IDENTIFYING ROAD REFORESTATION OPPORTUNITIES AT A LANDSCAPE LEVEL

A project funded by

The Society for Ecosystem Restoration
In North Central BC (SERN BC)

Steve Thompson (P.Ag.) and Darcie Fodor (RPF)

Why Road Reforestation ?

1. Could offset AAC fall down:
   - 1.5% of the land base = 2 years of an 80 year rotation
2. Can be used to support Access Management
3. Supports BC Forest Carbon Initiative

Rehabilitation Potential

History

2014 GeoBC creates roads database

2015 FREP Soils begins development of a GIS algorithm

2016 BC Forest Carbon Strategy

2017 First use of algorithm in Stuart Nechako District

GeoBC releases public version of roads database

2018 Improvement of algorithm (SERN BC)

Project Concept

- Use the Roads Database to identify road reforestation opportunity at a large scale
- Develop a GIS algorithm to automatically classify roads
- Validate algorithm across randomly selected areas in 4 nearby Districts

Forest Planning & Practices Reg.

1. Sets soil disturbance limits in the NAR: 5% or 10%

2. Defines Permanent and Temporary structures/roads:

Permanent Access Structures:

"roads and structures that at the time of construction provide for a future harvest opportunity"

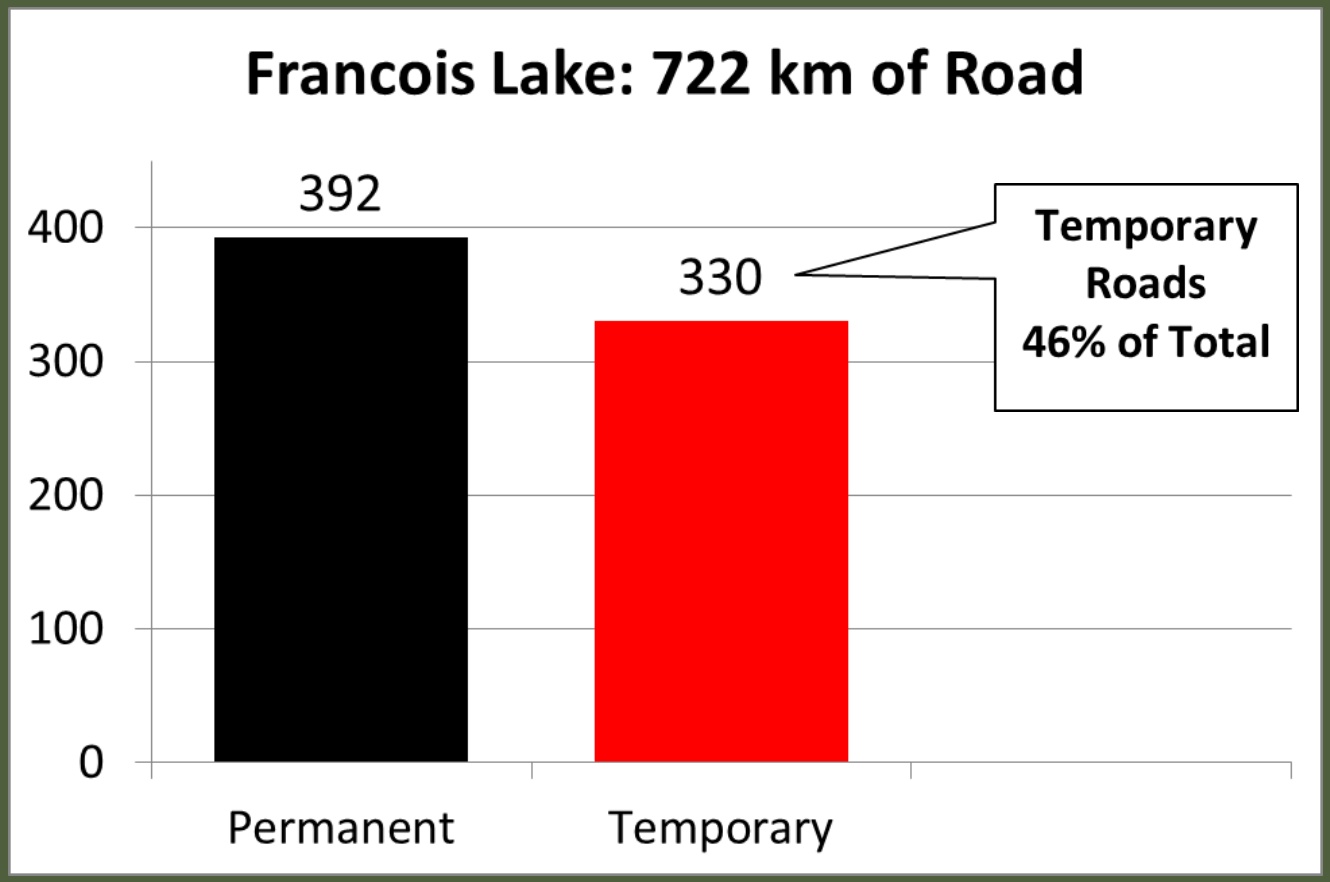
Temporary Access Structures:

- everything else: typically "in-block roads"
- counted as soil disturbance in the NAR

Key Findings from FREP Soils

1. Extensive construction of Temporary roads that were not rehabilitated
2. “In-block” roads excluded from the NAR by calling them Permanent

