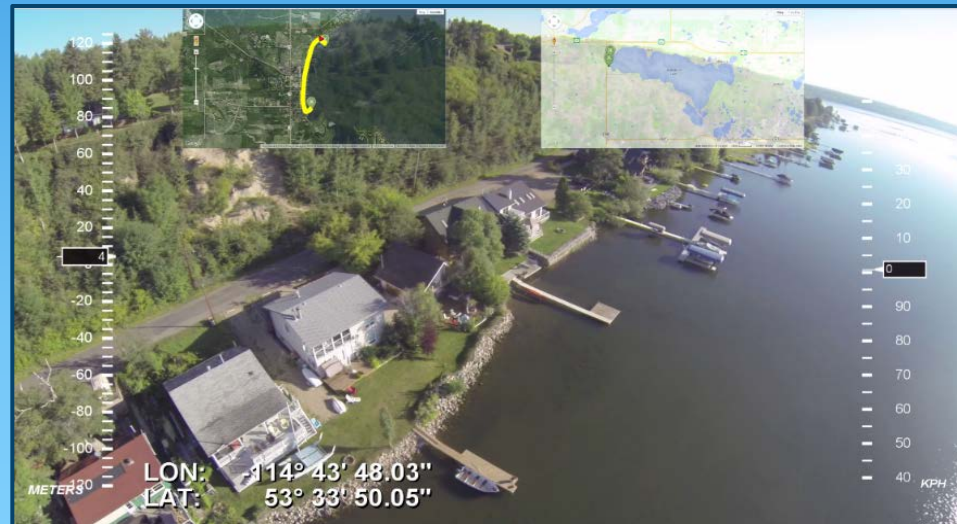


Aerial Riparian Health Assessment

Presented by Mary Ellen Shain, M.Sc.

September 2015



Ecosystem Services

- Trap sediments and contaminants
- Filter and buffer water (physical, biochemical)
- Recharge aquifers
- Store flood water and energy
- Reduce and dissipate stream and wave energy
- Maintain wetland habitats and biodiversity



Photo by Roger Kirchen



Riparian Management Area

Typical Riparian Vegetation

- Willow
- Dogwood
- Grasses
- Sedges
- Bulrush
- Cattail

Buffer Species

- Aspen
- Balsam Poplar
- Black Spruce

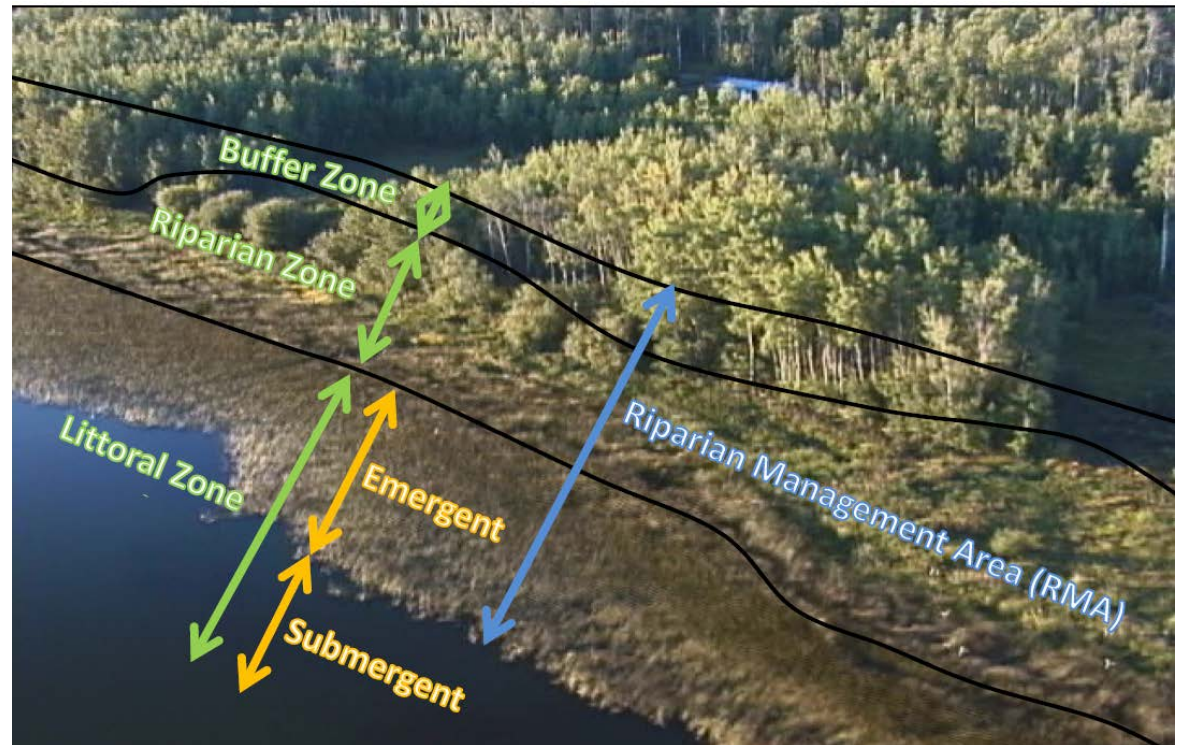


Photo by Teichreb and Walker (2008)



Methods



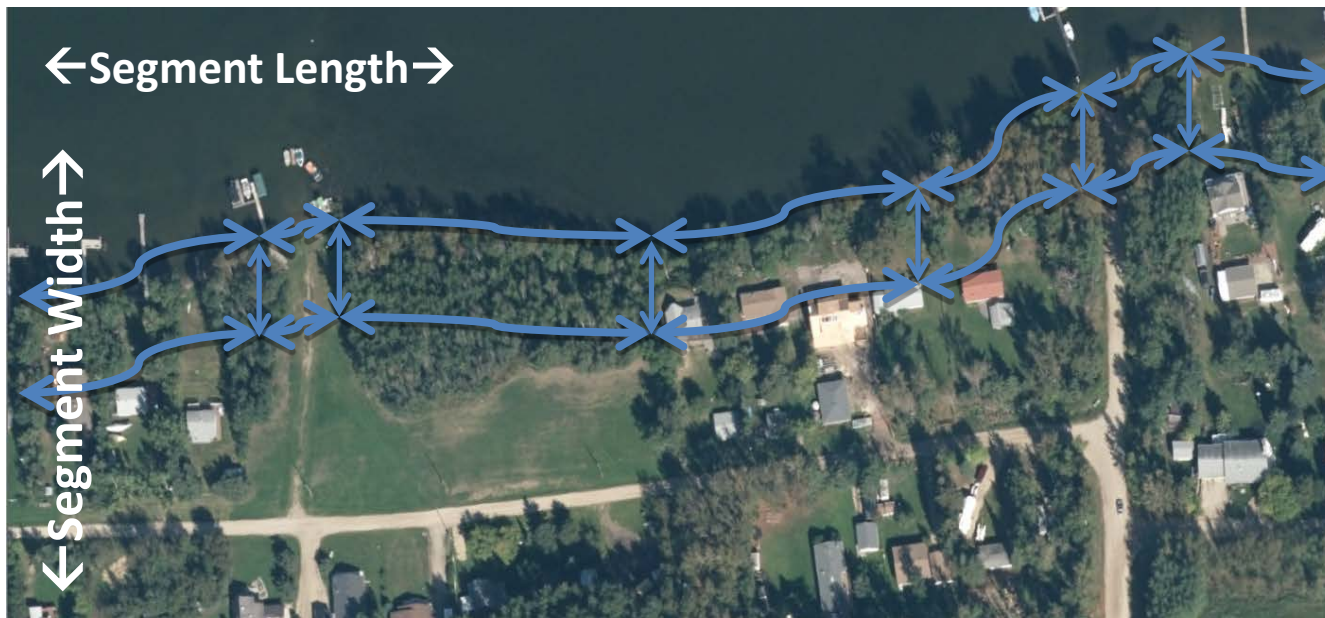
Unmanned Air Vehicle (UAV),
otherwise known as a drone.



Screenshot of UAV videography with
data overlay.



Assessment



Scorecard

Assessment Questions and Scoring.

1. 85% or more of the polygon area is covered with vegetation of any kind? (Polygon area does not include area covered by water. “Natural” applies to shorelines that would support < 85% vegetation – including natural sandy or rock/cobble shorelines.)
Yes ____ (2 points) **Natural** ____ (1point) **No** ____ (0 points)
2. Cattails and bulrushes are visibly growing in the littoral zone adjacent to the polygon area? (Identifying immature bulrush and cattail stands may be difficult. On some lakes these species do not grow because of site and/or climate conditions. It is important you know this prior to deciding if their absence is natural or human caused.)
Dense to Medium ____ (1 point), **Medium to Sparse** ____ (0.5 points), **None** ____ (0 points)
3. Woody plants like willow, birch or poplar cover 15% or more of the polygon area? (In some cases riparian areas do not have the potential for woody plants because of soil chemistry and other factors, i.e., saline and drainage. In some cases woody plants do not meet this threshold because of site and successional reasons. “Natural” applies to those naturally sandy or rock/cobble shorelines that inhibit woody growth.)
Yes ____ (1 point) **Natural** ____ (0.5 point) **No** ____ (0 points)
4. Within the 15% woody zone, what is the abundance of woody plants? (If the answer to Question 3 is no, this question receives 0 points)
Dense to Medium ____ (1 point) or **Sparse to Medium** ____ (0.5 points)
5. 35% or more of the polygon shows visual signs of human caused removal or alteration of vegetation? (e.g., includes conversion of native vegetation to lawn grass, mowing, grazing, cutting of woody vegetation, etc.).
Yes ____ (0 points) **No** ____ (2 points)

Scorecard

6. 35% or more of the polygon shows visual signs of human caused physical alteration? (e.g., addition or removal of sand or rock, harrowing beaches, retaining walls, boat houses, decks, patios, walking or ATV trails, cattle activity, etc.)
Yes ____ (0 points) No ____ (3 points)

7. What picture does most of the polygon look like?

Picture A? ____ (1 point)

Combination of A and B? ____ (0.5 points)

Picture B? ____ (0 points)



Total possible points = 11.

