

BLPOA Webinar – Lake Health

Tuesday, April 12th,

Hosts:

Bill St Jean/President BLPOA

Miles Barham/Vice-President BLPOA & Chair Water Quality Committee

Bass Lake Water Quality Update:

Discussing RVCA's water quality monitoring results and the current trends being observed on Bass Lake

Presenters/Panelists

Haley Matschke: Acting Surface Water Quality Coordinator

Sarah MacLeod-Neilson: Surface Water Quality Coordinator/ Planner

Lake Stewardship and Shoreline Naturalization Program

Presenter/Panelist

Meaghan McDonald - Lake Planning - Shoreline Stewardship Coordinator

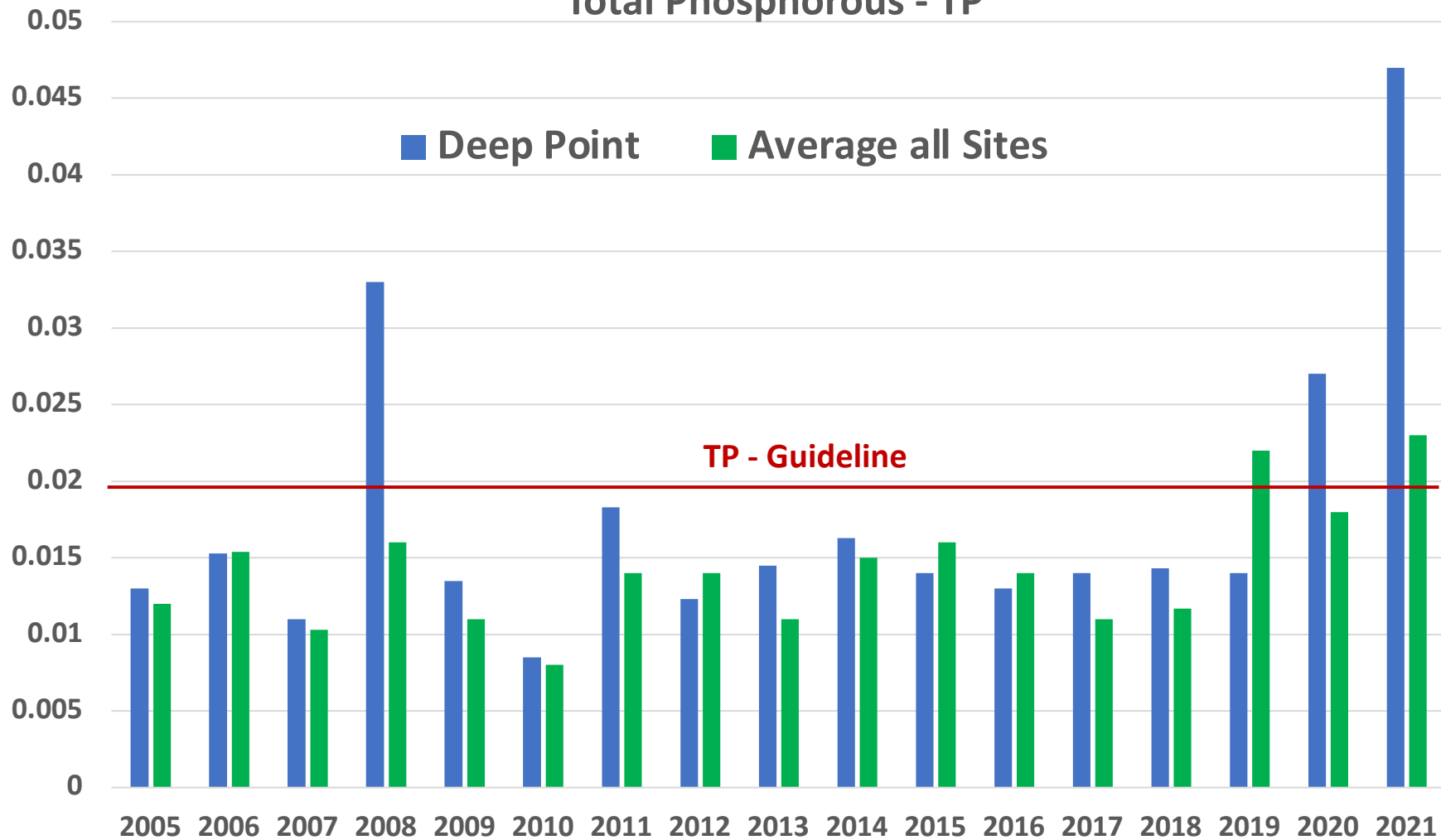


**Bass Lake
RVCA Watershed Watch**

**Water Quality Readings – Nutrients
Phosphorus (TP)
Nitrogen (TKN)**

Date Sampled	Site	TP (mg/L) 0.02	TKN (mg/L) 0.5
2021			
04-May	DP1	0.097	0.73
29-May	DP1	0.042	0.7
06-Sep	DP1	0.009	0.42
28-Oct	DP1	0.041	0.41
2020			
08-Jun	DP1	0.029	0.4
07-Aug	DP1	0.039	0.5
29-Sep	DP1	0.014	0.6
2005-2019 (15 years)			
Jul-19	DP1	0.021	0.49
Oct-18	DP1	0.021	0.5
Oct-17	DP1	0.025	0.59
Aug-14	DP1	0.024	0.47
Jul-15	DP1	0.025	0.36
Jul-11	DP1	0.025	0.4
Sep-08	DP1	0.067	1.15
8 years with no Exceedances			
7 years with One (1) Exceedance			

