

**Bone Lake Management District
Annual Meeting
Saturday, August 11, 2018
9:00 am Wilkins
FINAL**

Commissioners present:

Bob Murphy

Phil Foster

Alex Chorewycz

Karen Engelbretson

Mike Musial

Ron Ogren, Town of Georgetown

Doug Route, Polk County

Guest:

Cheryl Clemens, Harmony Environmental

The meeting was called to order at 9:10 a.m.

The agenda was modified to add the Auditor Report.

Minutes. The annual meeting minutes from August 12, 2017 were reviewed and adopted.
Motion to approve the 8.12.17 minutes: Chorewycz/Musial. Carried.

Financial report. Alex Chorewycz presented the Approved budget and Actual through 9/30/18. The report is part of this pdf. Motion to approve: Schaefer/Nusbaum. Carried.

Fiscal year audit report. The report created by Kirk Larson was read by Alex Chorewycz.

Grants report. Phil Foster presented the grants report.

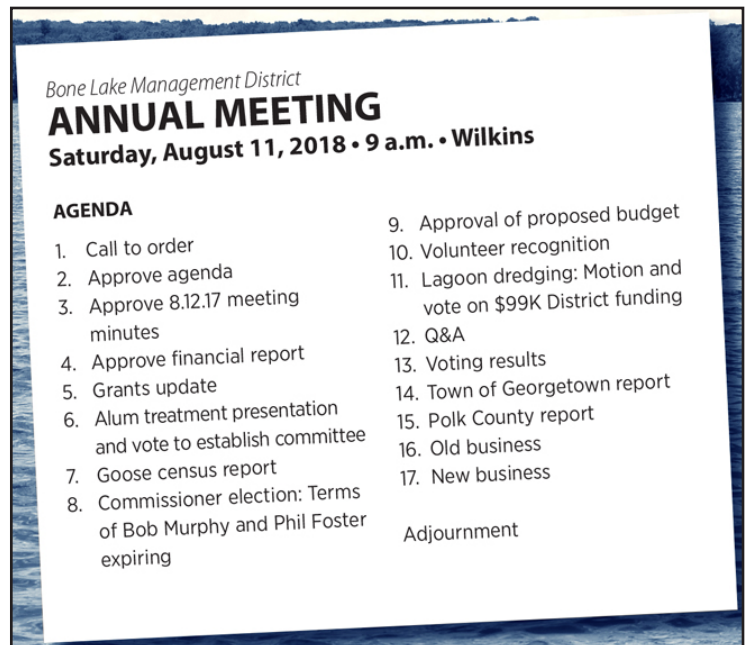
The report is included as part of this pdf.

- Sally Maki arranged a tour of runoff control projects around the lake from 9-11 a.m. on August 18, 2018. Maps were available at the meeting.
- Bob Boyd reported on a shoreline composition study completed on August 3, 2018 of 499 properties around the lake, last completed in 2008. Conditions of the shore were recorded at the high water mark and back 35 feet. Some property owners are letting grass grow at the shore. The chart is part of the meeting presentation pdf.
- Phosphorus loading. Previously internal loading was 15 percent, now it's 50 percent based on a recent study. The chart is part of the meeting presentation pdf.
-

What can we do about phosphorus loading

Alum presentation by Cheryl Clemens

A recent internal loading study of Bone Lake was completed by local consultant Steve Schieffer and Bill James, UW Stout. Alum treatments have been performed at nearby Long Lake and Cedar Lake where toxic algae conditions have existed in the past. Alum binds with phosphorus in the water and settles it on the bottom of the lake, keeping the phosphorus locked in sediment and unavailable to algae growth. This increases water clarity. At Long Lake, with internal loading at 70 percent secchi readings went from 5.9 to 10.8. At Cedar Lake with internal loading at 85 percent, secchi



readings went from 6.5 to 13 feet. Bone Lake, with internal loading at 50 percent, is expected to see secchi readings improve from 5.8 feet to 8.6 feet. Estimated cost is \$2,000,000. Some grant dollars may be available. To fund the treatment District properties would be assessed at approximately \$200 per \$100K in property value each year for five years. Another treatment would be required 10 years after the initial treatment, possibly using less alum than the first treatment. Alum treatment is projected to reduce the phosphorus internal loading by 90 percent.

Motion to establish an alum committee to address questions and make recommendations to the board and District members to treat or not to treat the lake with alum. Foster/Nusbaum. Carried with a ballot vote. Yes: 83; No: 32.

Questions:

What's the impact on fish? Possibly some effects at local application sites. Application will be at 30 feet and deeper. Water clarity improves aquatic plant growth, clarity helps small fish.

What about nitrate level? Use no phosphorus fertilizer.

What about safety, errors and risks? Dosing is most important. Alum is acidic. Jar tests of Ph are done every day following treatment.

Why based on property valuation? Seems most fair. Or could be done by a special assessment to each property.

What's the failure/success rate? Eighty three lakes have all had successful treatments. Unsuccessful would mean algae comes back.

Goose Census Report, Karen Engelbretson

The Wildlife and Natural Beauty Committee worked to develop a mapping system and counting protocol to quantify the number of resident Canada geese on Bone Lake following complaints from property owners about geese on their lawns. Three teams of volunteers went around the lake on three consecutive days: June 20, 21, 22. They found hardly any geese. At the most, 18 adults and 36 goslings were recorded. After consultation with USDA Dept. of Wildlife, it was decided there were insufficient numbers to conduct any control measures in 2018 or in 2019. The committee may decide to survey the population again in summer, 2019.

Commissioner Election

Ballots were prepared for re-election of Bob Murphy and Phil Foster. There were no nominations from the floor. Murphy and Foster were re-elected to three-year terms with a unanimous voice vote.

Approve 2018/19 FY Budget

Motion to approve budget: McColl/Peacock. Carried.

Volunteer Recognition

Recognition and a ceramic platter crafted with the outline of Bone Lake were awarded to Dick Boss, Jan and Bill Jungbauer, Tim Laughlin, and Bob Murphy.

Lagoon Dredging

Twelve lagoon property owners, led by Dave Smith presented their motion requesting \$99,000 in District funds to finance a \$300,000 dredging project of the lagoon at the north end of Bone Lake. Property owners can't get in or out of the lagoon which now is just two feet deep vs. the original 9 foot depth. Cheryl Clemens followed the presentation with figures comparing the cost to other phosphorus reducing projects conducted by the District. Motion to fund the lagoon dredging with \$99,000 in District funds. Voting by ballot, the motion failed with 75 no, 42 yes.

Ron Ogren, Town of Georgetown

- The Town Board is comparing Fire and EMT services, response time, first responders, ambulances. A public hearing will be held soon.
- Public access at Sandy Hook. Not much has happened. There's a wetland across the 50-foot wide property that cannot be traversed by a trail. The sandpoint well on the property must be removed. Dead trees have been removed. The Town is looking for an engineer to complete the required engineering study.
- The Georgetown board meets the third Tuesday of the month, 7 p.m. at the Georgetown Hall.

Doug Route, Polk County

Mr. Route introduced himself as our new Polk County Supervisor appointed to the BLMD board and gave his contact information.

- He is a member of the Polk County Environmental Services and Public Services and Highway Committees.
- Email: douglas.route@co.polk.wi.us
- Phone: 715-472-2620
- Address: 2689 80th St. Frederic WI 54837

It was noted that all contact information for District commissioners, county and town representatives is on page 2 of every newsletter and at bonelakewi.com.

Q&A Session

- Complaints of loud music and boisterous behavior on boats, including some foul and offensive language, and close calls between moving boats.
- People need to respect laws.
- Parents have responsibility, lots of times it's kids.
- Don't feed feral cats.
- Fourth of July fireworks are great.

Conservation wardens

- Jesse Ashton and _____ Carlson, Polk County conservation wardens, were invited to the meeting by Bill Jungbauer and were added to the agenda. Jungbauer's question to them was about pier rules. The wardens replied you can have two boat slips for the first 50 feet of property plus one PWC, then one boat slip for each additional 50 feet plus one PWC. Therefore a property with 100 feet of lakeshore can have three boat slips and two PWC slips. Also see the Pier Planner at the DNR website.

The wardens answered questions about boating rules:

- PWCs must observe no wake operation within 200 feet of shore.
- Motorboats must observe no wake operation with 100 feet of shore.
- All motorized boats must stay 100 feet from any dock, swimmer, buoy marker, boat under power, water skier or tuber.
- Many complained of PWCs operating at high speed too close to shore.
- Alcohol rules for motorboat operation on water are the same as for operating a motorized vehicle on a roadway.
- If you witness boating safety violations, use your smart phone to record a video of the incident, being sure to capture the boat's license numbers. Send to the DNR Conservation Wardens in Spooner WI. Citations have been issued for unlawful behavior reported this way.
- The wardens will be on the lake more often now.
- Turn your boat lights on at dusk. Make sure your lights are working before going out at night.
- Recommended ordering boating regulations and sending them out with the spring newsletter.
- Let your guests know the boating rules and show them how to operate boats and PWCs. 90 percent of those receiving citations are unfamiliar with boating rules and boat/pwc operation.
- Skiers, tubers and PWCs must be off the water at dusk. Time's different every day so check it to be sure you're lawful.

Old business

none

New business

none

Motion to adjourn: Ogren/Chorewycz. Carried.

Meeting adjourned 11:20 a.m.

121 District members signed in

Karen Engelbretson

BLMD Secretary

August 20, 2018

Following adjournment the elected commissioners met.

Motion to keep the same officers for the coming year.

Meeting dates are

- October 13, 2018
- April 13, 2019
- July 13, 2019
- August 10, 2019 Annual meeting
- September 28, 2019

Commissioners meeting adjourned at 11:31 a.m.

