Cumulative Effects Assessment & Lake Health Monitoring

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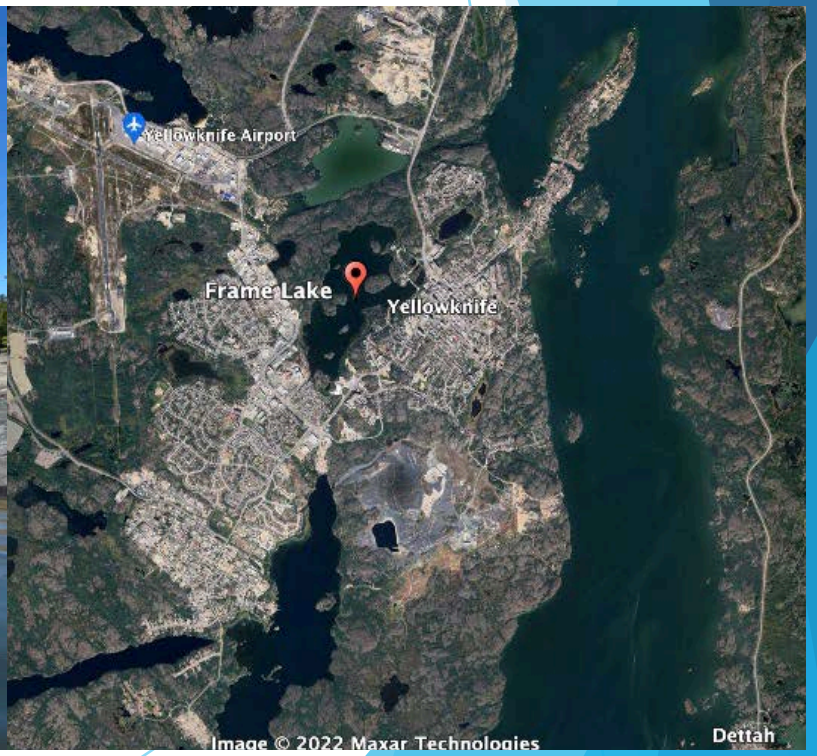
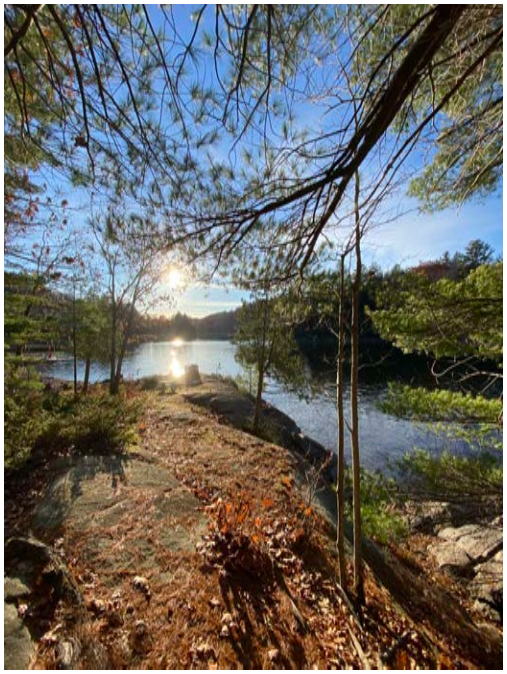
What are Cumulative Effects?

Cumulative effects are changes to the environment caused by the combined impact of past, present, and future human activities and natural processes.

