



Mine Reclamation Planning in High Elevation Caribou Range

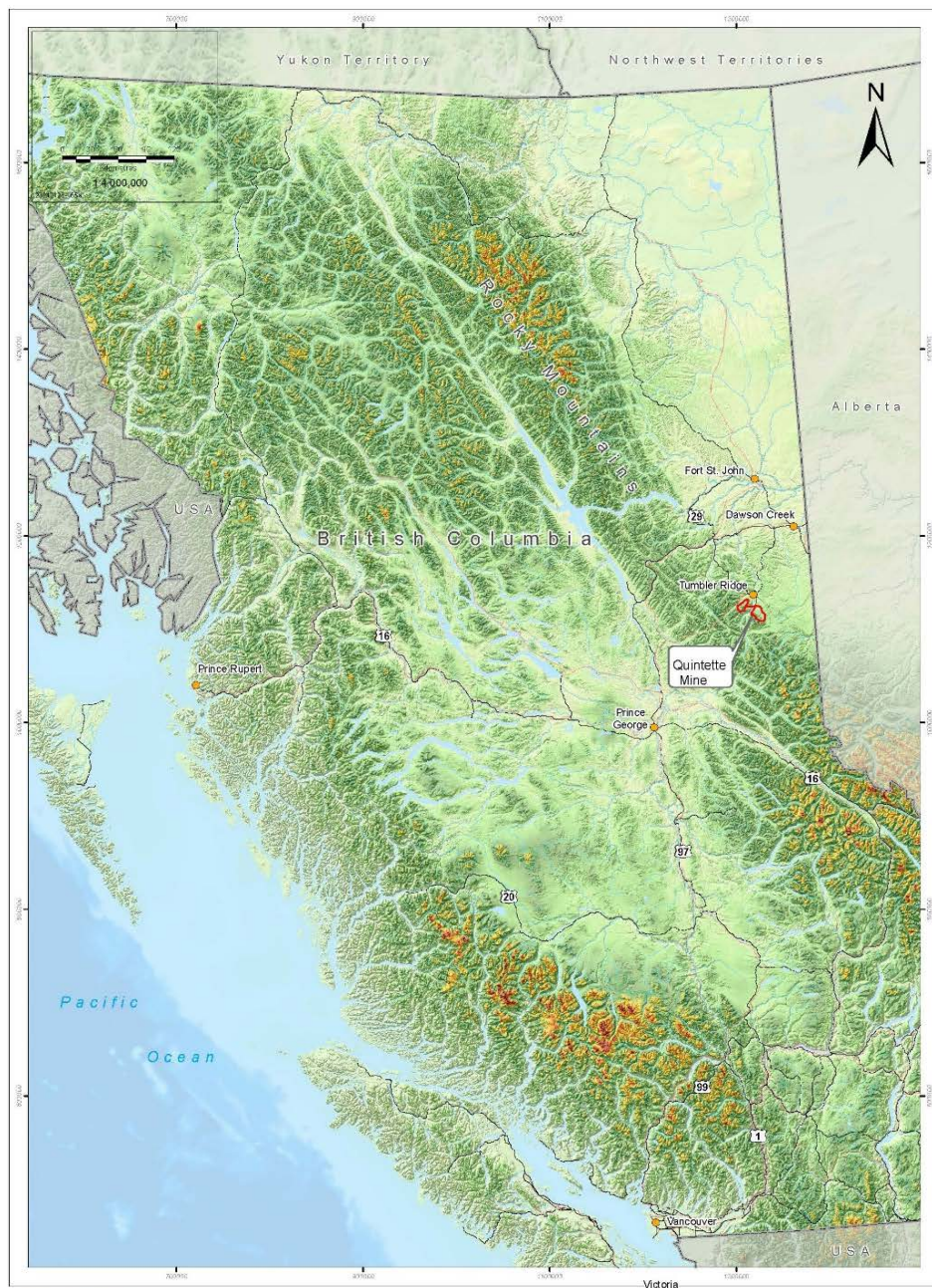
Advancing Ecosystem Restoration Research through an Academic Partnership with Teck Resource's Quintette Mine, First Nations, and Scientists



Photo credit: J. Rees, Teck

Joanna Preston, B.Sc., R.P.Bio.



