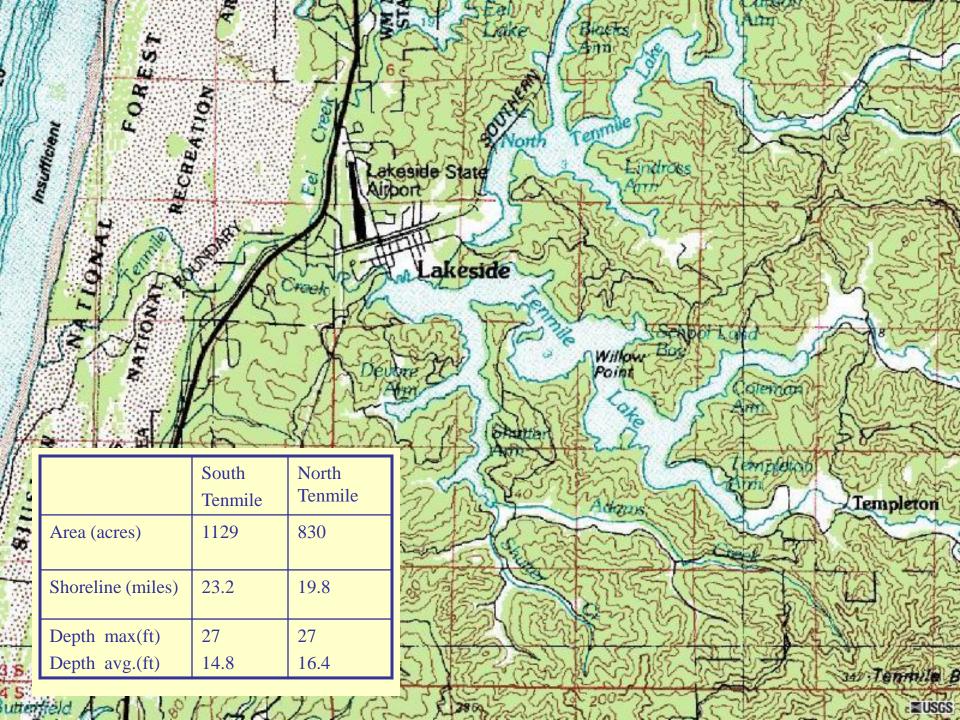


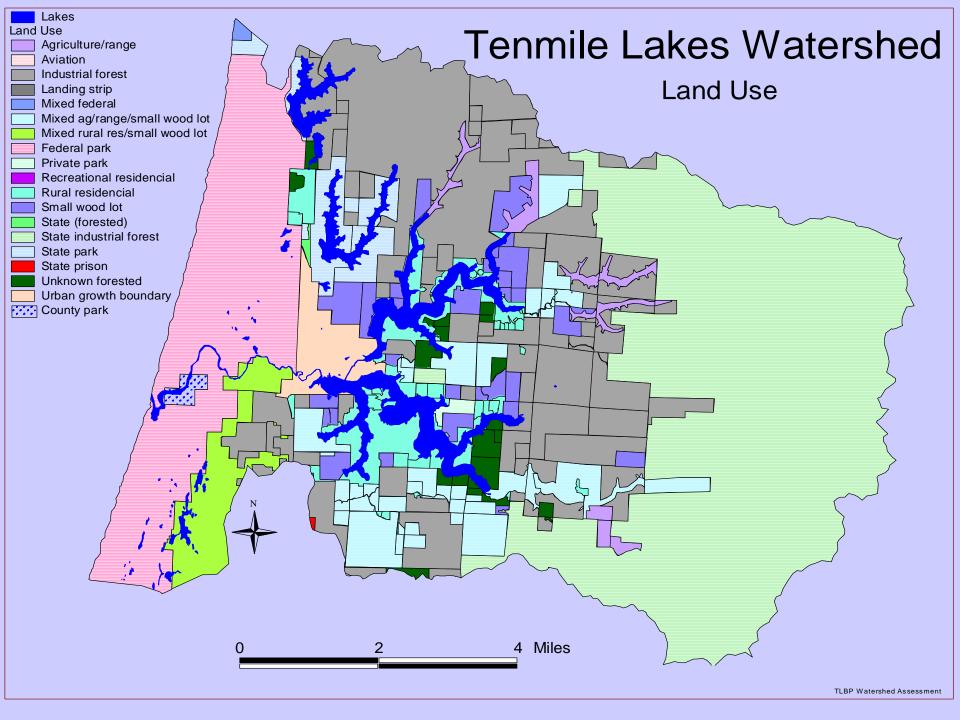
OVERVIEW

- **BRIEF LAKE HISTORY**
- •ALGAE SAMPLING
- NUTRIENT MONITORING
- **SEDIMENTATION**
- **SHORELINE DEVELOPMENT**
- **SEPTIC TANKS**
- **NON-NATIVE SPECIES**
- •VOLUNTEER OPPORTUNITIES





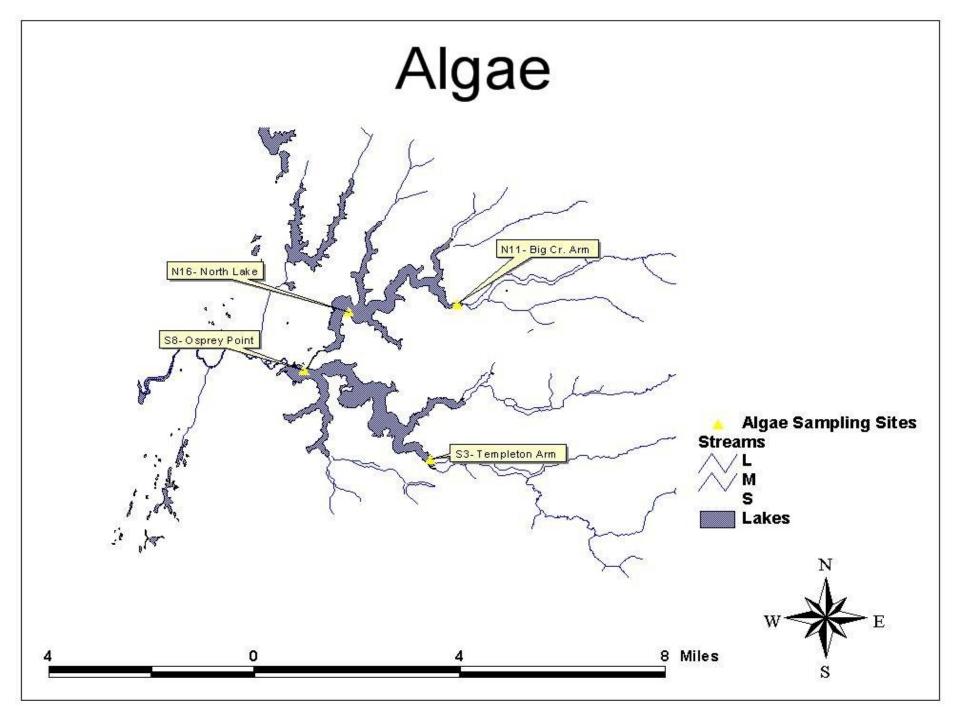


















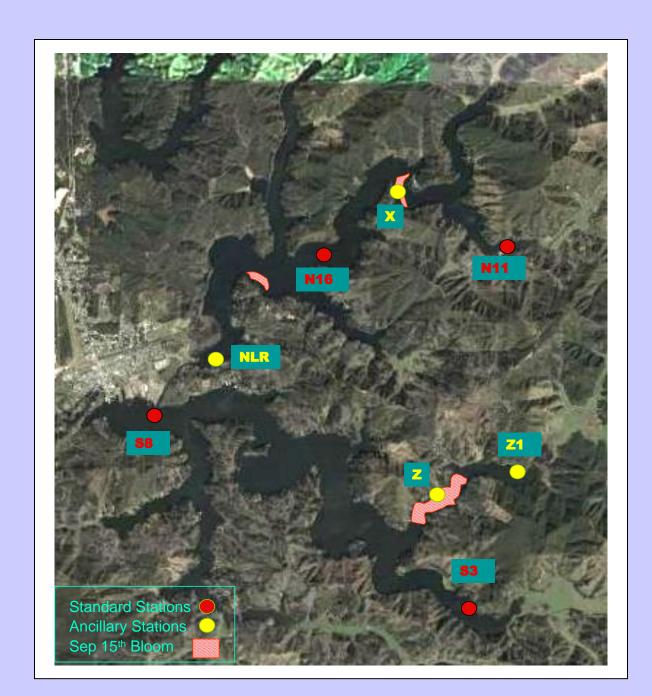












Oregon Harmful Algae Bloom Program

2009 Bloom Season Recap

Goals:

The Harmful Algae Bloom program is working to gain a better understanding about the occurrence of toxic algal blooms in Oregon and their impact on human health. Funding is through a five-year federal grant from the U.S. Centers for Disease Control and Prevention.

Accomplishments this year:

- Curtis Cude provided testimony on HAB issues to the Oregon Legislature.
- The first task force meeting occurred in March 2009 to increase collaboration among federal and state partners.
- HABS staff responded to numerous newspaper and radio inquiries, thereby furthering public outreach regarding HABs issues.
- 18 human and 10 animal exposures to HABs were investigated. These exposures ranged from health concerns that were not likely associated to HABs to our most significant incident of the summer which was a confirmed HABsrelated animal death.
- Two articles were published: one for the Oregon CD Summary (distributed to 16,000 medical providers statewide) and the other for the Oregon Veterinary Medical Association.
- The program research analyst established the HABISS data tracking system for Oregon.
- The Oregon PH Laboratory has developed capacity for toxin testing (microcystin), species identification and enumeration. More details soon...