Actual points (sum from questions above) = ____.

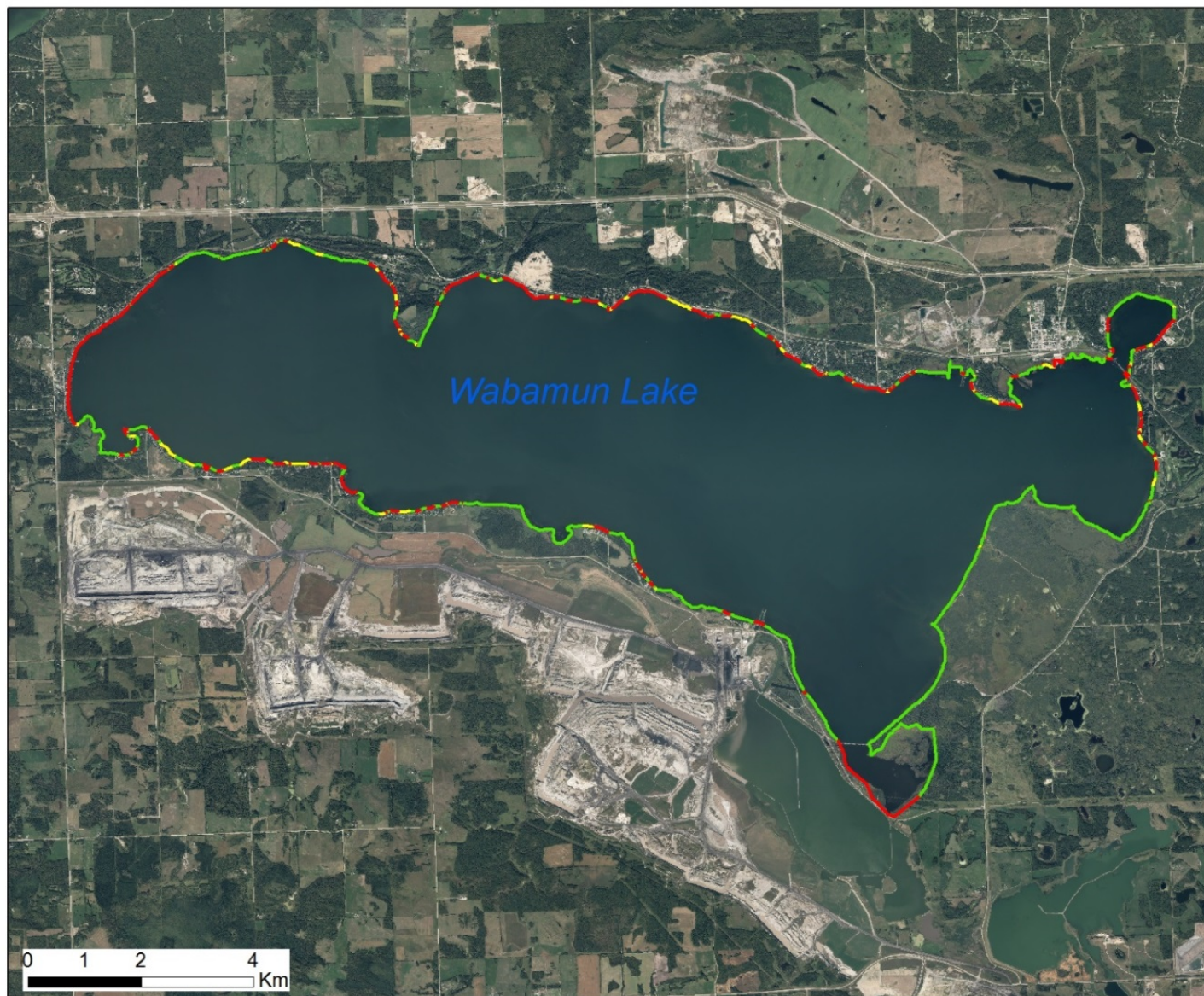
Summary of Question Scores

If the score is **more than 8** it is likely the Riparian Management Area is **healthy**.




If the score is **6.0 to 8.0** it is likely the Riparian Management Area is **moderately impaired**.

If the score is **less than 6** it is likely the Riparian Management Area is **highly impaired**.

Wabamun Lake: Aerial Riparian Health Assessment (2014)



Inset Map Legend

-  Lake Wabamun
-  North Sask. River
-  North Sask. Watershed



Map Legend

Shoreline Health Rating

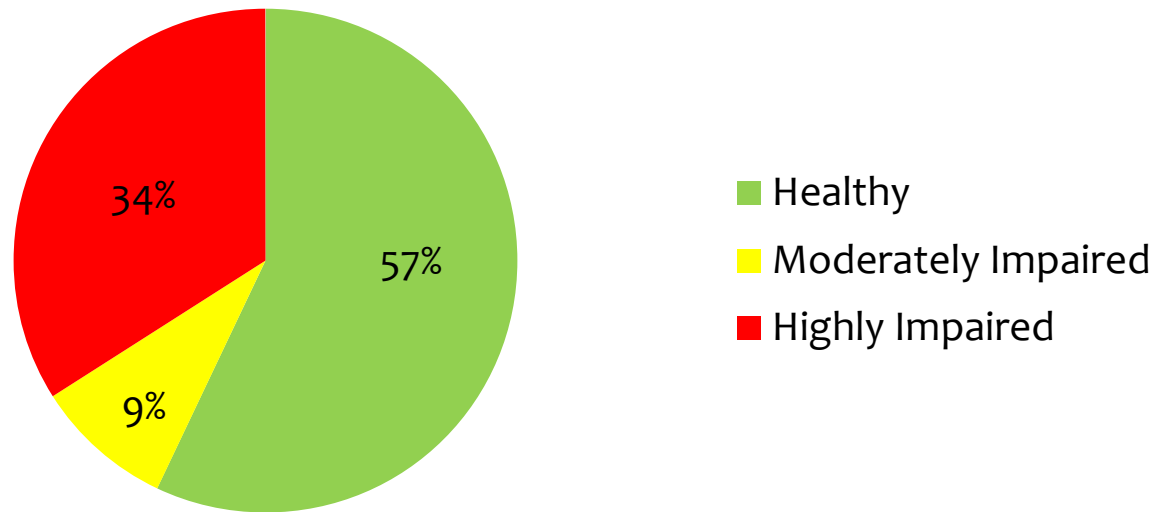
-  Healthy
-  Moderately Impaired
-  Highly Impaired

This map created for the Wabamun Watershed Management Council by the North Saskatchewan Watershed Alliance on January 30, 2015.

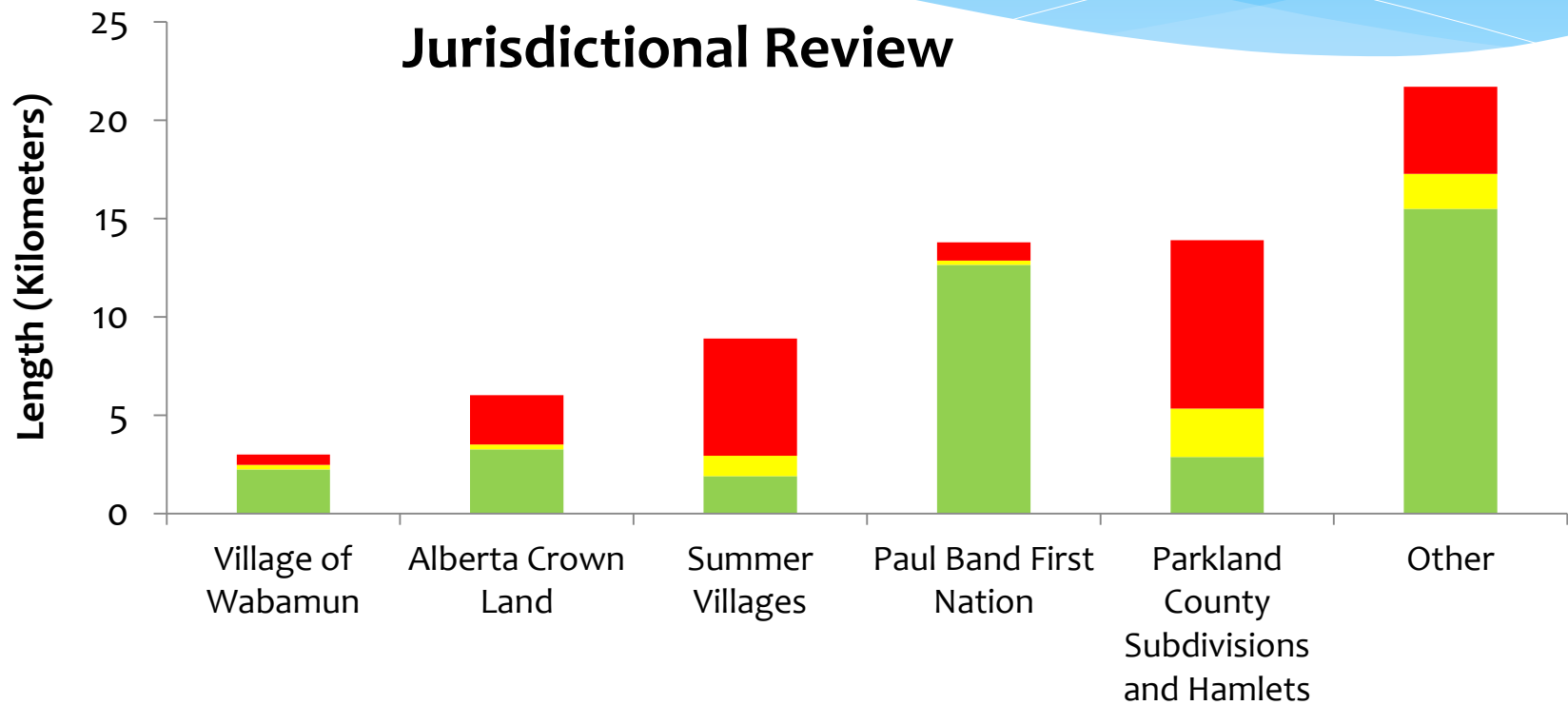
The information presented here is based on high resolution videography that was captured in August of 2014. As well, The orthophotographs captured in 2013 were provided by Parkland County. Funding for the project was provided by the Land Stewardship Centre