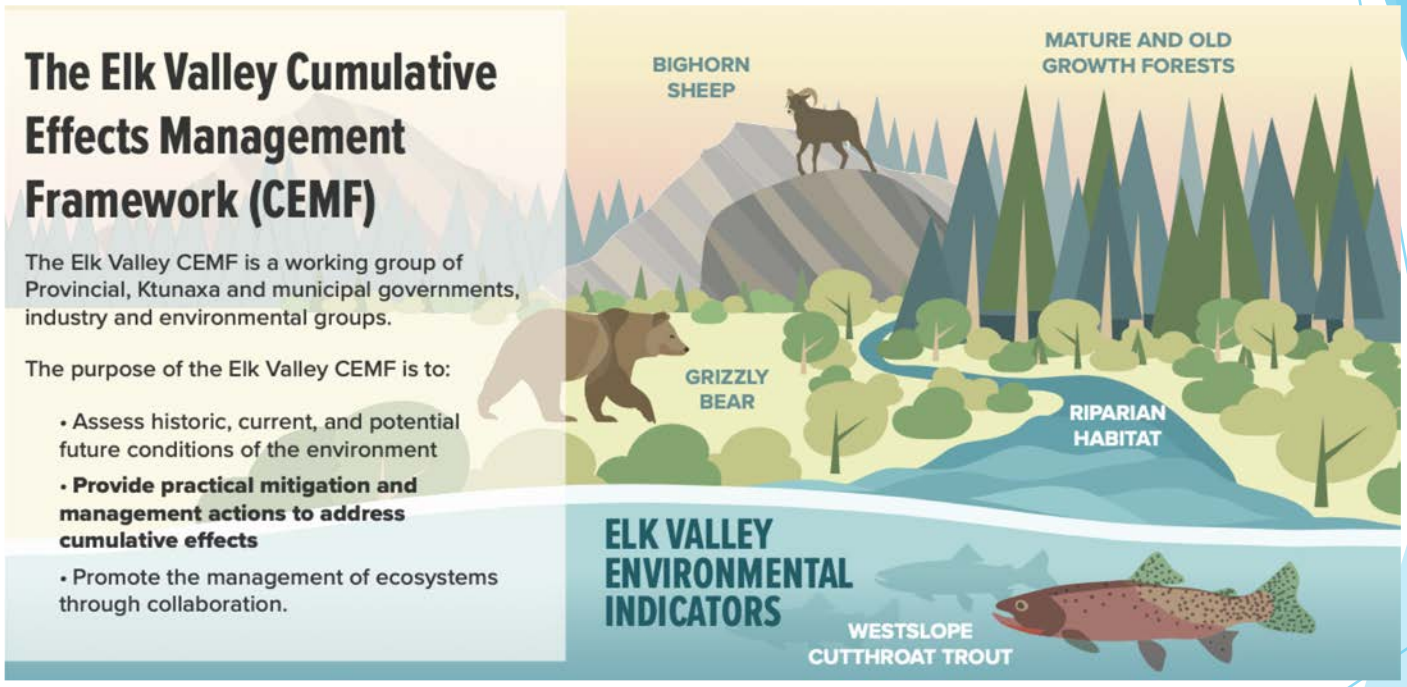
Frame Lake, Yellowknife, NWT



Example of Regional Cumulative Effects Assessment



Elk Valley Cumulative Effects Assessment



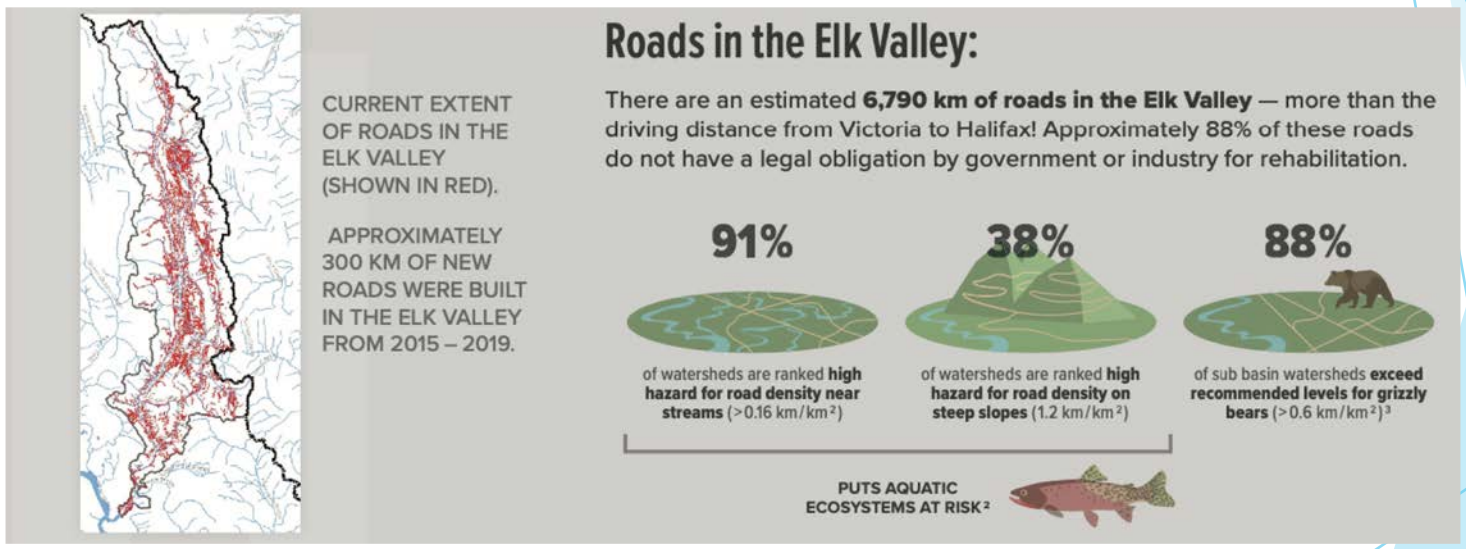
ELK VALLEY CEMF CUMULATIVE EFFECTS MANAGEMENT FRAMEWORK

