

Fish Habitat Restoration in Muriel Lake

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PURPOSE

- **Muriel Lake Restoration**
- **Do we have a Problem**
- **Specific Fish and Fish Habitat Facts**
- **Fish Habitat and Management Solutions**

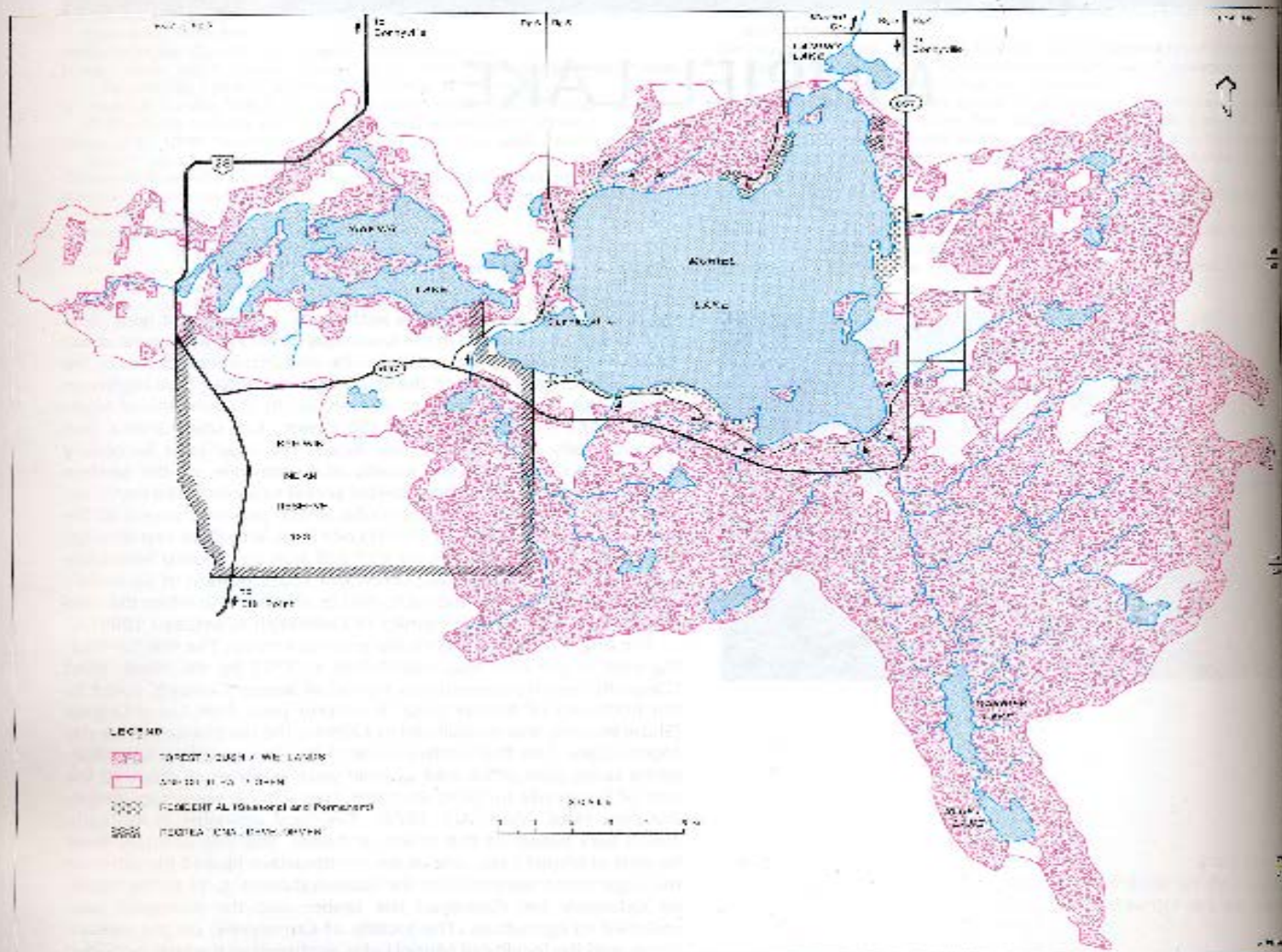


Figure 1. Features of the drainage basin of Muriel Lake.

SOURCES: Alta. Envir. r.d.; En. Mines Resour. Can. 1971, 1975. Updated with 1982 and 1986 aerial photos.