Total Phosphorous - TP

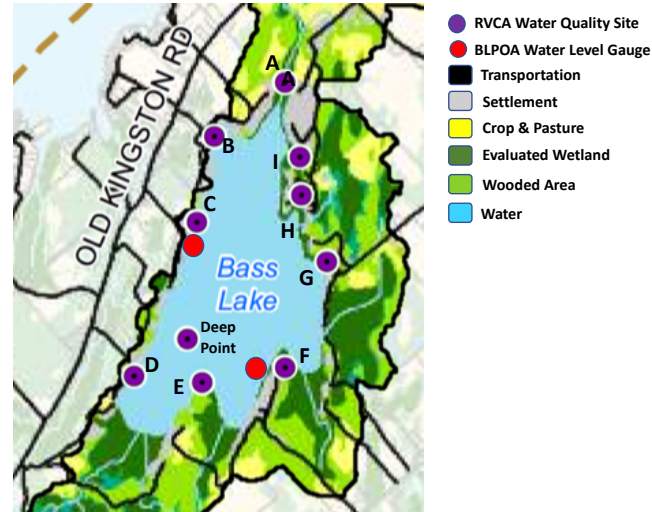


Lake Health & Water Quality Committee – Report

Introduction of BLPOA Water Quality Testing Program 2022



QUOTATION FOR ANALYTICAL SERVICES

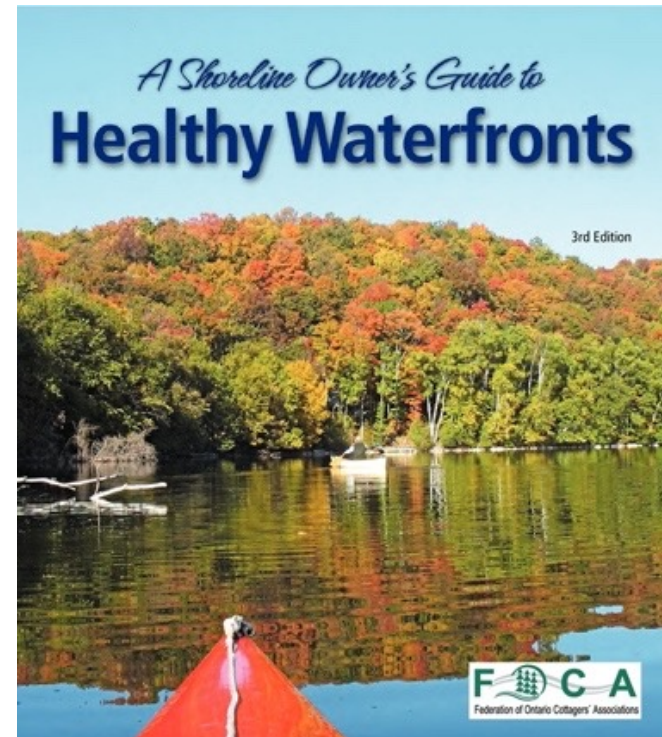
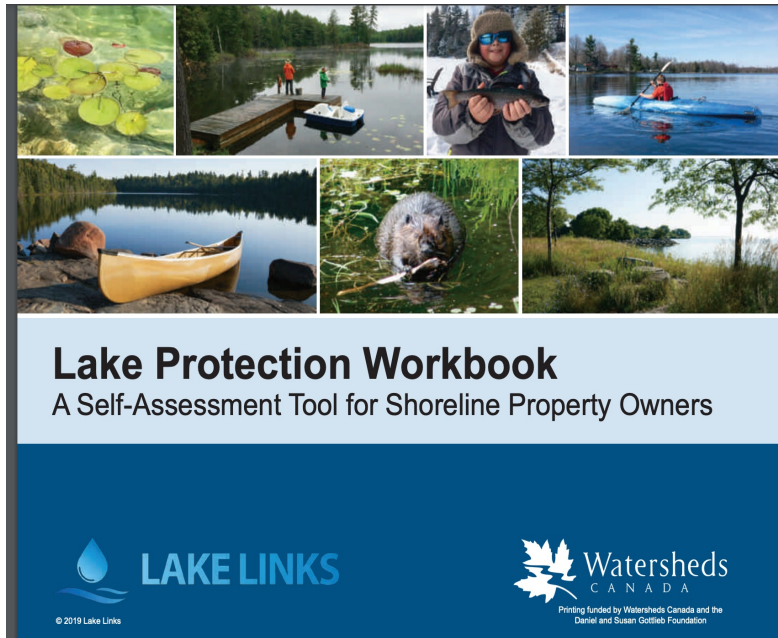


Item #	Quantity	Analysis Request	Matrix	Unit Cost, \$	Amount, \$
1	30	Total Phosphorus, Nitrogen	Lake Water	\$68.00	\$2,040.00
2	30	Ecoli	Lake Water	\$22.00	\$660.00
3	30	Sample Disposal Surcharge	Surcharge	\$2.00	\$60.00
4	-	Sample Supplies Surcharge	Surcharge	5%	\$135.00
				Subtotal	\$2,895.00
				HST	\$376.35
				Total Cost	\$3,271.35

Deep Point Site and 10 Shoreline Sites

BLPOA Lake Health - Information & Awareness Campaign

Need for all waterfront property owners to assess their own properties to institute best management practices that reduce the amount of nutrients reaching our lake through stormwater run-off.



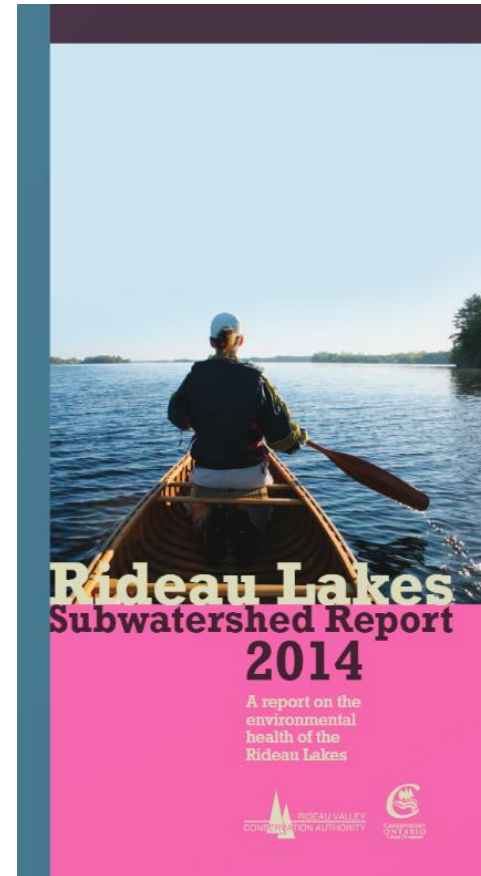


Water Quality Update: Bass Lake

Haley Matschke – Acting Surface Water Quality Coordinator
Sarah Macleod- Neilson – Planner/Surface Water Quality Coordinator

RVCA's Reporting Update

- Rideau Lakes Subwatershed Report published in 2014
- Watershed Wide report to be published in 2022
 - Report will aim to identify major trends and changes throughout the watershed
 - Report will focus on higher level detail i.e. WQI scores, major nutrient trends, etc.