KTUNAXA NATION · wildsight · NC NORTH COAL · FERNIE · BRITISH COLUMBIA Ministry of Energy, Mines and Petroleum Resources · BRITISH COLUMBIA Ministry of Forests, Lands, Natural Resource Operations and Rural Development · BRITISH COLUMBIA Ministry of Environment and Climate Change Strategy

Teck · CANFOR · NWP Coal Canada Ltd · SPARWOOD · EAO Environmental Assessment Office

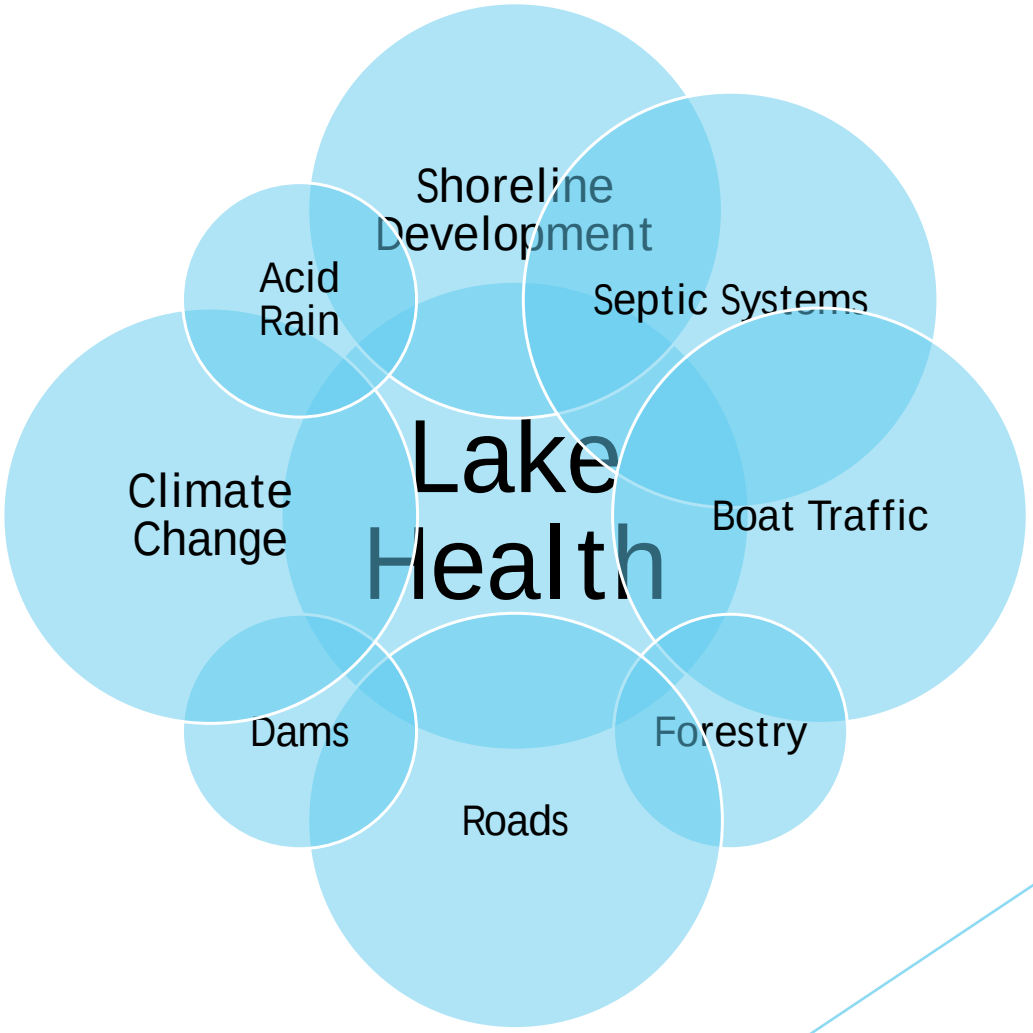
Source: Gov BC [Government of British Columbia]. (2020a).