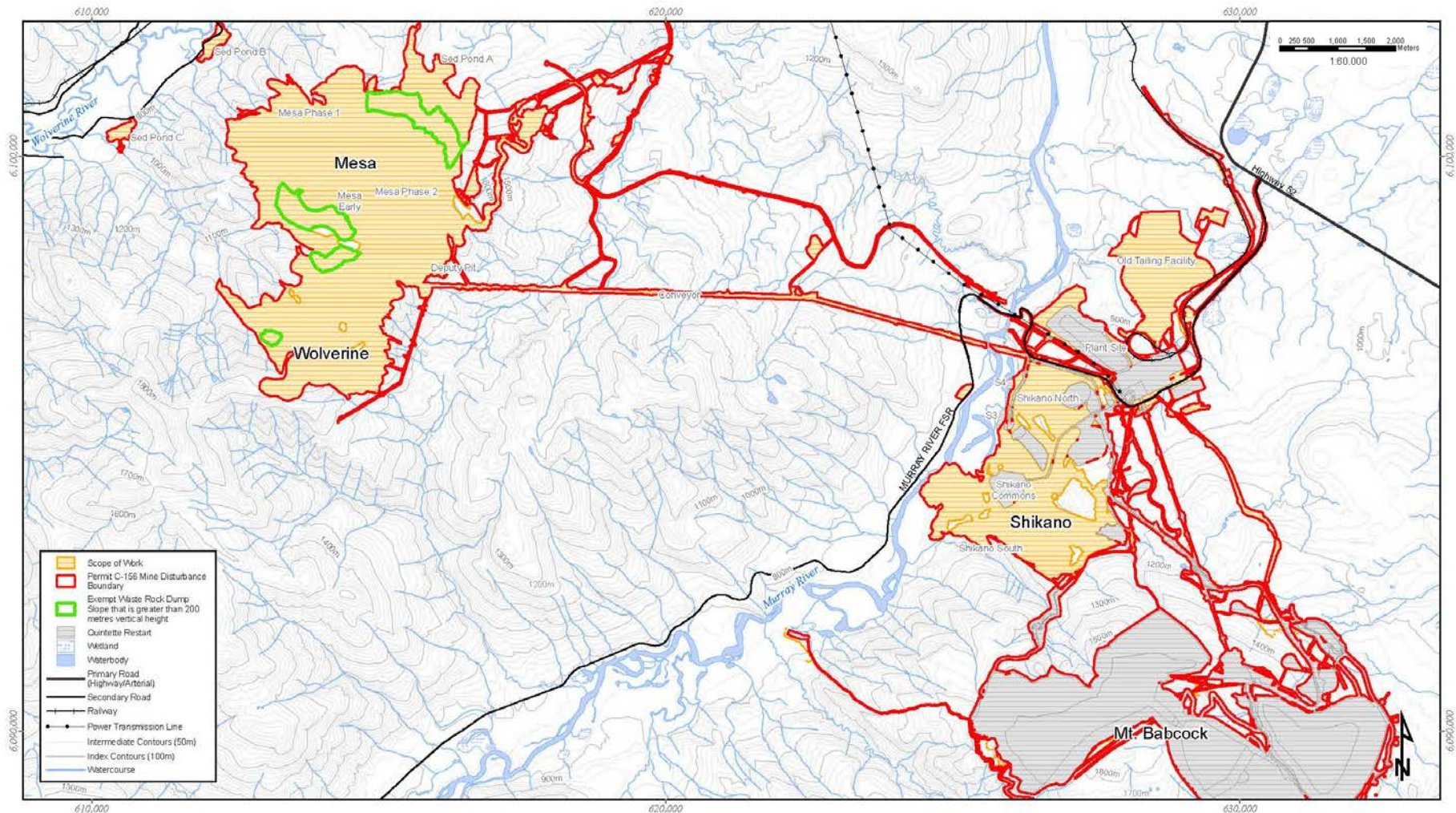


Teck's Quintette Mine Location

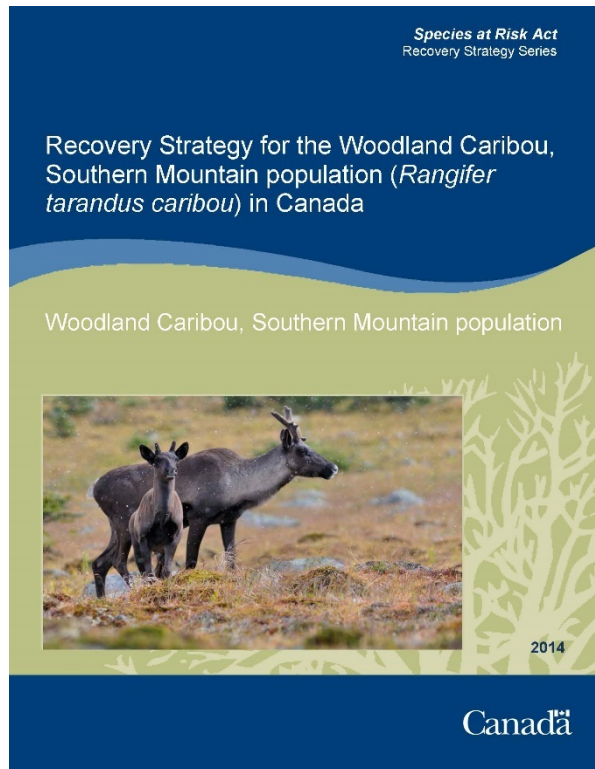
Source: Joint Application for Quintette Restart, Mine Permit C-156

Teck's Quintette Mine

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Source: Quintette Legacy Closure and Reclamation Plan for Mine Permit C-156