Current Wisconsin DNR Grants for the Bone Lake Mgmt District


As of June 30, 2018

		Grant Total	Grant Balance
Bone Lake Lake Mgmt Plan (April 15, 2015 to Dec 31, 2018)	Grant LPT-475-15	\$175,020	
Purpose: Improve water clarity, fisheries, wildlife and natural beauty			
Payment received to date		\$64,583	
Remaining grant balance			\$110,437
 CLP Control grant (2/1/15 to 12/31/18)	 Grant ACEI-171-15	 \$55,988	
Purpose: 50% funding to spray 30 acres of Curlyleaf Pondweed			
Payment received to date		\$50,121	
Remaining grant balance			\$5,866
 CLP Control grant (4/1/2018 to 12/31/19)	 new	 \$36,700	
Purpose: 50% funding to spray 30 acres of Curlyleaf Pondweed			
Payment received to date			
Remaining grant balance			\$36,700
 Clean Boats Clean Waters grant (2/15/18 to 12/31/18)	 Grant 51518	 \$4,000	
Purpose: Watercraft inspection and boater education on invasive species prevention			
Grant Advance:		\$1,000	
Payments received based on expenditures			
Remaining grant balance			\$3,000
 Internal Load Study grant (2/12/15 to 12/31/18)	 Grant LPL-1568-15	 \$24,669	
Purpose: Better understanding of impact to water clarity from the release of phosphorus			
from the lake sediment and also fish/wildlife monitoring			
Grant Advance:		\$12,564	
Remaining grant balance			\$12,105
 Healthy Lakes grant (4/15/16 to 12/31/18)	 LPT 521-16	 \$13,972	
Purpose: Install thirteen 10' by 35' native shoreline plantings			
Grant Advance:			
Remaining grant balance			\$13,972
 Aquatic Plan update grant (2/15/17 to 12/31/19)	 AEPP 49117	 \$9,461	
Purpose: Update Aquatic Management Plan and Aquatic Invasive Species monitoring			
Grant Advance:			
Payments received based on expenditures		\$3,605	
Remaining grant balance			\$5,856

**INCOME STATEMENT AND PROJECTED BUDGET
BONE LAKE MANAGEMENT DISTRICT**

FYE 2018 BUDGET - ACTUAL & PROJECTED 10/1/2017 THROUGH 9/30/2018 AND PROPOSED FYE-2019 BUDGET ENDING 9/30/2019 PRESENTED AT BONE LAKE ANNUAL MEETING 11 AUGUST 2018

	Budget FYE 2018 10/1/2017 thru 9/30/18	Actual & Projected 10/1/2017 thru 9/30/18	PROPOSED- FYE 2019 10/1/2018 thru 9/30/19
Town of Georgetown and Bone Lake	\$ 63,600.00	\$ 63,543.62	\$ 63,600.00
Frandsen Bank-Interest	\$ 21.00	\$ 25.58	\$ 25.50
Newsletter Ads	\$ 5,400.00	\$ 3,390.00	\$ 3,600.00
Polk County-Lottery Credit	\$ 500.00	\$ 456.38	\$ 400.00
Grants	\$ 50,000.00	\$ 48,541.43	\$ 40,000.00
Other-maps-owner cost share & Misc.	\$ 100.00	\$ 767.00	\$ 700.00
Total Revenue	\$ 119,621.00	\$ 116,724.01	\$ 108,325.50
Expenditures			
Lake Improvements			
Aquatic Plant Management (incl CBCW)	\$ 50,000.00	\$ 50,000.00	\$ 62,000.00
Consulting	\$ 3,000.00	\$ 3,000.00	\$ 2,000.00
Lake Management			
Watershed	\$ 10,000.00	\$ 2,700.00	\$ 10,000.00
Waterfront runoff	\$ 40,000.00	\$ 17,824.98	\$ 30,000.00
Evaluation and Studies	\$ 15,000.00	\$ 11,306.98	\$ 5,000.00
Wildlife and Natural Beauty	\$ 3,500.00	\$ -	\$ 3,500.00
Fisheries	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00
Communications/Education/Recognition	\$ 5,500.00	\$ 500.00	\$ 7,000.00
Sub- Total Lake Mgmt.	\$ 75,500.00	\$ 33,831.96	\$ 57,000.00
Total Lake Improvements	\$ 128,500.00	\$ 86,831.96	\$ 121,000.00
Public Safety			
Buoy Maintenance	\$ 4,000.00	\$ 4,170.00	\$ 6,000.00
Safety Patrol	\$ -	\$ -	\$ -
Total Public Safety	\$ 4,000.00	\$ 4,170.00	\$ 6,000.00
Information and Education			
Newsletter	\$ 10,000.00	\$ 7,025.92	\$ 10,000.00
Dues	\$ 775.00	\$ 775.00	\$ 775.00
Website	\$ 1,000.00	\$ 1,000.00	\$ 2,500.00
Meetings/Workshops	\$ 1,300.00	\$ 1,083.64	\$ 1,300.00
Total Information and Education	\$ 13,075.00	\$ 9,884.56	\$ 14,575.00
Administration			
Insurance	\$ 3,000.00	\$ 2,896.00	\$ 3,000.00
Donations/Subscriptions	\$ 1,000.00	\$ 1,100.00	\$ 1,000.00
Misc office expense	\$ 750.00	\$ 550.00	\$ 750.00
Total Administration	\$ 4,750.00	\$ 4,546.00	\$ 4,750.00
Total expenditures	\$ 150,325.00	\$ 105,432.52	\$ 146,325.00
Beginning Cash Balance	\$ 241,476.78	\$ 241,476.78	\$ 252,768.27
Ending Cash balance	\$ 210,772.78	\$ 252,768.27	\$ 214,768.77
Cash Balance - 6/29/2018			
Checking 6/29/2018 bal. book to bank		\$ 119,392.87	
Money Market Savings 6/22/2018 bal. book to bank		\$ 154,296.54	
Total		\$ 273,689.41	

A serene sunset scene over a calm body of water. The sky is filled with soft, wispy clouds in shades of orange, pink, and blue. The sun is low on the horizon, creating a bright glow that reflects on the water's surface. The water is dark blue with gentle ripples, and the distant shoreline is visible as a dark silhouette.

Bone Lake Management District Annual Meeting August 11, 2018

Agenda

1. Call to Order
 2. Approve Agenda
 3. Approve 8.12.17 Meeting Minutes
 4. Approve Financial Report
 5. Grants Update
 6. Alum Treatment Presentation
 7. Goose Census Report
 8. Commissioner Elections: Terms of Bob Murphy and Phil Foster Expiring
 9. Approval of Proposed Budget
 10. Volunteer Recognition
 11. Lagoon Dredging: Motion and Vote on \$99K District Funding
 12. Q&A
 13. Voting Results
 14. Town of Georgetown Report
 15. Polk County Report
 16. Old Business
 17. New Business
- Adjournment



Grant 475-15

\$80,000 unused

- Grant to expire Dec. 2018
- Why not use \$ to help improve Bone Lake's water clarity?
- Could possibly obtain grant extension if more interest



Native Plantings



Provide natural beauty
Decrease erosion
Increase infiltration
Stabilize shoreline
Provide habitat for
wildlife

Waterfront Infiltration



Rain Gardens





10 by 35 Plantings

Healthy Lakes Grant:

- Pays 75% of total project costs.
- Your time can make up to 25% @ \$12 per hour.
- Maximum payout of \$1,000



Do you have runoff on your property?

- Complete the hand out interest form and put on the table
- Please contact Mary Chorewycz at
651-454-9456
- Contact us after the meeting

