Fish Passage at Round Lake Weir Update 8-12-23

Roles

- **USDA USFS**: Owns the actual dam structure (sheet piling). Responsible for operation and maintenance of that structure. Follows federal and DNR regulations pertaining to dams. Any modifications by dam owner must be approved by DNR.
- **WDNR**: Regulates all waters of the state. All navigable waters are held in trust by the state of Wisconsin. The DNR is charged with the duty to protect and regulate our navigable waters including the fish and wildlife within those waters. Comparison must be made between existing ecological, aesthetic, economic, and recreational values versus these values after dam modifications. The WDNR makes this decision.

Stakeholders: Anyone who has an interest in the Pike Lake Chain. Helps inform the decision.

- Lake Association
- Cabin Owners
- Fishermen
- Tribes
- Hunters
- Out of state tourists
- Kayakers
- Hikers
- List can go on

Dam Ownership

Dams are owned by many entities across the state.

Detailed Information for Dam Round Lake

Dam Key Seq No		1435	Field File No	50.03
Size	SMALL		NID	10456
Popular Name	Pike Lake		Former Name	
Location				
County	Price			
Latitude	45.925594		Longitude	-90.080489
Permitted TRS				
QQQ:SW QQ:SW Q:SW - Sec:23 T:40N R:03E				
Contacts				
Owner	U.S. Department of Agriculture		Contact	
Waterbody				
Drainage Basin (sq mi)		97.00		
Stream			**Impoundment**	
Local Name	SOUTH FORK FLAMBEAU		Local Name	ROUND,PIKE,TURNER,AMIK LAKES
Row and Official Name			Row and Official Name	
Navigable?	not determined		Size (acres)	1,868.00
When was navigability determined?			Maximum Depth (ft)	24.00
Regulatory/Inspection				
NR 333 Years	EAP: IOM: HYD: STAB: ZONE:			
Auth. Approval Desc	G31.27/C272		Regulatory Agency	WIDNR
Hazard Rating	None		Estimated Hazard Rating	Low
Ferc. No			Exempt Issue Date	
Ferc. Inspection Year			License Expiration Year	
Construction Characteristics				
Normal Storage (acre-ft)		3,736.00	Max Storage (acre-ft)	14,500.00
Structural Height (ft)		4.00	Hydraulic Height (ft)	2.00
Crest Length (ft)		54.00	Spillway Type	Uncontrolled
Discharge Through Principal Spillway (cfs)		3,000.00	Width/Diameter of Principal Spillway (ft)	40.00
Total Discharge Through All Spillways (cfs)		3,000.00	Total Width/Diameter of All Spillways (ft)	40.00
Core Type	None		Position	None
Foundation Type	None		Foundation Certainty	
Purposes	Recreation		Structural Types	Rockfill
	None			Earth
	None			Arch

USFS Wilson Flowage

USFS Mondeaux Flowage

County

Price County-Phillips Chain

Utility

Xcel Energy Chippewa Flowage

Current Status of the Fish Passage Project

- ON HOLD-no actions scheduled at this time. Funding being explored.
- Most preliminary data collection already completed from 2015-2019.
- Needs a published proposed action, finalized NEPA (National Environmental Policy Act) documentation including public comment period before anything is constructed.
- Needs funding, finalized engineering plans, contractor, WDNR permits.

Project Name	Project Purpose	Planning Status	Decision	Expected Implementation	Project Contact
Chequamegon / Nicolet National Forest one District)	**Medford-Park Falls Ranger District (excluding Projects occurring in more than**				**R9 - Eastern Region**
Round Lake Fish Passage and Water Level Control CE	- Watershed management	On Hold	N/A	N/A	Matthew Monahan 715-762-2461 Ext. 5125 matthew.monahan@usda.gov
	Description: **On hold until water modelling/engineering plans are complete** The project will consist of reestablishing a two-way fish passage and reconnect the ecosystems of the Pike Lake Chain of Lakes and the South Fork Flambeau Rive **Web Link:** http://www.fs.usda.gov/project/?project=55358				
	Location: UNIT - Medford-Park Falls Ranger District. STATE - Wisconsin. COUNTY - Price. LEGAL - Not Applicable. T40N, R3E, Sections 23-26, Price County, WI.				

Fisheries Habitat Management

Standard:

Maintain a minimum of 80% shrub or tree shade (where present) around ground water seeps within cool and cold water systems.

Guidelines:

- Manage riparian areas so that they contribute large woody debris (LWD) to lakes, ponds, rivers, and streams. LWD characteristics include: (1) At least 10 to 30 pieces per 1,000 feet of shoreline adjacent to uplands, and at least 5 to 20 pieces per 1,000 feet of shoreline adjacent to forested lowlands; (2) Most pieces greater than 12 inches in diameter and some resistant to decay; (3) Many pieces in lakes with strong branches on the boles which hold part of the wood off the bottom; (4) LWD length should be at least 50 to 120 feet long in lakes and wide streams, or a length that is 1 to 2 times bankfull width in narrow-medium width streams (i.e. less than 50 ft wide).
- Restore or enhance habitat complexity in lake habitat manipulation projects by using a variety of wooden cover structures (e.g., fish cribs, tree-drops and half-logs) and rock reef placements.
- Simulate a natural appearance in aquatic habitat improvement tree drops by having variable distances between them. Stumps should either be flush cut or angled away from the lake, river, or stream. Bury tree drop holding attachments where possible.
- Reshape the bank and smooth contours when revegetating exposed streambanks. Partially cover stabilization structures with transplanted native vegetation and revegetate with native species suited for site stabilization. Vary the rock size and

utilize native rock for riprap and within water rock structures. Maintain natural lake edges and stream meanders when making shoreline and within stream improvements.