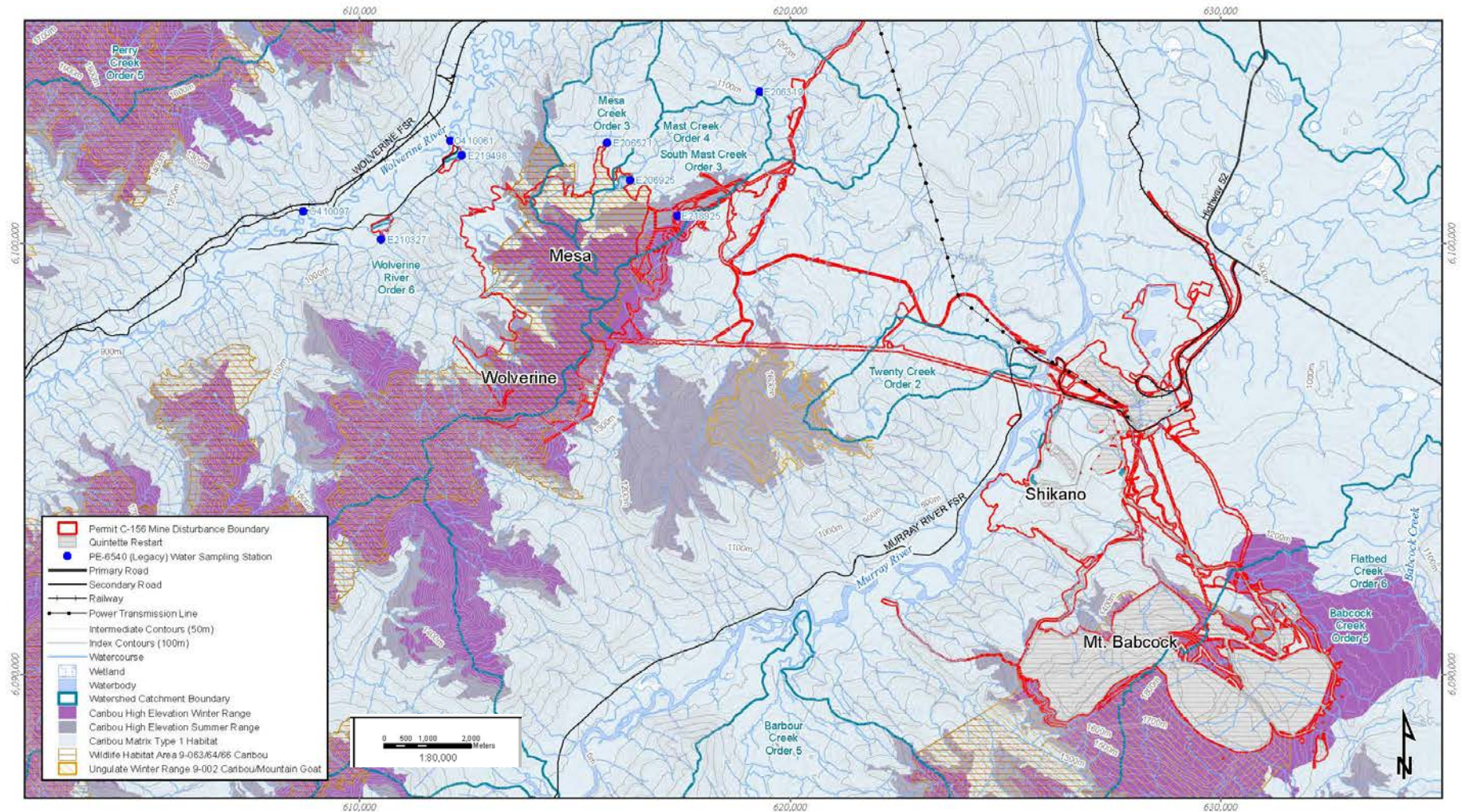


Federal/Provincial Actions

- Southern Mountain Caribou Protection Study (2017)
- Quintette Strategic Action Plan (2017)
- Quintette Restoration Implementation Plan (2018)