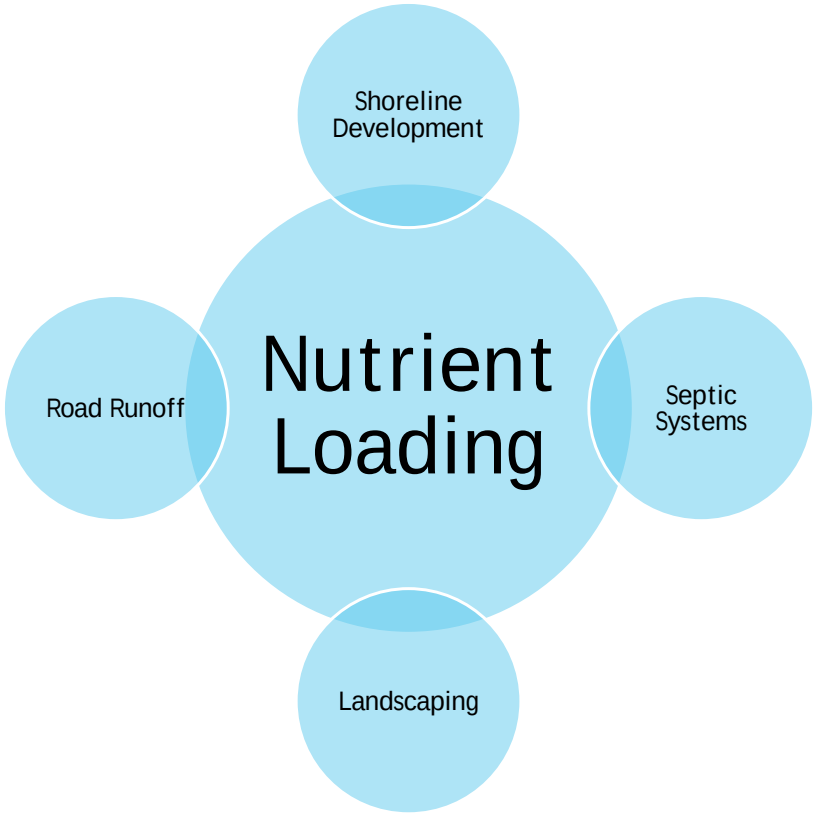
Elk Valley Cumulative Effects Assessment