- Design, construct, and maintain stream crossings and dams to minimize disrupting the migration or movement of fish and other aquatic life. Passage may be blocked for a prescribed fish management procedure or if passage is deemed unnecessary.
- Do not remove in-stream large woody debris for more than one-half the stream channel width when removal is necessary for recreational boating or canoeing.

CNNF Forest Plan Direction

- The Plan establishes direction to conserve habitat capable of supporting viable populations of existing native and desired non-native species.
- Provide ecologically healthy streams, riparian areas, lakes and wetlands.
- Conserve or restore populations of endangered, threatened and sensitive species. Lake Sturgeon is classified as a sensitive species.
- Design, construct and maintain stream crossings and dams to minimize disrupting the migration or movement of fish and other aquatic life.

DNR Fisheries Plan Direction

Fishery Management Plan

Pike Lake Chain of Lakes, Price County, Wisconsin

January 2015

Prepared by:

Jeff Scheirer, Fisheries Biologist at Park Falls
Wisconsin Department of Natural Resources

and

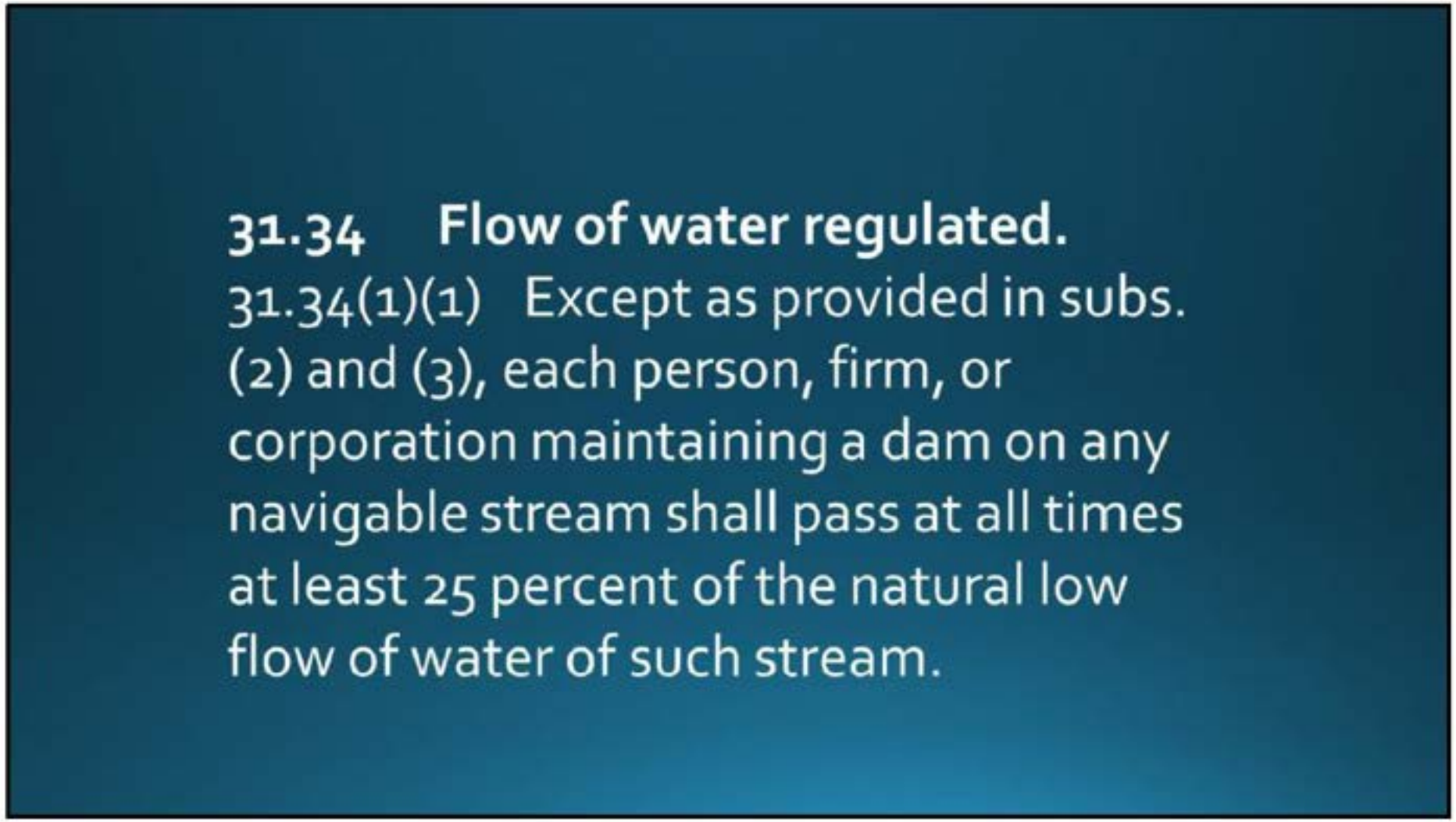
Dave Neuswanger, Fisheries Team Leader, Retired
Hayward Field Unit
Wisconsin Department of Natural Resources