- Canada-BC Conservation Agreement, s.11 of the Species at Risk Act (2018)

Caribou Critical Habitat

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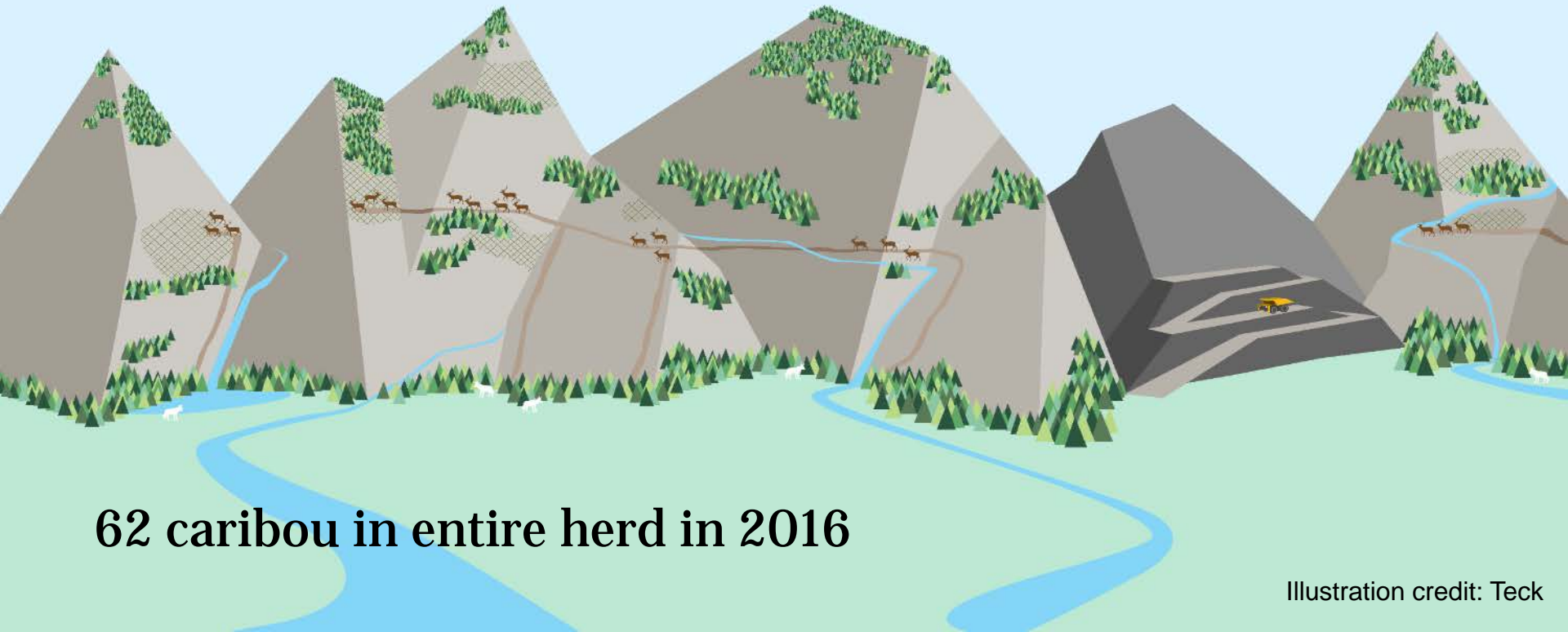
Source: Quintette Legacy Closure and Reclamation Plan for Mine Permit C-156