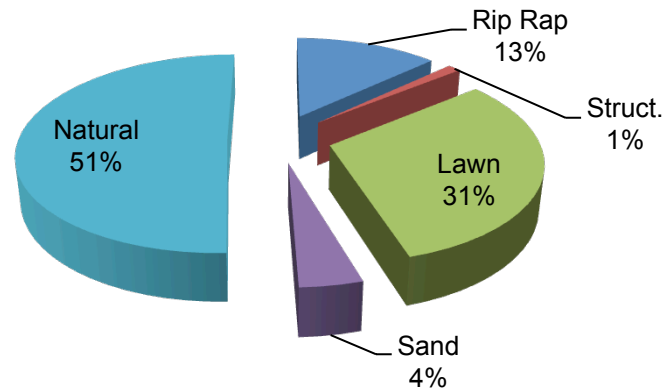


Tours

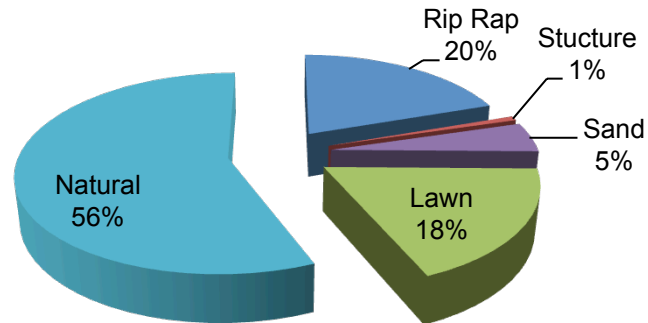
Next Saturday August 18



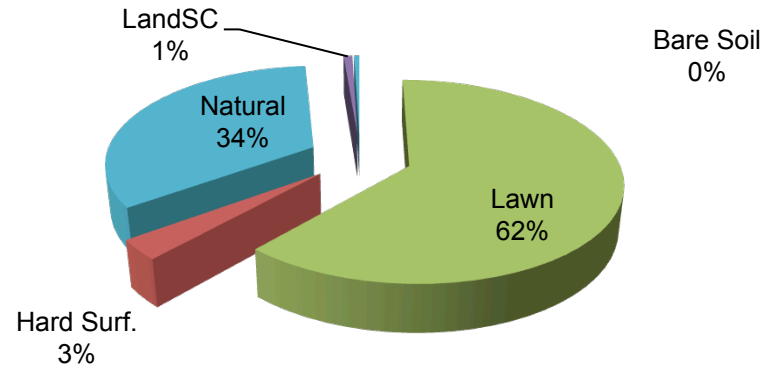
Bone Lake Shoreline Composition 2008



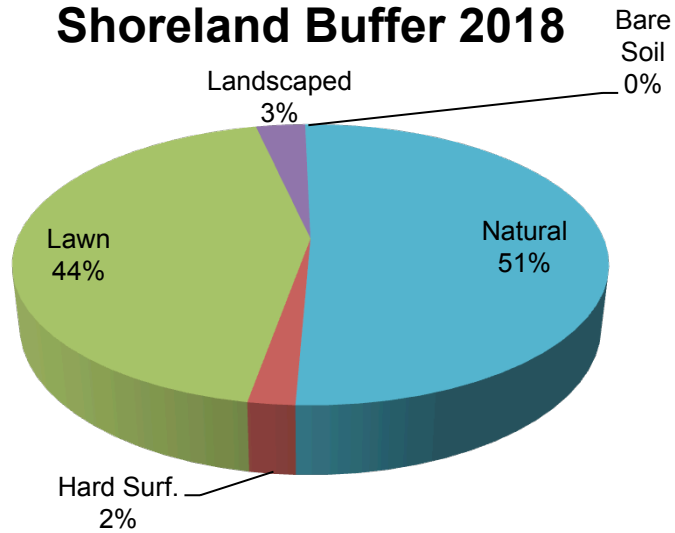
Bone Lake Shoreline Composition 2018



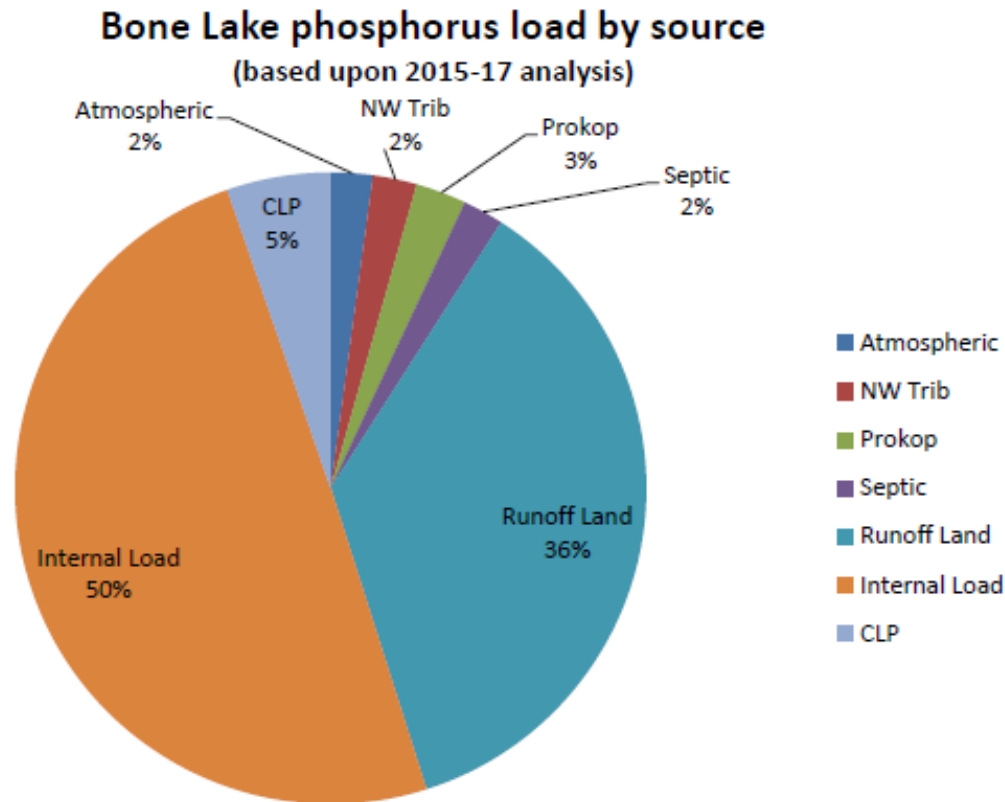
Shoreland Buffer Composition 2008



Shoreland Buffer 2018



Updated Phosphorus Budget Follows Internal Load Study



Alum as option

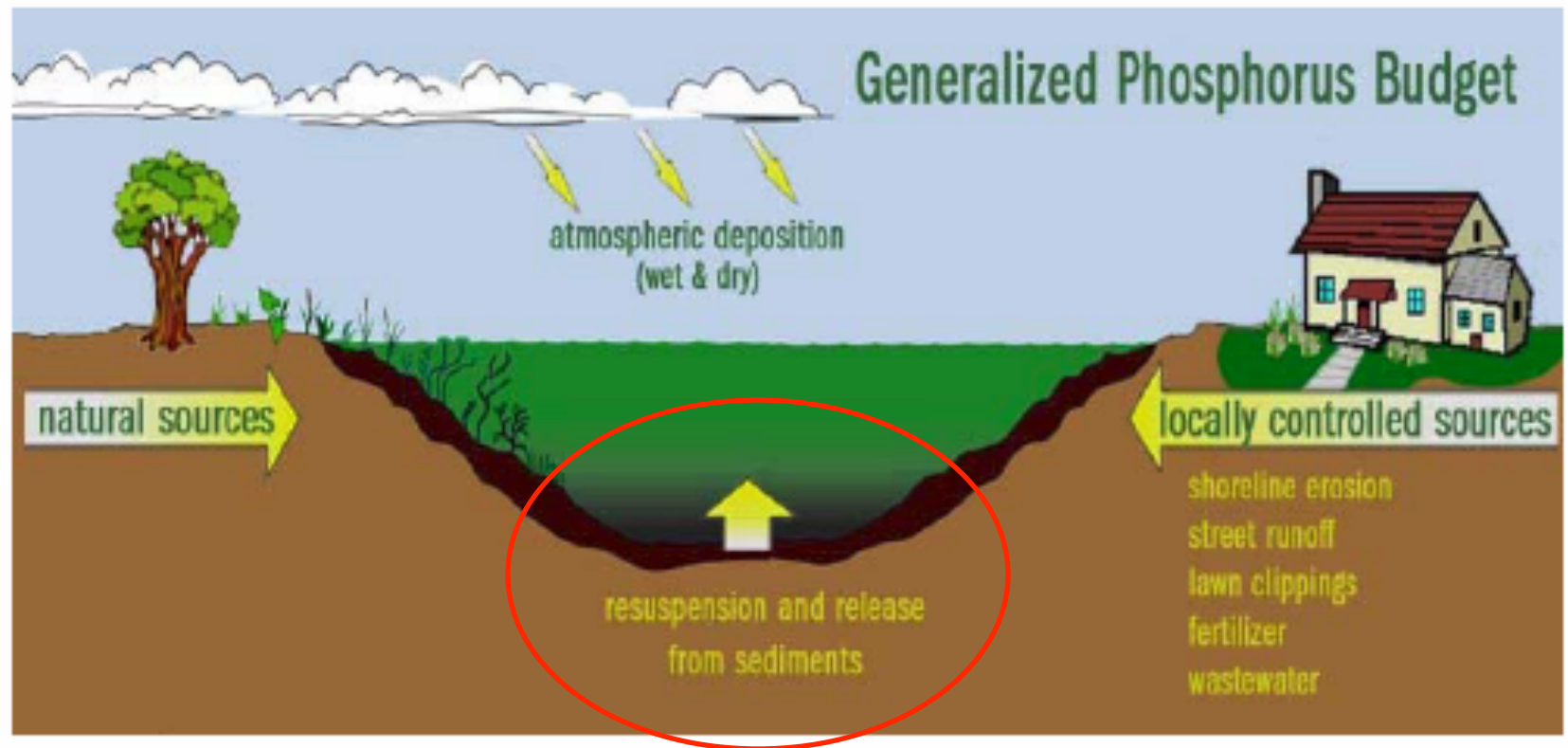
- At end of presentation, you will vote
- The Bone Lake Management District should form a committee to investigate the use of alum to control phosphorus coming from the internal loading. The committee's goal will be to recommend to use alum with corresponding implementation plan, or recommend not to use alum, to the BLMD board of commissioners and District membership at the 2019 annual meeting.



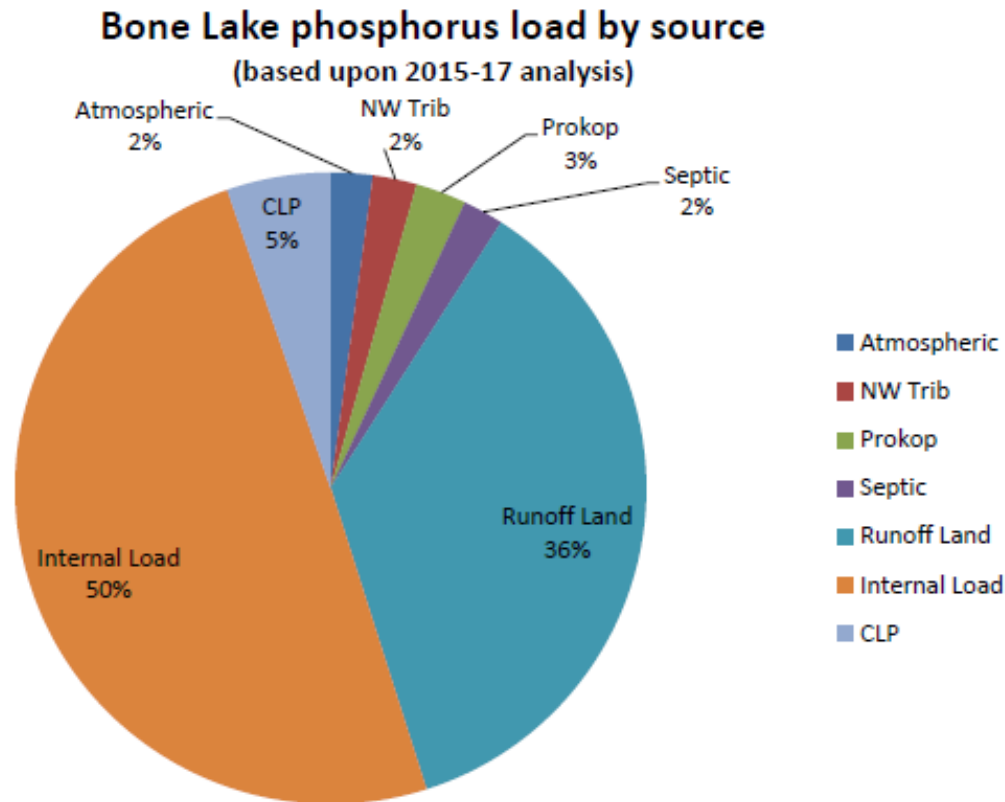
Water Clarity and Alum

Cheryl Clemens

Generalized Phosphorus Budget



Updated Phosphorus Budget Follows Internal Load Study



Why Alum Treatment?