Temporary Road Footprint



Temporary vs. Permanent Roads

Overbuilt Temporary Road

Temporary Roads: Easy Rehab

Temporary Roads: Easy Rehab

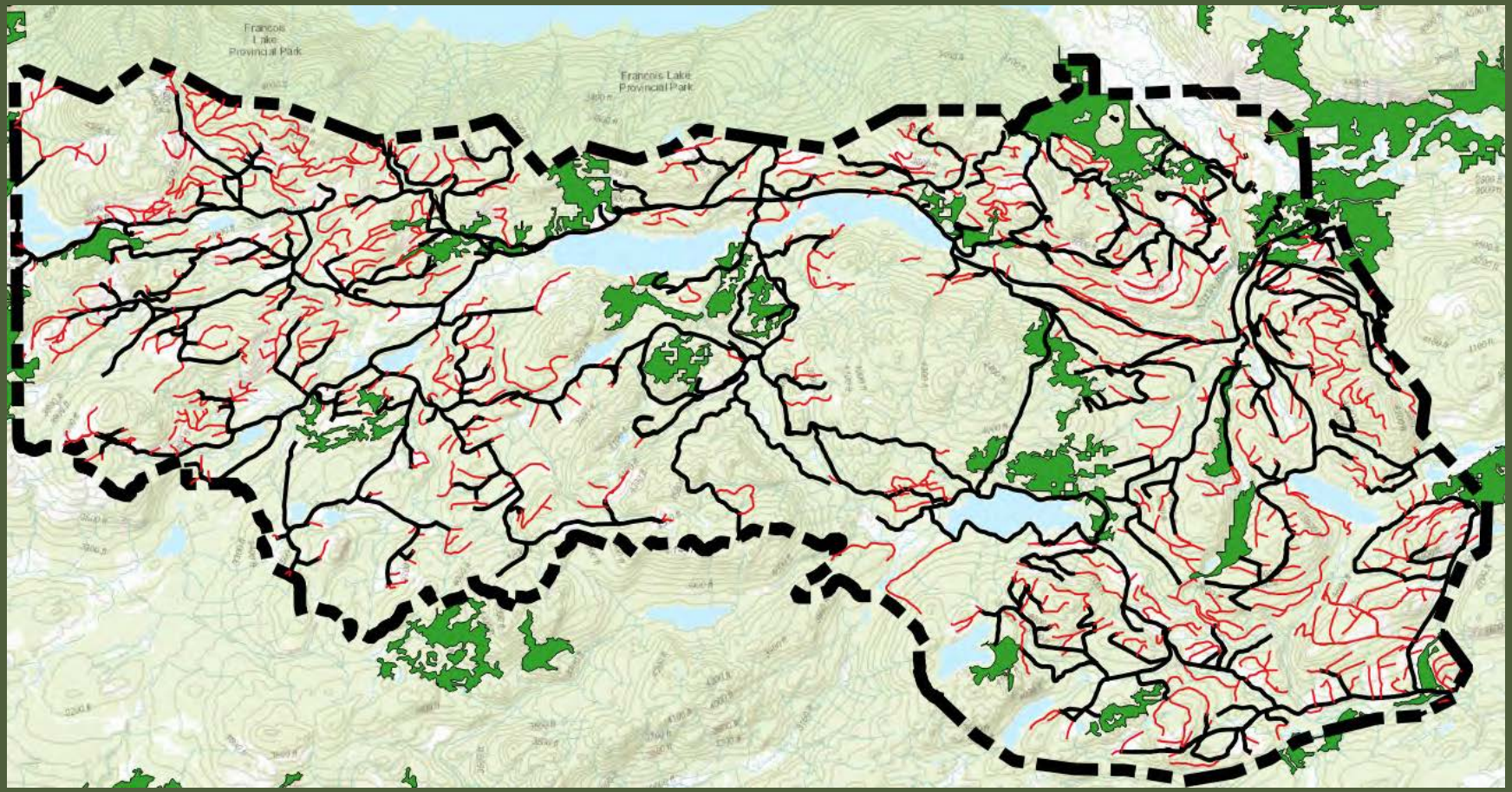
Roads: Best Practice

1. **Current practice:** roads that are Temporary are frequently identified as Permanent in Site Plans
   - What is the reason ?
     - Misunderstanding of the FPPR ?
     - A perception that nothing will grow on roads ?
     - To obtain a better Appraisal Allowance ?
     - Silvicultural obligations ?
     - Avoid non-compliance with soil disturbance limits ?
2. **Best Practice:**
   - Follow the FPPR definition of Permanent
   - Include rehab of in-block roads in the Site Plan