Wabamun Results

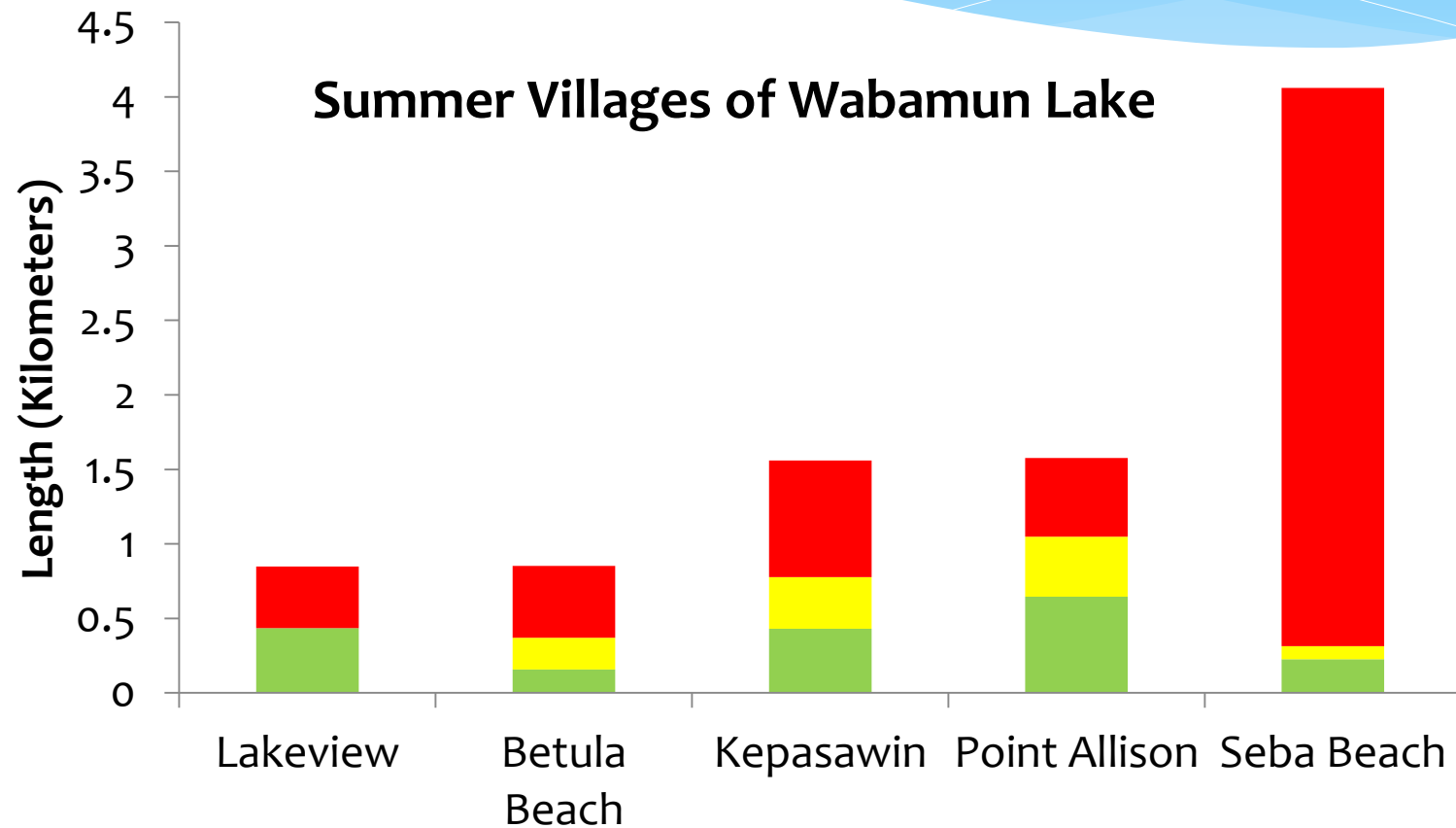
Wabamun Lake Riparian Health Assessment



Wabamun Results

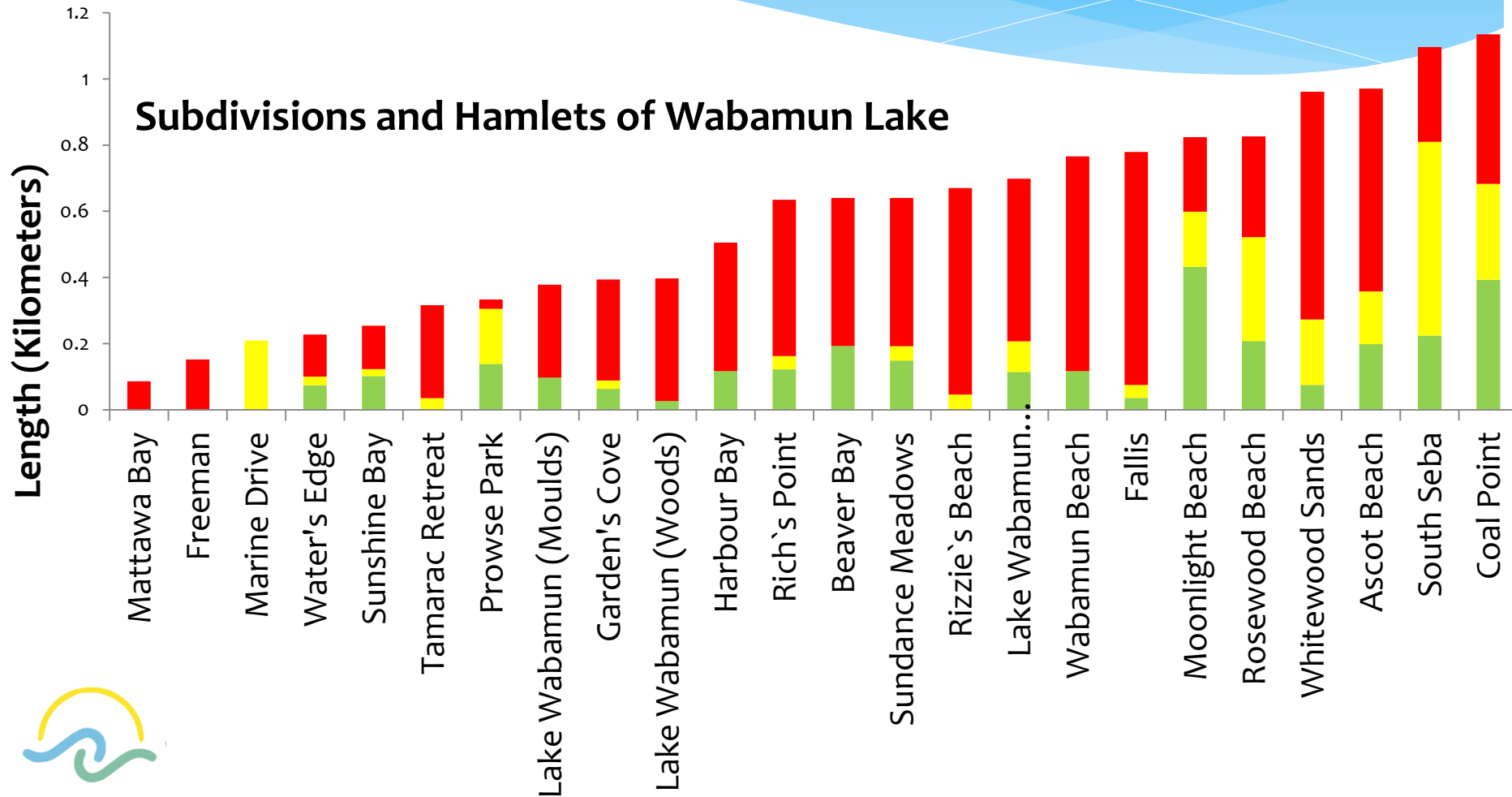


Wabamun Results



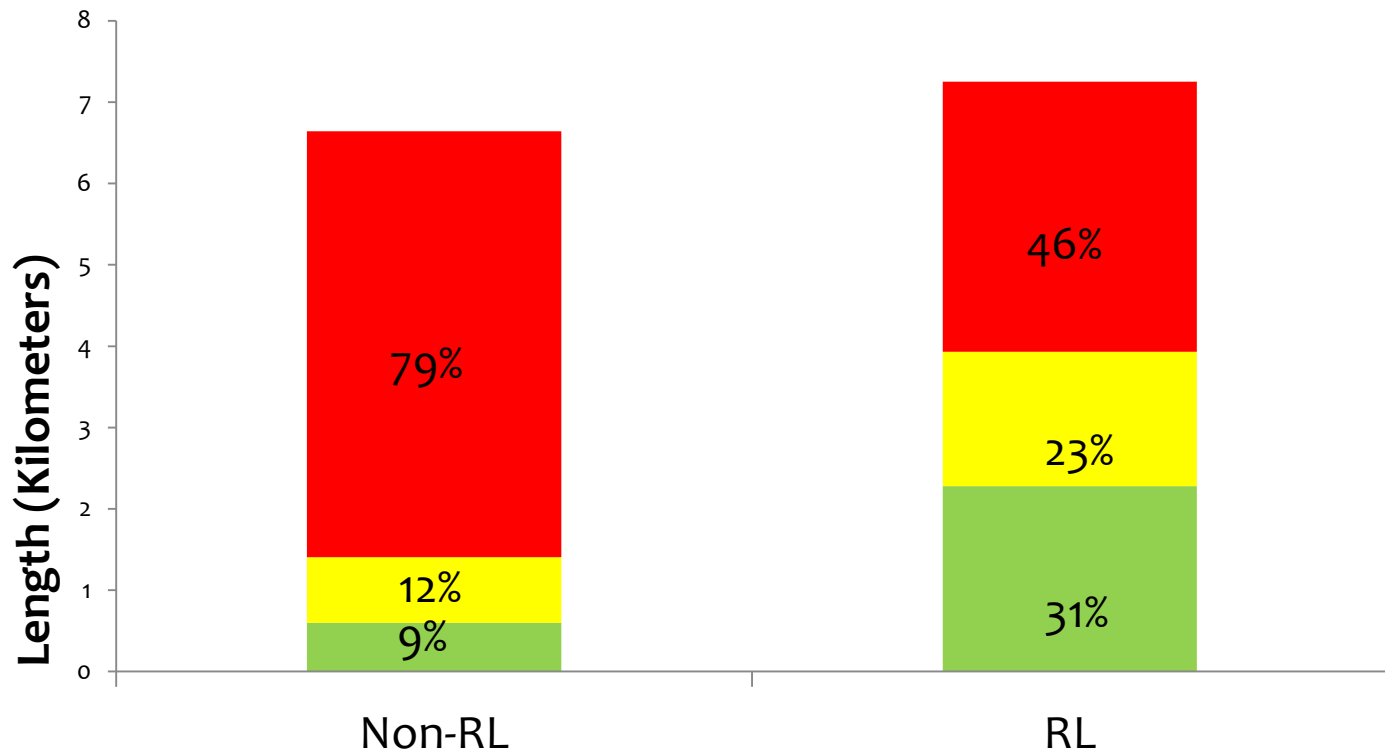
Wabamun Results

Subdivisions and Hamlets of Wabamun Lake



Wabamun Results