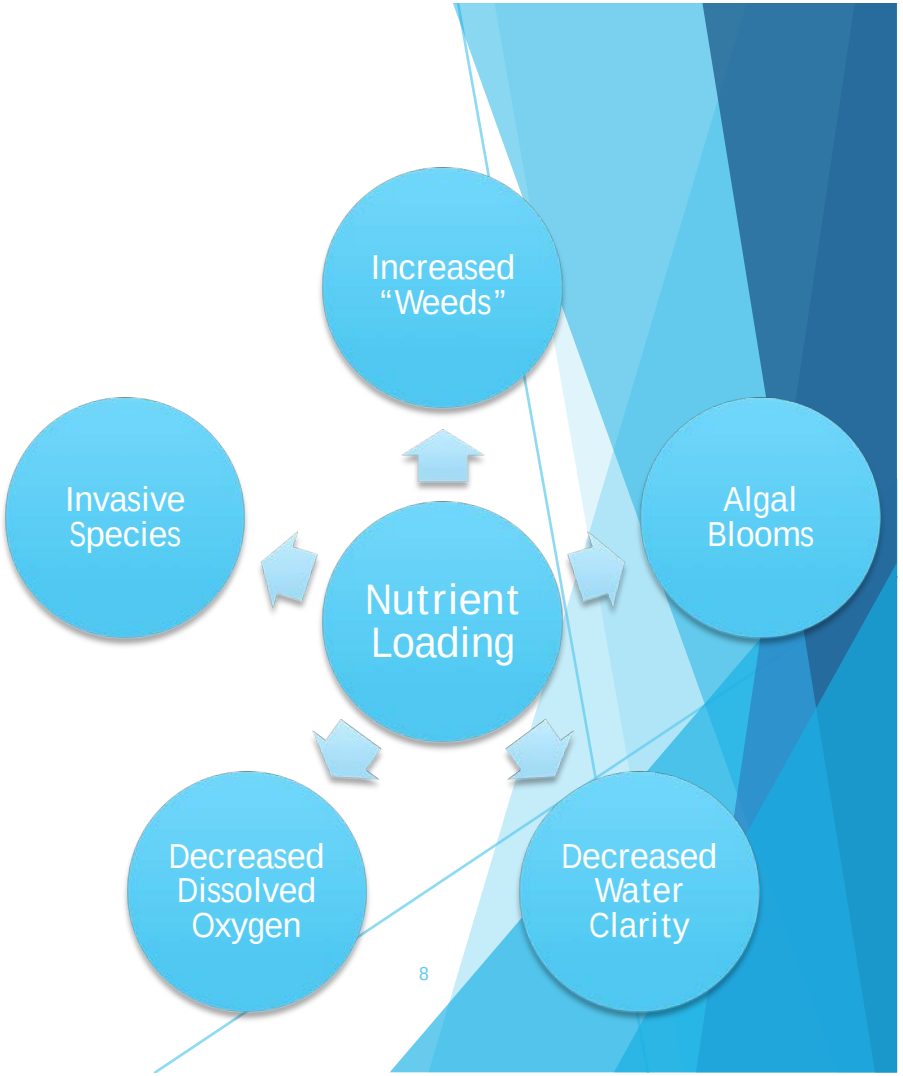


Source: Gov BC [Government of British Columbia]. (2020a).

Stressors of Lake Health for Haliburton Lakes

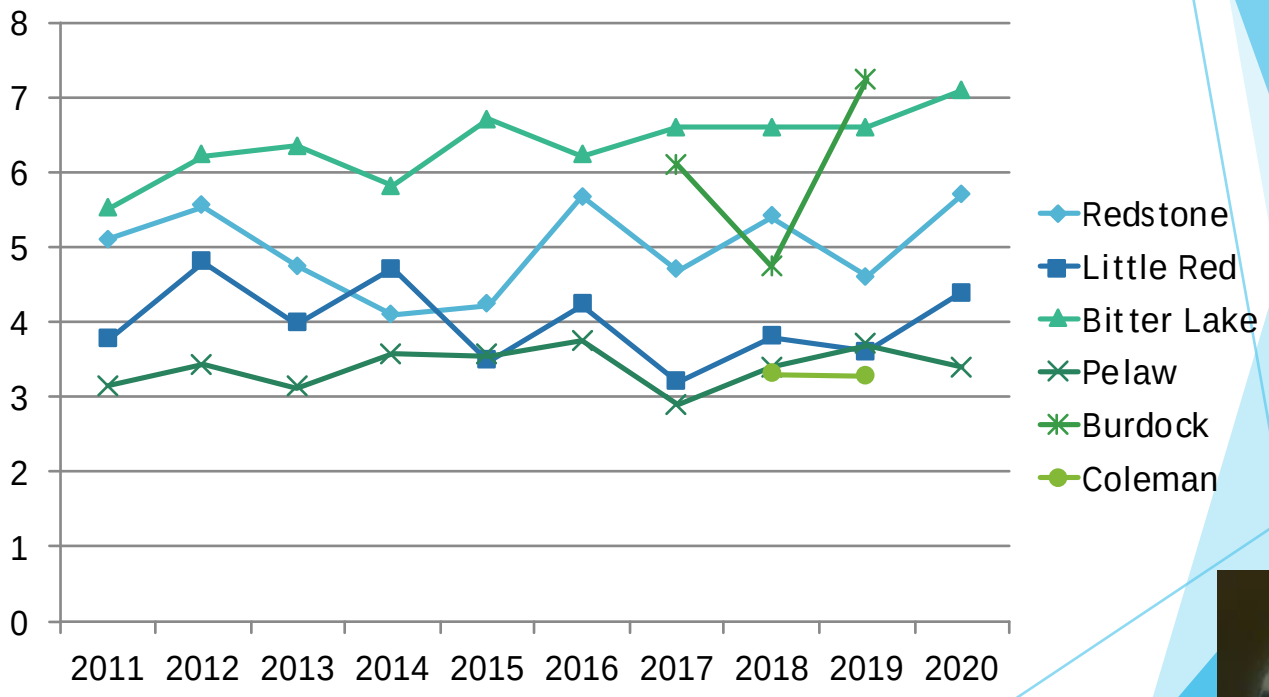


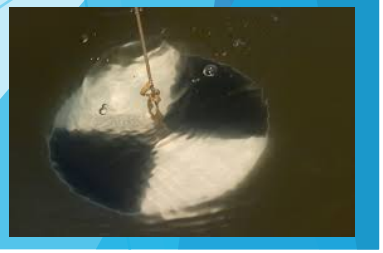

Shoreline Development
Road Runoff
Nutrient Loading
Septic Systems
Landscaping


Increased "Weeds"
Invasive Species
Algal Blooms
Nutrient Loading
Decreased Dissolved Oxygen
Decreased Water Clarity