Figure 1. 2009 Advisories, numbered chronologically

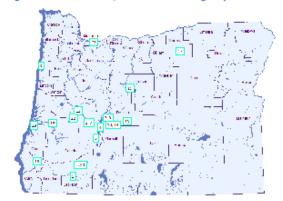
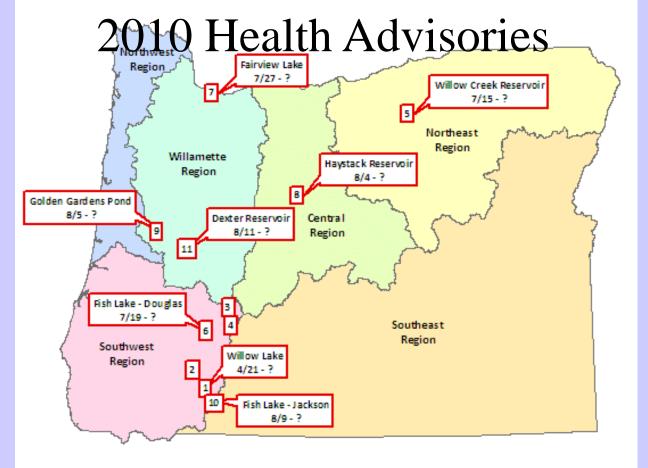


Table 1. 2009 Advisories by waterbody, date and county

#	Waterbody Name	County	Start	End	Duration
1	Hill Creek Reservoir	Lane	5/21	6/16	26 days
2	Lost Creek Lake	Jackson	6/15	6/29	14 days
3	Crane Prairie Reservoir	Deschutes	6/18	7/09	21 days
4	Odell Lake	Klamath	7/22	8/12	21 days
5	Whetstone Pond	Jackson	7/23	9/09	48 days
6	Lemolo Lake	Douglas	7/23	8/18	26 days
7	Hill Creek Reservoir	Lane	7/30	8/31	32 days
8	Devils Lake	Lincoln	7/31	9/08	39 days
9	Crane Prairie Reservoir	Deschutes	7/31	8/12	12 days
10	Wickiup Reservoir	Deschutes	8/12	8/31	19 days
11	Dexter Reservoir	Lane	8/13	9/28	46 days
12	Dorena Reservoir	Lane	8/13	10/23	71 days
13	Paulina Lake	Deschutes	8/27	9/21	25 days
14	Wickiup Reservoir	Deschutes	9/02	9/25	23 days
15	Elk Creek @ Umpqua R.	Douglas	9/04	9/22	18 days
16	Sru Lake	Coos	9/09	11/30	82 days
17	Willow Creek lake	Morrow	9/11	10/19	38 days
18	Tenmile Lake	Coos	9/18	11/30	73 days
19	Haystack Reservoir	Jefferson	9/18	11/02	45 days
20	Lost Creek Lake	Jackson	9/18	10/13	25 days
21	Blue Lake	Multnomah	10/14	11/06	23 days



No.	Waterbody	Region	County	Start Date	End Date	No. of Days
1	Willow Lake	Southwest	Jackson			
2	Lost Cr Lake	Southwest	Jackson			18
3	Lemolo Lake	Southwest	Douglas			32
4	Diamond Lake	Southwest	Douglas			19
5	Willow Creek	Northeast				
	Reservoir		Morrow			
6	Fish Lake	Southwest	Douglas			
7	Fairview Lake	Willamette	Multnomah			
8	Haystack Reservoir	Central	Jefferson			
9	Golden Gardens Pond	Willamette	Lane			
10	Fish Lake	Southwest	Jackson			
11	Dexter Reservoir	Willamette	Lane			

Blue-Green Algae Alert Levels

For Drinking Water:

- Alert Level 1- Increased Vigilance Level (>500 cells/ml of potentially toxigenic species)
- Alert Level 2- Consultation with Health Authorities and Media release (2000 cells/ml of potentially toxigenic species)
- Alert Level 3- assessment by health authorities indicates the water may be unsafe and is unacceptable for supply without treatment to remove toxins. (>15,000cells/ml)

For recreation:

Recreational postings occur when microcystis exceeds 40,000 cells/ml or when species such as anabaena exceed 100,000 cells/ml

Station	Date	Microcystis aeruginosa (cells/ml)	Gloeotrichia echinulata (cells/ml)	Microcystis + Gloeotrichia (cells/ml)	Anabaena flos-aquae (cells/ml)	Anabaena planktonica (cells/ml)	Anabaena circinalis (cells/ml)	Anabaena sp. (cells/ml)	Total Anabaena (cells/ml)
S3	6/22/09	0	0	0	0	501	0	0	501*
S8	6/22/09	0	0	0	0	0	0	0	0
N11	6/22/09	0	0	0	0	0	0	0	0
N16	6/22/09	0	0	0	0	0	0	0	0
S3	7/13/09	0	0	0	0	348	0	0	348
S8	7/13/09	0	0	0	259	677	0	0	936
N11	7/13/09	0	0	0	0	0	0	0	0
N16	7/13/09	0	3,191	3,191**	0	53	0	0	53
S3	7/27/09	0	0	0	353	6,611	0	0	6,964
S8	7/27/09	2,181	0	2,181	0	2,523	0	0	2,523
N11	7/27/09	0	0	0	0	1,667	0	0	1,667
N16	7/27/09	0	0	0	0	2,075	0	0	2,075
S3	8/10/09	3,719	0	3,719	0	5,397	0	0	5,397
S8	8/10/09	1,018	0	1,018	15	2,684	0	0	2,699
N11	8/10/09	0	0	0	0	10,966	0	0	10,966
N16	8/10/09	172	0	172	0	3,536	0	0	3,536
S3	8/25/09	0	0	0	0	1,945	0	0	1,945
S8	8/25/09	3,915	0	3,915	0	514	23	0	537
N11	8/25/09	741	0	741	0	293	0	0	293
N16	8/25/09	1,611	0	1,611	0	941	0	0	941
S3	9/8/09	2,497	0	2,497	0	0	0	0	0
S8	9/8/09	2,689	0	2,689	0	440	0	0	440
N11	9/8/09	1,222	0	1,222	0	50	0	0	50
Х	9/8/09	300,940	0	300,940***	0	605,160	0	0	605,160
N16	9/8/09	2,158	0	2,158	0	610	62	0	672
X	9/15/09	1,104,048	0	1,104,048	0	147,703	0	0	147,703
Z	9/15/09	2,158,388	0	2,158,388	0	2,137	0	0	2,137
S3	9/21/09	12,362	0	12,362	0	260	0	0	260
S8	9/21/09	1,901	0	1,901	0	184	0	0	184
Z	9/21/09	1,008,139	0	1,008,139	0	17,932	0	0	17,932
N11	9/21/09	4,126	0	4,126	0	428	0	0	428
N16	9/21/09	3,479		3,479	0	1,516	87	0	1,603
S3 S8	10/5/09 10/5/09	1,974 1,112	0	1,974 1,112	26	17 24	0	0	19 50
N11	10/5/09	4,507	0	4,507	26	40	0	0	40
N16	10/5/09	4,507	0	4,599	46	147	0	0	193
NLR	10/5/09	2,612,788	0	2,612,788	814	30,527	0	0	31,341
Z1	10/5/09	3,197,474	0	3,197,474	39,783	86,400	56,498	0	182.681
N16	10/20/09	6,797	0	6,797	182	358	0	0	540
NLR	10/20/09	601,663	0	601,663	9,456	5,621	0	0	15,077
Z1	10/20/09	4,664,468	0	4.664.468	770,835	82,308	0	0	853,143
S3	11/12/09	516	0	516	112	32	0	0	144
S8	11/12/09	535	0	535	51	0	0	0	51
N11	11/12/09	199	0	199	13	29	0	0	42
N16	11/12/09	1,377	0	1,377	90	45	0	0	134
INIO	11/12/09	1,377	U	1,377	90	45	U	U	134









Date: September 18, 2009

General questions: Jodi Sherwood, DHS, 503-480-4982

Technical questions: Laura Boswell, 971-673-0438

Tenmile Lake Basin Partnership: 541-759-2414

Public health advisory issued for Tenmile Lake

A health advisory prompted by high algae levels found in Tenmile Lake, 10 miles north of North Bend in Coos County, was issued today by the Oregon Department of Human Services (DHS).

- Water monitoring has confirmed the presence of blue-green algae that can produce toxins harmful to humans and animals, said Laura Boswell, Harmful Algae Bloom Surveillance program coordinator in DHS.
- These algae levels are likely to be associated with dangerous toxin concentrations in the water, according to World Health Organization guidelines. Swallowing or inhaling water droplets should be avoided, as well as skin contact with water by humans or animals. Drinking water from Tenmile
- Lake is especially dangerous. Boswell advised campers and other visitors that toxins cannot be removed by boiling, filtering or treating the water. People who draw in-home water directly from an algae bloom-affected water body are advised to use an alternative water source. If their drinking water supplier draws from an affected water source, they may want to ask if the water has been tested. If the supplier has not tested the water, DHS

recommends using another water source not affected by the bloom.

DHS recommends that people who choose to eat fish from waters where algae blooms are present should remove all fat, skin and organs before cooking since toxins are more likely to collect in these tissues.

(more)

Exposure to toxins can produce symptoms of numbness, tingling and dizziness that can lead to difficulty breathing or heart problems and require immediate medical attention. Symptoms of skin irritation, weakness, diarrhea, nausea, cramps and fainting should also receive medical attention if they persist or worsen. Children and pets are particularly susceptible.