Subdivisions and Hamlets of Wabamun Lake: Assessment of Riparian Health of Reserves Land (RL)

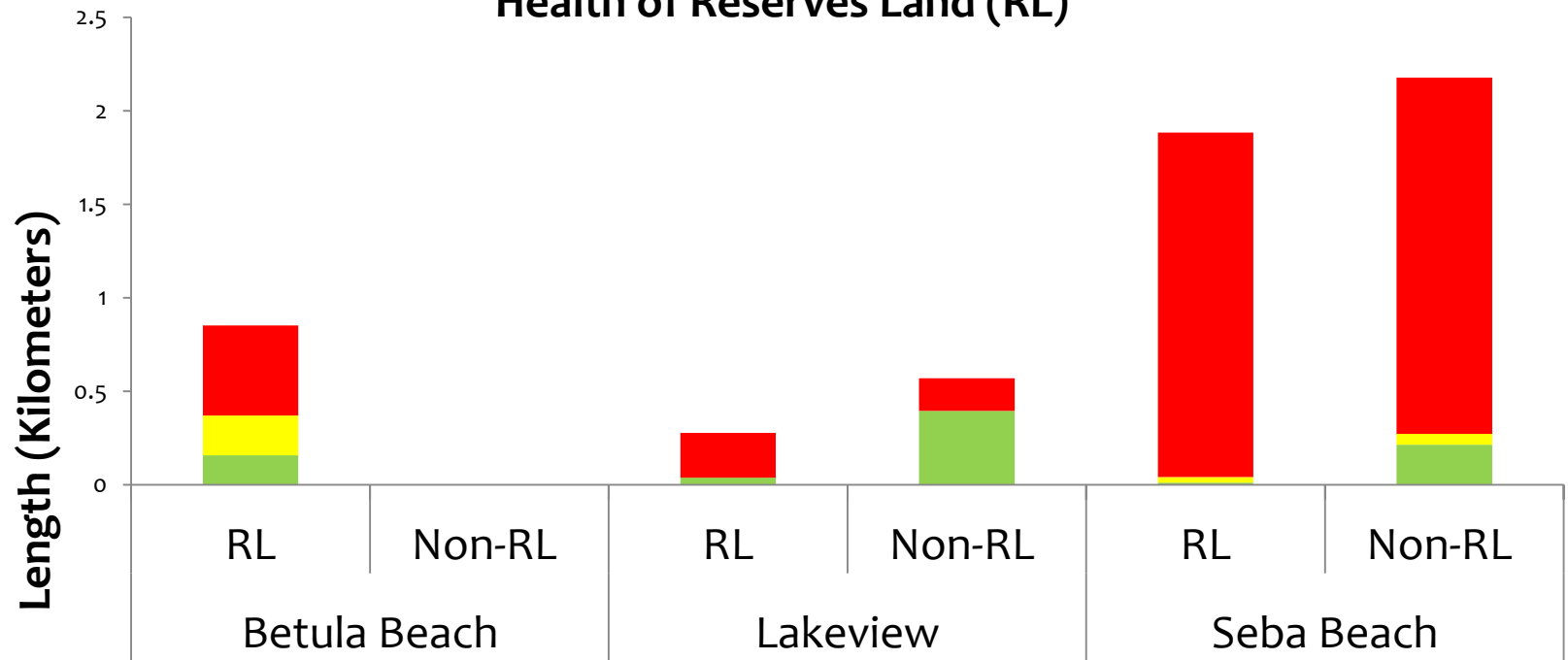


Reserve Lands ≠ Environmental Reserves



Wabamun Results

Summer Villages of Wabamun Lake: Assessment of Riparian Health of Reserves Land (RL)

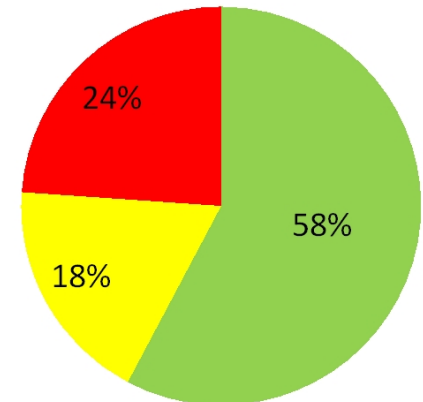
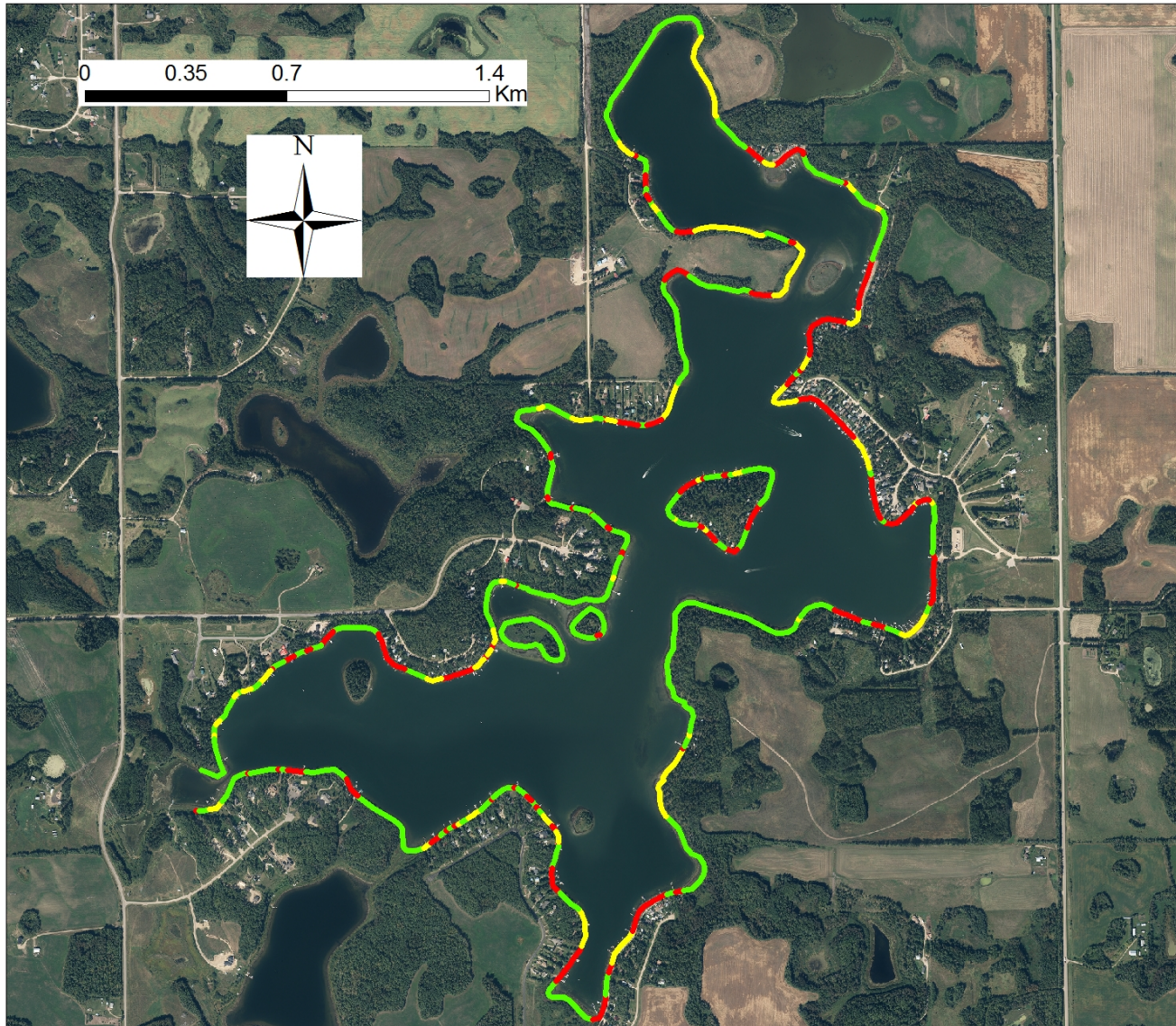