- ✓ High Internal P Load
- ✓ Mixes During Summer - sometimes



How Alum Works

- Aluminum sulfate (alum) added to water column
- Forms visible floc
- Attaches P and settles to the bottom
- Alum floc layer covers bottom sediments
- Inactivates P released from sediments



Alum Dose Recommended

30 feet and deeper
100g Al/m²

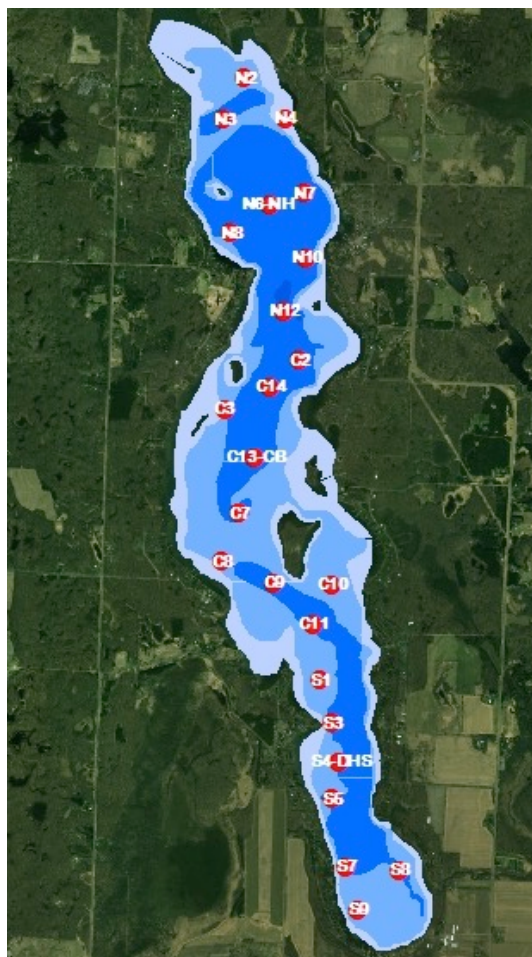


Table 7. Recent alum (as Al) dosages for various lakes.

Lake	Al Dose (g Al/m ²)	Reference
Bone Lake, WI	90-100	Present study
Cedar Lake, WI	100-130	(James unpubl. data)
Lake Riley, MN	100	(James unpubl. data)
Bald Eagle, MN	100	(James unpubl. data)
Black Hawk, MN	145	(James unpubl. data)
Tiefwareensee, Germany	137	Wauer et al. (2009)
East Alaska, WI	132	Hoyman (2012)
Half Moon, WI	75-150	James (2011)
Susser See, Germany	100	Lewandowski et al. (2003)
Green, WA	94	Dugopolski et al. (2008)

Lake Wapogasset: 40 g/m² (1999)

Alum Considerations

- Shown to have long-term effectiveness (5-20 years)
- Safe when dosage is professionally estimated
- Generally safe for fish and other biota
 - Some fish death associated with application due to short-term lower pH
- Causes temporary decline in pH
 - must maintain it above 6
- Shallow lakes with resuspension can affect the alum floc
- Watershed P sources should be relatively low

Bone Lake Predicted Results

June-Sept	Total Phosphorus (µg/L)	Chlorophyll-a (µg/L)	Secchi Depth (feet)
Mean 2015-17	54	22	5.8
ALUM: No sediment release	34	12	8.6

COMPARISON: Long Lake

June-Sept	Total Phosphorus (µg/L)	Secchi Depth (feet)
Prior to alum	80	5.9
Predicted after alum	39	10.8

COMPARISON: Cedar Lake

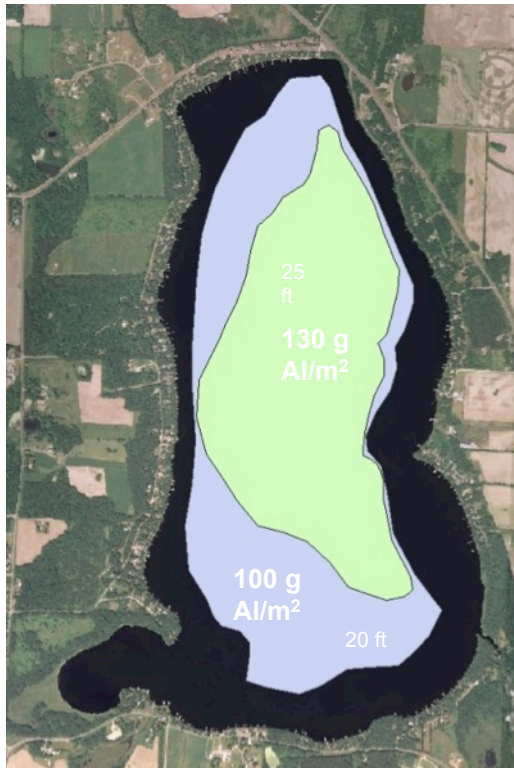
June-Sept	Total Phosphorus (µg/L)	Secchi Depth (feet)
Prior to alum	74	6.5
Predicted after alum	33	13

Nuisance summer algae blooms:
from 44% to 7% of the time

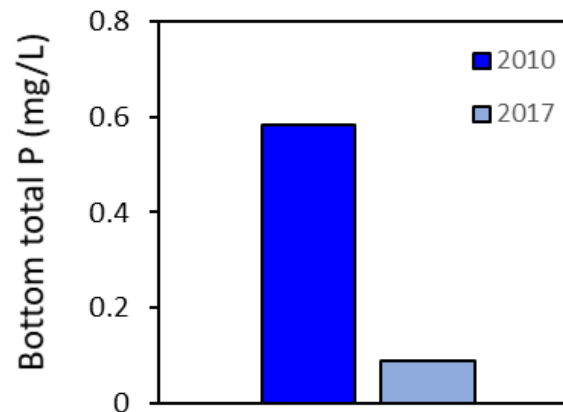
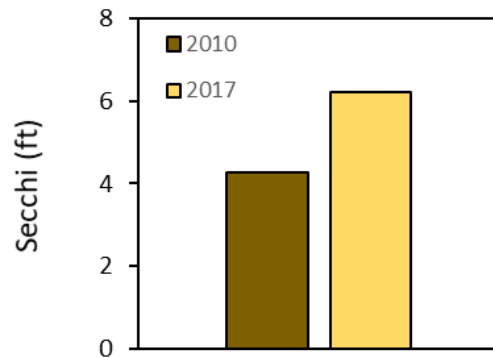
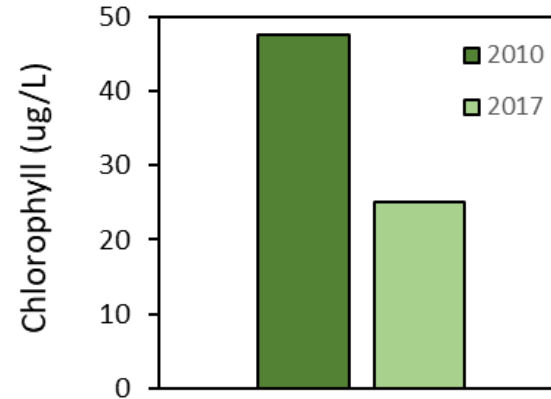
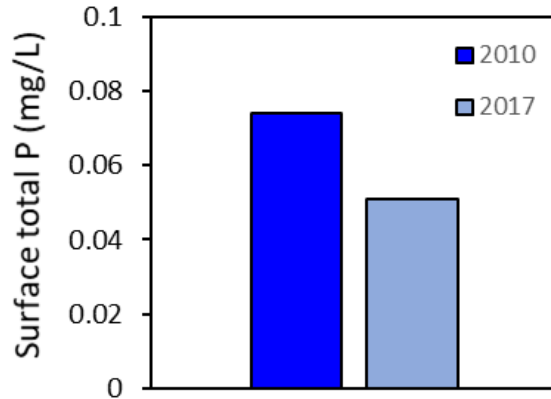
Toxin-producing algae blooms likely:
from 17% to 1% of the summer