Finally, a restoration strategy aimed at reconnecting the lake and river ecosystems should mimic natural conditions, restore the historic distribution of native fish and freshwater mussel populations, and promote balanced predator-prey interactions. Since 1876, the Round Lake Dam in various designs and states of repair has largely fragmented physical habitat, segregated plant and animal communities, and impeded both passive and willful movements of aquatic organisms between the Chain of Lakes and the South Fork

The South Fork Flambeau River is designated as an Outstanding Resource Water under Chapter NR 102, Wisconsin Administrative Code, which confers the most rigorous protection against degradation of its high quality water resources. Additionally, the South Fork is a candidate stream for inclusion under the national Wild and Scenic Rivers Act. If we take practical measures to apply what we know, protect and enjoy what we have, and carefully restore what we and others before us have disturbed, we can collectively advocate for the healthiest possible ecosystem and strengthen our assurance that the Pike Lake Chain will remain a special place for our children's children.

redhorse in the upper Chippewa River drainage. Sturgeon occasionally appear in contemporary surveys as very large, old individuals that probably entered the Chain before 1971 when the deteriorated condition of the former dam allowed fish to move between Round Lake and the South Fork Flambeau River. Now that the sheetpile dam has blocked fish movements again, it is doubtful that the Pike Lake Chain supports a viable lake sturgeon population in such apparently low abundance.

DNR Minimum Flow



WDNR chapter 31 – addresses providing minimum flow at all dams.

Connecting the SFFR and Pike Chain – why is it important?

- Ecosystems are complex and evolve over a long periods of time.
- The Fauna within the Chain and SFFR have evolved over 12,000 years with connection and open movement between the chain and the lake.
- Movement has been disruptive over a relatively short period of time.

Round Lake 1938 Aerial Photo

- 85 years sure flies by!
- A lot has changed

1930's WI aerial survey plane

Historical Perspective: Logging Era

- Logging era disruptions live on: Erosion, river widening, fish passage issues, stand composition changes.
- Logged right to the shore where soil is vulnerable.
- No conservation measures: No care was afforded to the land or waters.

Where were all the trees in northern WI? Down the river!

- It is hard to imagine northern WI so barren, but the volume of timber removed was unbelievable.
- The S. F. Flambeau was a major log drive river.
- The river was blasted, widened, scoured, and flooded to facilitate timber movement.

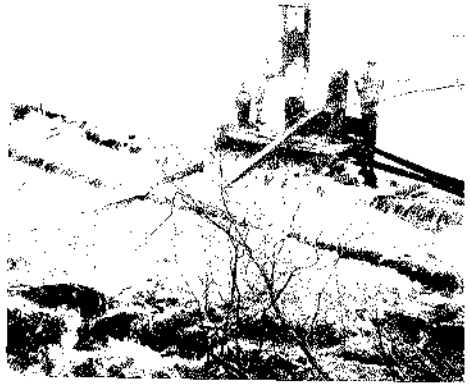
SFFR – Log Drives

- Log Drives caused significant damage to the river channel and river banks.
- Rivers were cleared of obstructions.
- Resulting in wider, shallower channels devoid of habitat complexity.
- Forest has been working for over 20 years on mitigating the damage.

To fully understand what has occurred in the area the impacts of historic logging need to be discussed. This entire conversation starts because of the logging dam at the outlet. The logging dam was built to facilitate movement of timber down to the mills. Log drives had significant and long lasting impacts on majority of our rivers and specifically the SFFR.

Round Lake Historic Photos

Undo past damage. We can provide fish passage and put things closer to the way things were before an era that caused much watershed harm, while still maintaining water level and preserving the historic structure.