Restoration Actions (Wabamun)

Relative Difficulty	Action in Riparian Management Area (RMA)	% RMA managed by all Jurisdictions	Cumulative Benefit
Low (R=0; L=0)	Preserving existing healthy RMA	57%	57%
Medium (R=1; L=1)	Restoring moderately impacted and highly impacted Reserve Land	15%	72%
Medium (R=0; L=1)	Restoring moderately impacted areas (non-Reserve Land)	6%	78%
High (R=1; L=1)	Restoring highly impacted areas (non Reserve Land)	22%	100%



Jackfish Lake: Aerial Riparian Health Assessment



Map Legend

Health

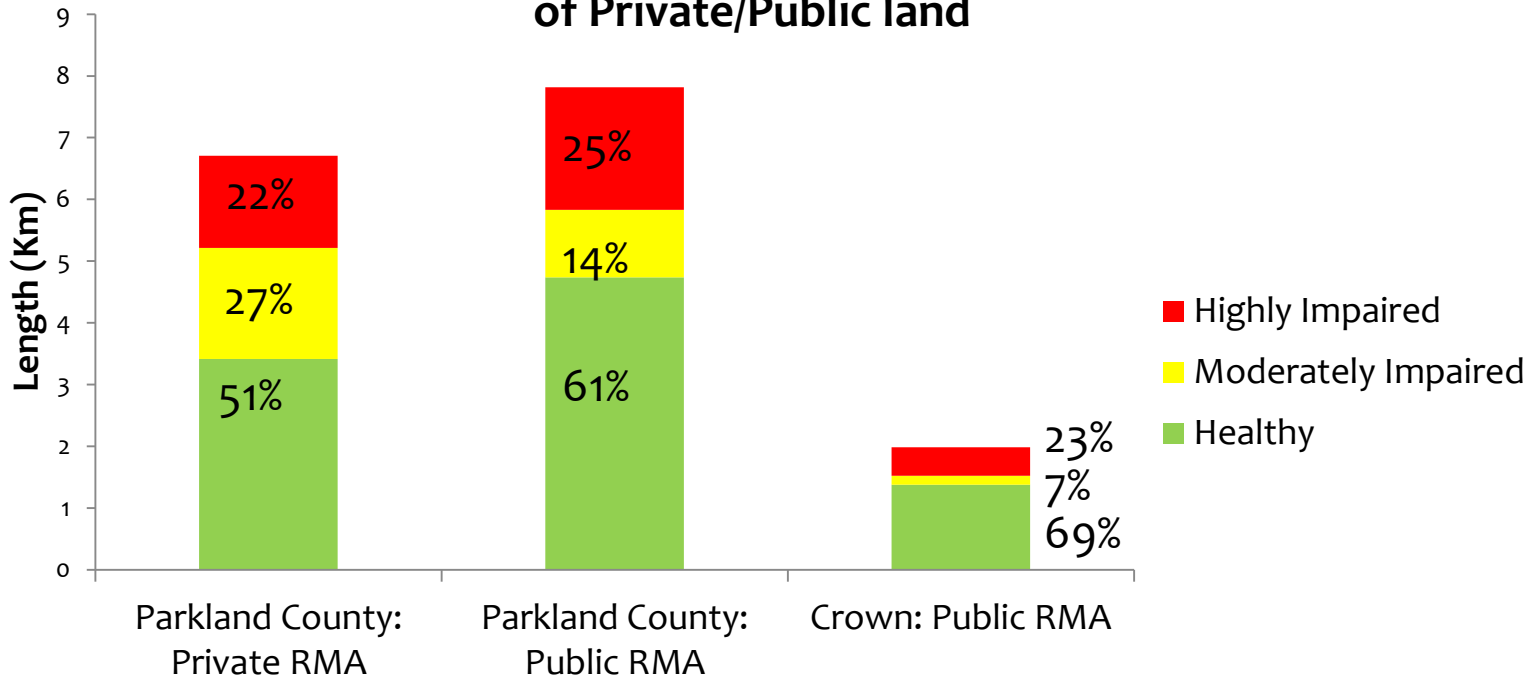
- Healthy
- Highly Impaired
- Moderately Impaired

This map was created by the North Saskatchewan Watershed Alliance on May 07, 2015.

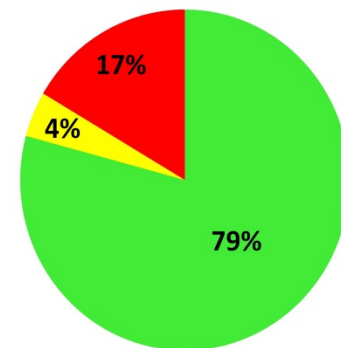
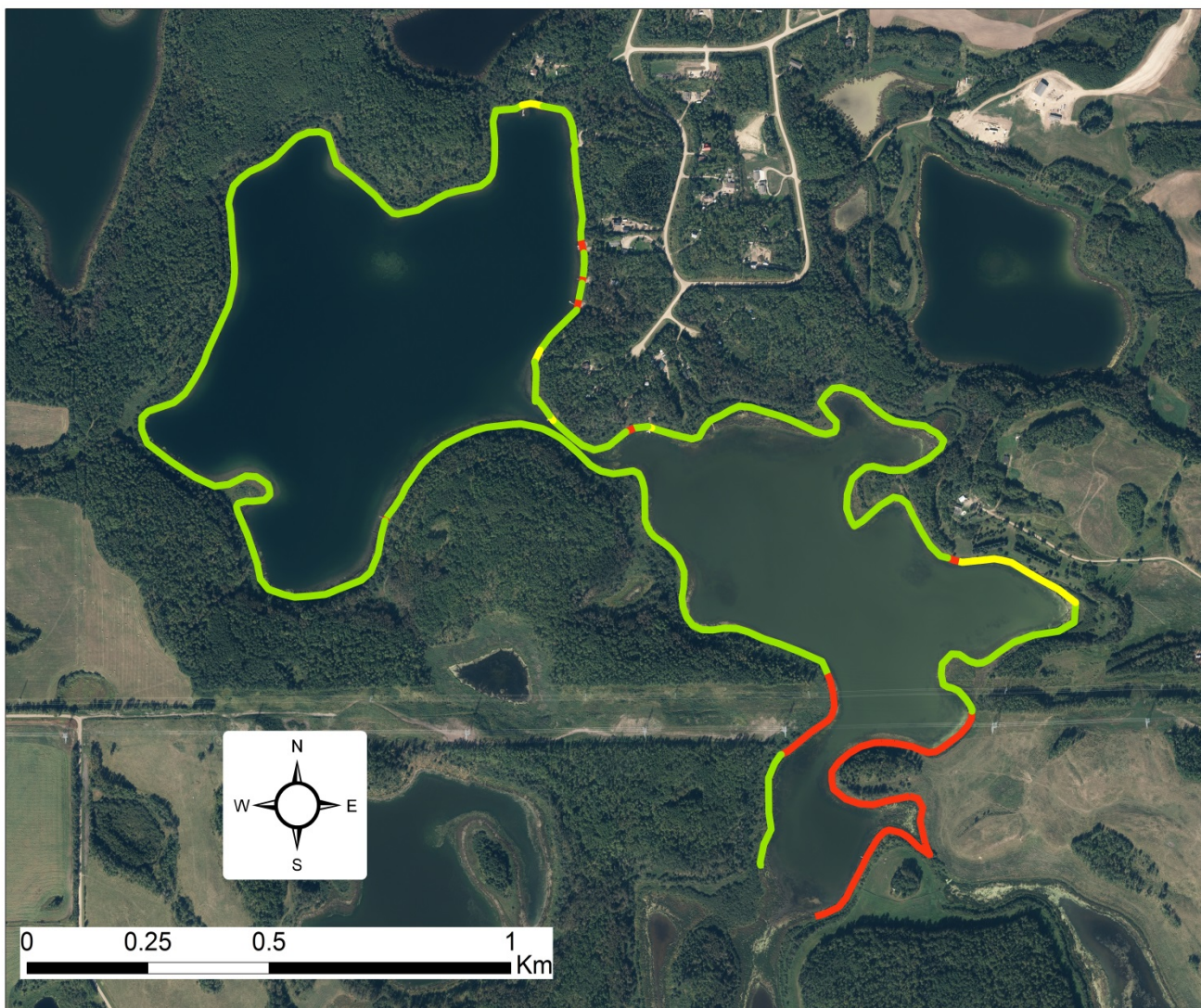
The information presented here is based on high resolution videography that was captured in August of 2014. The orthophotographs, captured in 2013, were provided by Parkland County. Funding for the project was provided by the Jackfish Lake Management Association.