Cedar Lake Results

Cedar Lake: Reduce internal loading by 90%



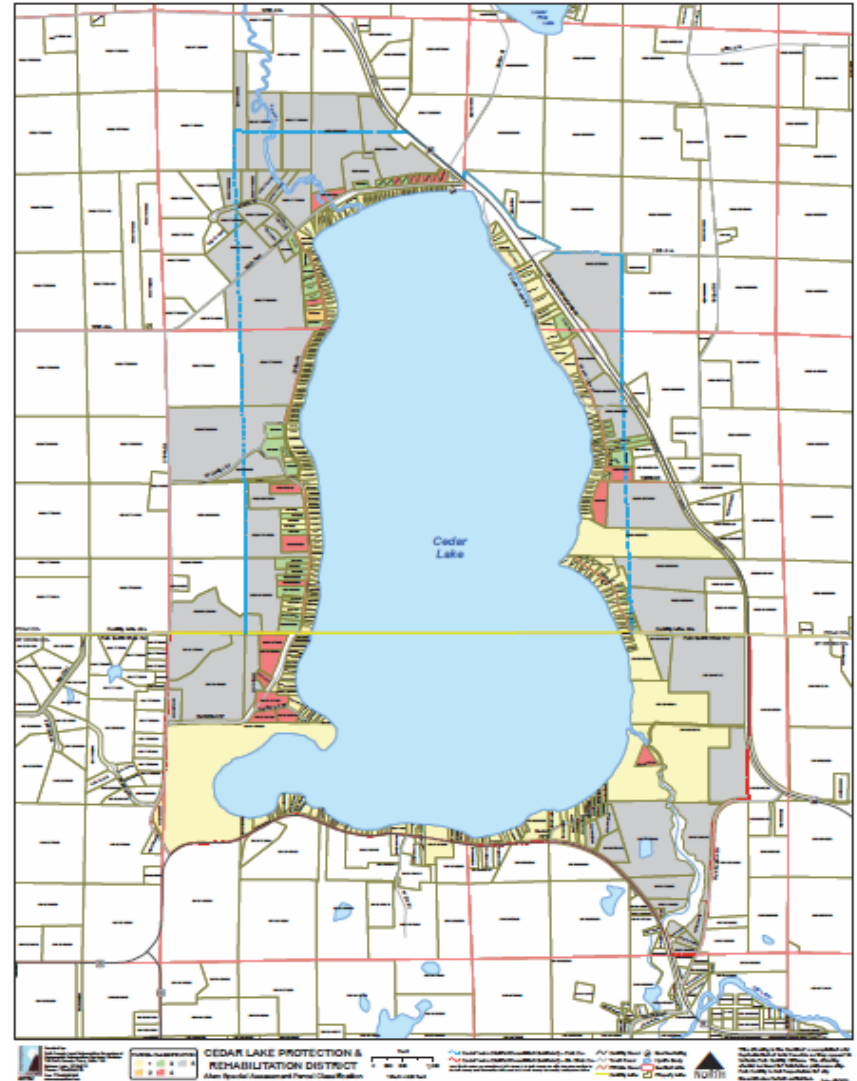
Cedar Lake Results



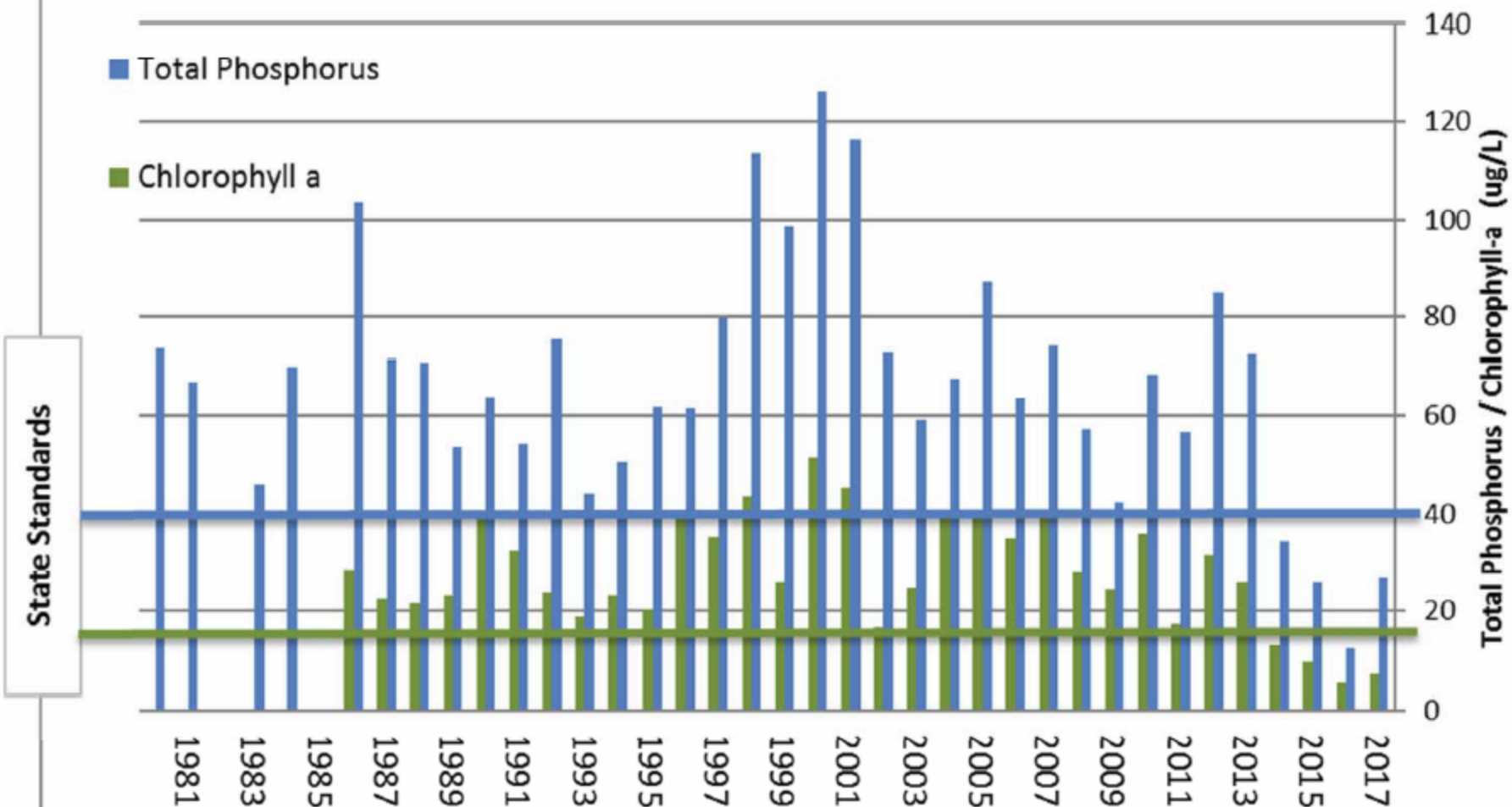
Cedar Lake Special Assessment

Per \$100,000

\$302 each year for 10
years



Bald Eagle Lake, Mean TP and Chl-a



Alum Long-term Effectiveness

83 lakes

Ave. TP reduction = 11 years (better in stratified lakes)

Secchi disk increase: 9.7 years

Chlorophyll a decrease: 8.8 years

Longer effectiveness in stratified lakes, especially in TP

Huser, et al. 2015

Alum Cost for Bone Lake

Table 8. Cost scenarios for treating the 30-ft contour with aluminum sulfate. Estimates assumed a current cost of \$1.76 per gallon of aluminum sulfate.

Al dose (g/m ²)	Gallons	Cost (\$)
25	257,202	\$452,676
50	514,405	\$797,327
60	617,286	\$956,796
70	720,167	\$1,267,493
80	823,048	\$1,275,724
90	925,929	\$1,435,189
100	1,028,810	\$1,810,705

$$1,028,810 \times \$1.88/\text{gal} =$$
$$\text{\textcolor{red}{\$1,934,163}}$$



Alum Cost for Bone Lake PRELIMINARY ESTIMATE

Cost per \$100,000
of valuation

\$200 each year for
5 years (**1 grant**)

Cost per \$100,000
of valuation

\$150 each year for
5 years (**3 grants**)

Additional application may be needed in
10 years at perhaps 55% of original
application

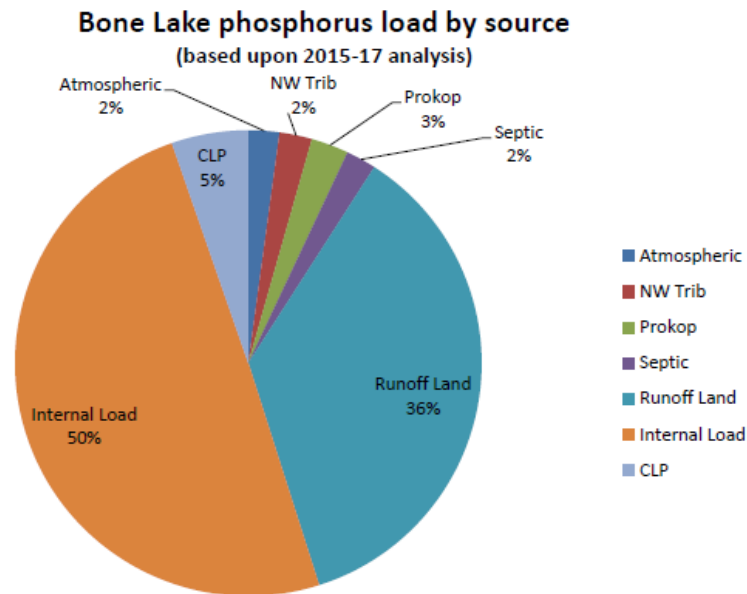
Application and Monitoring Schedule

Variable	Year 1	Year 2	Year 3	Year 4	Year 5
AI application	60 g/m ²		25-40 g/m ²		25 g/m ²
Assessment ¹					

