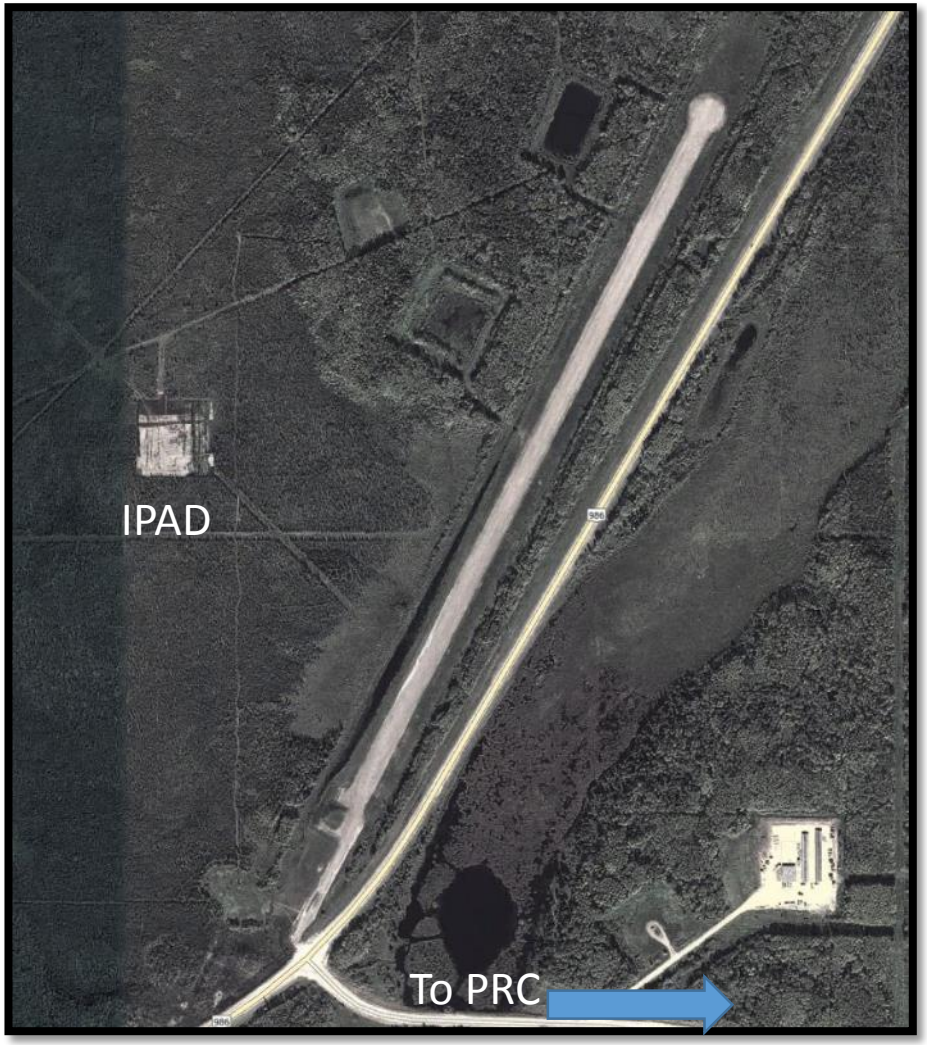
Bloise and Vitt 2010

Fall 2007

Summer 2008

Seven Years Later – Fall 2014

AirStrip – June 2014



Donor Material Collection

July 15, 2014

2015

Inversion Pad #1 (IPAD) – Winter 2011

- Based on North American Peatland Restoration Method
  - Developed in Eastern Canada, harvested peatlands
  - Combination of **soil amendment**, **donor materials transfer**, **tree planting**

Pad Removal

I. Plant collection

Donor sites profiles

Donor site 1

Dominant moss:

Sphagnum spp.