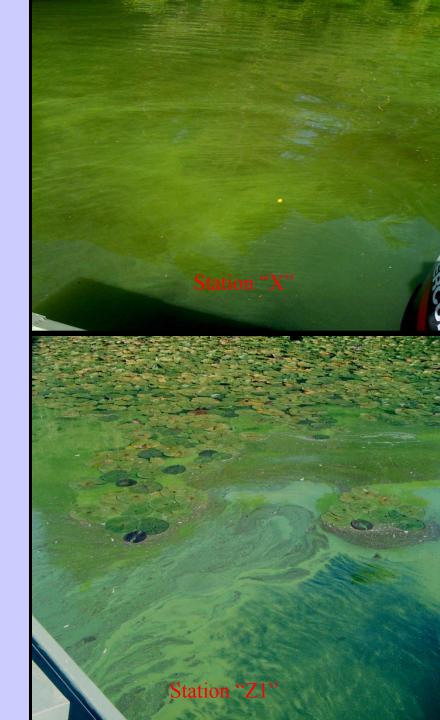
The public will be advised when the concern no longer exists.

With proper precautions to avoid water contact, people are encouraged to visit Tenmile Lake and enjoy activities such as camping, hiking, biking, picnicking, catch-and-release fishing and bird watching. Boating is safe as long as speeds do not create excessive water spray, which could lead to inhalation risk.

For local information contact the Tenmile Lake Basin Partnership, 541-759-2414.

For health information, contact Laura Boswell, Harmful Algae Bloom Surveillance program coordinator, 971-673-0438 or www.oregon.gov/DHS/ph/hab/; also the DHS toll-free information line at 1-877-290-6767, or Coos County Health Department at 541-756-2020.





							Exceedance of
				/			microcystin
							TDI of 0.04
				()			μg/kg/day for a
							20kg (44lb)
				()			child ingesting
		Microcystis +	Total				100 mls ¹ (x
		Gloeotrichia	Anabaena	Microcystin	Anatoxin-a	Saxitoxin	greater than
Station	Date	(cells/ml)	(cells/ml)	(μ <i>g/L</i>)	(µg/L)	(μg/L)	TDI)
X	9/8/2009	300,940	605,160	20.0	nd	nd	2.5
Z	9/15/2009	2,158,388	2,137	2365.0	nt	nt	295.6
Z	9/21/2009	1,008,139	17,932	910.0	nt	nt	113.8
Z 1	10/5/2009	3,197,474	182,681	1410.0	0.6	nt	176.3
Z 1	10/20/2009	4,664,468	853,143	1265.0	2.0	nt	158.1

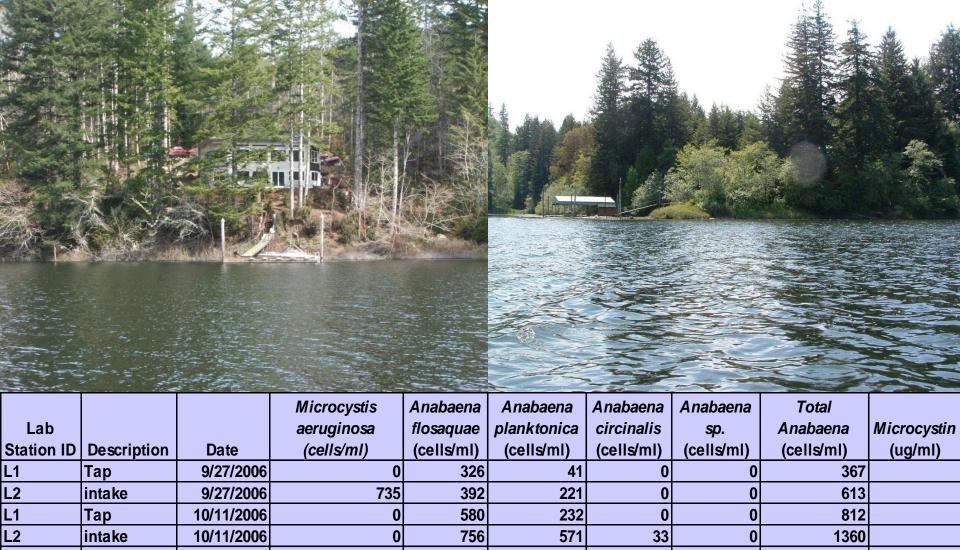
1ug/L – Drinking water advisory 8ug/L – Recreational advisory

Oregon Health Division Drinking water treatment guidance

- 1. Treatment systems should consist of sand filtration followed by chlorination, followed by activated charcoal filtration. It is essential that sand filtration be done before disinfection to remove as many algal cells as possible without killing or rupturing them.
- 2. Chlorination systems should be capable of maintaining at least 1 ppm of chlorine residual for at least 20 minutes contact time before the water enters the activated charcoal system.
- 3. The final step in the process should be effective activated charcoal treatment to remove toxin remaining after the sand filtration and disinfection processes.
- 4. All treatment equipment used should meet NSF standard 53, and should be adequately sized to treat the maximum amount of water that you use. Treatment equipment needs regular monitoring and servicing to assure that it functions properly.
- 5. Ideally all water entering your home should be treated as recommended. It is possible to treat only water used in the kitchen, but this increases chances that animals or pets would inadvertently drink untreated water.

As more monitoring is done and toxin levels are measured this advisory may be altered. The advisory is to remain in effect until specifically changed or lifted by county and state health officials.

Contact Person: Laura Boswell (971) 673-0440



Station ID	Description	Date	(ceiis/mi)	(ceiis/mi)	(ceiis/mi)	(ceiis/mi)	(ceiis/mi)	(celis/mi)	(ug/mi)
L1	Тар	9/27/2006	0	326	41	0	0	367	
L2	intake	9/27/2006	735	392	221	0	0	613	
L1	Тар	10/11/2006	0	580	232	0	0	812	
L2	intake	10/11/2006	0	756	571	33	0	1360	
L1	Тар	8/7/2007	0	0	742	0	0	742	
L2	intake	8/7/2007	323	3839	23517	264	0	27620	
L1	Тар	10/27/2007	0	35	0	0	0	35	non-detect
L2	intake	10/27/2007	4271	0	0	0	0	0	0.7
Dock	Тар	9/26/2009	0	0	0	0	0	0	non-detect