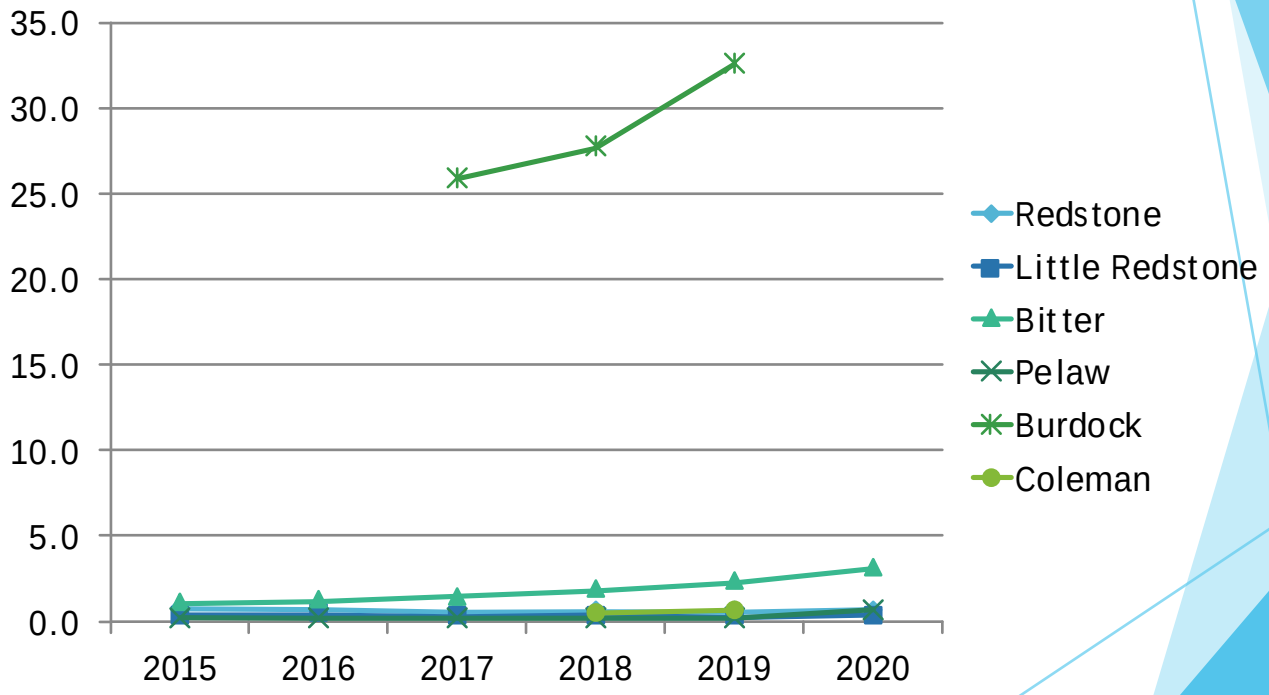
What do we know about the health of RLCA lakes?

Secchi Disk Depth (Water Clarity)