The largest recreational facility on Muriel Lake is Muriel Lake Park, which is operated by the Municipal District of Bonnyville. It is located on the large bay at the northeast end of the lake (Fig. 2). Signs on Secondary Road 667 direct visitors to the area. The park is open from

water is usually moderately transparent. Aquatic vegetation covers an extensive area, particularly along the south and east shore of the lake, but emergent vegetation is not abundant in most areas. Species of sport fish in the lake are northern pike, yellow perch,

Muriel Lake

6800 ha at fsl

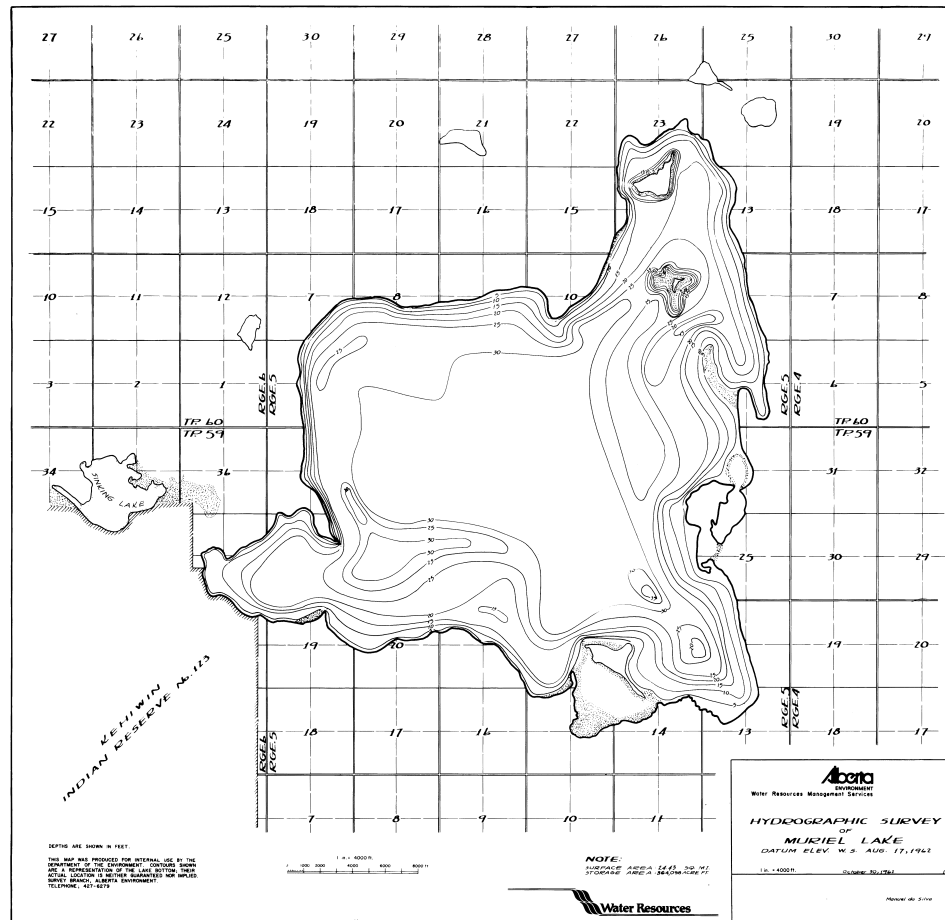
1981 - 559.1m Geodetic Elevation

1993 - 557.8m Geodetic Elevation

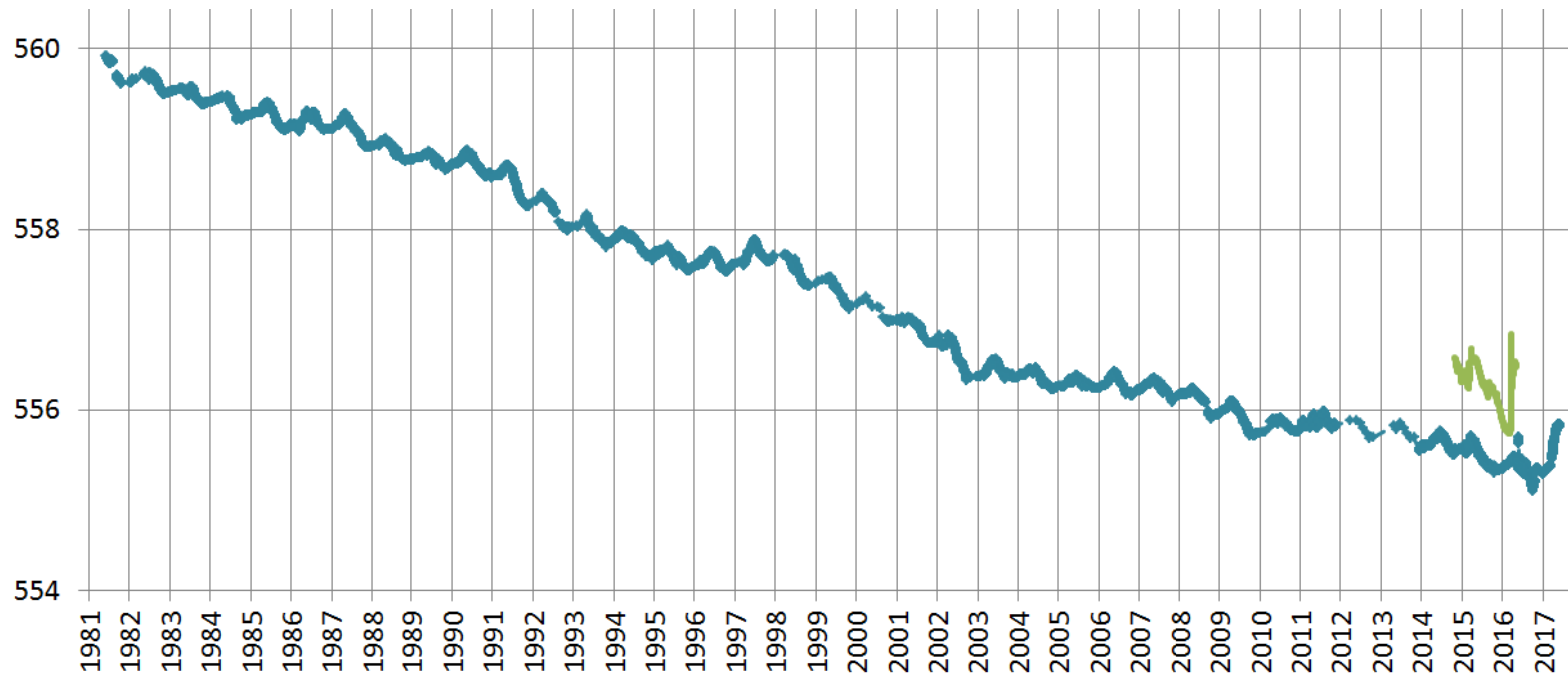
2013 - 555.7m Geodetic Elevation

2018 - 555.8m Geodetic Elevation

Muriel Lake 7m depth 2018

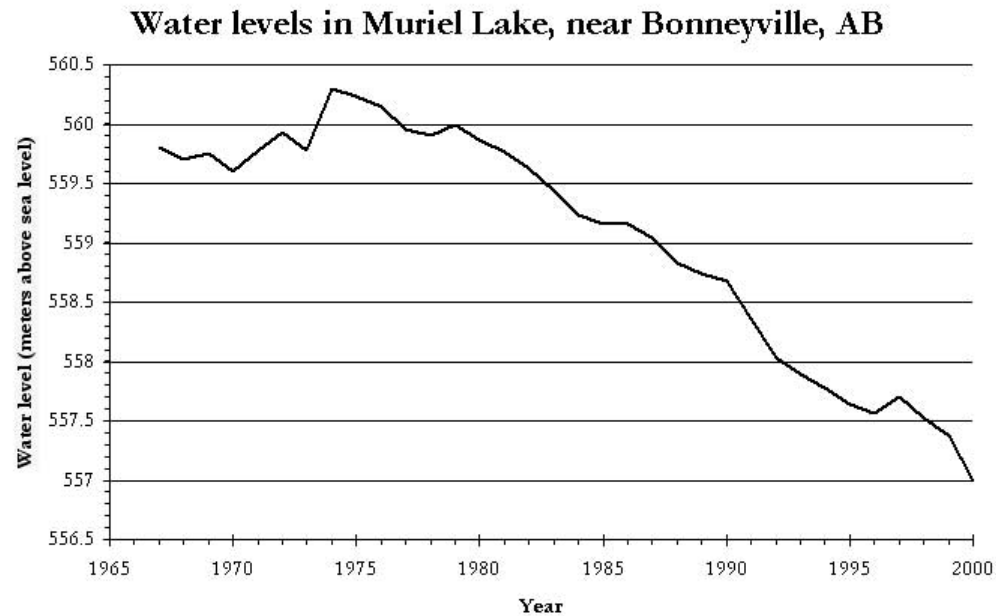


Lake Level



40 Year Trend of Declining Water Level

- Current level
- 555.8m 2018





FACTS & OBSERVATIONS

What is the Problem?