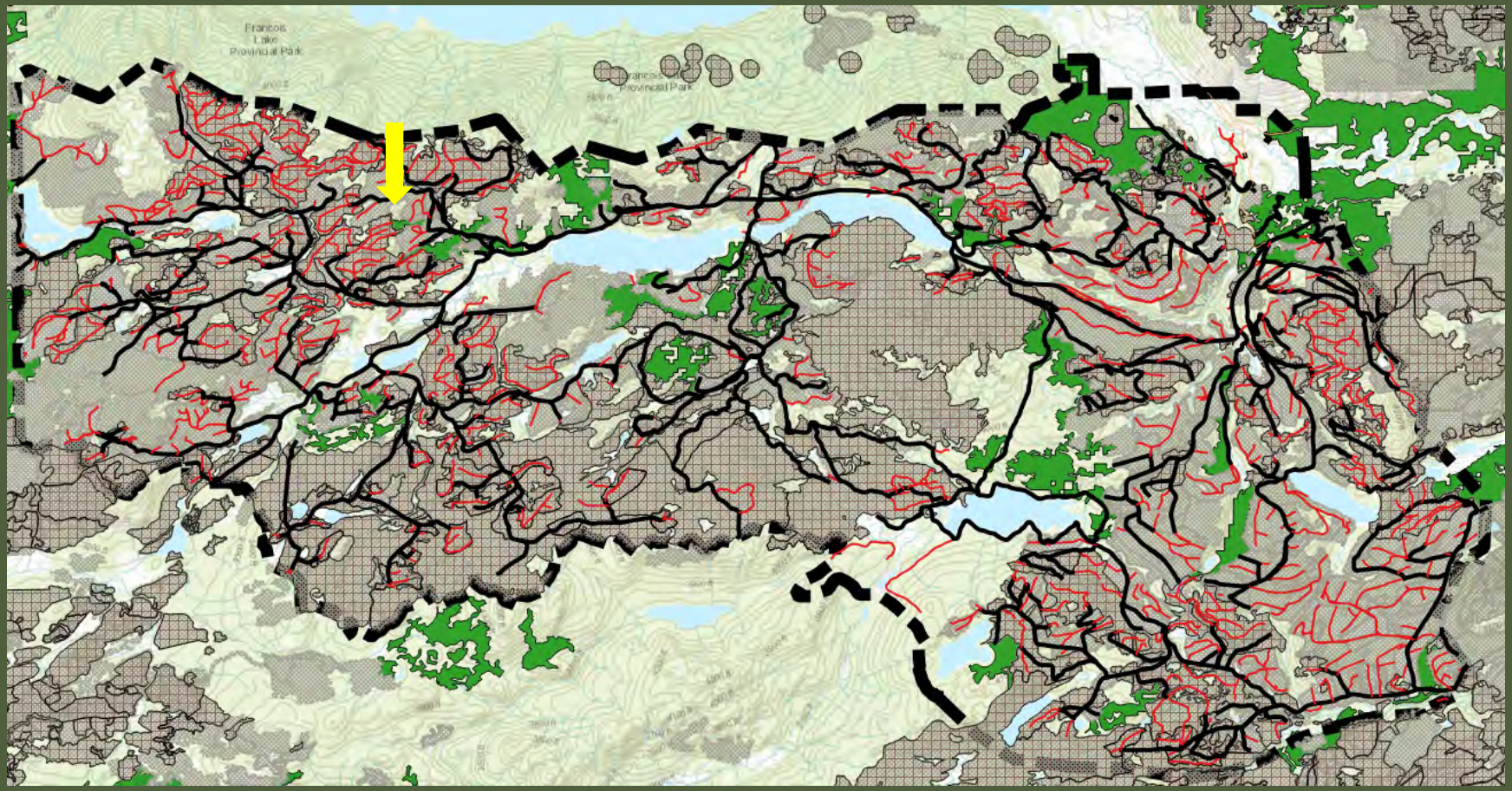
Algorithm: Key Elements

1. **Road Network:** defined by known Permanent roads (e.g. FSR's, active FTEN permits, etc.)
2. **Distance to Opportunity:** < 200 meters to road
3. **Definition of Opportunity:** 40 ha, 100 m^3/ha
4. **Silviculture Obligations:** provide road access to non-Free Growing blocks
5. **Constraints:** reserves, parks, private land, etc.
6. **Adjacent Stand Age**