Caribou Use

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Quintette Mine area

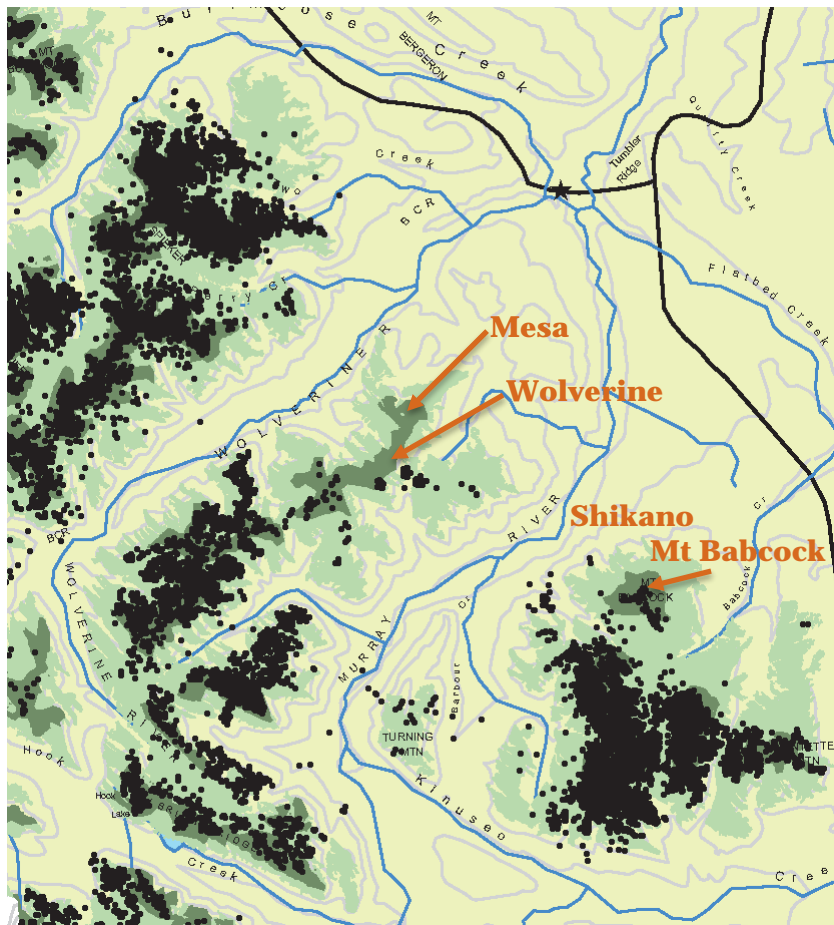
- 300 caribou in 1970s
- Regular use in 1980s
- No evidence of use since 2011