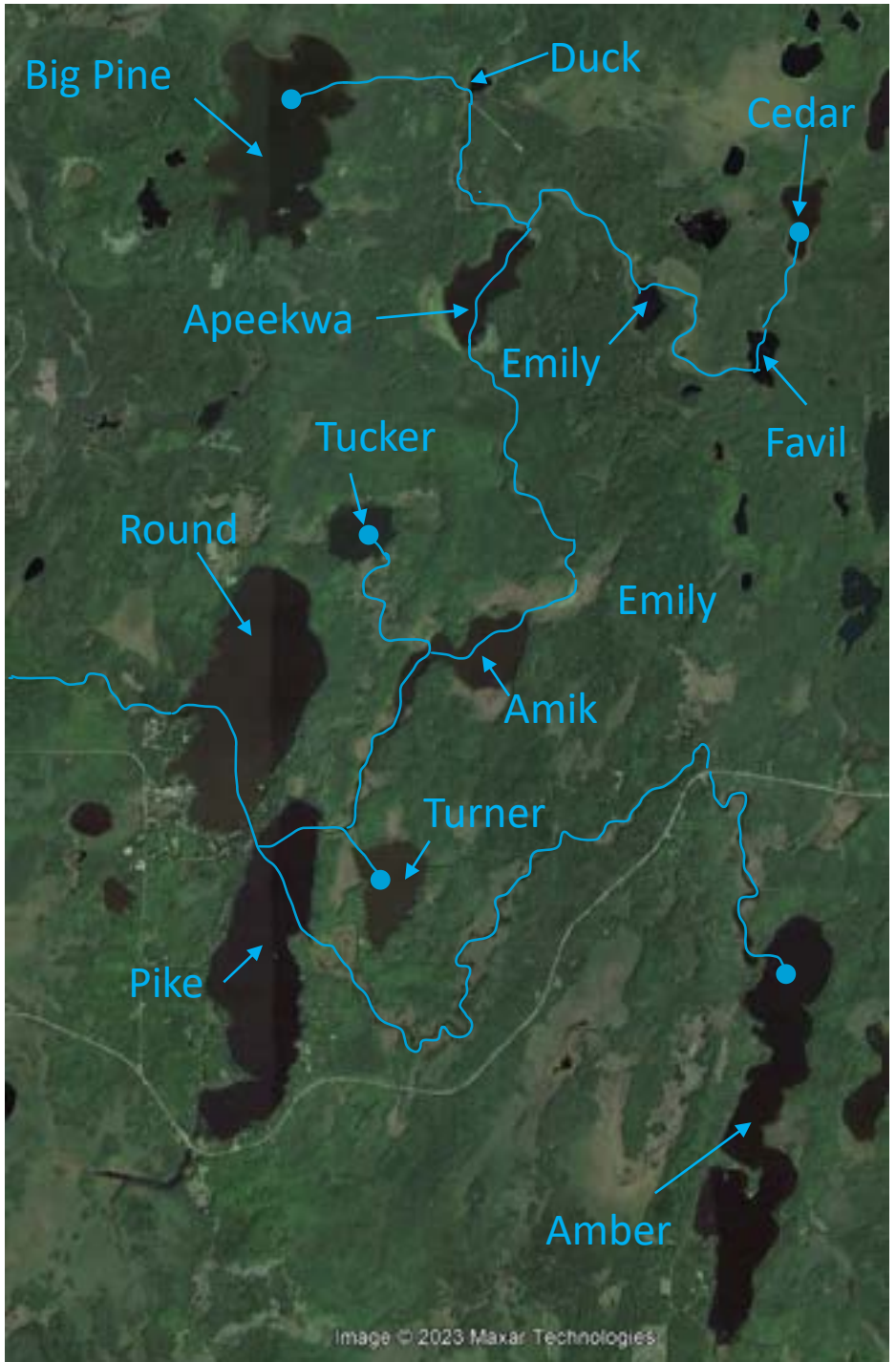


South Fork Flambeau River downstream from Fishtrap Road
USFS Habitat Restoration Work (2006-2015)

It's All Connected: The Headwater Lakes of the South Fork Flambeau River

- The Chain reaches wider than just Round, Pike, Turner, and Amik
- Many of Wisconsin's large and medium rivers might never be free flowing. They are "working rivers" meaning they have dams which serve a purpose such as hydropower or industrial use.
- South Fork Flambeau system is free flowing except for low head dams on Round Lake and the outlet of Amber Lake.
- Fish are drawn to current areas during the spawn. Lots of oxygen and clean substrate.

73 miles undammed to N. Fork Flambeau



How Will Passage Affect the Fishery?

Use our years of fisheries data to predict any adverse affects.

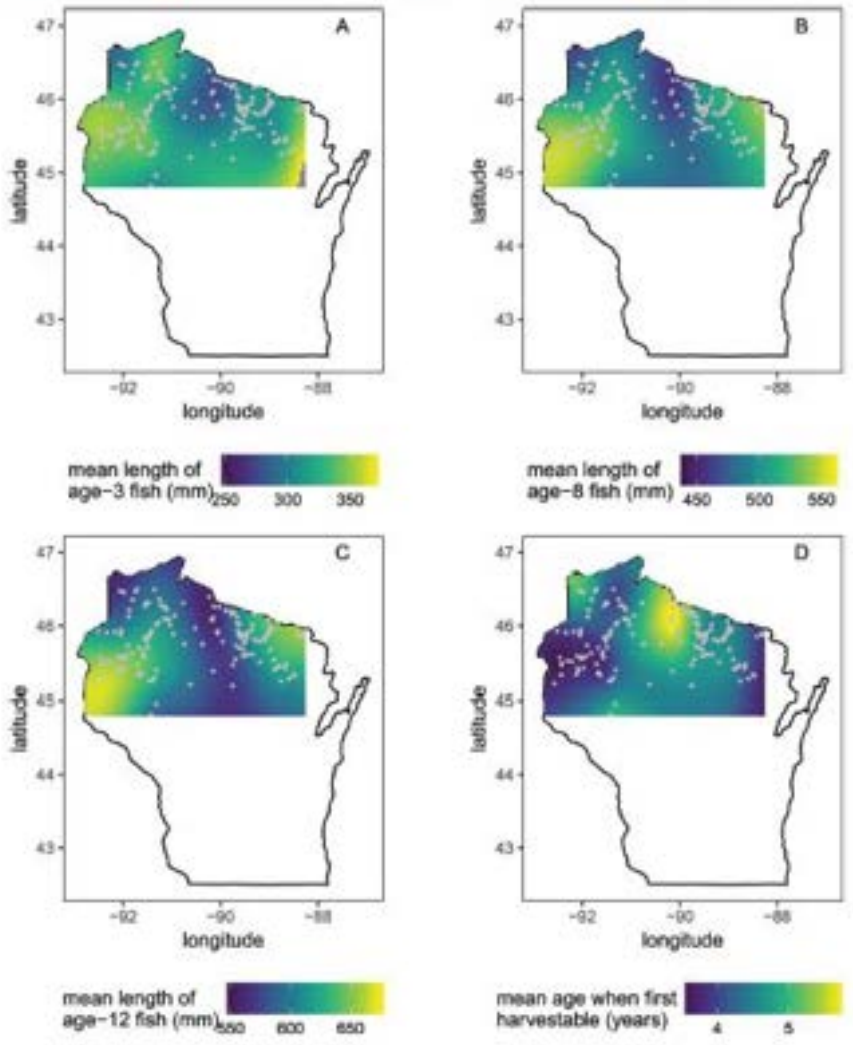
Walleye: 50+ years of data has shown the Chains walleye are abundant but slow growing. Known walleye spawning areas are on main lake shores. Walleye prefer to spawn and stay in the lake. Telemetry study showed no walleye followed current over the dam. No data points to passage negatively affecting any of those parameters on a population level.