210

1117

0

0

1458

1.8

10561

Dock

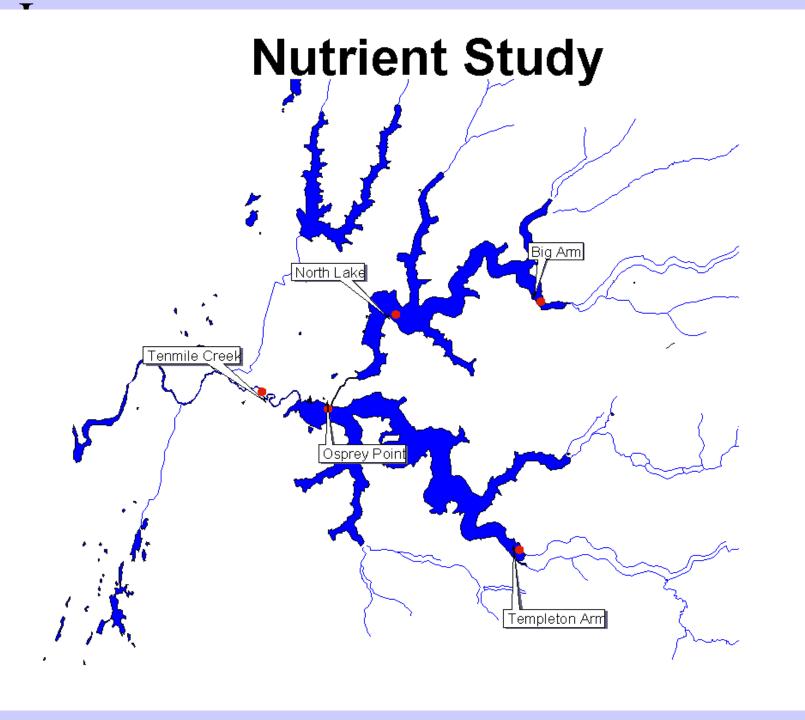
intake

9/26/2009

Alterative water sources



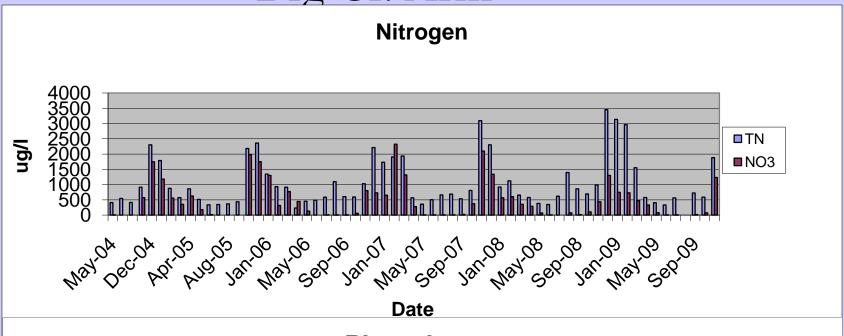




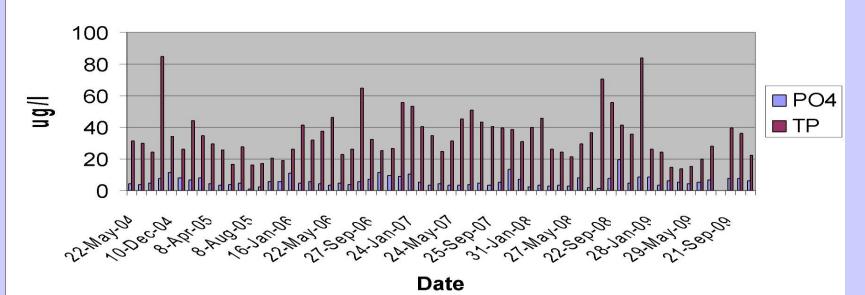




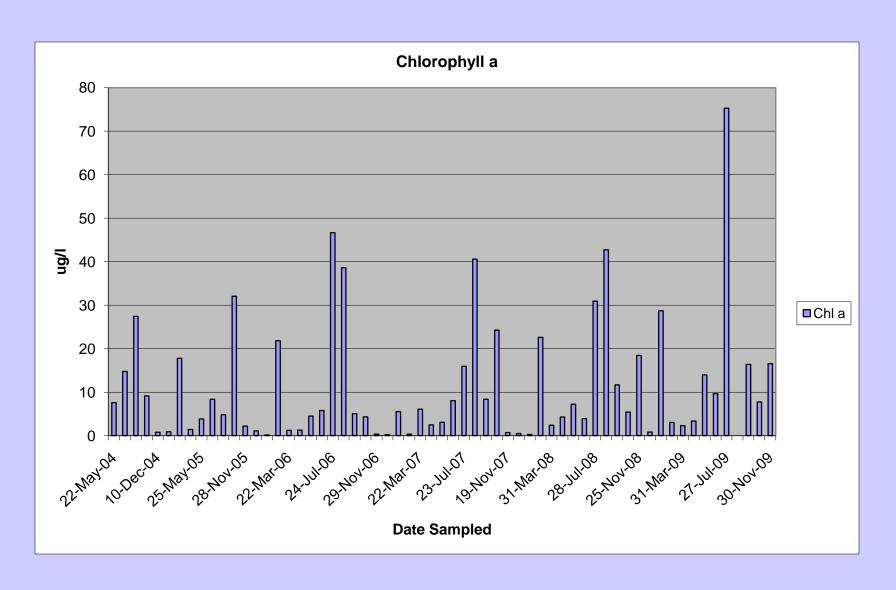
Big Cr. Arm







TEMPLETON ARM



Tenmile Nutrient Summary USEPA Tenmile Lakes (5.5yr avg.) Parameter $NO_2 + NO_3$ 20 (ug/L) 320-510 (ug/L) 190 (ug/L) 785-1091 (ug/L) TN

TP 7.1 (ug/L) 36-44 (ug/L)

Chlorophyll <u>a</u> 2.3 (ug/L) 7-18 (ug/L)

Storm Chasing Blacks Cr Big Cr. North Lake Benson Cr Templeton Arm

Rainfall Triggers

Return Periods for Daily Precipitation

North Bend

2 year Storm Event

Hours: 24 48 72 96 120

Inches: 2.68 4.1 5.15 5.95 6.73

5 year Storm Event

Hours: 24 48 72 96 120

Inches: 3.81 5.51 6.6 7.57 8.41

10 year Storm Event

Hours: 24 48 72 96 120

Inches: 4.87 6.49 7.51 8.57 9.45

25 year Storm Event

Hours: 24 48 72 96 120

Inches: 6.43 7.74 8.59 9.74 10.66







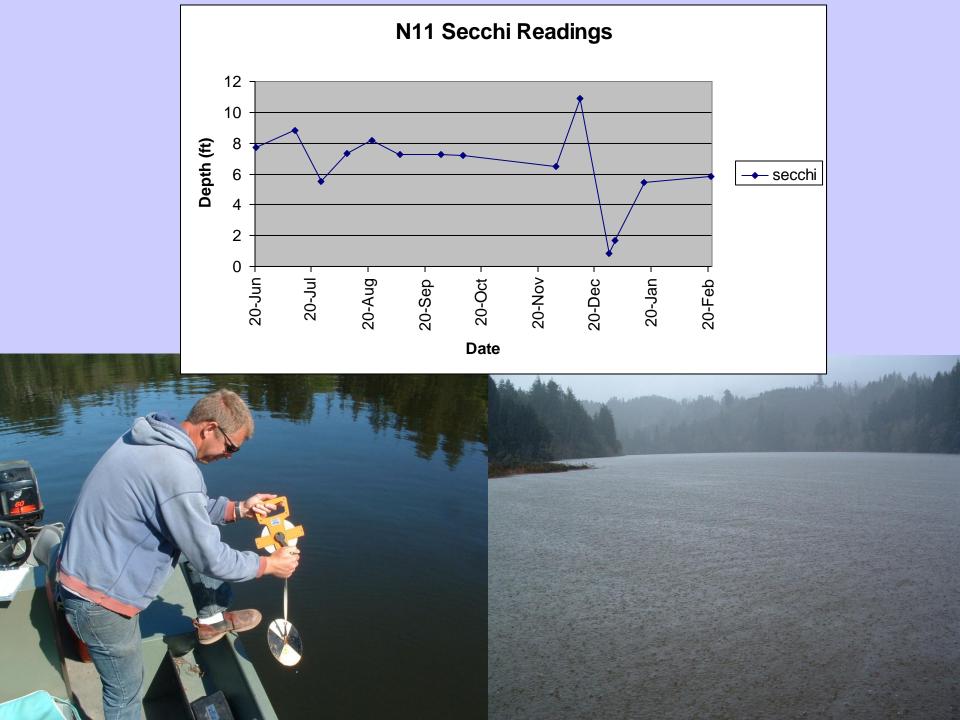
Benson Auto Sampler



Bowron Cr. Auto Sampler



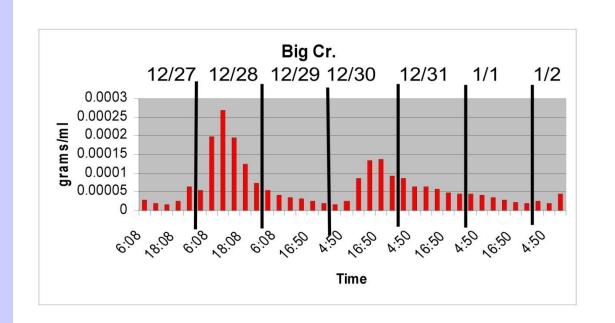


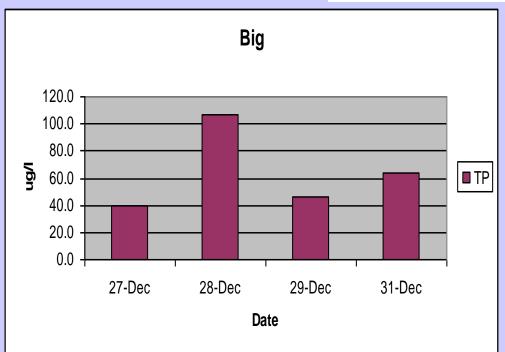


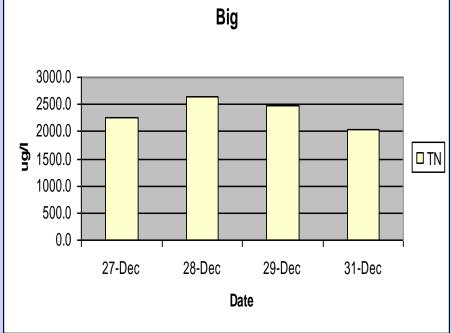
Data

Big Cr.

Avg. TSS- 64 mg/L



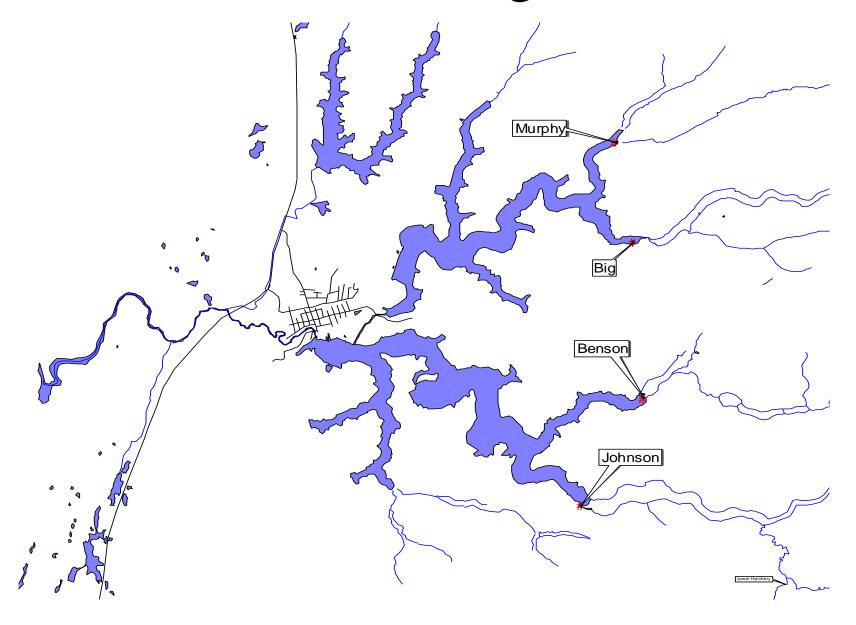




SEDIMENTATION



Delta Building Sites



Benson Cr.