- Many older anglers indicate fishing was very good in the 1960's, 1970's and 1980's when some whitefish, pike, perch and walleye would be caught and used.
- Since 2000 little consumptive use



FACTS & OBSERVATIONS

What is the Problem?

- **For over 20 years, several lakes in the area have had zero limits or very restrictive catch and keep limits.**
- **Many lakes have due to low water levels been unable to support fish including Muriel.**



FACTS & OBSERVATIONS

What is the Problem?

- **Alberta's commercial fishery was closed in 2014. Muriel Lake closed in 1996**
- **Anglers and fish consumers are not satisfied with prohibited consumptive use of Alberta's publicly owned fish resources.**

Annual Production - Muriel

- **Walleye 5848 kg/year (0.86 kg/ha)**
- **Northern Pike 15,368 kg/year (2.26 kg/ha)**
- **Yellow Perch 15,368 kg/year (2.26 kg/ha)**
- **Lake Whitefish 29,920 (4.4 kg/ha)**

Historic Harvest, Stocking and Regulations Muriel Lake

Years	Type of Fishery	WALL	NRPK	YLPR	LKWH	Comments
1967-1976	Commercial	<20kg	<1332	<10	<40,554	kg
1988-1996	Commercial	<223kg	<1930	0	<25,890	Closed 1996
Pre 1998	Recreation	3	10	15	10	Catch limits
1998-2017	Recreation	0	0	0	0	Catch limits











Muriel Lake 2012

- **Government FWIN Testing 11 nets**
- **Longnose Suckers (3) and Cyprinids (126)**
- **No pike, whitefish, perch, burbot or walleye**
- **Need some information here**

Muriel Lake

- **Annual production for pike, lake whitefish and perch has not been harvested for the past 20 years.**
- **Current Government plan is:**
- **Zero harvest on all fish species**
- **Wait for natural recovery????**

Muriel Lake

- **Fish sampling required to determine fish presence and fish status.**
- **GoA FIN data or angler information**

Other Considerations/Factors Users

- 1. Poaching**
- 2. Catch and release mortalities**
- 3. Domestic fishing**
- 4. Commercial fishing**
- 5. Tournament fishing**

Other Considerations/Factors -Users (continued)

**6. Predation-Cormorants and Pelicans Lac
La Biche 10 year cormorant control
program 2003-2013 resulted in**

- 83% decrease from 16,000 to 2,500 birds.**
- 30,444 nests disturbed and**
- 8,143 birds culled**

Cormorant Factor

- **Cormorants consumption 1.5 to 2 pounds of fish per day**
- **Government Program**
- **Individuals - Wildlife Control Permits**
- **Other jurisdictions**

Other Considerations/Factors (Opportunities)

7. Fish Stocking

**8. Fish Habitat Restoration or
Development**

**9. Fish Habitat Protection Always
Number 1 Concern - Muriel, Seibert,
Cache, Stoney, Vincent, Mann Lakes,
Missawawi, Charron, Bonnie etc.**

Fish Habitat Factor

- **Water Levels**
- **More Water=Larger Surface Areas=More Fish Habitat= More Fish**
- **Higher Water Levels Create Increased Fish Production (1974)**

Muriel Lake Restoration Target

- **Maintain water level of >557.8m**
- **Re-establish fish stocks**
- **Aerate during the winter to re-establish fish resources beginning 2018-19**
- **Ensure water quality is suitable for aquatic life**

Muriel Lake Specific Concerns

- **Fish Habitat Restoration**
- **Water levels – need 2.0m increase to 557.8m**
- **Drainage area needs verification**
- **Explore and select options to increase water levels**
- **Water quality – arsenic, selenium, boron**

Muriel Lake Restoration Action Steps

- **Conduct specific assessment of locations that surface drainage could yield the most water**
- **Arrange and implement drainage corrections
(Reita Lake, Garnier Lake etc.)**
- **Avoid the beaverdam drainage as a solution?**
- **Begin lake aeration fall of 2018**
- **Monitor winter dissolved oxygen**

Muriel Lake Restoration Action Steps

- **Create Muriel Lake Restoration Team**
- **Verify objectives to increase water levels, improve water quality and to restore fish habitat and fish resources**
- **Establish funding sources and budget**