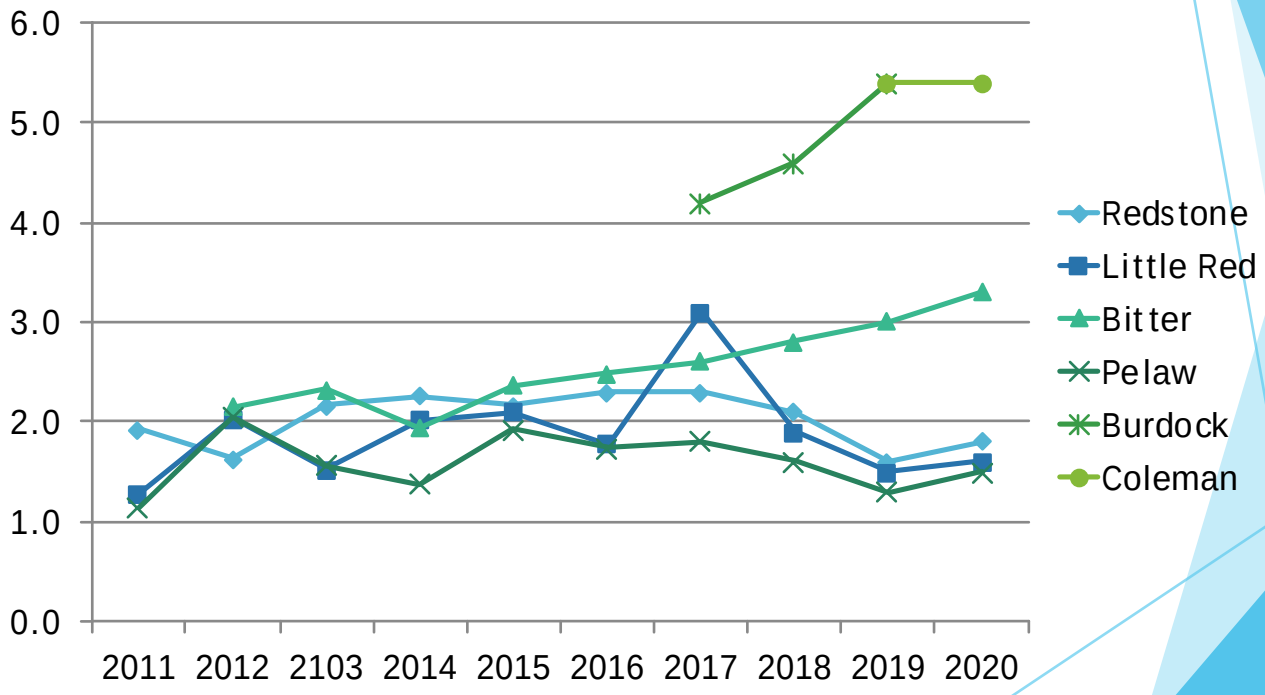




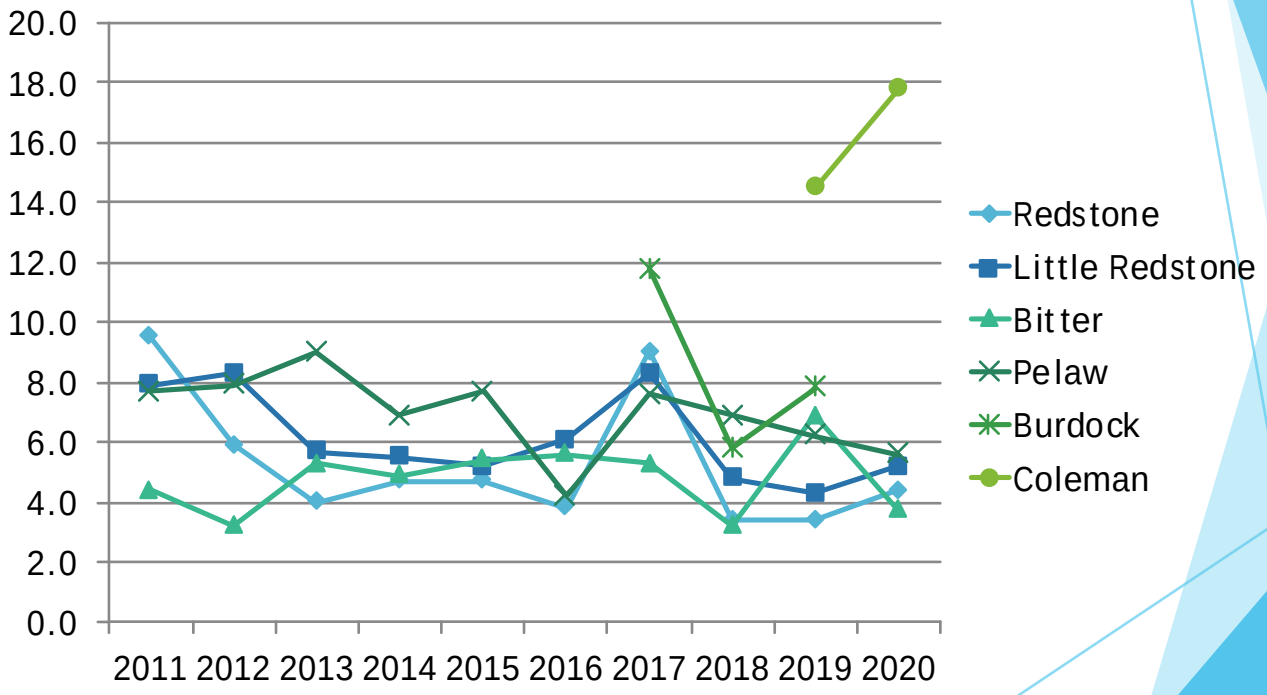
Chloride Levels



Calcium Levels



Phosphorus Levels



What can we do?