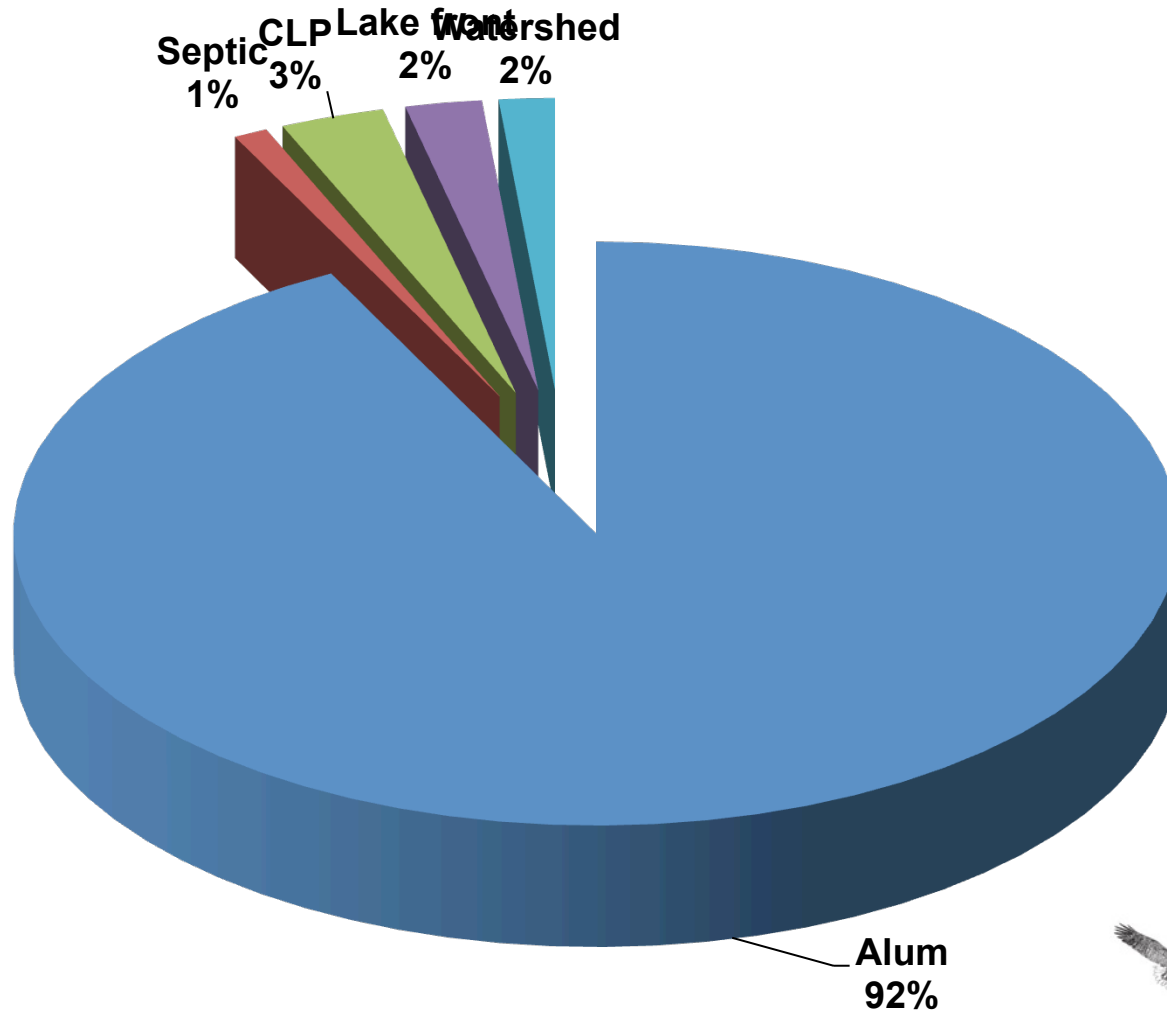
¹Sediment core collection and vertical profile monitoring

Controlling Runoff Remains Critical

Reducing External Load
Allowing Effective Internal Load
Treatment



Bone Lake Phosphorus Reduction next 10 years



Alum estimated funding first 5 years @ 100 g/m²

Grants	\$ 200,000
District Cash	\$ 200,000
Tax levy	\$1,700,000
Total	\$2,100,000

Tax levy per year

**\$200 per \$100,000
in valuation**

Alum estimated funding years 6 to 15 @ 55 g/m²

Grants

District Cash

Tax levy

\$1,200,000

Tax levy per year

**\$70 per \$100,000
in valuation**

Total

\$1,200,000

Questions/ Issues with Alum

- Interest to further pursue
- Other lakes issues/successes/financing
- Alum treatment dosage options
- Wake boats impact to the alum floc
- How to pay/finance/grants
- Understand the benefits – better water clarity, increased property values



Alum Committee for Next Step?

1. Membership of believers and skeptics
2. Address issues and questions
3. Two to three meetings this fall
4. Recommendation to do or not
5. If to do, develop implementation plan
6. Present to Board in April 2019
7. Present to 2019 annual meeting



Alum Motion

- The Bone Lake Management District should form a committee to investigate the use of alum to control phosphorus coming from the internal loading. The committee's goal will be to recommend to use alum with corresponding implementation plan, or recommend not to use alum, to the BLMD board of commissioners and District membership at the 2019 annual meeting.





BLMD Wildlife and Natural Beauty Committee:

Cris Dueholm

Wayne Wolsey

Bob Boyd

Karen Engelbretson, Chair

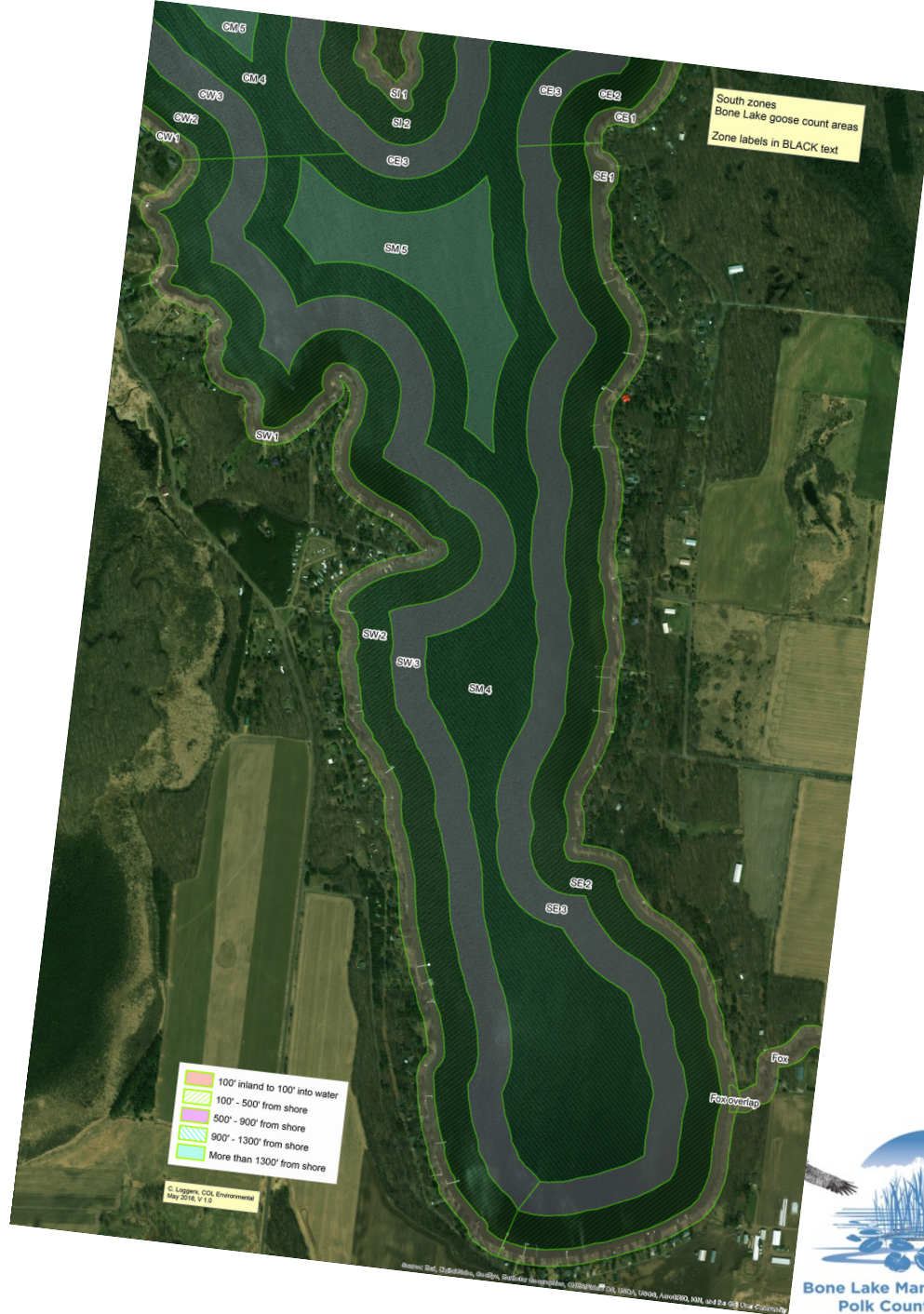
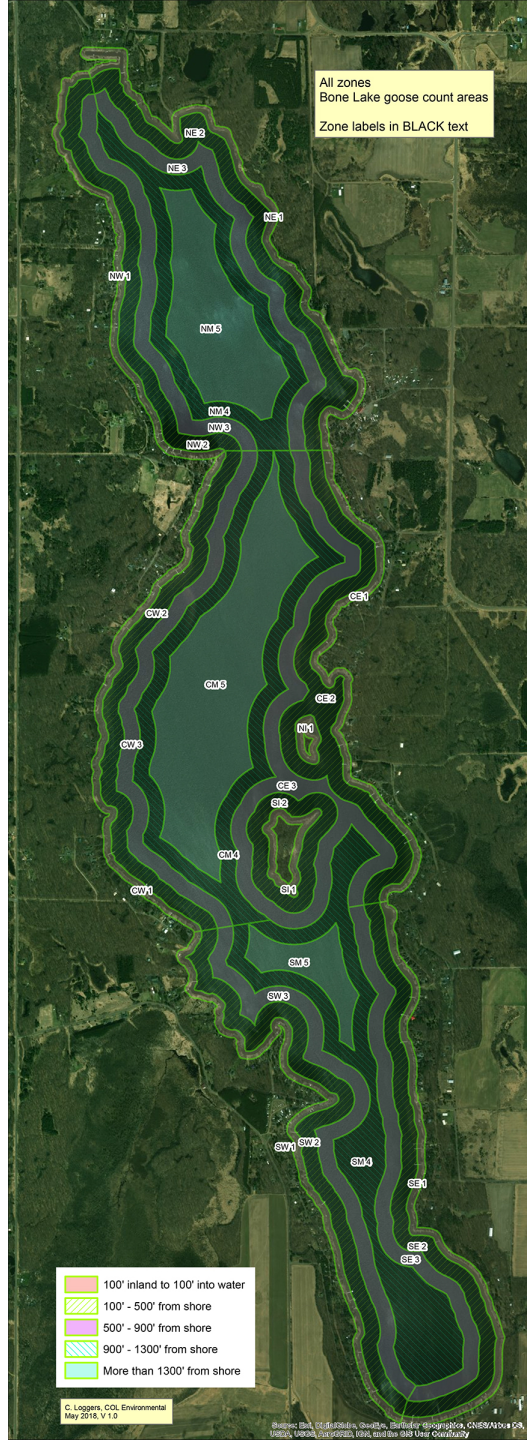


Canada geese census

We set out this spring to answer

- How many resident geese do we have?
- Where are they nesting?
- Where are they a problem?
- What population reduction/control measures are appropriate?