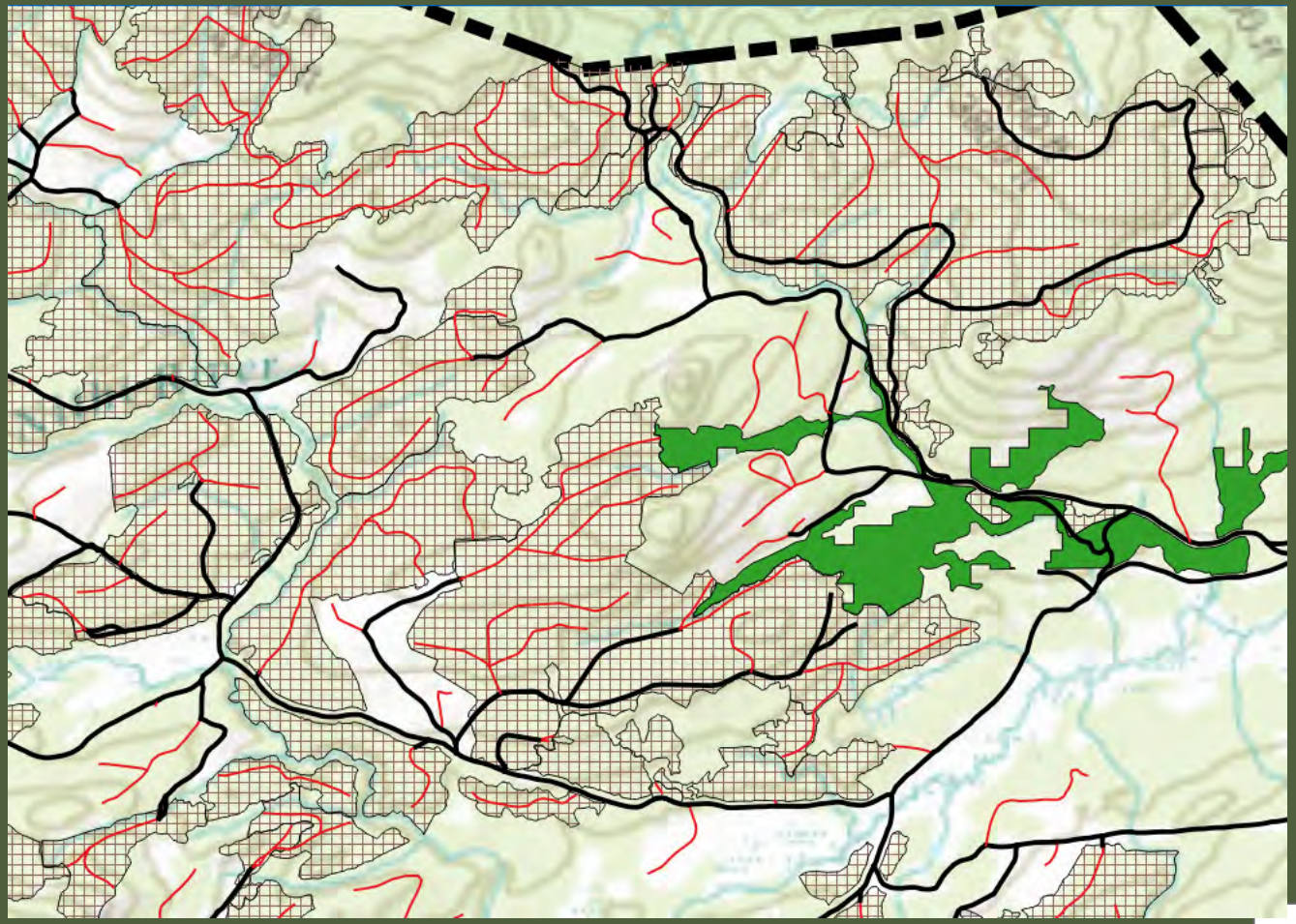
Road Network



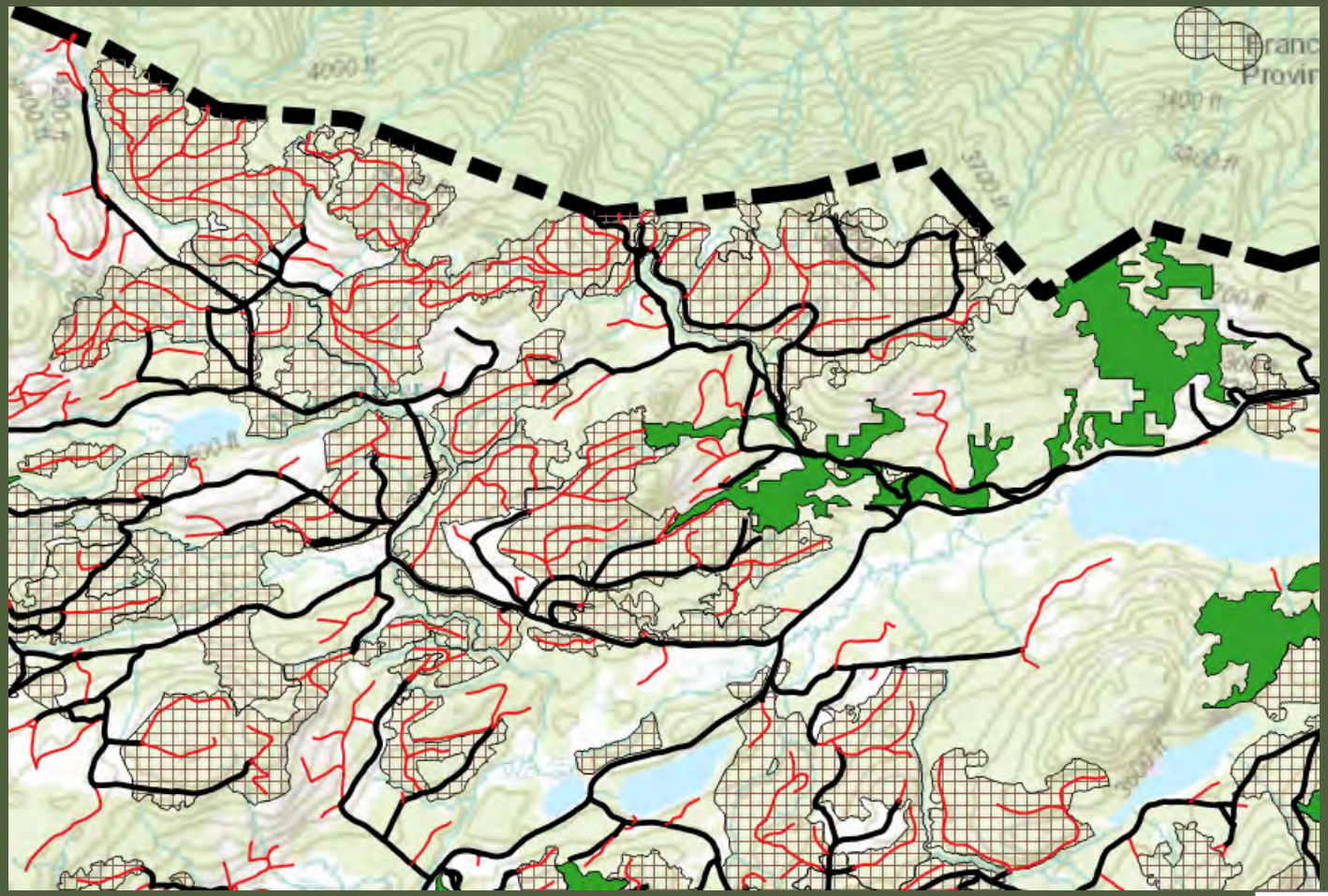
Road Network



Silvicultural Obligations



Distance to Opportunity



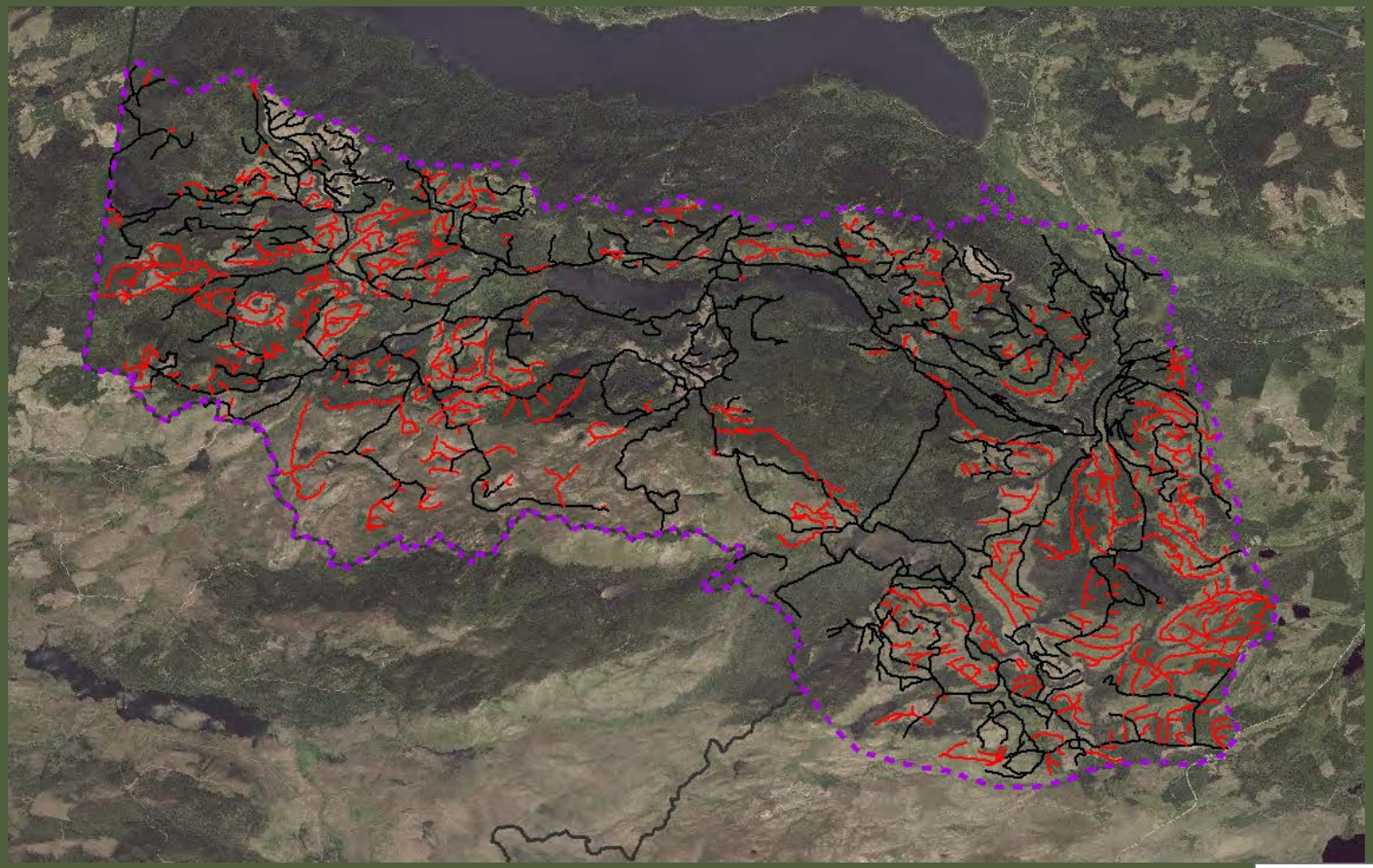
Validation

Case Study – Francois Lake

- **Project Scope:**

- Identify access roads that could be rehabilitated with *limited impact* to other users
- Return this portion of the land base back to productive forest (*sequestering carbon*)