Muriel Lake Restoration Team

- **Muriel Lake Basin Management Society (MLBMS) –yes**
- **Zone 5 AFGA, Beaver River F&G, St. Paul F&G; -yes**
- **Municipalities Bonnyville, St. Paul, Cold Lake yes**
- **Alberta Government (AEP)**
- **Lakeland Industry and Community Association (LICA) - yes**

Muriel Lake Restoration Team

- **Alberta Lake Management Society (ALMS) – yes**
- **Indigenous Communities – yes Kehewin**
- **Local Industries such as Pengrowth and CNRL – yes both verbally**
- **Interested Local Citizens from the Agricultural Community – invited**
- **Sporting Goods Stores (Sylvestre Sporting Goods , Warehouse Sports)**

Muriel Lake Restoration Team

- **Alberta Lake Management Society (ALMS)**
- **Key contributor to all the Lake Restoration Projects**
- **Winter work is highly recommended for Muriel Lake and other restoration lakes**

Overall Fish Management

- Many other lakes similar concerns
- Website GoA Survey – limited options
- Public Meetings Calgary, Edmonton, **Lac Bellevue**, Slave Lake, Grande Prairie, Lac La Biche

Fish Caught in Fish Index Netting AEP

Lake/ Surface Area/Year	Walleye # (CUE)	Pike # (CUE)	Perch #	Lake Whitefish #
Garner 776 ha 2013	160 (29.5)	4 (0.7)	75	
Lac Bellevue 461ha 2015	223 (74.3)	2 (0.3)	6	
LacLaBiche 23,652 ha 2016	141 (17.6)	41 (5.2)	16	17
Lawrence Lake 1392 ha 2016	0	594 (31.6)	490	
Pigeon 9732 ha 2015	360 (51.4)	7 (1.0)	1	110
Seibert 3790 ha 2015	214 (26.8)	12 (1.6)	47	62

Pigeon Lake FWIN

Pigeon 9732 ha	Walleye # (CUE)	Pike # (CUE)	Perch #	Lake Whitefish #	Mean TL Wall
2003	197 (42.2)	8	0	47	500
2004	236 (36.2)	12	3	69	476
2005	226 (29.1)	3	0	92	473
2006	332 (49.1)	9	1	63	467
2007	276 (39.6)	6	3	135	443
2008	217 (27.6)	5	2	89	437
2009	223 (26.0)	4	6	183	432
2010	215 (26.7)	6	5	106	450
2011	314 (40.7)	12	21	133	467
2012	343 (34.1)	1	25	203	450
2013	384 (36.8)	5 (0.5)	30	94	464
2015	360 (51.4)	7 (1.0)	1	110	

Walleye-Pike Lakes

- The current ratio of walleye to pike caught in test nets in 21 pike-walleye lakes is 5306 walleye : 865 pike.
- Walleye numbers are currently 6.13 times higher than pike

Walleye-Pike Lakes

- **GoA harvest targets use to be 1 kg walleye: 2.6 kg of pike: 3.0 kg perch:4.4 kg lake whitefish.**

Walleye-Pike Lakes

- **GoA angling regulations on pike harvest numbers and minimum total lengths which were at 3 pike>63cm reduced to 1 pike>63cm to 1 pike >75cm to 1 pike>100cm to zero pike has not been effective**

Solution

- **LOW RISK
CONSUMPTIVE FISH
HARVEST
REGULATIONS!**
- **Ecological Balance**

Fisheries Management Frameworks For Walleye and Pike

- To **establish an ecological balance** of the walleye, pike, perch, lake whitefish and all species.
- To establish the ecological balance based on the established ratio of **annual production** for each species.
- To maintain sustainable harvest of walleye, pike, perch, lake whitefish and all species for all anglers with **simplified regulations**.

Fisheries Management Frameworks For Walleye and Pike

- To utilize **low risk harvest methods** that will sustain the ecological balance.
- To provide simplified regulations that will allow the people to **use the fish as food and at the same time provide economic benefits** to the local communities for continued recreational fishing and tourism.

Fisheries Management Frameworks For Walleye and Pike

- To deploy **supplemental stocking of walleye** in selected lakes that will allow for put and take fisheries similar to those used in Saskatchewan. Increase fish stocking and create supplemental walleye stocking programs in a few selected lakes.
- To develop and **improve fish habitats** in Alberta and in so doing increase fish production and recreational opportunities.