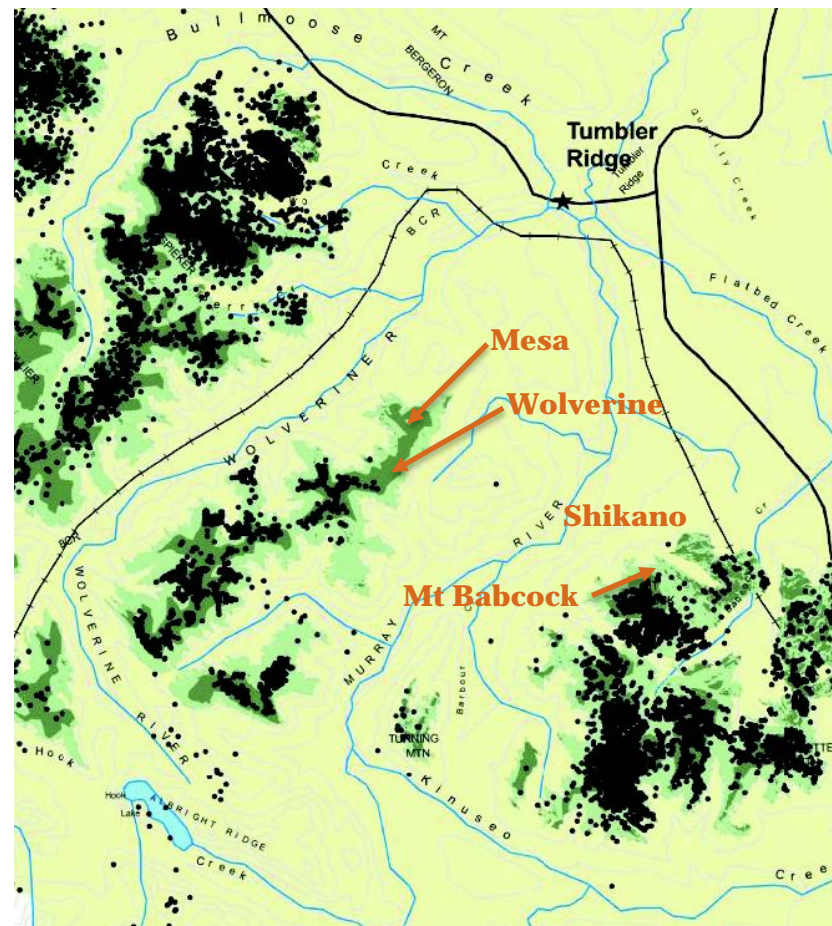
62 caribou in entire herd in 2016

Caribou Use

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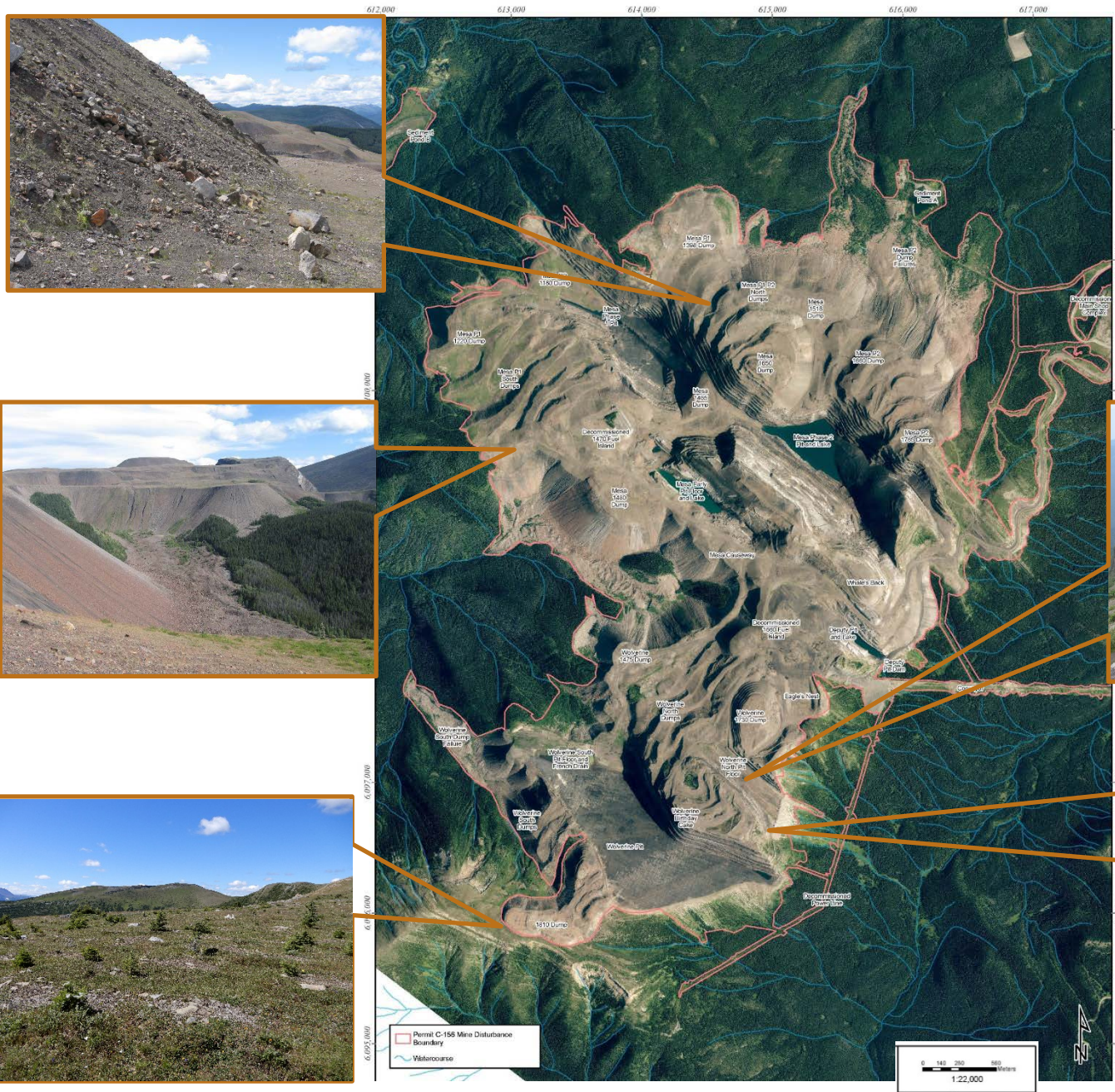
Summer Telemetry, 2002 - 2014



Winter Telemetry, 2002 - 2012

- Amendment of Quintette Mine Permit (2013)
 - update to reclamation plan for the legacy portions
 - include restoration to support caribou recovery
- Quintette Legacy Closure and Reclamation Plan
 - To Ministry Jan 15, 2018
 - Incorporate First Nations feedback
 - Develop reclamation research program

Mesa/Wolverine High Elevation Range



Source: Quintette Legacy Closure and Reclamation Plan for Mine Permit C-156

Photo credits: J. Rees, Teck

Restoration Challenges

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- High elevation ecosystem in a mined landscape



Photo credit: J. Rees, Teck



Photo credit: Sean Sharpe Environmental

Restoration Challenges

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- Methods new, untested, costly
- No soil salvaged
- Inaccessible to caribou (steep slopes)
- Coarse fragment spoil (large rocks)
- High elevation, wind-swept, harsh
- Limited pre-mine data on caribou use (baseline)