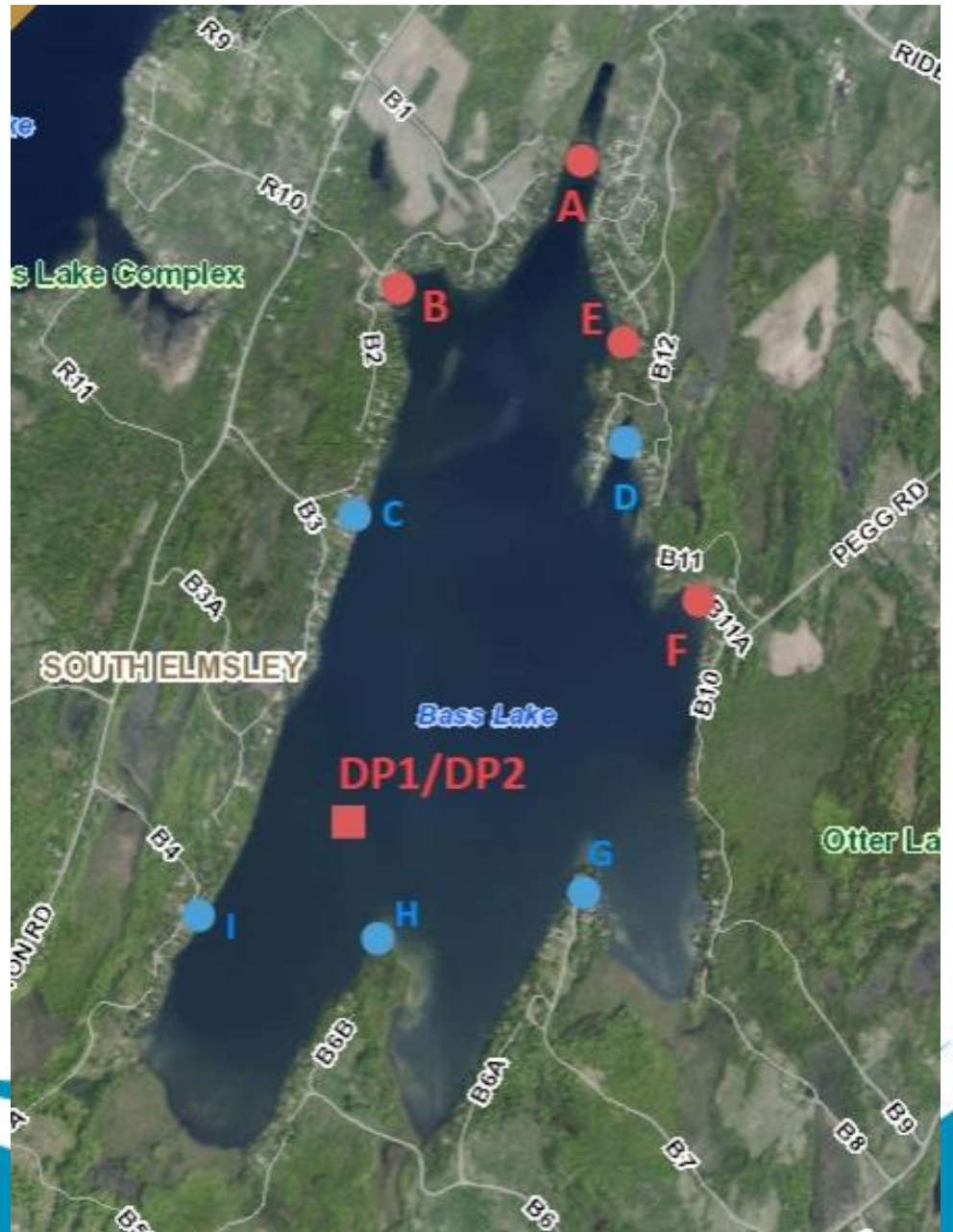


Bass Lake – Monitoring Activities



- Watershed Watch
 - 39 Lakes Monitored
- Bass Lake
 - Monitoring began in 2005
 - 1 Deep point (DP1)
 - Sampled 4 times/ year
 - 9 Shoreline/Near Shore Sampling locations
 - Sampled twice Yearly: A, B, E, F
 - Sampled every 5 years: C, D, G, H, I
 - Last sampled in 2020, to be sampled next in 2025

Monitoring Locations



CCME WQI

- Water Quality Index (WQI) Scores calculated at 3-year intervals following Canadian Council for the Minister's of the Environment (CCME) Guidance
- Index aims to measure and quantify the scope, frequency, and amplitude of departure of variables from the water quality guidelines
- Scores are presented under 5 categories, representing system's degree of impairment

Table 1. CCME Water Quality Index Score Categories and descriptions (RVCA Terminology, original CCME terms in brackets)

WQI Ranking	WQI Scores	Water Body Description
Very Good (Excellent)	95 - 100	Water Quality is protected with virtual absence of threat or impairment. Conditions are very close to natural or pristine. This value is received when all guidelines fall within the appropriate range all of the time.
Good	80 - 94.9	Water Quality is protected with only a minor degree of threat or impairment. This value is received when conditions rarely depart from natural or desirable levels
Fair	65 - 79.9	Water Quality is usually protected by occasionally threatened or impaired. This value is received when conditions sometimes depart from natural or desirable levels.
Poor (Marginal)	45 - 64.9	Water Quality is frequently threatened or impaired. The value is received when conditions often depart from natural or desirable levels.
Very Poor	0 - 44.9	Water Quality is almost always threatened or impaired. This value is received when conditions usually depart from the natural or desirable levels.

Freshwater Lakes - Guidelines

- Deep points on all lakes are sampled 4 times a year (May, June/July, July/August, October) to capture seasonal variability
- Results from analyzed water samples and deep point profiles are compared against 5 guidelines:

Parameter	Recommended Guideline	Source
Fish Habitat Suitability (Warm Water Species)	> 4 mg/L Dissolved Oxygen (DO) < 25°C Water Temperatures	CCME 1999
Secchi (Water Clarity)	> 2 meters	CCME 1987
pH	> 6.5, < 9	CCME 1987
Total Kjeldahl Nitrogen (TKN)	< 0.5 mg/L	Canadian Inland Waters
Total Phosphorus (TP)	< 0.02 mg/L	Provincial Water Quality Objective (PWQO)

WQI Scores

- Preliminary Results
- CCME recommends calculations at 3-year intervals
 - 2021 score calculation does NOT meet these recommendations

Lake	WQI Scores						
	2000 - 2002	2003 - 2005	2005 - 2008	2009 - 2011	2011 - 2014	2015 - 2017	2018 - 2020
Bass Lake (RVL35)		Good*	Poor	Poor	Good	Fair	Fair
		88.3*	63.8	64.8	88.3	76.8	76.1
*Denotes limited available data for the reported time period							

Lake	Median WQI Score	WQI Score Range	Trend	WQI Score and Category	
	2001 - 2020			2018 - 2020	
Bass Lake (RVL35)	76.45	Poor- Good	↔	76.1	Fair

Station	Index Period	CCME WQI	WQI Category
Bass Lake (RVL35)	2021-2021	69	FAIR

Raw Data – 2018-2021

- Exceedances found within nutrient values
- Currently no concerns for secchi, pH, FSH