Coleman Arm

2004

- Length- 74' 11"
- 1: Width: 20' 7"
- 2: Width: 10' 2"
- 3: Width: 17' 19"
- 4: no width

Lake Height for

2004 & 2009-

6.43ft

- total delta length-172'2"
- 1: width-38'7" **
- 2: width-43'4"*
- 3: width-39'*
- 4: width-30'6"*
- 5: width-32'1"*

- 6: width-63'4"**
- 7: width-78'2"**
- 8: width-55'7"*
- 9: width-24'9"**
- *Survey gained 7"-1' of sediment on top of survey marks
- ** 3-5" of sediment on top of survey marks

Murphy

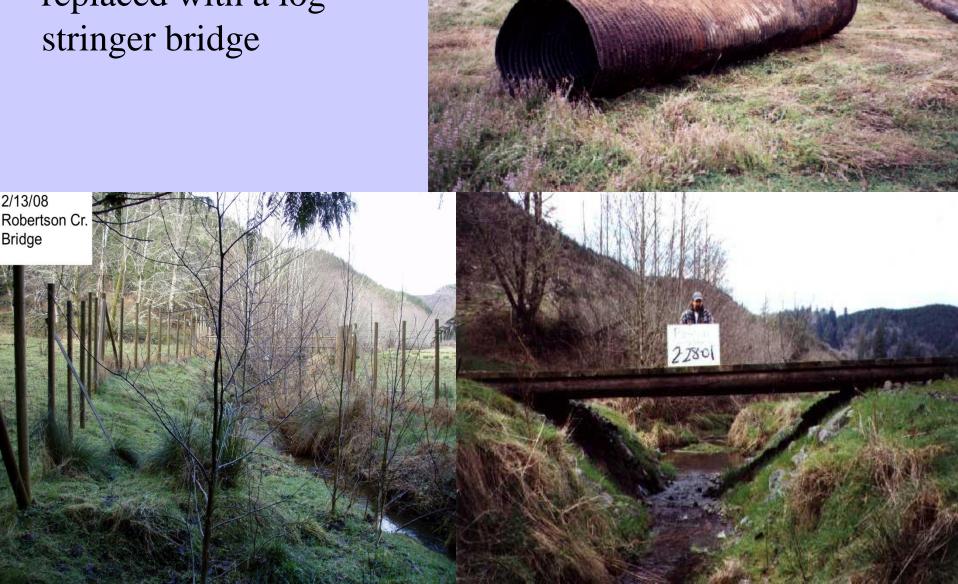




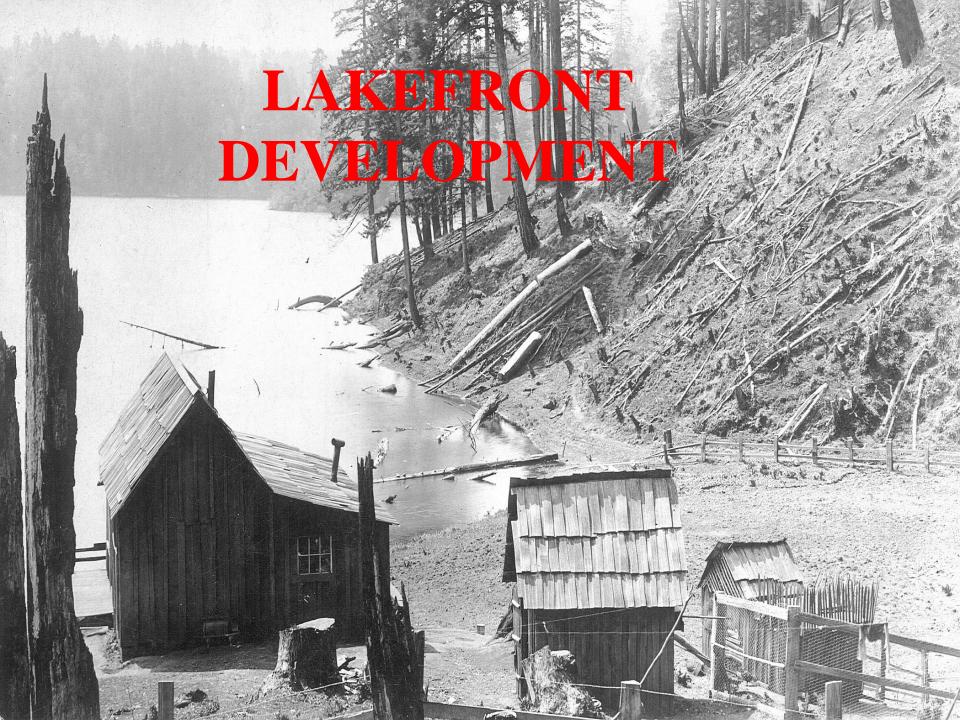
Robertson Cr. Failed Culvert Replacement



Robertson Cr. Culvert replaced with a log stringer bridge





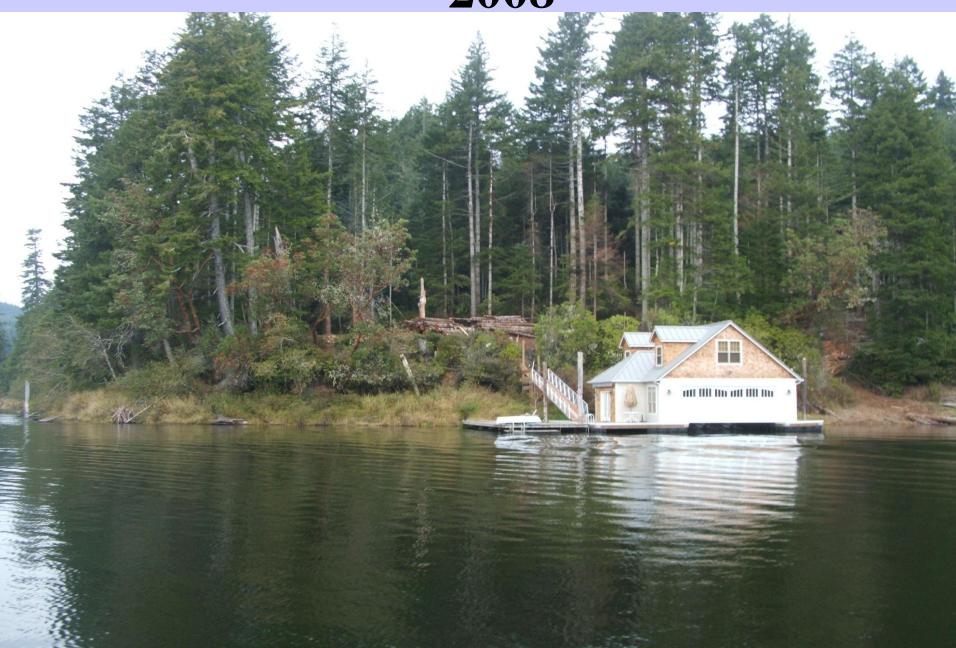














5/7/07





10/29/07





Reducing your impacts to this area will keep your shoreline stable and minimize negative impacts to the lakes. Viewing the lakes from your property often seems to conflict with maintaining



healthy riparian zones. But with help lakefront owners can often find a compromise in planning lakefront landscaping that protects the lakes as well as providing beautiful views. Impacts to these areas below 12.21 msl requires contacting DSL for authorization and falling of trees may require a permit from the Oregon Depart-

ment of Forestry. When developing or improving your property some riparian friendly solutions include: 1) Minimize use of non-native shrubs, 2) Develop a filter strip of native plants above the high water mark. 3) Minimize use of fertilizers and herbicides. For more information and assistance please contact:

Coos Bay ODF 541.269.4136
Department of State Lands 541.378.3805
Tenmile Lakes Basin Partnership 541.759.2414

LAKEFRONT EROSION

Whether building a new three bedroom on Lindross Arm or just adding an out building to an existing home on Big Creek Arm, this is where "lake friendly" planning should begin. The Tenmile

Lakes are filling in with sediment 1000 times faster than before the Tenmile area was settled. Development of lakefront lots are contributing to this problem. With a little common sense and basic understanding of your property, new homes and addi-



tions may be completed with minimal impacts to the lakes while achieving your goals for your lakefront property. Some common "lake friendly" recommendations include: 1) Ensure you have all permits. 2) If not doing the work yourself, hire a qualified contractor familiar with Tenmile issues like steep ground and drainage issues. 3) Have and implement an Erosion Control Plan that includes silt fences and seeding exposed soils with grass mix. For more information and assistance please contact:

Coos Bay ODEQ 541.269.2721 Tenmile Lakes Basin Partnership 541.759.2414 Department of State Lands 541.378.3805

TENMILE LAKES STEWARDSHIP

A

GUIDE

FOR

LAKEFRONT

PROPERTY

OWNERS

We sure are lucky! We own lakefront property along the shorelines of beautiful North and South Tenmile Lakes. With this ownership comes a responsibility to ourselves and other lake users to do what we can to maintain the quality of the lakes.