Dominant forb:

Carex aquatilis

Donor site 2

Dominant moss:

Tomenthypnum nitens

Dominant forb:

Carex magellanica

Donor site 3

Dominant moss:

Polytrichum strictum

Sphagnum spp

Dominant forb:

Do

Wa

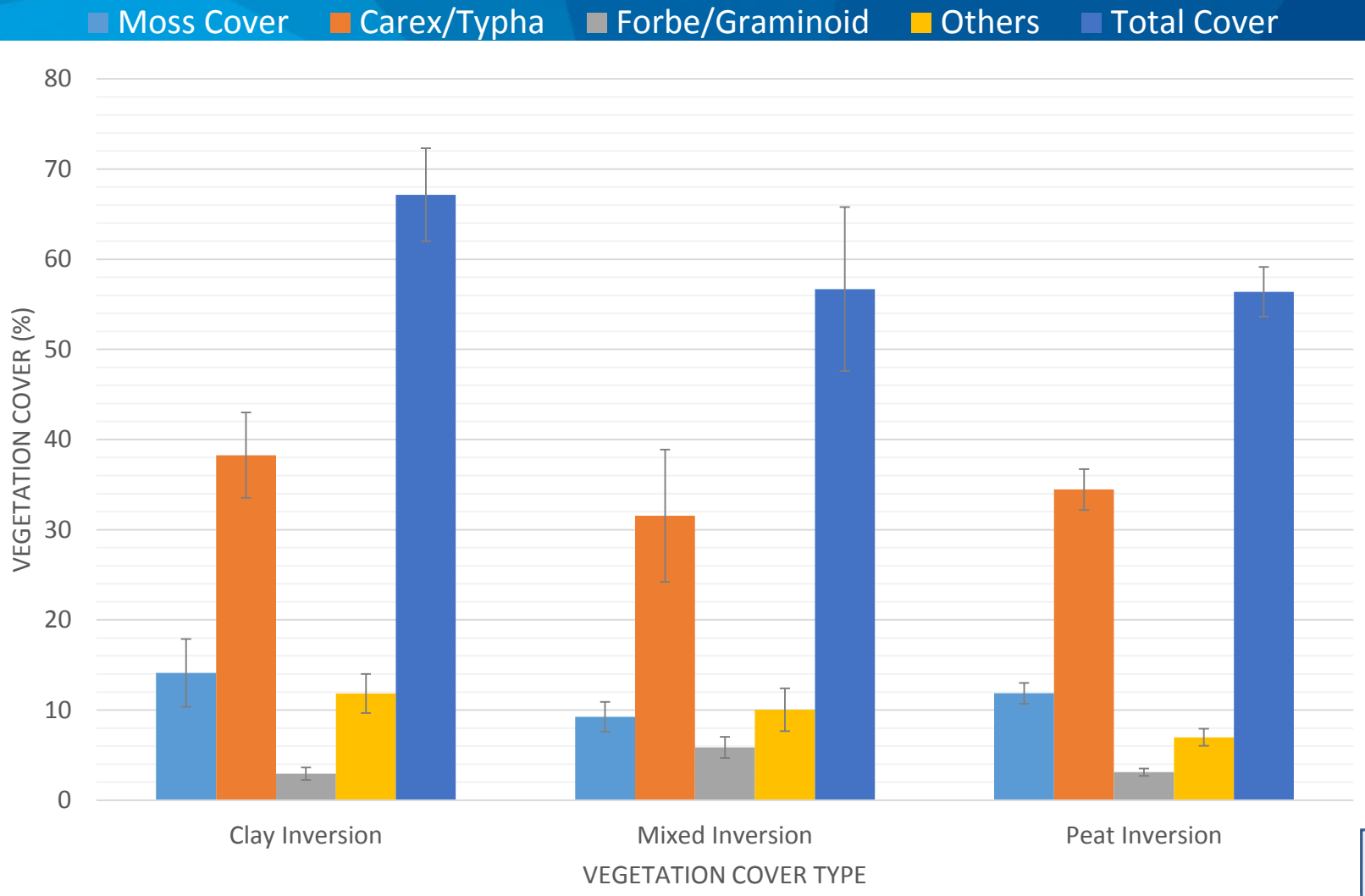
III. Plant Spreading

Comments:

Ratio surface collected: surface restored = 1:10

August 2012

Vegetation cover in different soil treatments



Inversion Trials #2 #3


Thin clay & geo-textile being removed
Flipped and bladed peat
Next strip – hoe sits on