Case Study – Francois Lake



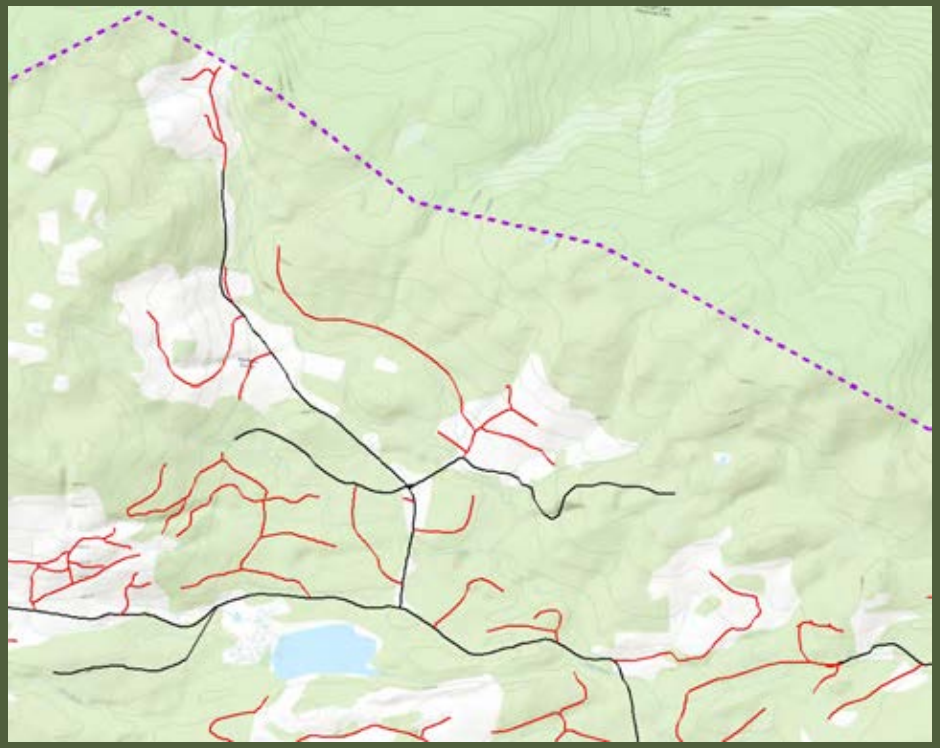
Case Study – Francois Lake

- **Process:**

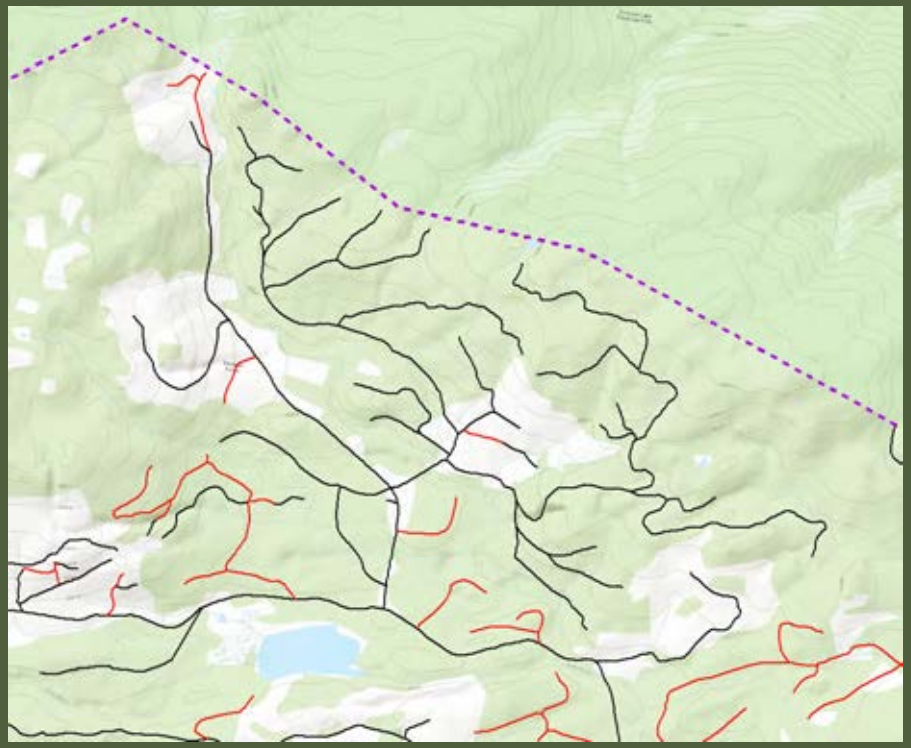
1. Manual updates and reclassification of algorithm results
   - Earlier version of algorithm
2. Planning and review with licensees
3. Field assessments
4. Treatment prescriptions