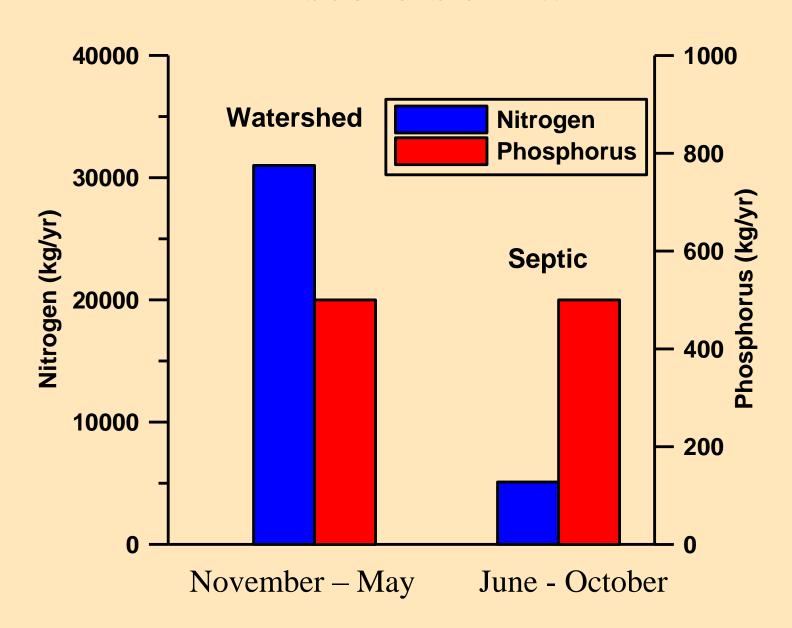
Sometimes this is a tough compromise. For example, clearing shoreline vegetation to increase the view can impact slope stability and damage the filter strip that is important in reducing sediment inputs into the lakes which in turn, affects weed and algae growth.

This brochure is your guide to taking proper care of your lakefront property and the Lakes. It will give you some general information about Tenmile, discuss important issues with owning lakefront property, describe actions that need authorization or permits, and provide specific information that you need to protect our Lakes so we can continue to enjoy them in the future.





LAKE SOURCES OF N & P

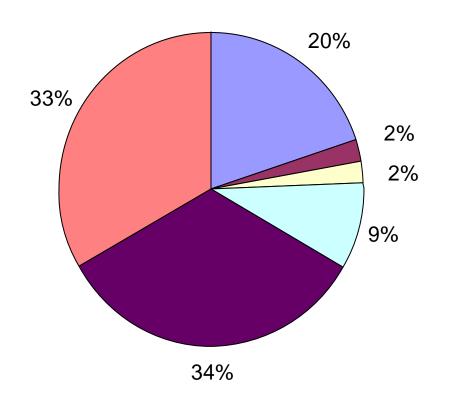


Pre-1974 Septic System Survey

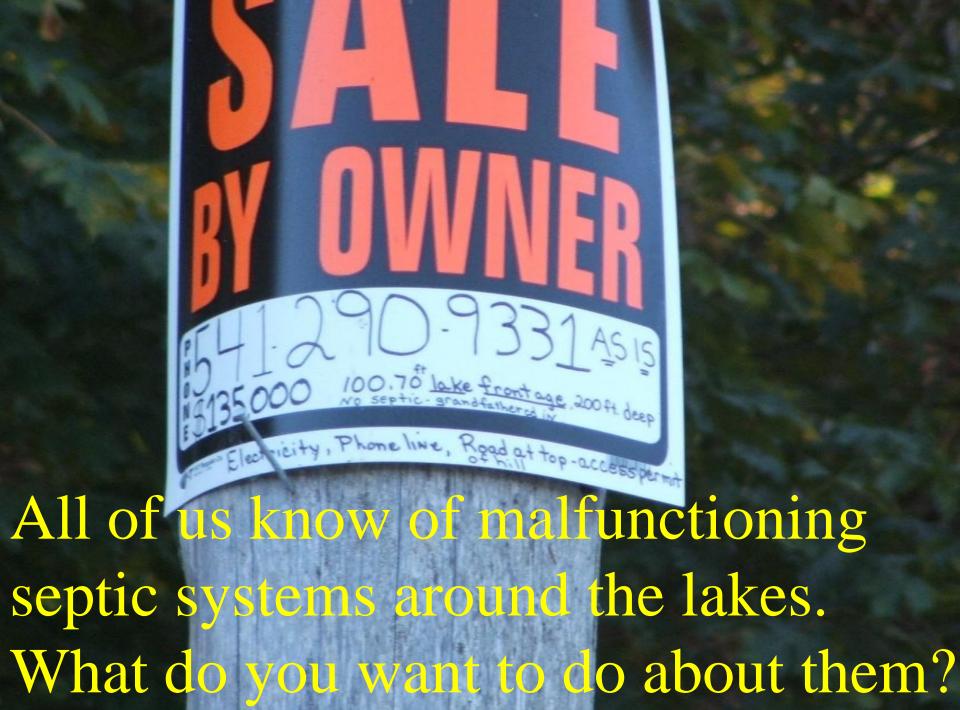
Worked with county health department to inspect 26 lakefront homes in 2006 and 2007.



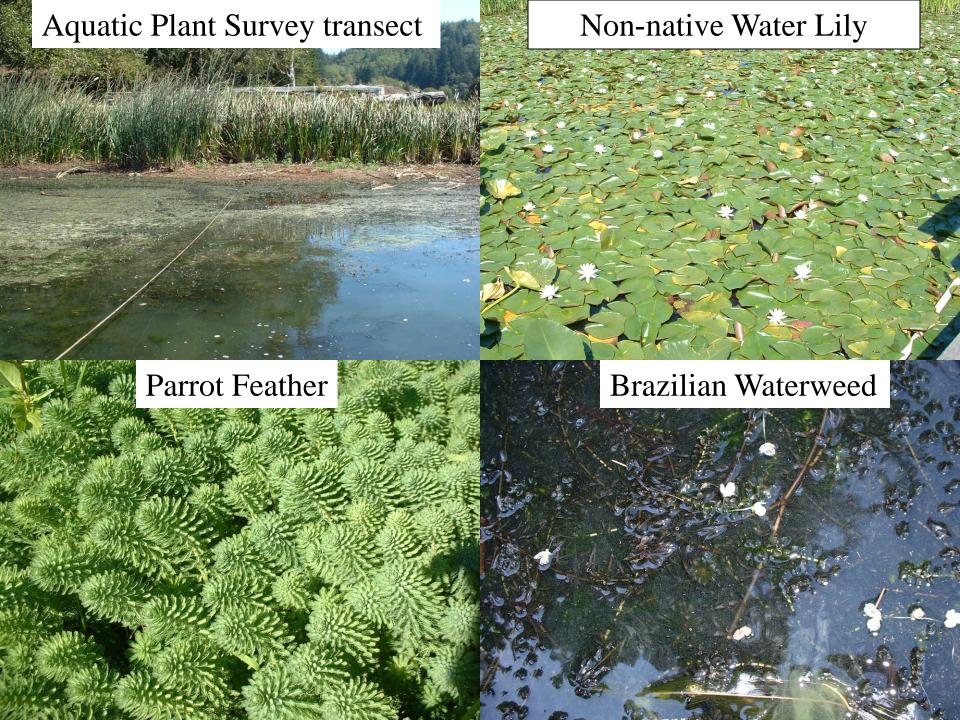
Results of Tenmile Lakes Septic Survey



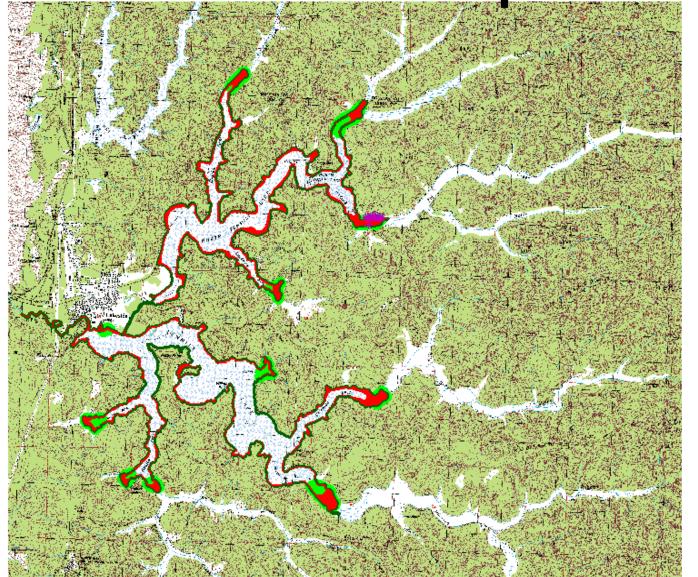
- Apparent properly functioning systems.
- Sites with untreated gray water discharge.
- System failures with evidence of sewage discharge into lake or ground water.
- ☐ Bottomless tanks identified.
- Systems in need of repair (not including gray water).
- Owners with systems in need of repair.