Chip Road


CAT
CAT

Winter Access Road

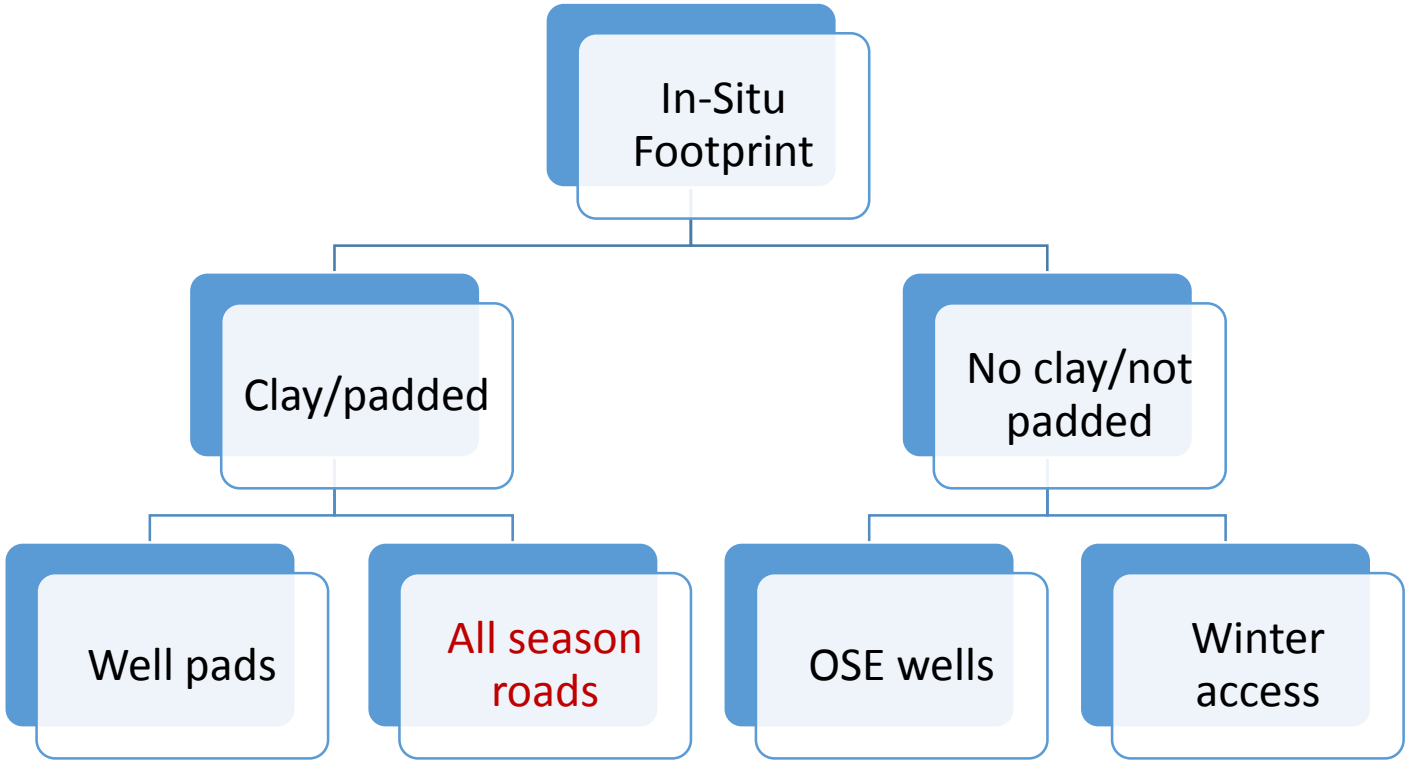
May 2014

- Peatland with compaction: raise the surface is required
  - Mounding, donor island transfer
- Is planting really necessary?
  - Abundant natural regeneration of woody species
  - Time to closure
- Other considerations

OSE Wells – Minimal disturbance

OSE with woody debris

Sloped OSE with clay and compaction compaction


In-Situ Footprint
Clay/padded
No clay/not padded
Well pads
All season roads
OSE wells
Winter access

Peatland Reclamation

- What are your goals?
  - Vegetation, C accumulation, tree growth, habitat
- Constraints?
  - Site access, budget/cost, peatland type,
- Available options (limited)
  - Pad removal, partial removal
  - Inversion, ripping
  - Moss transfer
  - Direct transfer
  - Alternative land use