Station	Date	TKN	TP	Secchi	pH	FSH
RVL35-DP1	5/29/2018	0.4	0.009	9	8.29	1
RVL35-DP1	7/11/2018	0.37	0.008	4.5	8.28	0.85
RVL35-DP1	8/20/2018	0.5	0.019	4	8.44	0.54
RVL35-DP1	10/15/2018	0.5	0.021	2	7.68	
RVL35-DP1	5/19/2019	0.4	0.002	7.8	7.35	1
RVL35-DP1	7/5/2019	0.49	0.021	3.9	8.28	0.26
RVL35-DP1	8/1/2019	0.31	0.015	2.5	8.03	
RVL35-DP1	10/17/2019	0.48	0.018	3.5		
RVL35-DP1	6/8/2020	0.4	0.029	8.5	8.24	1
RVL35-DP1	8/7/2020	0.5	0.039	5	8.44	0.5
RVL35-DP1	9/29/2020	0.6	0.014	3	7.96	0.59
RVL35-DP1	5/4/2021	0.72	0.097	3.5	8.08	1
RVL35-DP1	5/29/2021	0.7	0.042	6	8.2	1
RVL35-DP1	9/6/2021	0.42	0.009	4	8.22	0.444
RVL35-DP1	10/28/2021	0.41	0.041	4	7.94	1

Parameter Trends

- Statistically significant trends
- 2021 was a tipping point year for TP trends
- pH and FSH/DO trend possibly a result of equipment improvements

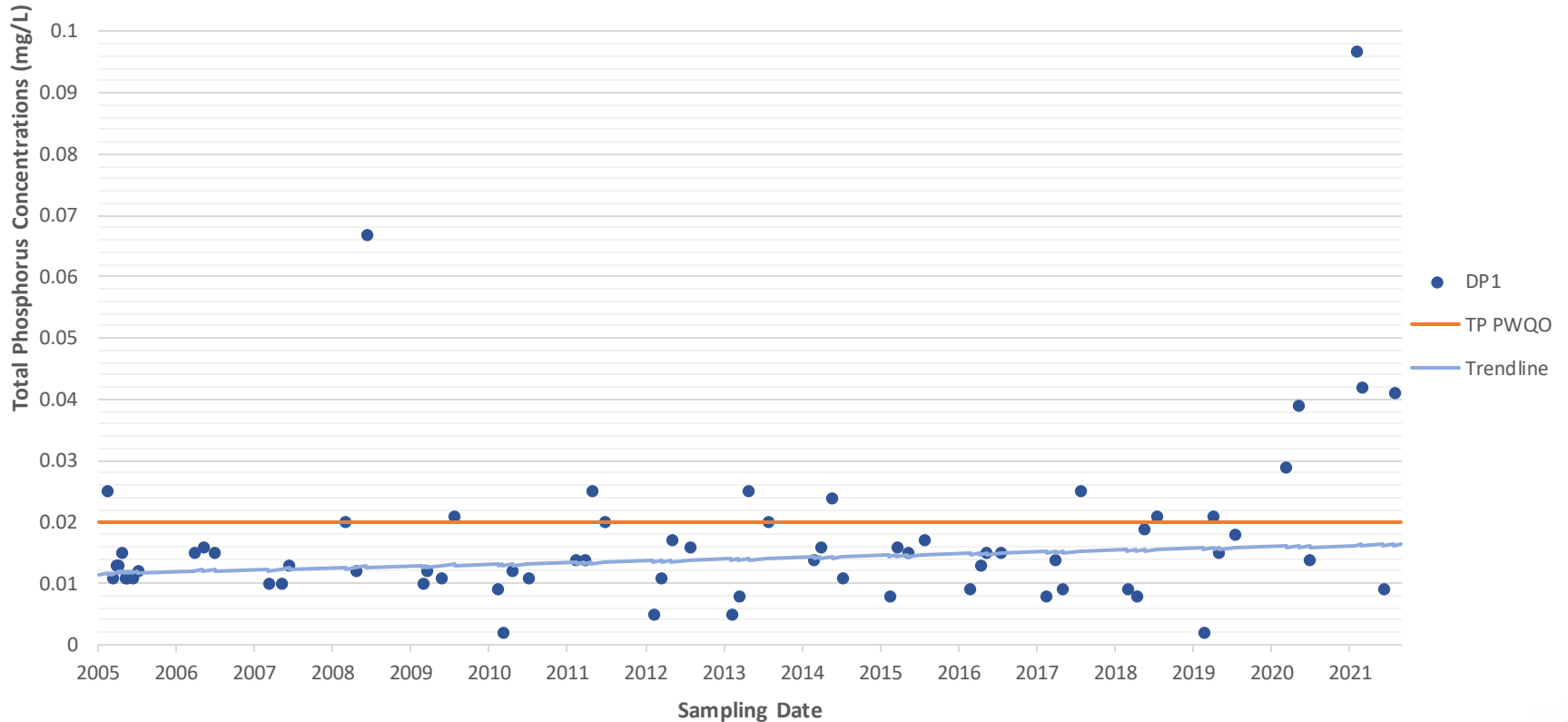
<i>Lake</i>		<i>TP</i>	<i>TKN</i>	<i>Secchi</i>	<i>pH</i>	<i>DO</i>
2005 - 2020						
RVL-35-DP1	Bass Lake	↔	↔	↔	↓	↑
2005 - 2021						
RVL-35-DP1	Bass Lake	↑	↔	↔	↔	↔