Fisheries Management Frameworks For Walleye and Pike

- To revise the Alberta Sportfishing Regulations to: **Harvest More Walleye**
- “Harvesting **one walleye daily limit of slot-sized** between 40cm and 50cm total length with a specified concurrent season (all lakes in the same week or days). A **shorter concurrent season for the smaller-sized lakes** (less than 1000 hectares surface area) could also be a consideration. Catch and release fishing would remain unchanged”

Fisheries Management Frameworks For Walleye and Pike

- To revise the Alberta Sportfishing Regulations for pike catch limits in the **walleye-pike lakes at one pike daily slot size** of 55cm-65cm.
- To revise the Alberta Sportfishing Regulations for pike catch limits in all **pike-perch lakes to a 2 pike daily slot size of 55cm-65cm or a 2 pike limit any size** for these lakes.

Fisheries Management Frameworks For Walleye and Pike

- To revise the fish status monitoring program that will **reduce the mortalities on the fish**. Utilize methods and opportunities that will be indicators of the fish population status in specific watercourses and lakes.
- The **Alberta Fish Sustainability Index** which indicates risk to walleye and pike populations based upon Catch per Unit (CUE) measures used in the FWIN/FIN needs to be re-assessed.

Recommended direction

- **Allow anglers to harvest walleye**
- **Reduce walleye numbers to create ecological balance**
- **Continue to harvest some pike with low risk harvesting regulations**

Solution

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CONSUMPTIVE FISH
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- **Ecological Balance**



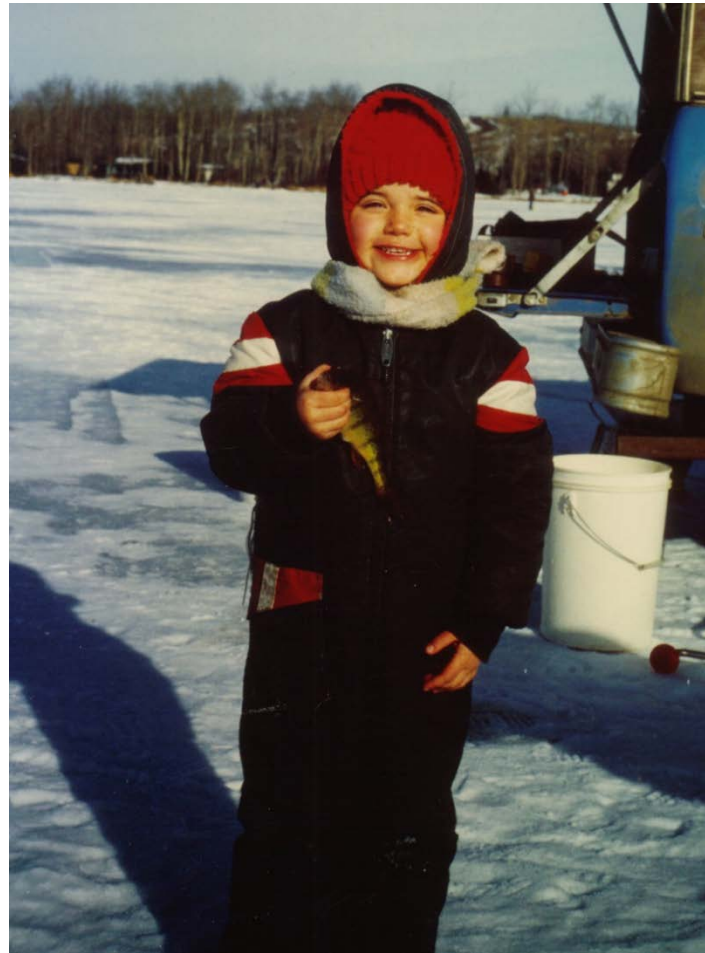




Alberta Fisheries Management Regulatory Preference Options - January 2018

- **Voice your views**
- **Continue to speak out**

Thank you



Alberta Fisheries Management Regulatory Preference Options

Options for Walleye	Preference (#1 highest)
Catch and Release only for walleye	
Special Draw for Tags for walleye	
One walleye daily limit slot size and season adjustment for small lakes	
Two-Three walleye daily limit minimum size for large lakes	

Alberta Fisheries Management

Regulatory Preference Options

Options for Pike	Preference (#1 highest)
Catch and Release only for pike	
Special Draw for Tags for pike	
One pike daily limit slot size for walleye-pike lakes	
Two pike daily limit slot size or any size for pike-perch lakes	