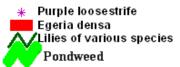






Tenmile Lakes Aquatic Weeds







Tenmile Lakes Watershed

Aquatic Plants



Produced by:

Tenmile Lakes Basin Partnership

Non-native fish

BLUEGILL

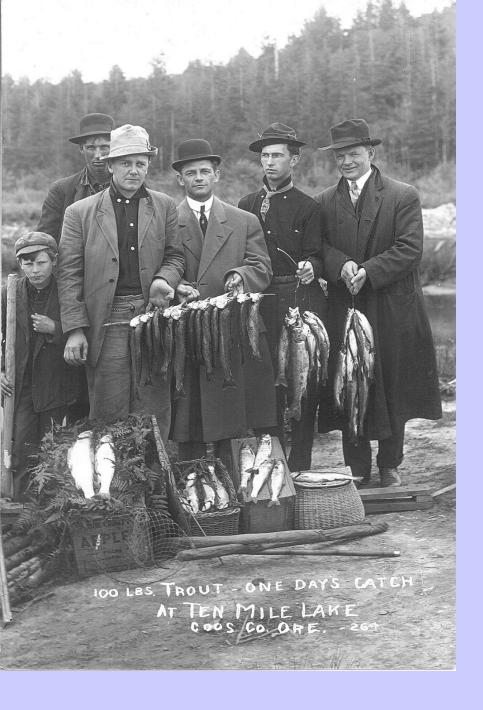


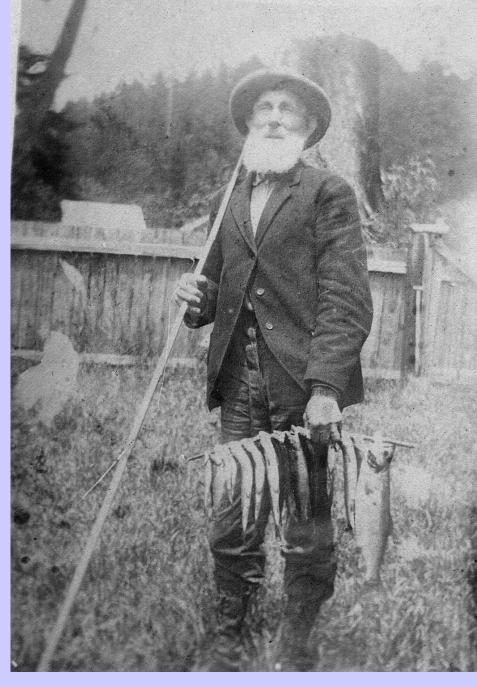
LARGEMOUTH BASS



BLACK CRAPPIE



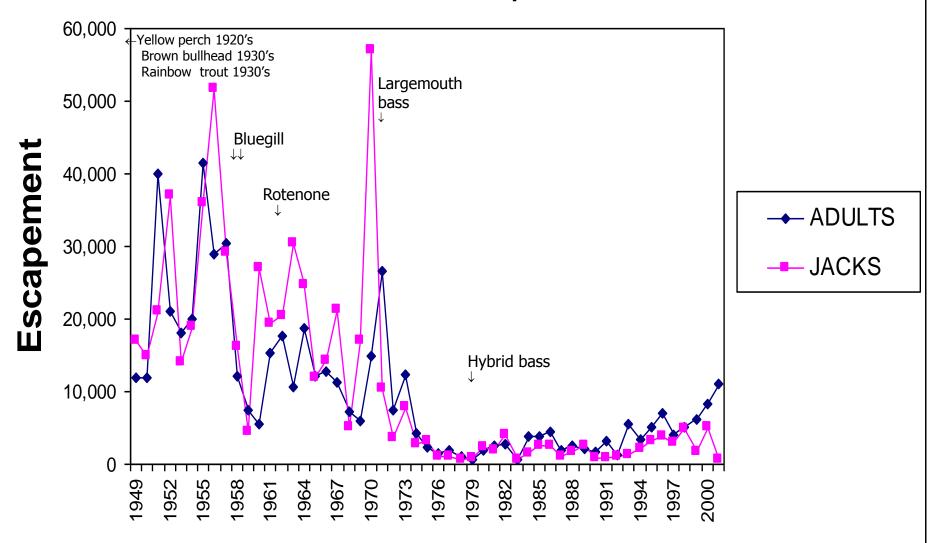






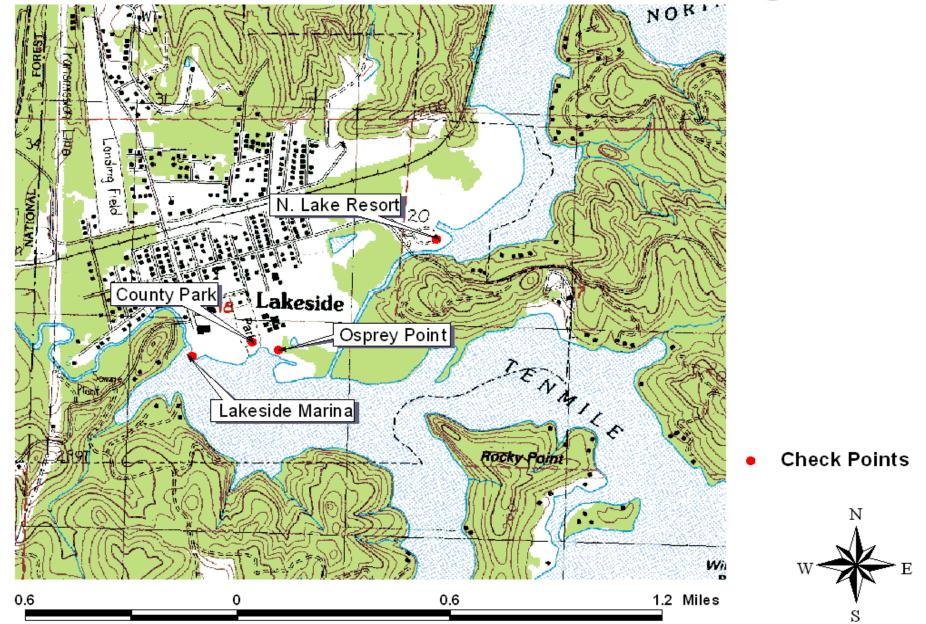


Tenmile Lakes Coho Escapement Estimates





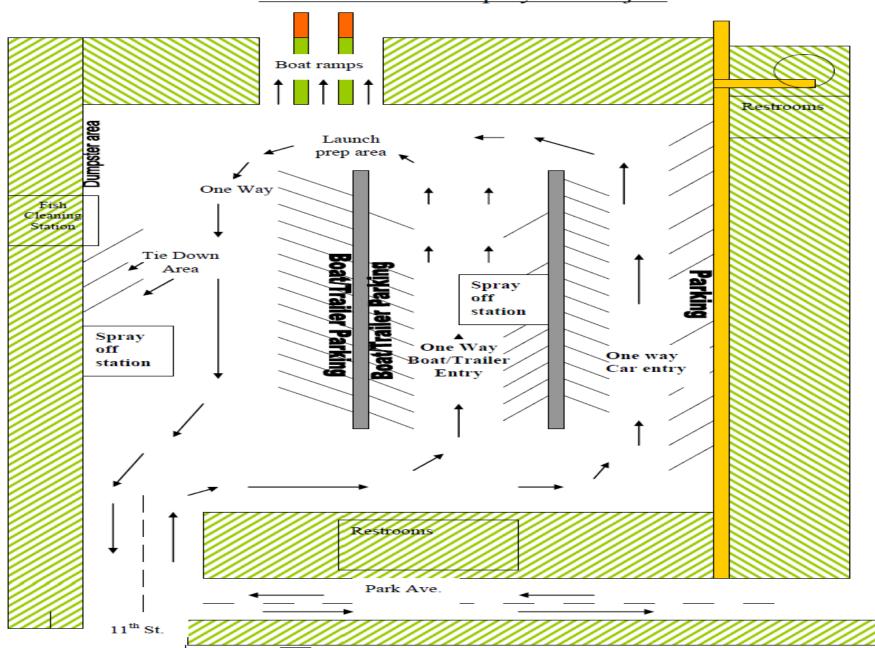
Invasive Species Monitoring







Tenmile Lakes County Park Draft Boat/trailer Spray-off Project



TENMILE LAKES RESORT and MARINA INVASIVE SPECIES BOAT and TRAILER GUEST INSPECTION QUESTIONAIRE #____

RESORT/MARINA:	
RECORDED BY:	
1) ARE YOU TRAVELING WITH A BOAT and TRAILER?: YES	NO
2) WHAT STATE ARE YOU FROM?:	
3) LAST STATE BOAT and TRAILER WERE IN?:	
4) LAST WATERBODY BOAT and TRAILER WERE IN?:	
5) LAST TIME and LOCATION BOAT and TRAILER WERE INSPECTED?:	

- 6) IS BOAT and TRAILER FROM STATE or WATERBODY WITH PRESENT INFESTATIONS?: YES NO (Refer to Map and Literature)
- 7) CONDITION OF BOAT and TRAILER: CLEAN UNCLEAN
- 8) IS BOAT OWNER WILLING TO VOLUNTARY CONDUCT BOAT and TRAILER INSPECTION?: YES NO
- 9) ON CURSORY VISUAL INSPECTION, DOES BOAT and TRAILER LOOK UNCLEAN: (DIRTY FILM, VEGETATION HANGING) YES NO

Taking all aspects of this report into account, If you suspect the presence of QUAGGA or ZEBRA MUSSELLS or invasive aquatic plant species, strongly suggest to Owner that you jointly Inspect boat and trailer.

If you find invasive species, <u>DO NOT ALLOW BOAT TO BE LAUNCHED!</u> CALL FOR ASSISSTANCE.

For Report and Assistance:

Public Reporting Number 1-800-437-2744 (24-7) or

The City of Lakeside at 541-759-2414/541-260-0914

ATTENTION BOATERS



HELP PROTECT EEL LAKE AGAINST POLLUTION

FLUSHING OF MOTORS AND BILGES MAY PUT YOU IN VIOLATION OF STATE LAWS

PLEASE FLUSH BOAT MOTORS AT HOME!

* Aquatic Invasive Species such as the New Zealand Mud snail can live in both brackish waters and fresh water. This species is found in lakes and bays up and down the Oregon Coast. Please help to STOP the spread of these harmful species. CLEAN, DRAIN and DRY your boat away from storm drains, ditches and waterways.

Oregon State Laws and Administrative Rules:

830.560 - It is unlawful to launch a boat that has ANY visible aquatic species on its exterior hull, motor, trailer or any other exterior surface. -Class B Violation-

Launching a boat includes the act of placing a boat into a waterway for recreational boating, for flushing or testing an engine or for any other purpose.