Manual Data Updates

Original Algorithm

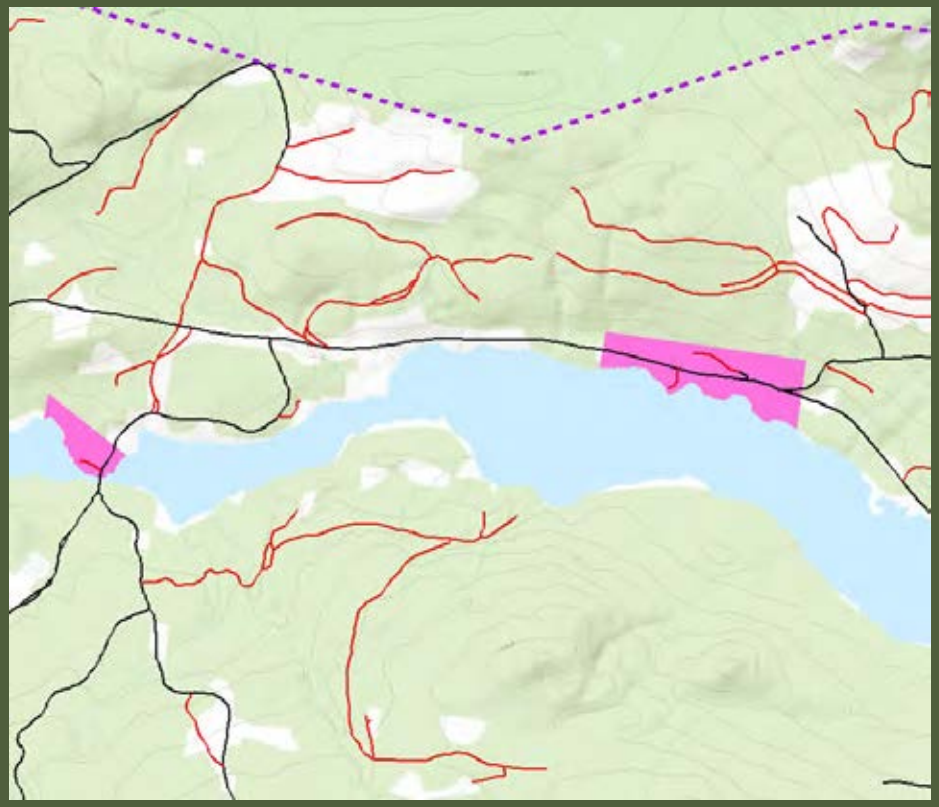


Manual Updates

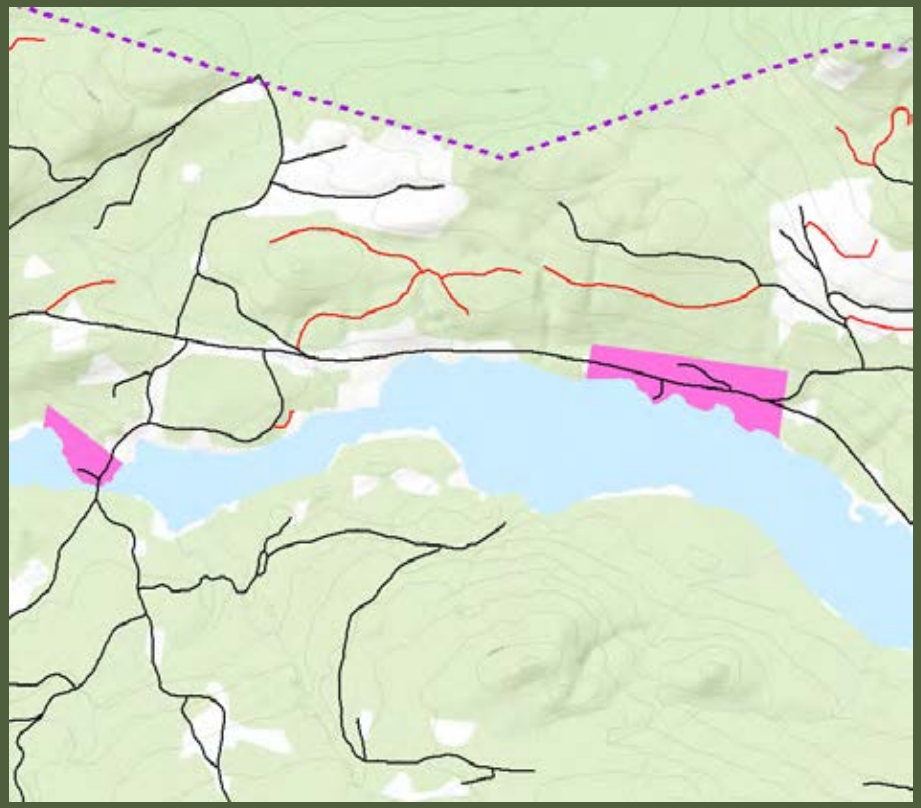


Planning Process – Manual Reclassification

Original Algorithm

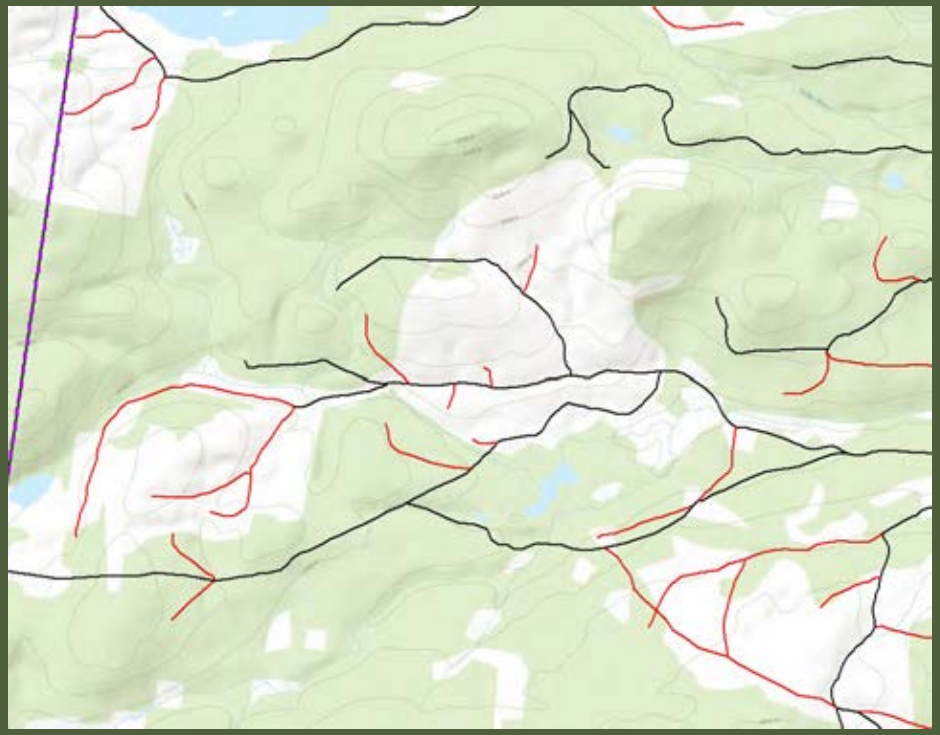


Manual Updates

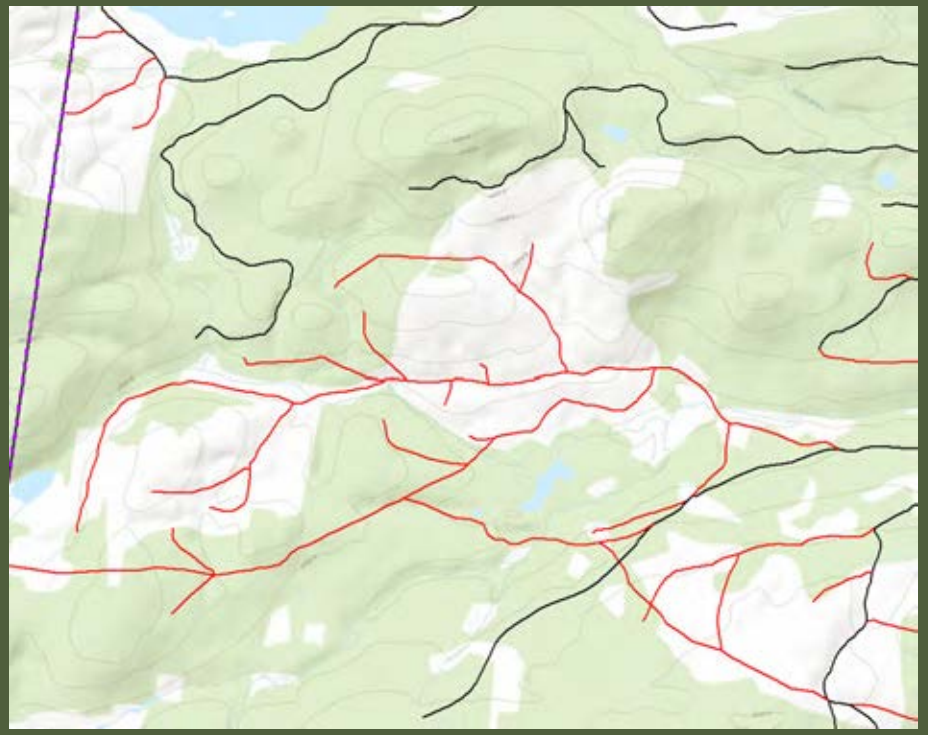


Planning Process – Licensee Review

Original Algorithm



Licensee Updates



Workshop – Site Visits

Francois Lake – October 2017

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Rehab Standards & Field Assessments

Field Assessment Objectives:

1. Is the road a candidate for rehabilitation?
   - Current site occupancy and conditions
2. What treatment is required?
   - Site-specific and higher-level considerations
3. Is the road a priority for treatment?
   - Prioritized if specific conditions warrant

Is the Road a Rehab Candidate?

- Natural regeneration:
  - Species composition
  - Well-spaced
  - Healthy
- Other concerns?

Rehab Candidate – Site Data

- Road width
- Soil conditions (basic)
- Vegetation – road prism
- Vegetation – adjacent stand
- Hydrology

What Treatment is Required?

- Mechanical site prep
  - Cat with ripper
  - Mini excavator
  - Excavator
  - Other
- Planting
  - Species mix
  - Density
- Natural drainage patterns
- Access control structures

Is the Road a Priority for Treatment?

- High, Medium or Low
- Environmental considerations
  - Fish & riparian
  - Soil erosion
  - Wildlife
- Social factors

Next Steps – Francois Lake

1. Complete field assessments
2. Develop treatment prescriptions
   - Standardized process
3. Ongoing stakeholder discussions
   - Review proposed treatments
4. Implement treatments – plant trees!

Conclusions

1. Algorithm is a good *starting point* for large scale rehabilitation planning
2. New algorithm has significantly reduced misclassification
3. Current estimate of misclassification is 20%
4. Manual reclassification of roads will always be required in the planning process
5. The algorithm has been scripted and provides for user inputs for some (landbase specific) criteria

Discussion Points

1. How much "in-block" road is needed for silviculture?
   - **Assumption:** less than 800 m length can be reforested
2. What would define a future harvest opportunity?
   - **Assumption:** 40 ha with minimum 100 m^3/ha
3. Adjacent stand age threshold ?
4. Other factors not considered?