Jackfish Results

Jackfish Lake: Jurisdictional Comparison of Private/Public land



Mayatan Lake: Aerial Riparian Health Assessment (2014)



Map Legend

Health Assessment Rating

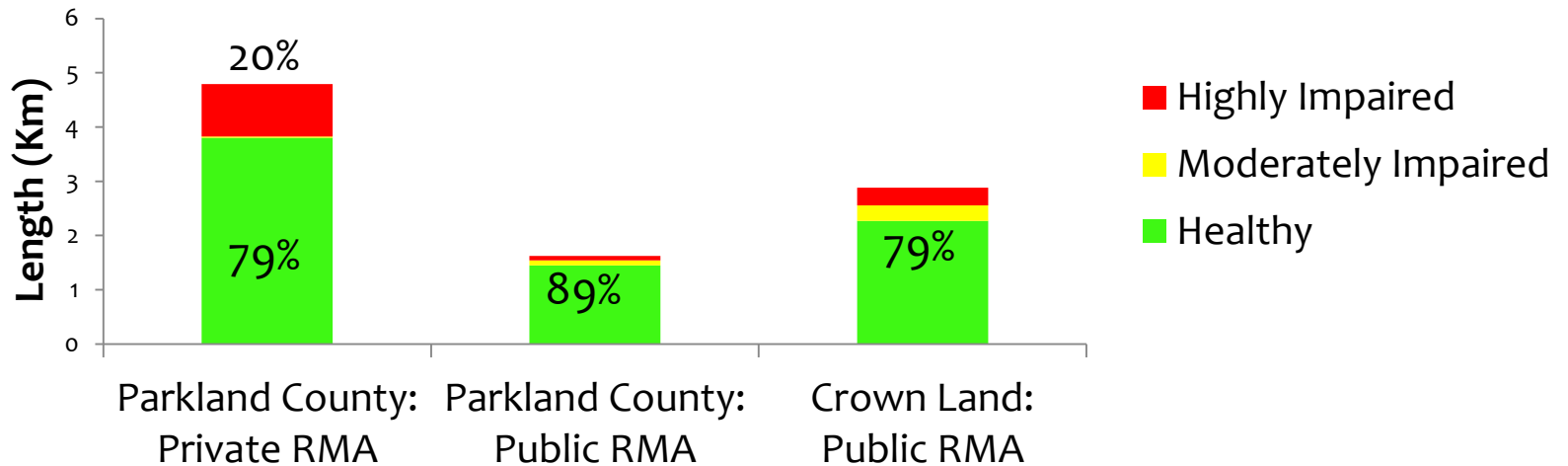
- Healthy
- Moderately Impaired
- Highly Impaired

This map was created by the North Saskatchewan Watershed Alliance on April 17, 2015.

The information presented here is based on high resolution videography that was captured in August 2014. The orthophotographs, captured in 2013, were provided by Parkland County. Funding for the project was provided by the Mayatan Lake Management Association.

Mayatan Lake Results

Mayatan Lake: Jurisdictional Comparison of Private/Public Land



Acknowledgements

- * Wabamun Watershed Management Council (WWMC)
- * Jackfish Lake Management Association
- * Mayatan Lake Management Association
- * Land Stewardship Centre
- * Parkland County