TP Trend

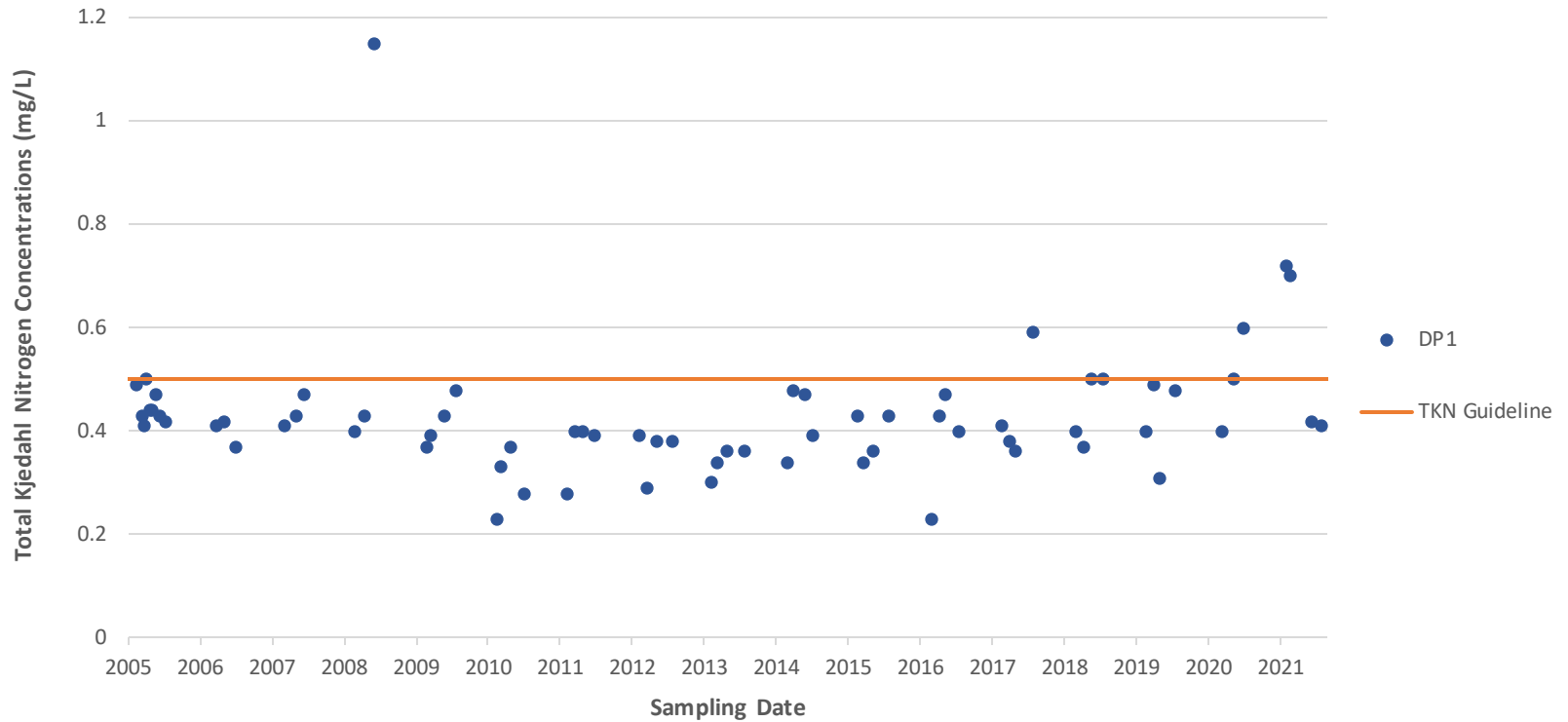
- Trend Notes:
 - P Value: 0.08280706 – statistically significant
 - Slope: 0.0000007654232

Collected total phosphorus concentrations (mg/L) within the Euphotic Zone at the deep point on Bass Lake (RVL35-DP1)