Alberta Fisheries Management Regulatory Preference Options

- **Name**
- **Email Address Optional:**
- **Telephone Number Optional:**
- **Return completed preferences to
ray@enviromak.com**

- **Thank you**

2017 Current Lakes with Draw for Tags

- Baptiste 33.0 -2016; Bourque 23.8 -2016;
- Elinor 24.2 -2015; Fawcett 13.8 -2013;
- Garner 29.5 -2014; Gull 14.1 -2014;
- Hilda 17.6 -2012; Iosegun 27.3 -2016;
- Lac Bellevue 74.3 -2015; LLBiche 17.6 -2016;
- Lac Ste Anne 38.7 -2016; Long 25.2 -2013;
- Newell 15.0 -2013; Pinehurst 20.2 -2014;
- Pigeon 51.4 -2015; Smoke 16.5 -2016;
- Whitefish 23.6 -2016; Wolf 17.3 -2014

Inconsistency in Tag Allocation

- **Lac Bellevue was assigned 5.4 walleye/ha Class B tags in 2017. CUE 74.3 in 2015.**
- **Pigeon Lake was assigned 0.48 walleye/ha Class B tags and 1.6 walleye/ha all three classes in 2017 CUE 51.4 in 2015.**
- **Lac La Biche was assigned 0.08 walleye/ha Class A tags in 2017. CUE 17.6 in 2016 and 28.8 in 2015.**

Total Walleye Tag Numbers

- **In 2017 number of lakes with tags increased but number of permits declined**
- **In 2017 18 lakes with 16,522 permits are available. The 5 new lakes have added 3806 permits (23%). However in 2016, 13 lakes with 20,385 permits were available.**
- **Pigeon Lake has 5531 permits (33.5%) available with 3239 Class C size of fish.**





Other Fisheries Management Methods & Regulations (2016)

- Saskatchewan (4 walleye with 1 >55cm; 5 pike with 1 >75cm; 25 perch)
- Manitoba (6 walleye 1 >55cm; 4 pike with 1 >75cm; 25 perch)
- Ontario (4 walleye with 1 >46cm; 6 pike with 2 >61cm; 100 perch)
- NWT (3 walleye; 5 pike)
- Yukon (4 pike with 0 >75cm)
- USA 5 northern states (5-6 walleye; 3 pike; 30 perch)
- Alberta (0 to 3 walleye with tags and with minimum size; pike 0-3 with minimum sizes from 63cm to 75cm to 100cm; perch 5 to 15)

Other Considerations/Factors -Users (continued)

**6. Predation-Cormorants and Pelicans Lac
La Biche 10 year cormorant control
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- 83% decrease from 16,000 to 2,500 birds.**
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- 8,143 birds culled**

Too Many Anglers?

- **Less anglers and more people in Alberta**
- ***In 2015-16 increase in resident angler licences to 303,212 (which is still 12.3% decrease from 1986-87)***
- ***Alberta population has increased from 2.4 million in 1980-81 to 4.25 million in 2015-16; 78% increase”***

5. Solution

- **LOW RISK
CONSUMPTIVE FISH
HARVEST
REGULATIONS!**

Conclusions

- **This is not a political issue. The people simply want to use their fish in a manner that sustains the use for future generations.**

Conclusions

- **The proposed solutions are intended to allow for all the fish species in these lakes to be maintained in a balanced way.**