381mm=15”

Age and Growth (TL in mm) of the Walleye in Wisconsin

Location	1	2	3	4	5	6	7	8	9	10	11	12	Source
Northwestern Wis. drainage lakes	145	241	312	371	421	472							Snow (1969)
Trout L. (Vilas Co.)	135	221	348	421	483	526	551	566	587	592			Schloemer and Lorch (1942)
Pike L.–Round L. (Price Co.)	140	208	267	307	333	358	381	399	429	434			Bever and Lealos (1974)
Mississippi R., Pool 7*	196	290	356	427	472	480	526	605	607	630	663	673	Gebken and Wright (1972a)
Mississippi R., Pool 11	175	307	414	453	541	584	610	627	648	665	681		Vasey (1967)
Red R. (Dunn Co.)	162	264	328	373	419	452	474	490	514	537	562	618	Colvin (1975)
Big Eau Pleine Res. (Marathon Co.)	180	299	393	468	498								Joy (1975)
South Green Bay													
Males	226	333	399	470	493								Niemuth et al. (1959a)
Females	216	335	421	500	559	617	691	711					
L. Winnebago (Winnebago Co.)													
Males	142	259	323	361	384	396	411	427					Priegel (1969a)
Females	152	257	340	396	439	472	495	521					
L. Puckaway (Winnebago Co.)													
Males	190	323	394	432	460	480	498	516	541				Priegel (1966b)
Females	198	345	439	488	536	569	599	627	648				
Pike L. (Washington Co.)													
Males	173	287	358	401	432	457							Mraz (1968)
Females	178	292	376	429	480	533	574	630	653	701			

Fig. 3. Maps of mean walleye (*Sander vitreus*) stock size characteristics across the Ceded Territory of Wisconsin during 1990–2012. Each grey point represents a lake. Colors represent an estimate of the mean value of each characteristic at a given point in the landscape modelled using a generalized additive model. Light colors indicate higher mean values and dark colors represent lower values. (A) Mean length of age 3 walleye. (B) Mean length of age 8 walleye. (C) Mean length of age 12 walleye. (D) Mean age when walleye are first harvestable. [Colour online.]



How Will Passage Affect the Fishery?

Lean on all available Historic Data

Walleyes in Early Spring 2012 Fyke Nets

	Number per net-night ≥ 10"	Quality Size ≥ 15"	Preferred Size ≥ 20"	Memorable Size ≥ 25"
Amik	1.2	87%	30%	4%
Pike	2.4	45%	10%	2%
Round	2.4	26%	10%	2%
Turner	2.8	82%	21%	0%
Combined	2.2	51%	15%	2%

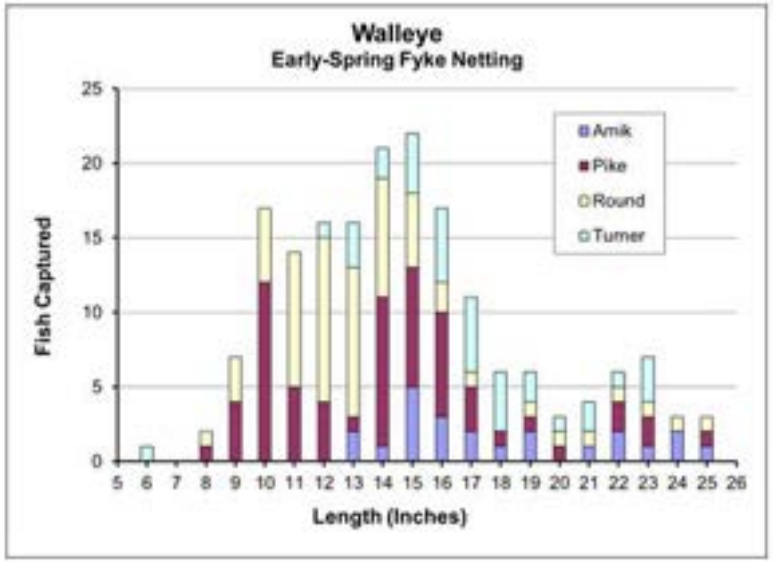


Figure 6. Capture rates and length distribution of walleyes captured in fyke nets, April 9 – 17, 2012.