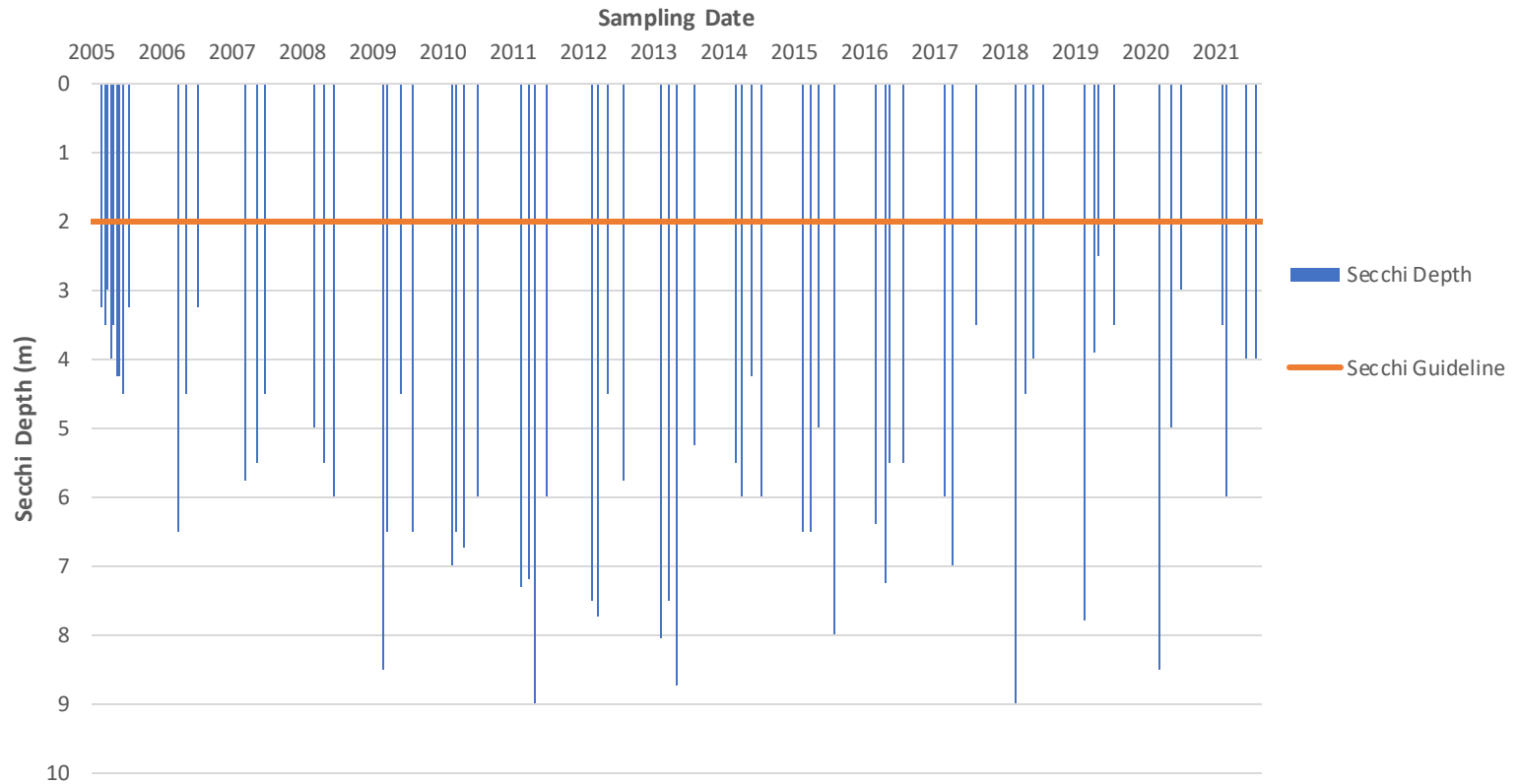
TKN Trends

- No Statistically significant trend



Secchi Depth Trend

- No Statistically significant trend



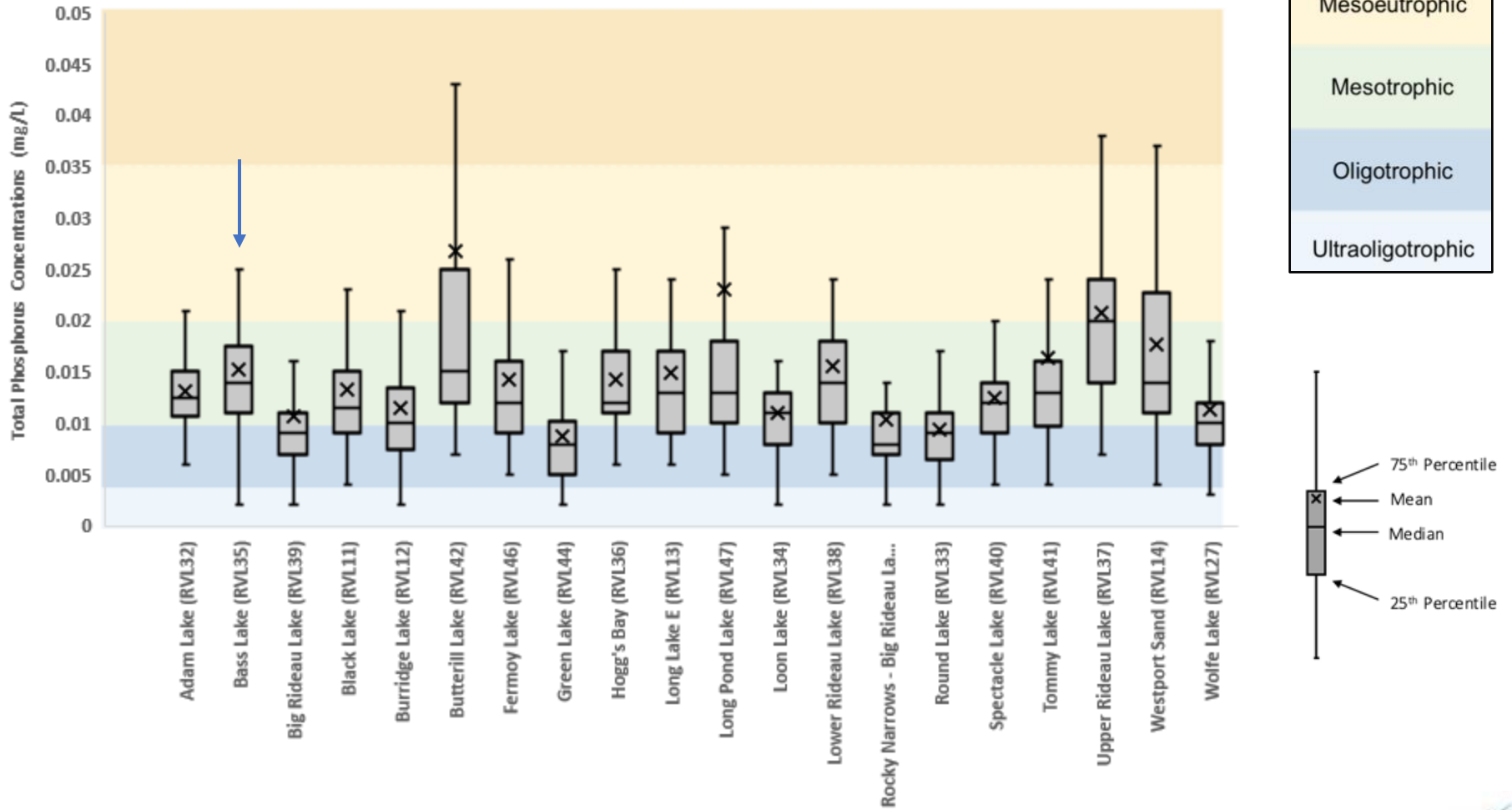
Lake Health and Trophic Status

Table 6. Lake Trophic Status Ranges

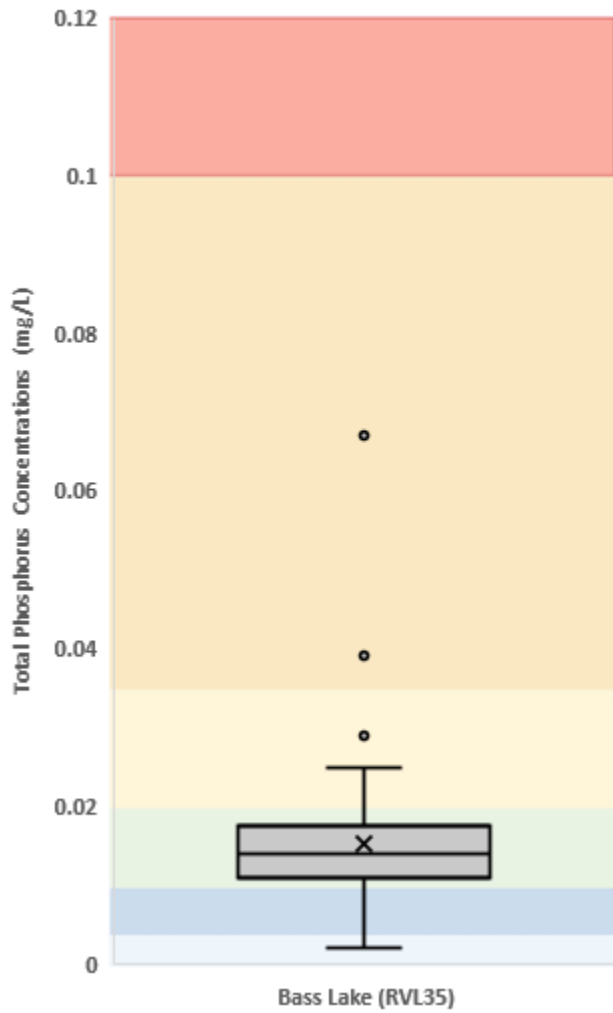
Trophic Status	Total Phosphorus Ranges
Ultraoligatrophic	0 - 0.004 mg/L
Oligatrophic	0.004 - 0.01 mg/L
Mesotrophic	0.01 - 0.02 mg/L
Mesoeutrophic	0.02 - 0.035 mg/L
Eutrophic	0.035 - 0.1 mg/L
Hyper-eutrophic	> 0.1 mg/L