Bone Lake Management District
Polk County, Wisconsin

Bone Lake goos

Survey name: SOUTH

2/7-18

Start time 9:00 A.M. End time 9:25 A.M.

Obs #	Zone ID	Place-mark #	# Adults	# Goslings	Notes (include neck or other band information, if any)
SW1	PM1	4	22		on land, grazing on lawn.
SW2	PM2	2	5		swimming by shore.



We found hardly any geese.



Table 2. Observation dates, locations, and bird numbers for Bone Lake census. Colored numbers indicate matched observations (duplicates) recorded on different days.

20-Jun							Feet from shore**
Zones	SubZone	Observer	Latitude	Longitude	Adults	Goslings	
South	SW1	JBoyd	45.521332	-92.393839	4	22	90
South	SW2	JBoyd	45.504723	-92.381670	2	5	420
Fox Ck	Fox Ck	Joey Bob	None provided		2	5	Unknown
Central	CE1	KEngelbretson	45.531881	-92.382769	2	3	-40
Central	CE1	KEngelbretson	45.532771	-92.383475	1	1	-90
North	NE1	NBoyd	45.564492	-92.395511	1	0	0
Fox Ck	Fox Ck	NBoyd	45.505183	-92.373128	2	5	30
Totals					12	36	
21-Jun							
Zones	SubZone	Observer	Latitude	Longitude	Adults	Goslings	
Central	CE1	KEngelbretson	45.541353	-92.382208	1	0	0
North	NE2	NBoyd	45.564504	-92.394689	1	0	130
Central	SI2	KEngelbretson	45.529317	-92.386103	8	0	300 (flying)
South	SW1	JBoyd	45.518714	-92.391014	4	22	0
South	SE1	JBoyd	45.524262	-92.380517	4	7	0
Totals					18	29	
22-Jun							
Zones	SubZone	Observer	Latitude	Longitude	Adults	Goslings	
North	NW2	NBoyd	45.562713	-92.402879	1	0	90
North	NW2	NBoyd	45.562502	-92.402807	2	2	100
North	NW2	NBoyd	45.562162	-92.402687	2	0	70
South	SE2	JBoyd	45.522943	-92.380181	4	7	120
Totals					9	9	

Complete report can be found at bonelakewi.com.



Control efforts elsewhere

Cumberland

Affecting golf course and public beach

- ~200 rounded up in 2016
- 170 rounded up in 2017
- No control in 2018

*Takes volunteers to herd the geese to shore.
USDA recommended oiling eggs; not done yet.*

Balsam Lake

Affecting public beach, private property

- 2017: Changed ordinance to allow hunt/kill of nuisance animals in Village limits, ~200 birds rounded up
- 2018: Counting, oiling eggs around the entire shore of the 2054-acre lake over 45 days.

Nearly 20 volunteers participating. Permissions from property owners conducted via Facebook.



Control efforts elsewhere

Amery School District

*Affecting athletic fields, city park,
municipal golf course*

- 2017 roundup: ~100 geese eliminated
- 2018 roundup: 231 eliminated
- 2018 Egg oiling: 56 eggs oiled spring, will oil eggs again in 2019.

The geese are smart—they hide.

Half Moon Lake

Affecting public beach

- 2017: Publicized early hunt season
- 2018: Roundup planned. No data on number of geese removed.



Conclusion

Anecdotal evidence:

- Low numbers around Bone Lake may be due to April 14 snowstorm covering early nests; adults moved on.
- Control efforts in nearby areas may have included Bone Lake residents.
- It's just a weird year all around.



Conclusion

- Due to low population count, no control measures are planned for 2018 or 2019 around Bone Lake.
- Another census may be conducted in summer, 2019.
- Control measures may be proposed for 2020 if sufficient numbers are quantified.

Volunteers will be needed to conduct another census.





Volunteer Awards for 2018

Four awards



Volunteer Recognition

- Dick Boss
- Janet and Bill Jungbauer
- Tim Laughlin
- Bob Murphy



Lagoon Dredging Project



Bone Lake Homeowners Presentation

August 11th, 2018



Preface

- The lagoon has been a settling pond for many years and now has navigation problems.
- This project is an example of the need for focusing on maintenance projects.
- We are asking that BLMD share 33% of the cost of the dredging project not to exceed \$99,000.
- We already have DNR permits and are ready to start the project if we receive the funds.
- This project will be removing sediment that contains nitrogen and phosphorus from the lake.



What Has Been Done So Far

- BLMD spent \$30K to mitigate the inflow of material from the creek in NE corner (2013).
- 12 lagoon homeowners invested \$13,000 and hundreds of hours researching the project for the permit.
- We have obtained permits from WDNR
 - BLMD Board approved the permit application
- We have obtained several bids/estimates for doing the dredging and the lowest amount is \$300,000.
- We have estimates from numerous contractors over 6 years and feel strongly that we cannot get it done for less.



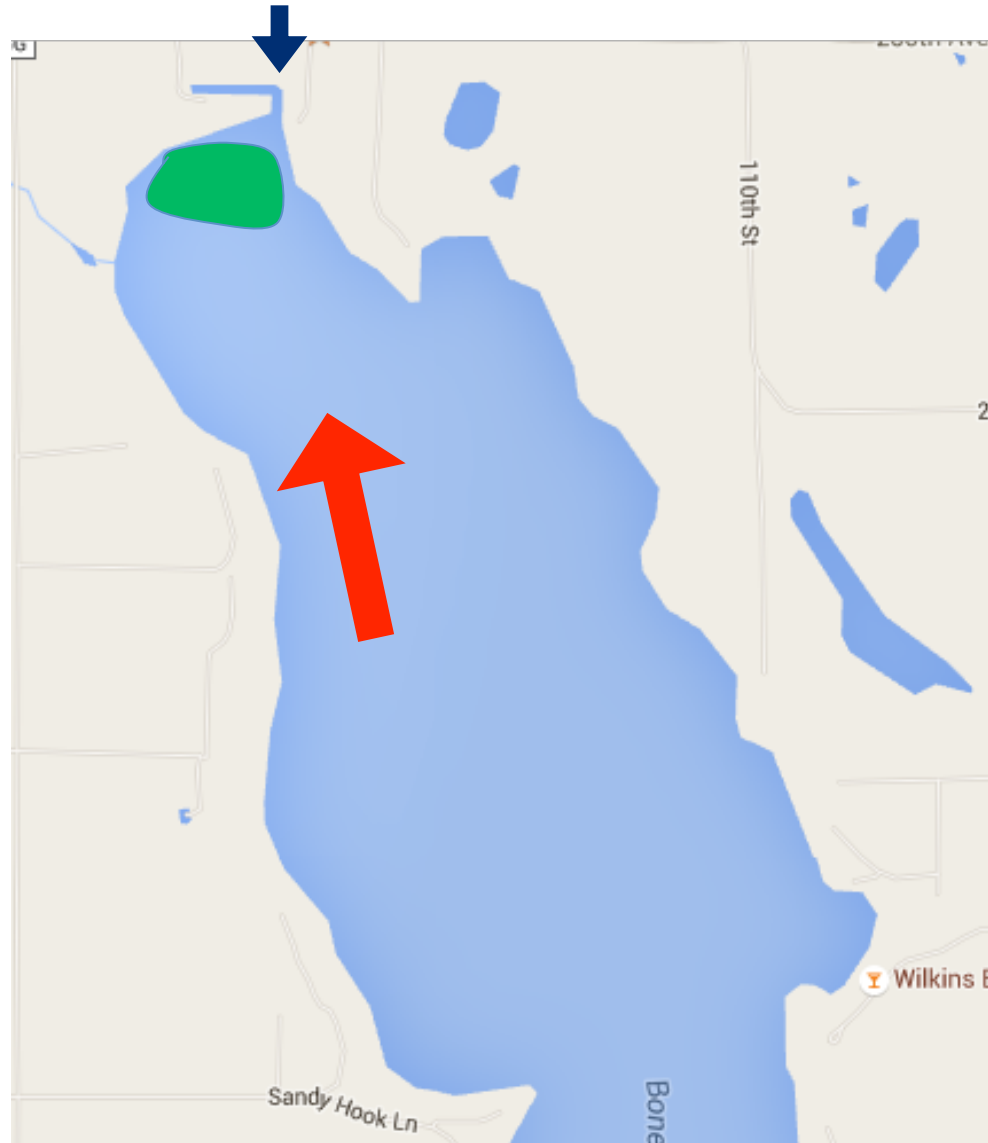
History & Current Problem

- Originally dredged in 1967 to a depth of 9 ft – entirely public and entirely part of Bone Lake
- By default the lagoon has acted as a settling pond
- Sediment enters the lagoon from several sources
- Sediment buildup over 51 years leaves navigation problems throughout the lagoon, stirs up with traffic
- The sediment contains nitrogen and phosphorus
- Fisheries are limited compared to years past
- ➔ Like any settling pond, it needs to be maintained (i.e. emptied)



Cause of Problem

- Creek flowing into NE corner dumps sediment in from north of 250th Ave
- Prevailing winds from south to north push the current into the north bay containing sediment
- Weed growth & algae in north bay and lagoon adds degradable material



What's In The Sediment?

June 2015 Nutrient Report from Pace Analytical, Inc.