Restoration Challenges

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- Accommodate caribou **AND** provide functional ecosystem that benefits multiple species



Photo credit (background): J. Rees, Teck

- Accommodate wildlife **AND** human traditional land use
 - Treaty No. 8 First Nations and Kelly Lake traditional territory
 - First Nations expressed a desire to shift from a passive role to a more interactive role when it comes to reclamation in their territory



Photo credit: J. Rees, Teck

- Teck worked with Stantec to develop the **Quintette Legacy Closure and Reclamation Plan** to:
 - Establish self-sustaining ecosystems that lead to approved, viable, long-term and diverse land uses
 - Establish site conditions and biological processes that support functional wildlife habitat that do not compete with species specific objectives

- Teck forms a **Research Partnership**

“to develop and share support for a restoration research program focused on restoring functional caribou habitat on mined landscapes (Mesa/Wolverine). Participation from First Nations is anticipated”

Teck letter to Ministry, January 3, 2017

Meeting the Challenge

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Ecological Restoration
Program: a collaboration
between



Treaty 8 First Nations:



Meeting the Challenge

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- BCIT/SFU **Ecological Restoration Masters Program**
- Teck agreed to use the Quintette Legacy for research
- Teck formed a **Reclamation Working Group** with T8FN
- Stantec Scholarship **Community Engagement Program**



- Teck and Stantec are **Industrial Partners** in student's Mitacs internship

Research Partnership

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- Mine site
- Mine resources
- Equipment

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- Community engagement
- Traditional knowledge
- First Nations land use
- Twin Sisters Nursery



Photo credit: Sean Sharpe Environmental



- Students
- Access to federal grants
- Academic credibility
- Innovation



- Qualified scientists, expertise
- Knowledge of site
- Relationship with Teck
- Closure and Reclamation Plan



Partnership is....

- Collaboration
- Recognizing different values
- Creating opportunity for innovation
- Working towards ecosystem recovery
- Building ecological resilience
- Social resilience
- Cost-effective



- Find **innovative** ways to enhance functional habitat
- **Students** complete testing and monitoring through directed research questions
- **Credibility** from an academic institute
- Teck committed to **12 year** research program



1. Develop caribou habitat restoration model



- to identify **biophysical features** and **landforms** caribou need
- to inform mine **reslope** design
- to inform **revegetation** prescriptions

Photo credit: Teck

Other potential projects...

2. Incorporate TK and First Nations values in restoration planning
3. Revegetation and transplant trials, and other treatments
4. Restoration monitoring
 - Targets and performance measures
 - Monitoring methods

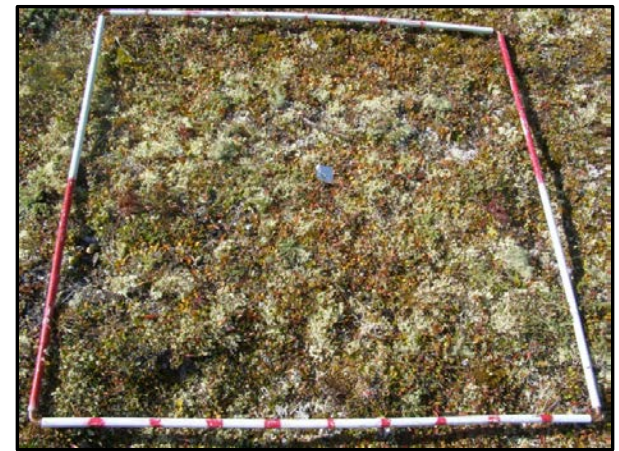


Photo credit: Integral Ecology Group

- Collaboration is essential for caribou habitat restoration to be successful
- Student study hopefully the first of many projects
- Opportunity for Teck to meet their commitments to research while meeting conditions of the permit

Thank You

Teck

Questions?

Thanks to:

Jeff Rees, Teck Resources

Natalie Tashe, Stantec

Dr. Scott Harrison, SFU

Dr. Doug Ransome, BCIT

Heather Short, M.Sc. Candidate



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