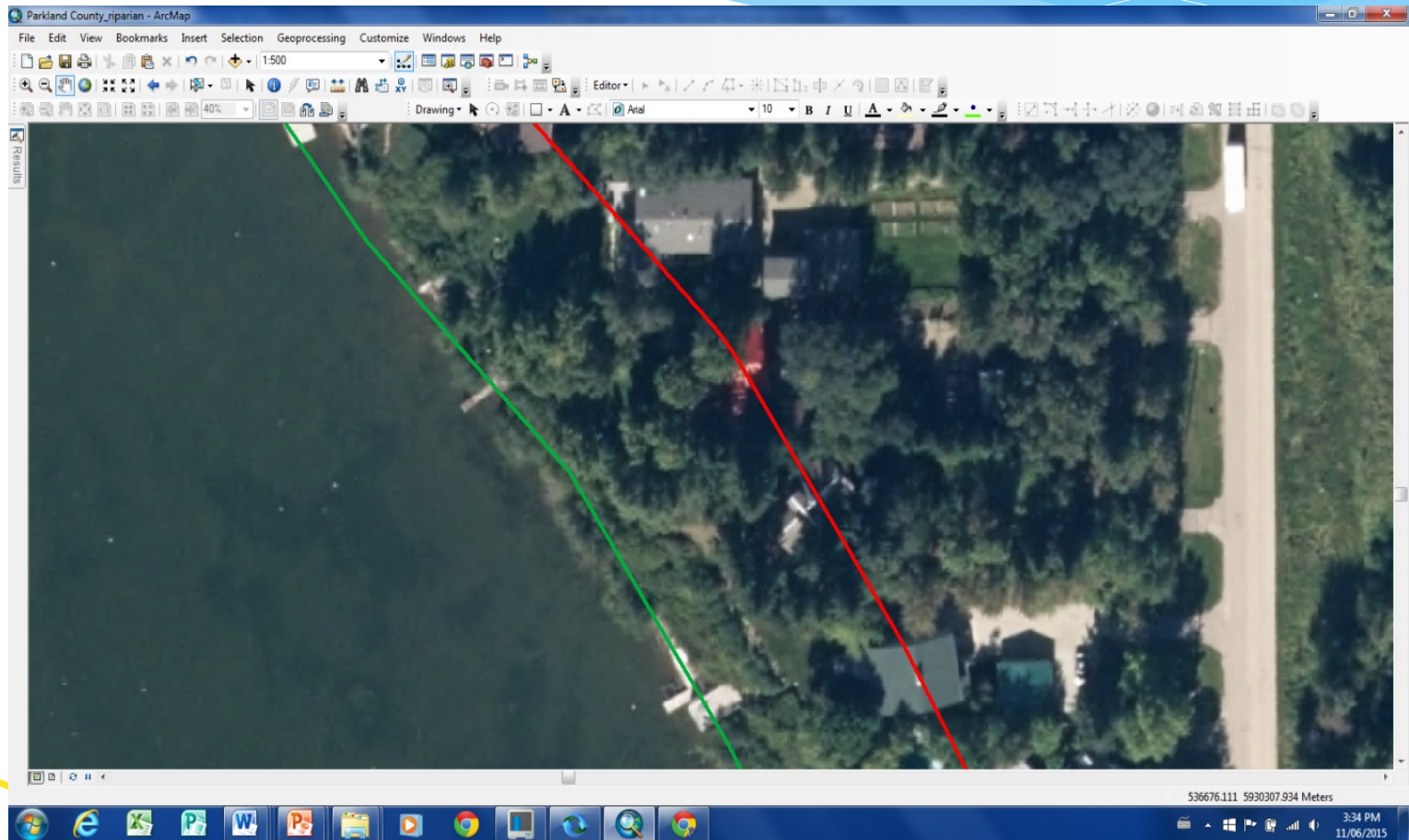
Appendix 1

Example of lower impact development

- * Shoreline vegetation intact
- * Cottage set back from shoreline



Appendix 1

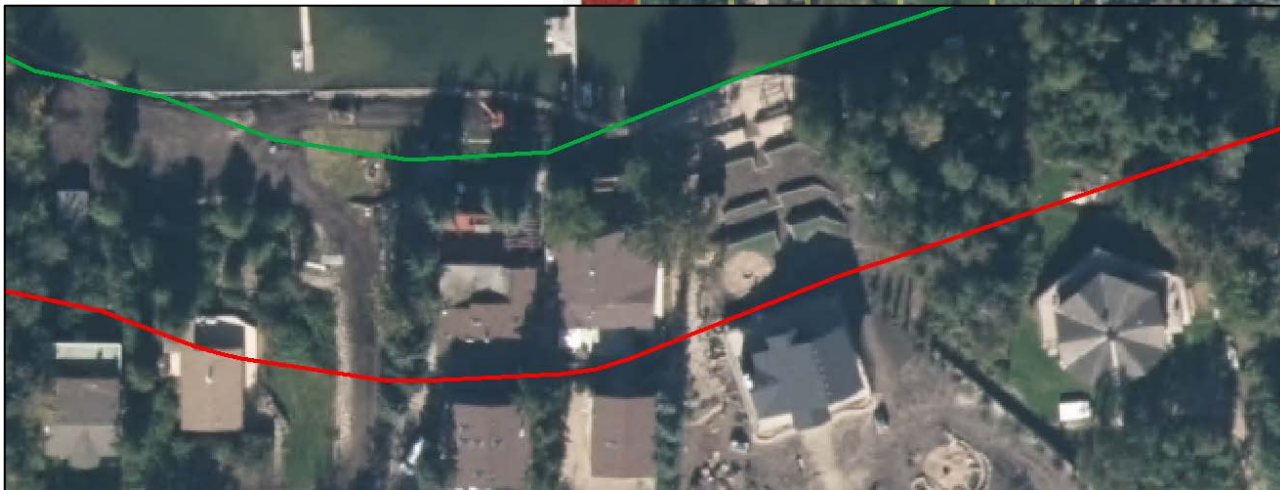
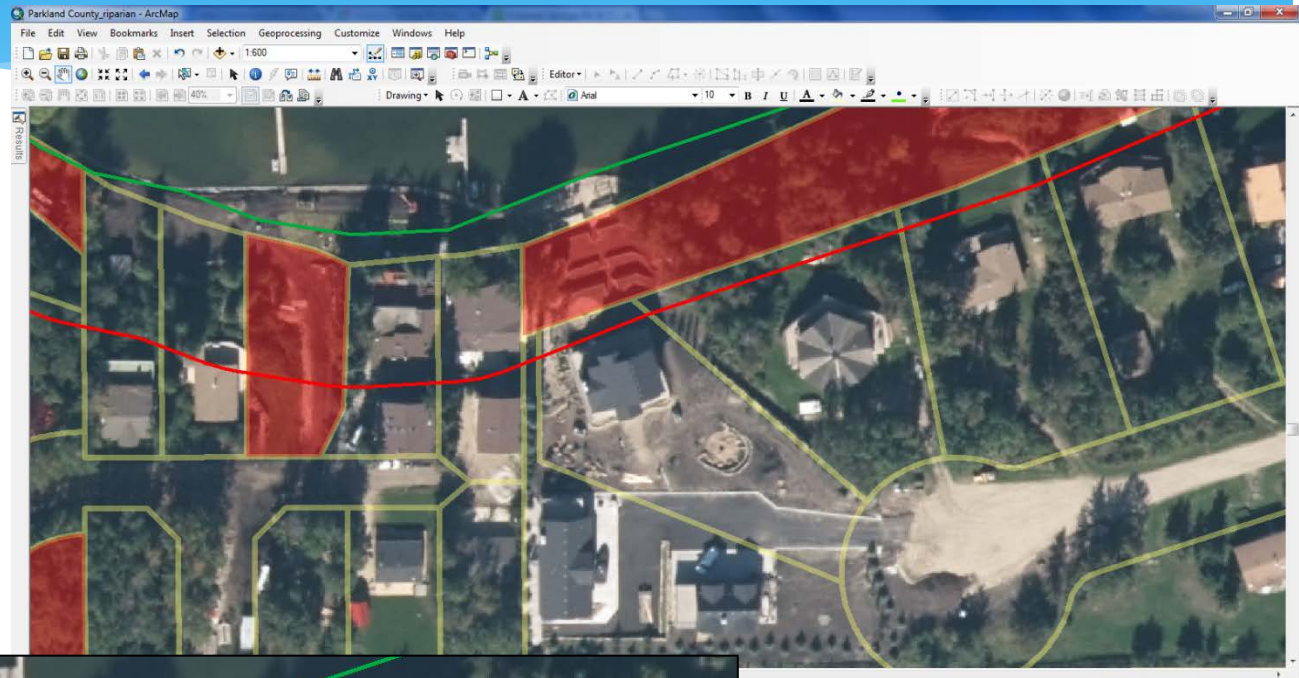