- Awareness
  - We can work together to reduce the impact of our collective actions.
  - Do not assume the current health of our lakes will remain the same.
- Protection
  - Shoreline Restoration Project – Jim Prince.
  - Reduce boat speed within 30 m of shore.
  - Maintain septic systems in good working condition.
  - Clean, drain, dry your boats
- Monitoring
  - Monitoring the lake health will help us to understand the stressors that are currently influencing our lakes so that we can identify the most urgent protective measures.

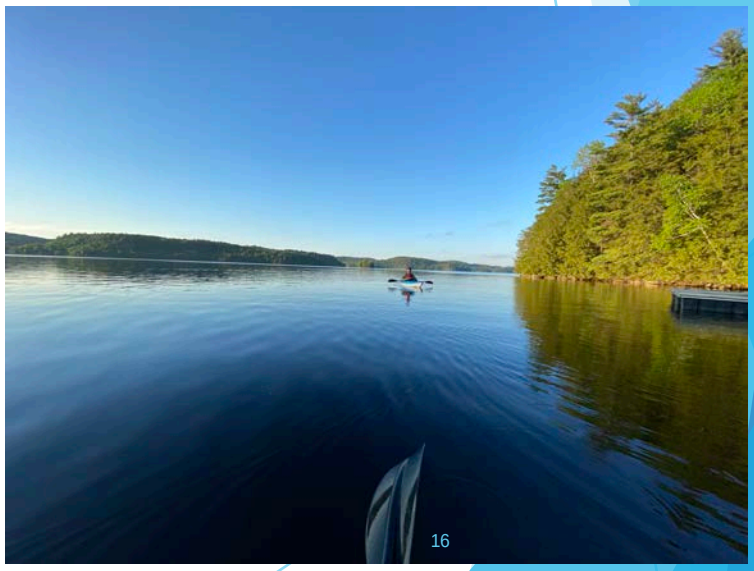
Monitoring

- RLCA lakes currently participate in the Lake Partner Program
  - Annual calcium + nutrient sample
  - Monthly secchi disk measurements
- ULINKS + Trent University conduct an annual benthic invertebrate monitoring program
- Pilot Haliburton-wide Water Quality Testing Project
  - Nutrient samples 3x per year (July, October, January)

Pilot Water Quality Testing and Monitoring Program

PARAMETER MEASURED	Lake Partners Program	MECP - Broad Scale Monitoring	KLCOA (LPP + KLCOA WQ)	Haliburton WQ Pilot PROPOSED
FREQUENCY →	Once per Year	Every 5-8 years Twice Per Year	Once or Twice/Year	3 Times/year
Secchi Depth (m) (Clarity)	YES	YES	YES	YES
Total Phosphorus	YES	YES	YES	YES
Ammonia- Nitrogen	NO	YES	YES	YES
Nitrite-Nitrogen	NO	YES	YES	YES
Nitrate+Nitrite - Nitrogen	NO	YES	YES	YES
Total Kjeldahl Nitrogen	NO	YES	NO	NO
Dissolved Organic Carbon	NO	YES	NO	YES
Dissolved Inorganic Carbon	NO	YES	NO	NO
pH	NO	YES	NO	YES
Total Alkalinity	NO	YES	NO	YES
Conductivity (uS/cm)	NO	YES	NO	YES
Calcium	YES	YES	YES	NO
Magnesium	NO	YES	NO	NO
Hardness	NO	YES	NO	YES
Total Suspended Solids	NO	YES	NO	NO
Total Dissolved Solids	NO	YES	NO	NO
Dissolved Oxygen	NO	YES	YES	YES
Temperature	NO	YES	YES	YES
Chloride	YES	NO	YES	NO
Bacterial Contamination				
E Coli	NO	NO	NO	NO
Total Coliforms	NO	NO	NO	NO

Do you want to be involved? Email us ☺



Good News Story

Questions?

References

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Muskoka Watershed Cumulative Effects Assessment

- Partnership with Canadian Water Network, Ontario Ministry of Environment and Climate Change, and seven universities.
- 11 studies over three years using historical and current data
- Baseline studies for physical and biological indicators (e.g., water quality, benthic invertebrates)
- Major stressors included:
  - acid rain,
  - climatic variability,
  - shoreline development,
  - land-use change
  - invasive species.