OPRD 736-010-0040 (5) – A person may not dispose of garbage, recyclables, sewage or waste generated by activities conducted outside a park area in a park area. -Class D Violation-

EEL LAKE IS A DRINKING WATER SOURCE, PLEASE DO YOUR PART TO HELP PROTECT THIS WATERBODY

CLEAN BOATS PROTECT CLEAN WATERWAYS



Lakeside Water District Logo OR Parks & Rec. Logo Tenmile Lakes Basin Partnership



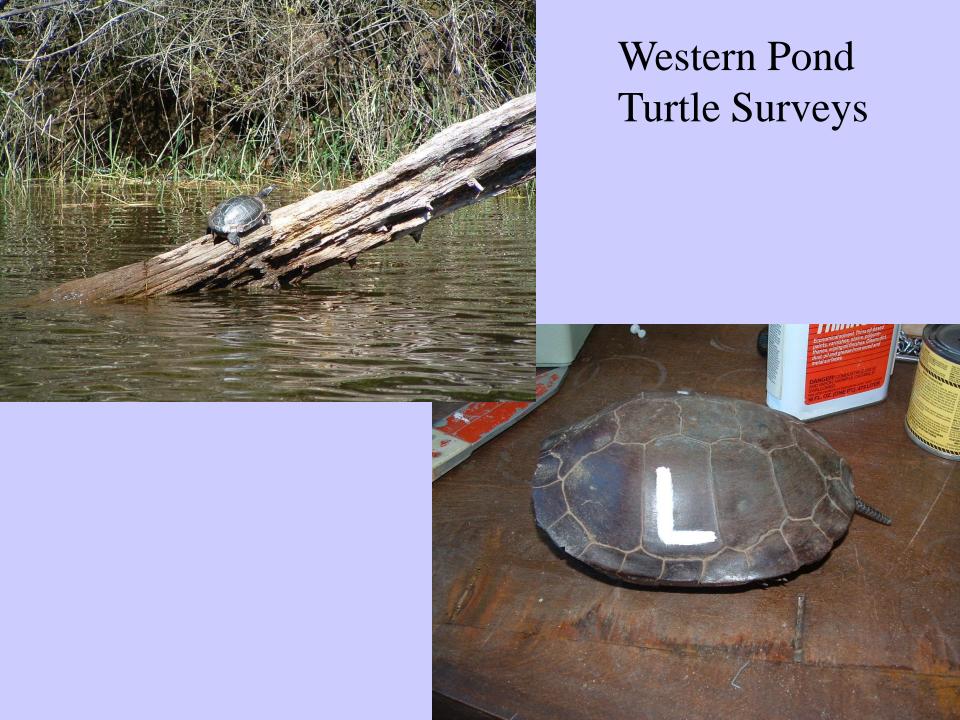




Fry Salvage









Purple Martin Nesting



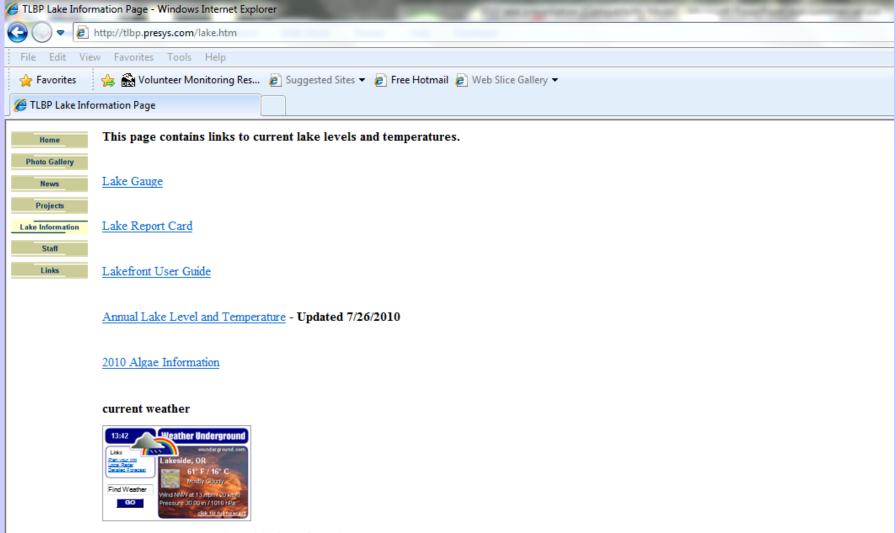












10 Day Temperature and Precipitation Information

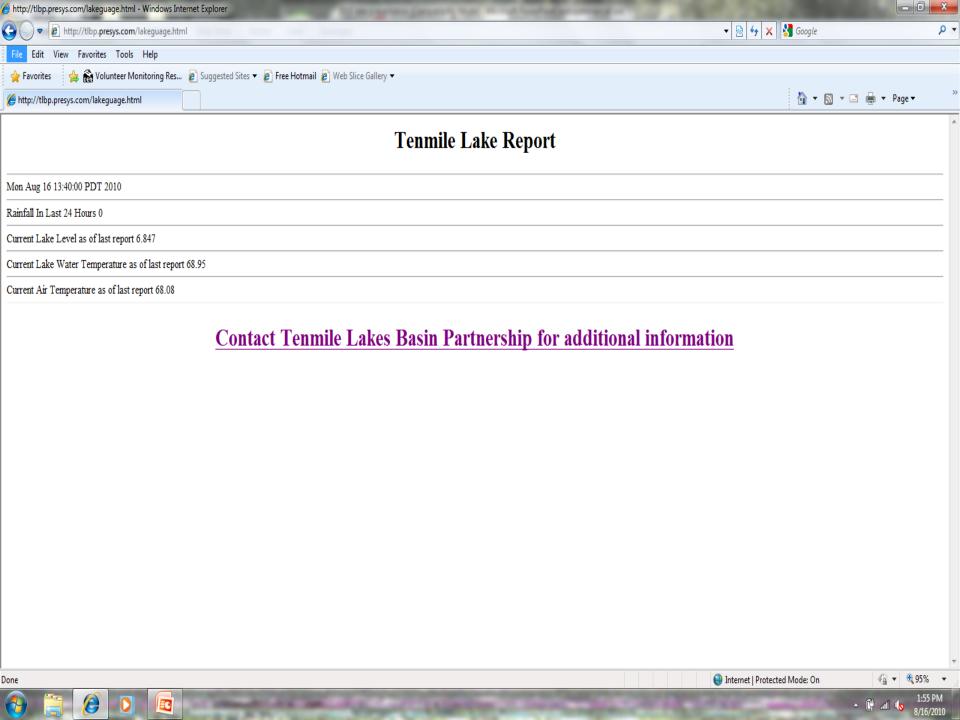
Weather Conditions for North Bend Airport

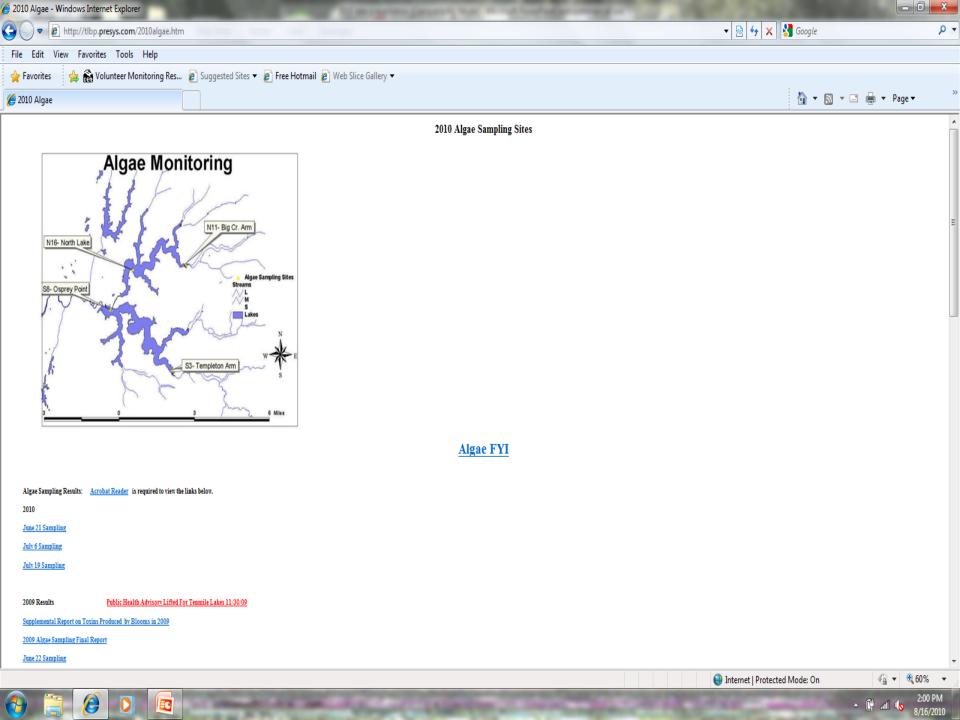
North Bend Airport Current Conditions-same data given in a different format

Weather Observations for the last 3 days

24 Hour Satellite Loop

4





Thank You

City of Lakeside

OWEB

ODEQ

Milo Crumrine

ODFW

Ringo's Lakeside Marina

Preferred Systems

BLM

Dr. Jacob Kann

ODSL

Project Site Landowners

Osprey Point Resort

Lakeside Lions

Eel/Tenmile STEP

Lakeside McKays

Jeff Fletcher

TLOA

North Lake Resort

Zacch Seay

Mike Knips