Size Range Inches	Walleye	N Pike	Musky
<3.0			
3.0 - 3.4			
3.5 - 3.9			
4.0 - 4.4			
4.5 - 4.9	3		
5.0 - 5.4	46		
5.5 - 5.9	55		
6.0 - 6.4	29		
6.5 - 6.9	17		
7.0 - 7.4	2		
7.5 - 7.9			
8.0 - 8.4	5		
8.5 - 8.9	9		
9.0 - 9.4	24		
9.5 - 9.9	21		
10.0 - 10.4	15		
10.5 - 10.9	24		
11.0 - 11.4	57		
11.5 - 11.9	61		
12.0 - 12.4	29		
12.5 - 12.9	47		
13.0 - 13.4	28		
13.5 - 13.9	10		
14.0 - 14.4	11		
14.5 - 14.9	4		
15.0 - 15.4	4		1
15.5 - 15.9	1		
16.0 - 16.4			
16.5 - 16.9		1	
17.0 - 17.4			1
17.5 - 17.9			
18.0 - 18.4			1
18.5 - 18.9			
19.0 - 19.4			
19.5 - 19.9		2	
20.0 - 20.4		1	
20.5 - 20.9		3	
21.0 - 21.4			
21.5 - 21.9			
22.0 - 22.4			
22.5 - 22.9			
23.0 - 23.4	1		1

1989 Chain Walleye Telemetry

- Walleye spawning congregations were nearshore gravel areas on the North and West shores and a few other scattered locations.
- Lake walleye in the study were not tracked going over the dam or trying to “get out” down the Flambeau.

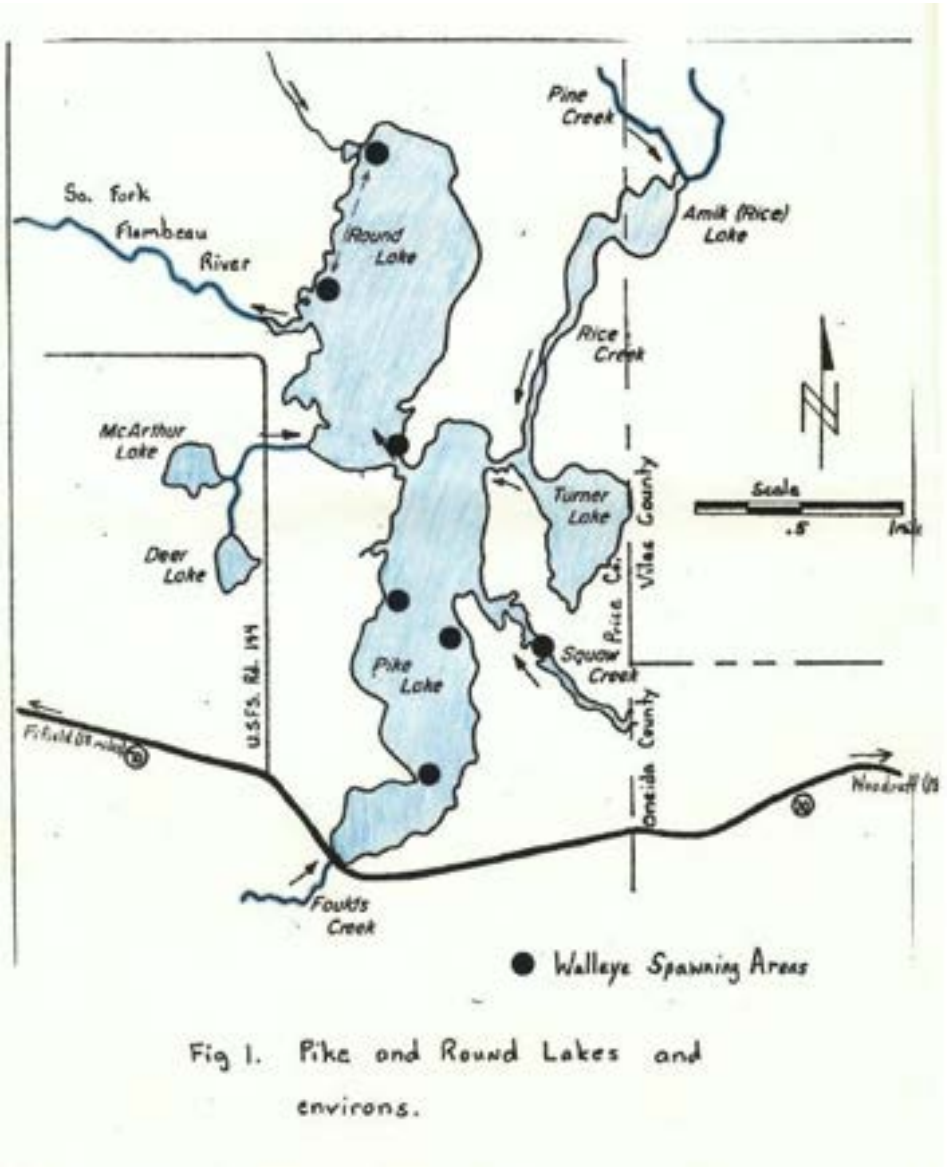


Fig 1. Pike and Round Lakes and environs.

Musky and Dams

The musky “run” at Lake Wingra. 3ft Dam height.
Deep Plunge Pool.
Seeking warm water at ice out.

Musky and Dams

- Unlike many fish, musky don’t seek out and spawn over rock.
- Resident river musky need quiet, warm, vegetated lake or backwater habitat to spawn successfully.
- Passage would give resident river musky expanded spawning opportunities.
- Passage would give musky and all fish that get washed over the dam a chance to get back in.
- Recent research suggests that musky behave strangely near dam currents near the crest, often swimming headfirst over them.