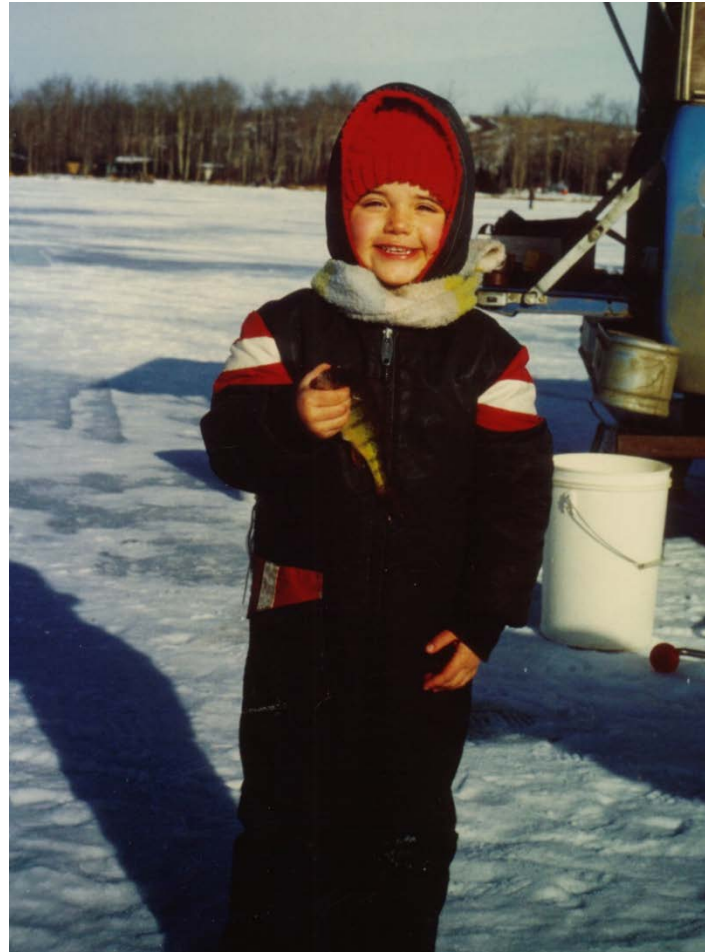
Conclusions

- **Abundant walleye populations in these lakes have reduced pike, perch and forage fish populations and in some lakes the walleye are showing signs of starvation.**

Conclusions

- **We believe that the simplified changes will enhance the overall fish populations and allow people to use the fish as food and at the same time provide economic benefits to the local communities for continued recreational fishing and tourism.**

Thank you - Questions



1981



5. Moose Lake

- 4053 ha (4050 kg)
- Currently 1>50cm catch limit
- 4050 – 1.0 kg walleye
- FWIN Data – collapsed or vulnerable
 - 2014 (152 wall, 14.4 CUE, 79 pike, 107 perch)
 - 2011 (329 wall, 13.2 CUE, 123 pike, 1107 perch)
 - 2008 (302 wall, 15.6 CUE, 126 pike, 919 perch)
 - 2005 (307 wall, 17.1 CUE, 170 pike, 194 perch)
 - 2000 (296 wall, 15.7 CUE, 200 pike, 195 perch)

Moose Lake

1 walleye>50-1 pike>63

Lake/ Surface Area/Year	WALL (CUE)	NRPK	YLPR	LKWH	Total Fish	Mean TL mm Walleye
Moose 4053 ha						
2000	296 (15.7) (19.9)	200	195	31		450
2005	307 (17.1) (18.5)	170	194	14		483
2008	302 (15.6) (19.8)	126	919	7		460
2011	329 (13.2) (19.4)	123	1107	12		419
2014	152 (14.4)	79	107	5		451

7. Seibert Lake

- 3679 ha (3600 kg)
- Currently 1 Walleye >50cm and 1 pike >100cm
- 3600 – 1.0kg walleye
- FWIN Data - collapsed
 - 2010 (232 Wall, 12.3 CUE, 44 pike, 493 perch)
 - 2006 (260 wall, 10.2 CUE, 31 pike, 283 perch)
 - 2000 (240 Wall, 5.4 CUE, 104 pike, 58 perch)
- Traditionally smaller-sized abundant walleye

Seibert Lake

1 walleye >50; 1 pike >100

Lake/ Surface Area/Year	WALL (CUE)	NRPK	YLPR	LKWH	Total Fish	Mean TL mm Walleye
Seibert 3790 ha						
2000	242 (10.1) (10.1)	104	58	263		384
2006	260 (14.8) (14.8)	30	282	11		388
2010	232 (12.3) (15.0)	44	493	122		412

8. Winefred Lake

- **12619 ha (12600 kg)**
- **Currently 0 walleye, 1 pike <70 cm and 1 pike >100cm**
- **12600 1.0kg walleye**
- **FWIN Data - collapsed**
 - **2011 (236 wall, 11.9 CUE, 90 pike, 457 perch)**
 - **2007 (385 Wall, 12.2 CUE, 110 pike, 1551 perch)**
 - **2004 (273 Wall, 10.2 CUE, 78 pike, 76 perch)**

Winefred Lake

0 walleye - 2 pike (1 under 70 & 1 over 100)

Lake/ Surface Area/Year	WALL (CUE)	NRPK	YLPR	LKWH	Total Fish	Mean TL mm Walleye
Winefred 12619ha						
2004	273 (10.2) (11.0)	78	76	419+37 9		562
2007	385 (12.2)	110	1551	489		516
2011	236 (11.9)	90	457	227		462