350.1 Ammonia	Analytical Method: EPA 350.1	
Nitrogen, Ammonia	244	mg/kg
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2	
Nitrogen, Kjeldahl, Total	1860	mg/kg
365.1 Phosphorus, Total	Analytical Method: EPA 365.1	
Phosphorus	524	mg/kg

ANALYTICAL RESULTS

Project: Bone Lake, WI
Pace Project No: 10311389

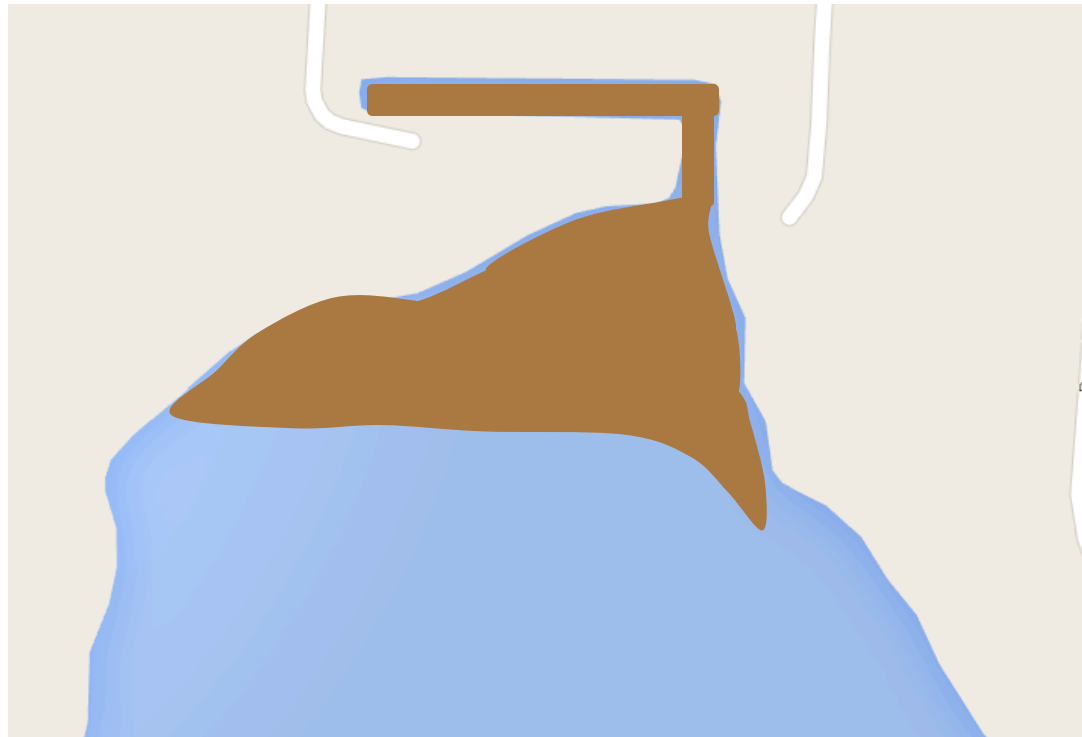
Sample: Bone Lake Sediment Lab ID: 10311389001 Collected: 06/18/15 15:50 Received: 06/22/15 17:19 Matrix: Solid
Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Dry Weight								
Analytical Method: % Moisture								
Percent Moisture	45.3	%	0.10	1		07/01/15 15:10		
300.0 mg/kg								
Analytical Method: EPA 300.0 Preparation Method: EPA 300.0								
Nitrate-N (mg/kg)	ND	mg/kg	2.0	1	07/07/15 13:00	07/07/15 23:08	14797-55-8	N2
Nitrate-N (mg/kg)	ND	mg/kg	2.0	1	07/07/15 13:00	07/07/15 23:08	7727-37-9	N2
Nitrite as N (mg/kg)	ND	mg/kg	2.0	1	07/07/15 13:00	07/07/15 23:08	14797-65-0	N2
350.1 Ammonia								
Analytical Method: EPA 350.1 Preparation Method: EPA 350.1								
Nitrogen, Ammonia	244	mg/kg	5.5	1	07/07/15 15:26	07/08/15 11:10	7664-41-7	
351.2 Total Kjeldahl Nitrogen								
Analytical Method: EPA 351.2 Preparation Method: EPA 351.2								
Nitrogen, Kjeldahl, Total	1860	mg/kg	91.4	1	07/06/15 13:00	07/07/15 08:23	7727-37-9	
365.1 Phosphorus, Total								
Analytical Method: EPA 365.1 Preparation Method: SM 4500P B								
Phosphorus	524	mg/kg	9.1	2	07/06/15 11:46	07/07/15 11:27	7723-14-0	



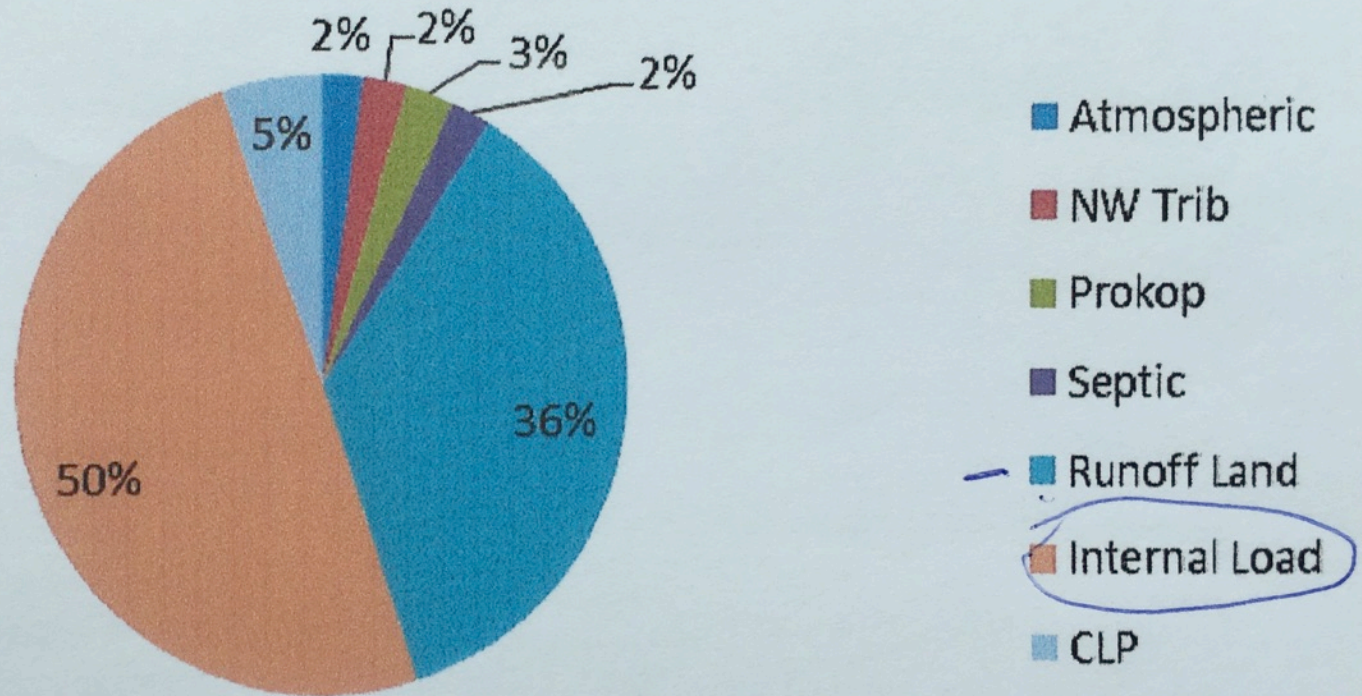
Impact of Doing Nothing

- Sediment (N&P) will remain in the lake
- Stirs up around the lagoon and north bay
- Lagoon access will close off, likely at mouth first
- Muck will continue to settle & build up in north bay, farther & farther out into the lake



Bone Lake phosphorus load by source

(based upon 2015-17 analysis)



Benefits of Dredging Project

Lagoon Owners

- Navigation and water quality returned to 1967

All Lake Owners & Public

- Navigation and water quality (fishing, kayaking, canoeing, etc)
- Improved fishery & wildlife
- Remove nitrogen, phosphorus & suspended solids from the lake helping reducing the Internal Load.
- Maintain the settling pond
- Establish a precedent of lake maintenance with DNR



Lagoon / North End

- Water quality analysis



Cheryl Clemens,
Harmony Environmental

Meghan Funke, PhD
Emmons and Olivier
Resources



Lagoon Sediment Accumulation

Mechanisms

- Side slumping
 - Sediment deposition from intermittent stream
 - Organic sediment deposition (plants and algae)
- 11,100 Cubic Yards of sediment = 980 lbs. P
 - Over 49 years equivalent to approx. 20 lbs./year

Background: 250th Project

- Drainage area to 250th Ave. Culvert/Lagoon = 122 acres (1.3% of watershed)
- Contributes about 30 lb. P/year (1% of lake P)
- Installed projects remove about 8 lb. P/year



Total cost: \$30,000 (\$3,750/lb.)
District funds: \$4,500 (\$562.50/lb.)

Lagoon impacts

No dredging

- Accumulated sediments may be re-suspended: biggest impact (increased algae growth) within lagoon itself, **however P release from shallow sediments very low.**
- No additional sediment capture from 250th stream

Lagoon dredging

Lagoon will again serve as a second/third line of treatment for 250th stream

Will remove perhaps 5 lbs. P/year remaining from 250th stream

Cost Analysis: Annual P removal

If Lagoon removes 5 lbs.

- \$300,000 (\$60,000/lb.)
 - \$100,000 (\$20,000/lb.)
 - Longevity: 30 years?
 - Lifespan costs: \$670/lb.
- Watershed/waterfront projects generally from \$500/lb. to \$10,000/lb.
 - Lake protection grants cover over 85% of costs (with grants \$75/lb. to \$1,500/lb.)
 - Contracts = 10 years
 - Lifespan costs: \$7.50 to \$150/lb.

Motion

The Bone Lake Management District should fund one-third of the costs to dredge the channel (lagoon) at the north end of the lake from the District's current cash balance, not to exceed \$99,000, with the remaining two-thirds of the dredging costs, including any cost over-runs, to be paid by twelve affected homeowners.