Musky and Dams

North American Journal of Fisheries Management

Article | Full Access

Field and Laboratory Evaluation of Dam Escapement of Muskellunge

Max H. Wolter, Corey S. DeBoom, David H. Wahl

First published: 06 August 2013 | https://doi.org/10.1080/02755947.2013.812585 | Citations: 19

- 24 of 100 tagged musky went over dam within one year
- Most went over during daylight
- Musky would probe edge of dam headfirst, and then couldn't turn around or swim backward fast enough.

Crappie and Panfish

- Crappie ranked highest in importance to anglers in 2015 Management Plan
- No data to suggest passage at Round Lake will negatively or positively affect the crappie fishery.

State of Wisconsin
Department of Natural Resources

Panfish Length Frequency

Form 3600-64 Rev. 1-80

County			Water			Date			Gear		Hours
PRICE			Round Lake			9/26/2022			BS - AC (3 Dippers)		0.5
Size Range Inches	Species					Size Range Inches	Species				
	Bluegill	B Crap.	Y Perch	Pkd	R Bass		Blg	BC	YP	Pkd	RB
Count						7.0					
1.0 - 1.4						7.1			1		
1.5 - 2.0						7.2					
2.1						7.3					
2.2			2			7.4					
2.3			1			7.5			1		
2.4			2			7.6					
2.5			3			7.7					
2.6			2			7.8					
2.7	1		2			7.9					
2.8	1					8.0					
2.9		1	2			8.1					
3.0						8.2					
3.1			2			8.3					
3.2						8.4		1			
3.3						8.5					
3.4						8.6					
3.5						8.7		1			
3.6						8.8		1	1		
3.7						8.9	1	1	1		
3.8						9.0		3			
3.9						9.1		1			
4.0						9.2			1		
4.1						9.3	1		2		
4.2			1			9.4		1	1		
4.3						9.5		2	1		
4.4						9.6					
4.5	1		2			9.7		1			
4.6						9.8		1			
4.7						9.9		3	1		
4.8			1			10.0		4			
4.9						10.2		6			
5.0			1			10.4		6	1		
5.1			1			10.6		1			
5.2			1			10.8		2	1		
5.3		1				11.0		1			
5.4			1			11.2		1			
5.5			1			11.4					
5.6						11.6		1			
5.7						11.8		1			
5.8						12.0					
5.9						12.2					
6.0						12.4		1			
6.1						12.6		1			
6.2		1				12.8					
6.3						13.0					
6.4						13.2					
6.5			1			13.4					
6.6						13.6					
6.7						13.8					
6.8						14.+					
6.9						TOTAL	5	44	38	0	0

Notes:

Bluegill PSD6 = 67% Bluegill RSD7 = 67%
B. Crappie PSD8 = 95% B. Crappie RSD10 = 58%
Also found were spottail shiner (P), johnny darter (P), mudminnow (P) and logperch (P).

Flambeau River fish that **can** jump low head obstacles given deep enough plunge pool.

- Musky
- Northern Pike
- Smallmouth bass

Species not adapted for dealing with high flows. Won't make it back into lake anyway.

- Bluegill
- Crappie

Resident Flambeau River fish that **can't** or **won't** jump low head obstacles given deep plunge pool depths. Need passage that doesn't require jumping. These river fish are important components of a healthy Chain.

- Walleye
- Lake Sturgeon
- Shorthead Redhorse
- Golden Redhorse
- Greater Redhorse
- Northern Hog Sucker
- White Sucker
- Perch
- Logperch
- Johnny Darter
- Bullhead
- Channel Catfish
- Burbot
- Creek Chub

Its All Connected
Tucker Lake

INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

A. S. HAZZARD
Director

April 8, 1933

Report 203

REPORT ON TUCKER AND JUPA LAKES, P[illegible]
WISCONSIN

The two lakes mentioned above were investigated
Institute for Fisheries Research of the University o
part of July, 1932.

The two lakes will be considered separately.

Tucker Lake

Description

Size, and Location — Tucker Lake is an excellent lake. It i
timber and partly by second growth tim
of the west shore. The lake has an are
and is more or less square to circular in shape.

Inlets and Outlets — The lake has one very definite inlet, Roger's Creek, which has its mouth at the northeast "corner" of the lake. This stream has a relatively small volume of water.

A spring enters the lake on the north side. There are very likely other small springs, since the outlet of the lake has a considerable flow. There is a probable considerable seepage from the swamp on the west side.

The outlet, Tucker Creek, which leaves the lake at the southeast "corner", empties into Rice Lake. Drainage is into the Mississippi via Rice Lake, Rice Creek, Pike Lake, Round Lake, South Branch Flambeau River, Flambeau River and Chippewa River.