- Natural Process of Lake Aging
- Anthropogenic influences can change the rate at which a lakes ages and moves through trophic statuses
- Lower the Trophic Status = lower productivity (ability to support plant and animal life)
 - Can be beneficial for some species, but limiting for others
 - Ex: Oligotrophic lakes tend to support deeper trout species, while shallower warmer lakes may support a more diverse ecosystem

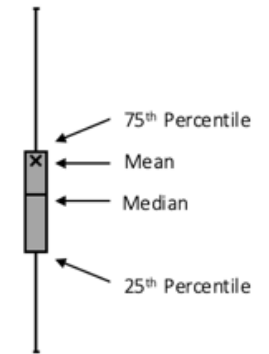
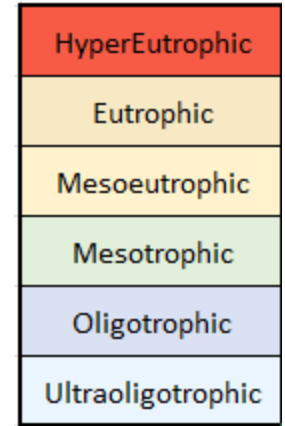
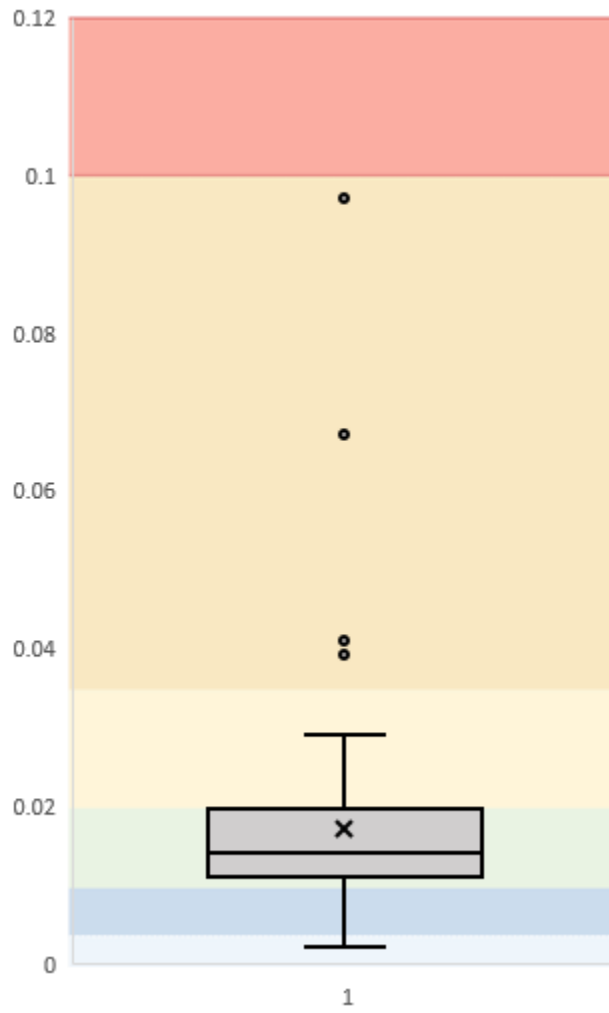
Total Phosphorus Lake Sampling Results and Lake Trophic Status based on collected data from 2005 to 2020



2005 to 2020



2005 - 2021



Near Shore Environment - Trends

- Sampling completed at depths of 1m near shore
 - Sampling is completed from the water, not on shore
- Declines in E.coli concentrations
- No trends at individual sites for nutrients, but combined demonstrates source of concern

Location	Trends		
	TP	TKN	E.Coli
A	↔	↔	↓
B	↔	↔	↓
C	↔	↔	↓
D	↔	↔	↓
E	↔	↔	↓
F	↔	↔	↓
G	↔	↔	↔
H	↔	↔	↓
I	↔	↔	↔
All -Combined	↑	↔	↓

What are we Observing?


- Increased biomass
 - Secchi depth readings are declining in some lakes suggesting potential changes in biomass within the water column
- Warmer temperatures and reduced oxygen levels during the summer months
- Low water conditions during summer months



Bass Lake Algae Blooms

- 2021 – 2 Blooms reported
- Samples collected for Grad Student Research
 - Not sampled for regulatory purposes and not analyzed by a certified regulatory laboratory
- Little information available currently:
 - Congeners Found:
 - MC-LR
 - Most toxic
 - MC-LA
 - Most abundant and was noted as consistent with other sampled algae blooms across Ontario and Quebec
 - MC-YR

Contacts

- Haley Matschke
 - Haley.matschke@rvca.ca
 - Sarah Macleod-Neilson
 - Sarah.macleod-neilson@rvca.ca
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Stewardship Opportunities on Bass Lake



Existing RVCA Programs- Rural Clean Water Program

- Provides incentive grants for a number of project categories aimed at improving water quality in rural areas
- Project categories that may of interest to Bass Lake:
 - **Erosion Control- Shoreline:** 90% up to \$3,500
 - **Buffer grants** (usually used to top-up Shoreline Naturalization Program)
 - **Livestock Restriction Fencing**
 - **Septic Repair-** 50% up to \$1000
 - **Well Projects** (decommissioning, upgrades, replacements): \$500 to \$2000
 - **Education Projects-** 75% up to \$1000
 - Several more categories for farmers with an Environmental Farm Plan
- Projects completed to date on Bass Lake: 15 grant projects since 2008, \$11,695 in grants distributed

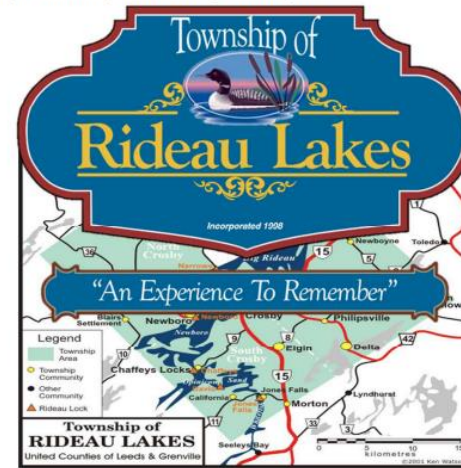


Existing RVCA Programs- Septic Inspection

- Failing or underperforming septic system can be one of the major contributors to excess nutrients and contaminants on the lake and ground water
- Program is under the Mississippi- Rideau Septic System Office
- 165 properties inspected in 2020
- Criteria: septic systems 10 years and older or had no previous inspections
- 46% no concerns, 46% required remedial work, 8.5% needed replacing
- Report is on Rideau Lakes Township [webpage](#)

2020

Septic Re-Inspection Program Report



Prepared For: Township of Rideau Lakes
Prepared By: Eric Kohlsmith,
Septic Inspector
December 22, 2020



MANDATORY SEPTIC RE-INSPECTION PROGRAM

Your township is committed to protecting the health of the watershed. Your participation in this re-inspection program will ensure a safe home with healthy groundwater and surface water and the continued enjoyment of a clean, healthy waterfront environment for generations to come.