Appendix 2



* Complete removal of trees on parcels

Appendix 2

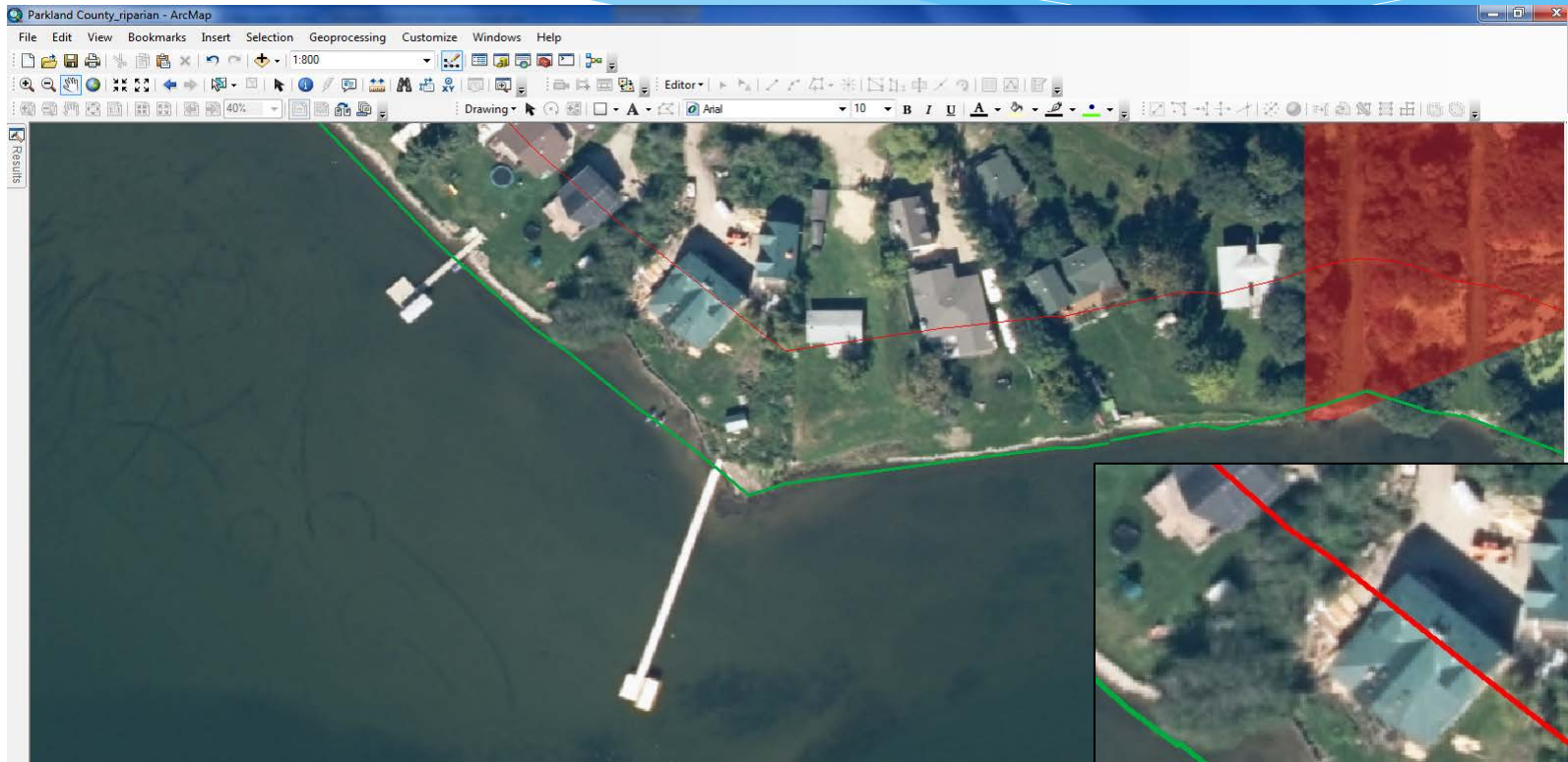


Appendix 3

- * Ongoing shoreline hardening
- * Building construction in RMA



Appendix 3



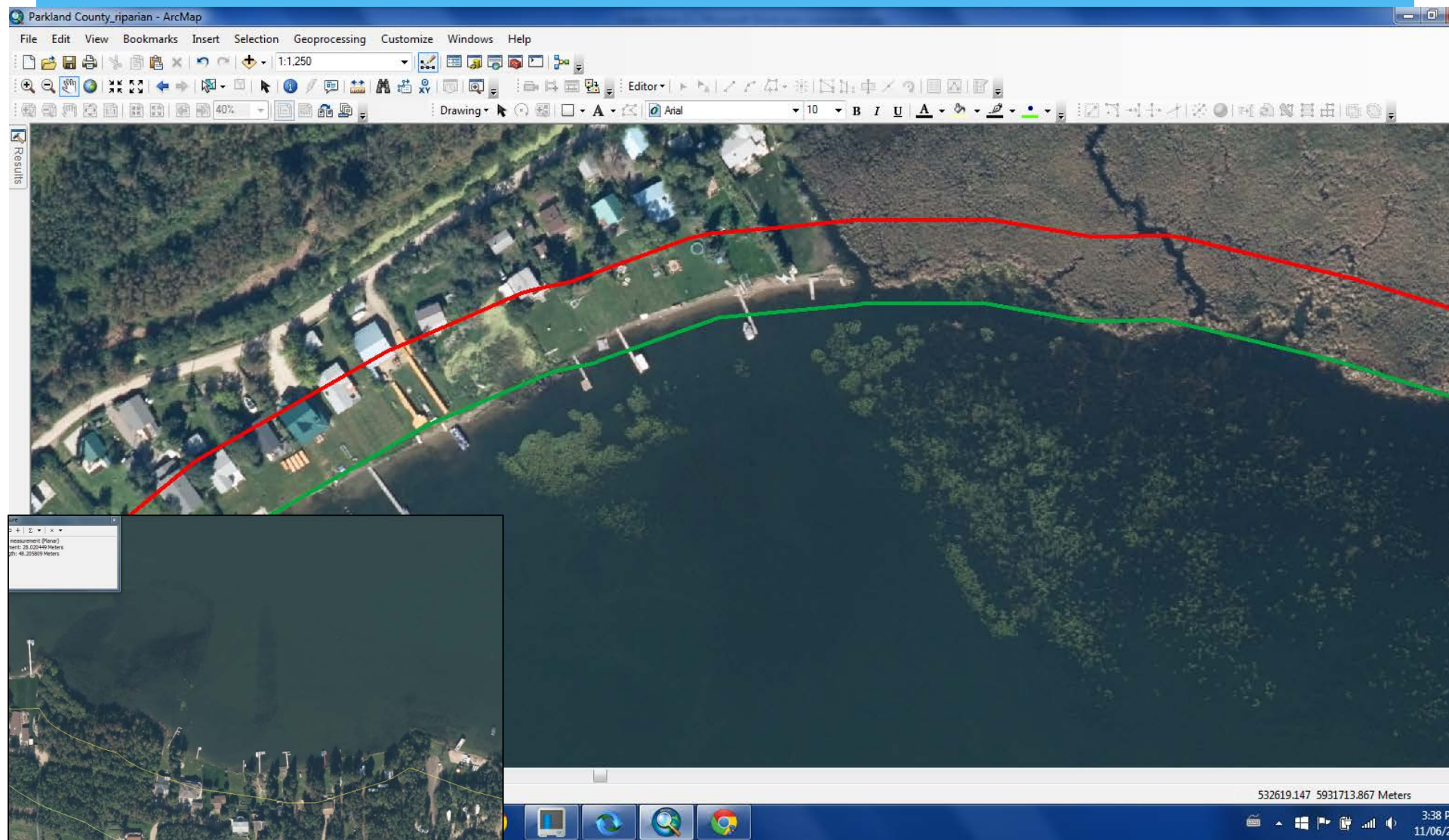
Appendix 4



* Impact of motor boats on shoreline vegetation



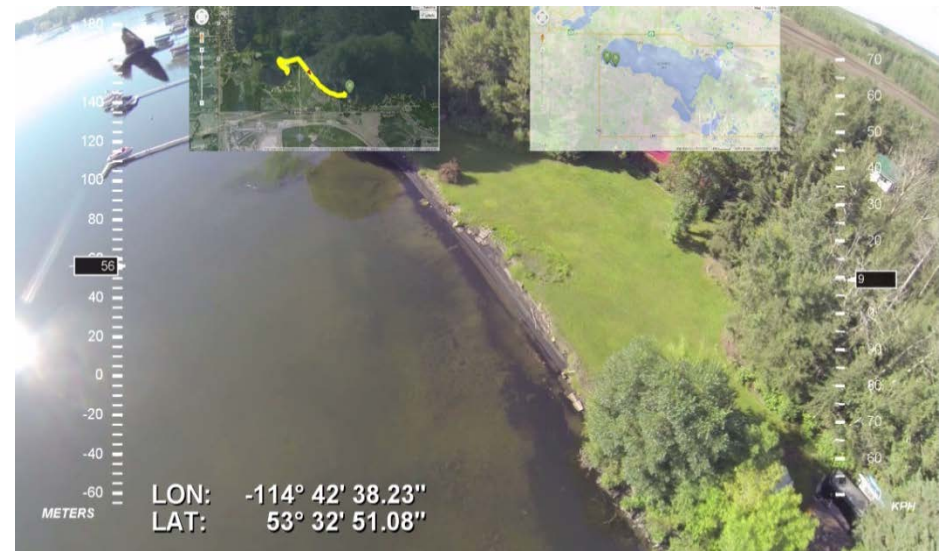
Appendix 4



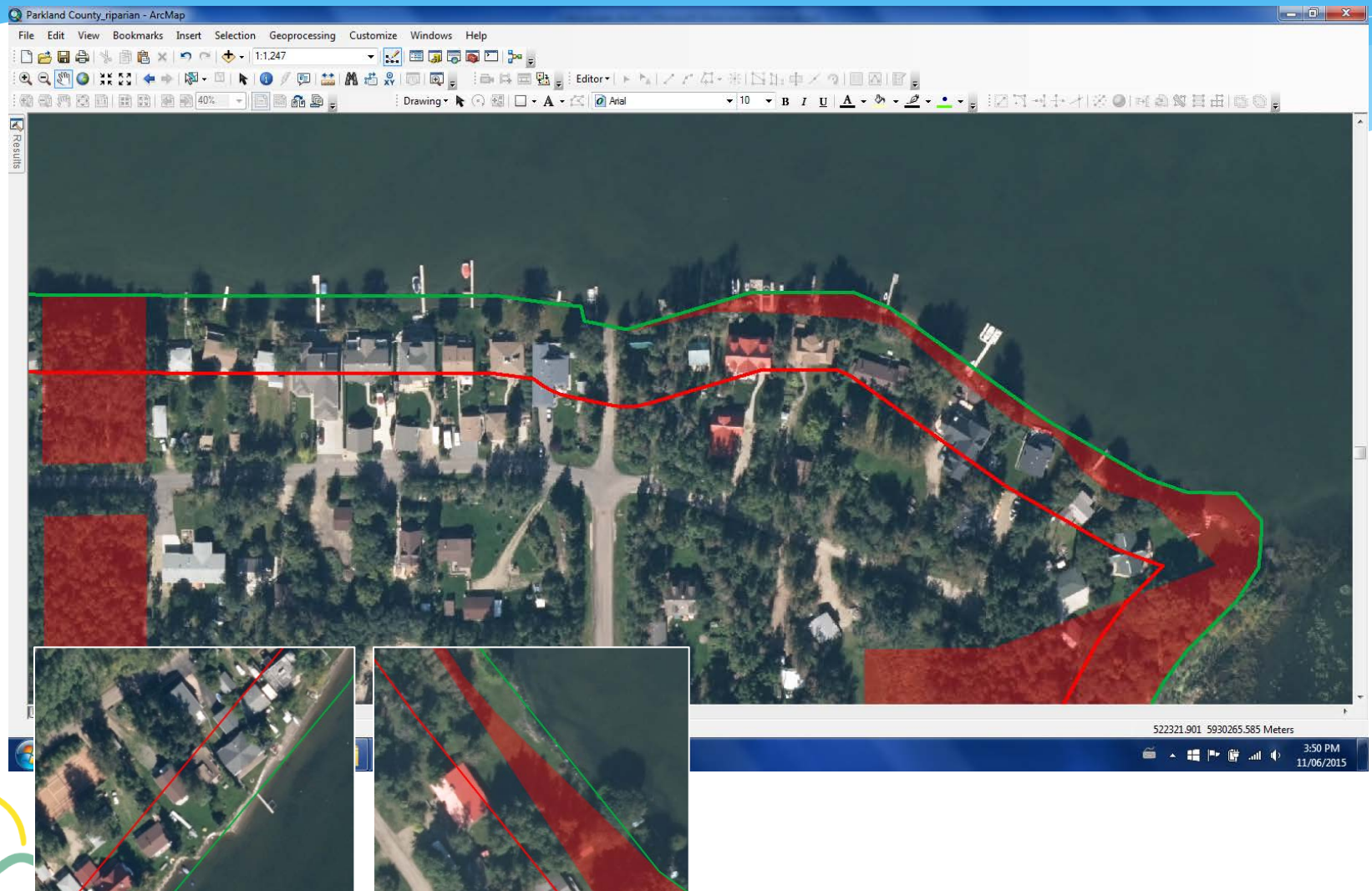
Appendix 5

Which property has a reserve?

- * Encroachment onto reserves
- * Policy confusion



Appendix 5



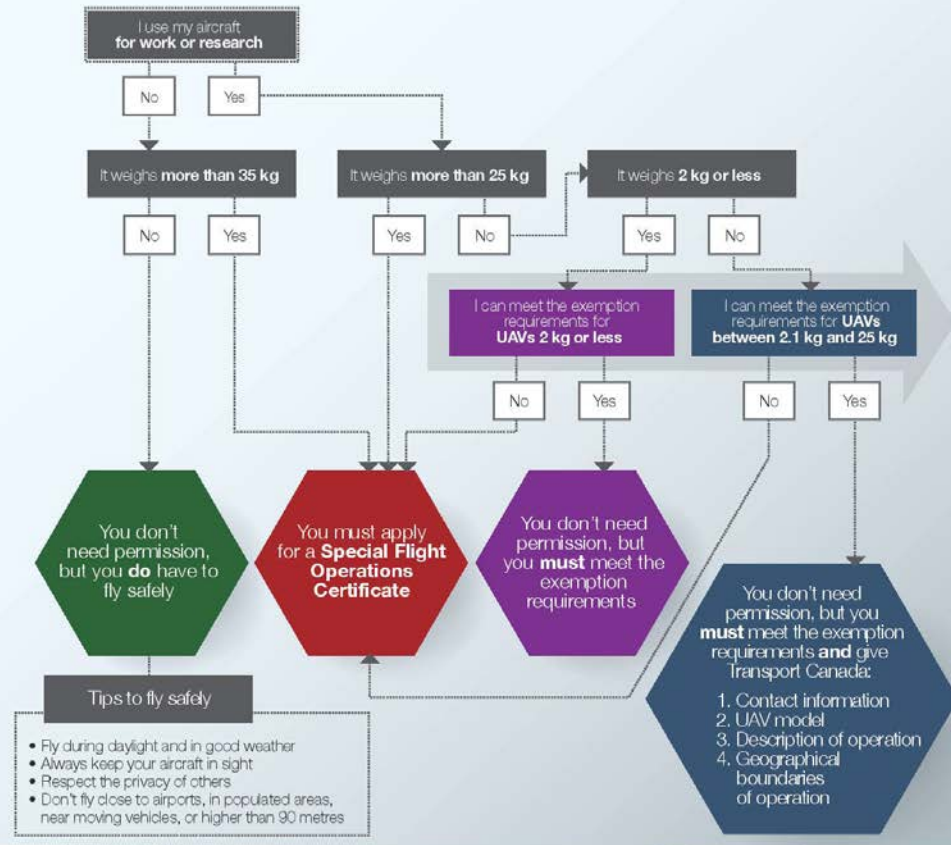


Transport
Canada

Transports
Canada

Flying an unmanned aircraft?

You may need permission from Transport Canada



tc.gc.ca/safetyfirst

Canada