Questions? Contact: Eric Kohlsmith
Mississippi Rideau Septic System Office (MRSSO)
10970 Highway 7, Carleton Place, ON K7C 3P1
T 613-253-0006 ext. 256 F 613-253-0122
Email: ekohlsmith@amvc.on.ca

Components of a conventional, residential septic system

For the health of your home, your lake and your community!

Existing RVCA Programs- Private Land Forestry

- Large scale tree planting
- Benefits: Slows runoff and encourages infiltration, provides shading to streams and near shore areas, provides habitat, carbon sequestration, etc.
- Requirements: Minimum 1 acre, 1000 trees for full-service program
- Suitable for larger properties, farms around the lake and it's headwaters
- Over the counter tree sales are also available if you don't meet the minimum requirements
- Total trees planted around Bass Lake since 2006: 30,800 trees, 15.4 ha

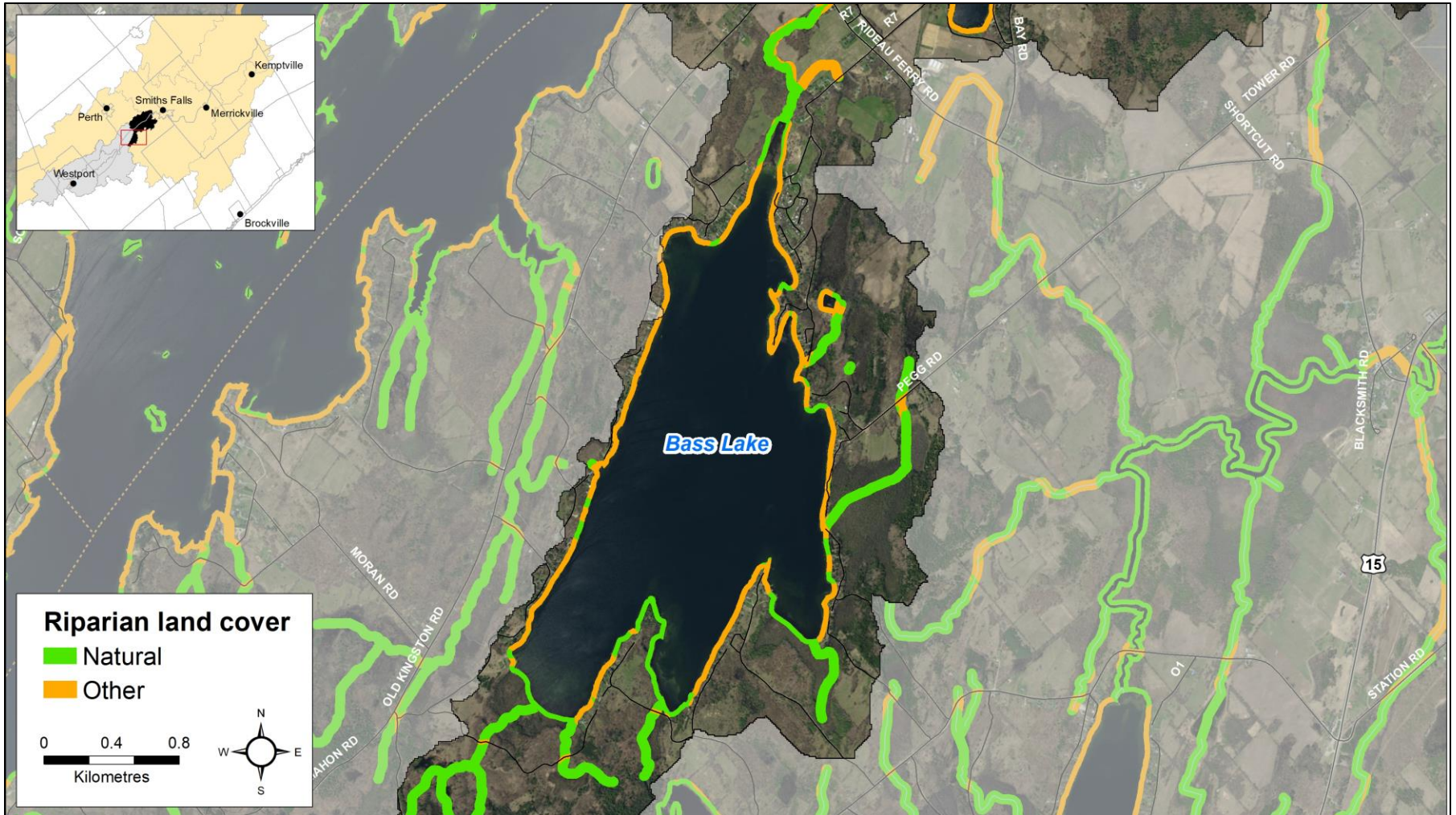


Existing RVCA Programs- Shoreline Naturalization

- Suitable for any shoreline property, No minimum requirements
- Benefits of Shoreline Naturalization- natural erosion control, slows and filters runoff, contributes to the “ribbon of life” habitat, deters geese
- Full-service planting available as well as over the counter sales
- Includes native trees and shrubs, site visits, planting plans, advice, etc.
- Covers 75% of the cost of the planting projects (limits apply)
- Total # of projects on Bass Lake: 9,820 trees and shrubs planted on 9 properties



Bass Lake Shoreline Cover



Other Activities

- Runoff Reduction Projects
 - Rain barrels
 - Redirected downspouts
 - Rain gardens and soak ways
 - Reducing hardened surfaces and naturalizing
- Invasive Species Management
- Lake Protection Workbook
- Wildlife Enhancement
- Partnership Opportunities
 - Targeted outreach campaign with RVCA Stewardship Team
 - Project Fundraising through Rideau Valley Conservation Foundation
 - Open to suggestions!



Lake Protection Workbook
A Self-Assessment Tool for Shoreline Property Owners



© 2019 Lake Links

Partially funded by Watersheds Canada and the Daniel and Susan Gottlieb Foundation

Key Messages

- Septic inspection and maintenance is key
- Bass Lake has one the highest amount of altered shorelines and nearshore development- Every action counts
- Fostering a community interest in lake protection through outreach and education is needed
- Community engagement and involvement in development proposals- review, comment, stay engaged
- Refer to Rideau Lakes Subwatershed Report 2014- Lower Rideau Lake Catchment for further recommendations and opportunities

Contacts

- Meaghan McDonald
 - Meaghan.mcdonald@rvca.ca