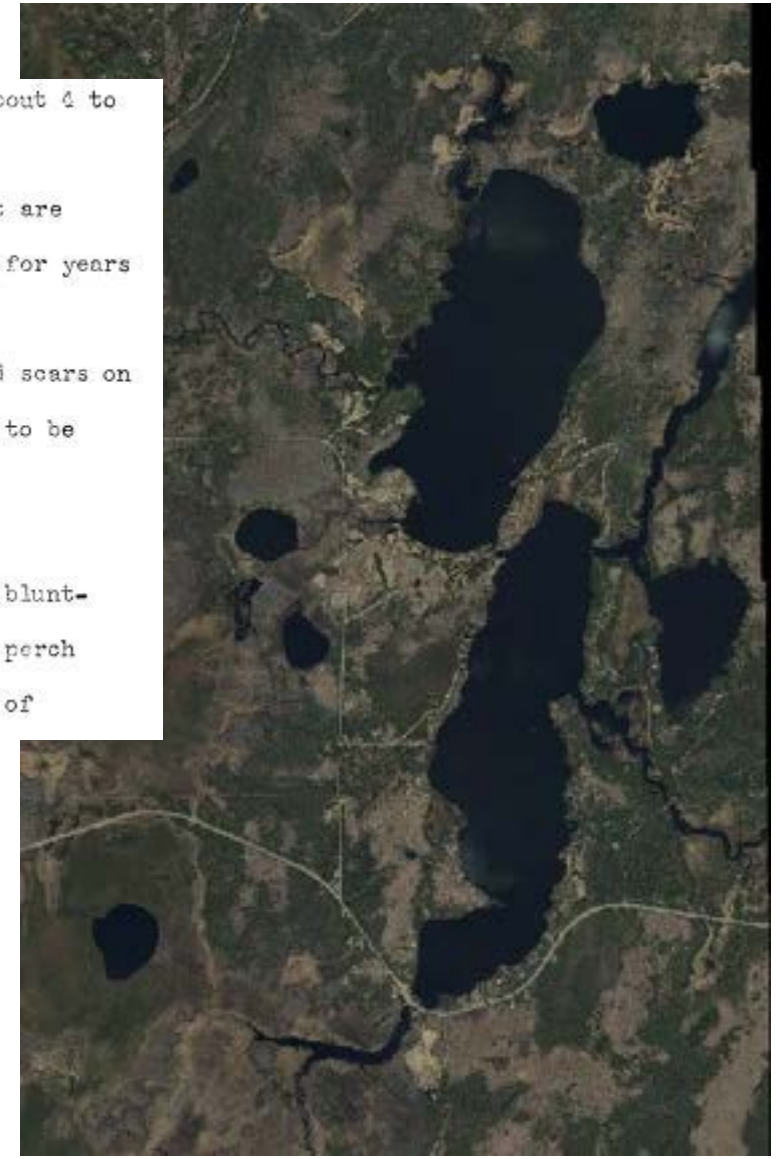
Both inlet and outlet have a dam.

Species of Fish Present — Game fish.--Muskellunge are abundant but are small, averaging about 4 to 8 lbs. Wall-eyes are fairly abundant and appear to be in good shape. Perch, bluegills and pumpkinseed sunfish are present but are not abundant and apparently do not become very large. Bass have been present for years but none could be taken by our party. If still present, they are rare.

Coarse fish.--A half dozen or so very large suckers were seen. These had scars on them, apparently having been attacked by muskies, but were probably too large to be taken. The species could not be determined certainly.

Obnoxious fish.--No obnoxious fish were seen or reported.

Forage fish.--Forage fish are present in limited numbers. The desirable blunt-nosed minnow and golden shiner were taken here; also black-nosed shiners, log perch and Iowa darters. The number of species present is relatively small and none of



- Connection benefits Tucker and other lakes in the Chain
- Natural musky and walleye movement in Tucker Lake.
- 1988: 45” musky caught in conibear beaver set in Tucker Creek moving between Amik and Tucker

“So, if historic data suggests that passage won’t have a large affect on abundance or growth of gamefish and panfish in the Chain, why do we need passage?”

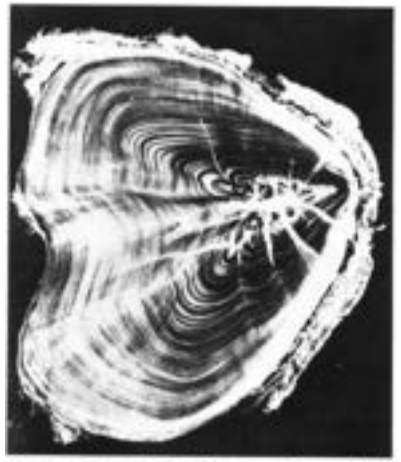
- All comes back to reconnecting a complete ecosystem the best we can, damaged by an era when conservation was not a priority.

Lake Sturgeon

- Long lived (80+ years) WI record (that's known) 120 years, slow growing, slow maturing.
- Regional Forest Sensitive Species targeted for conservation measures.
- Populations in the Chippewa and N.F. Flambeau River are fragmented because of hydroelectric generation.
- The S.F. Flambeau River population can travel freely within the river, into a section of the North Fork, and up to the Round Lake Dam.
- Important sport fish on the Flambeau system during sturgeon season.

Why do sturgeon need to get past the dam if they are already living just fine in the river?

- Fragmented Spawning: There could be unknown spawning areas further up the Chain.
- Food: Large expanses of soft lake sediment provides more of the invertebrate food sturgeon prefer. Ex: Lake Winnebago "worm beds"
- Wintering habitat: Also connected to food, sturgeon prefer to winter in the slowest portion of rivers or stay in lakes where the water is marginally warmer, expend less energy and has more food. Ex: Chippewa River system, Bear Lake, Blaisdell Lake, Black Lake Michigan, Winnebago system.
- Habitat Choice: More available habitat choices offers built in resilience to environmental stressors.



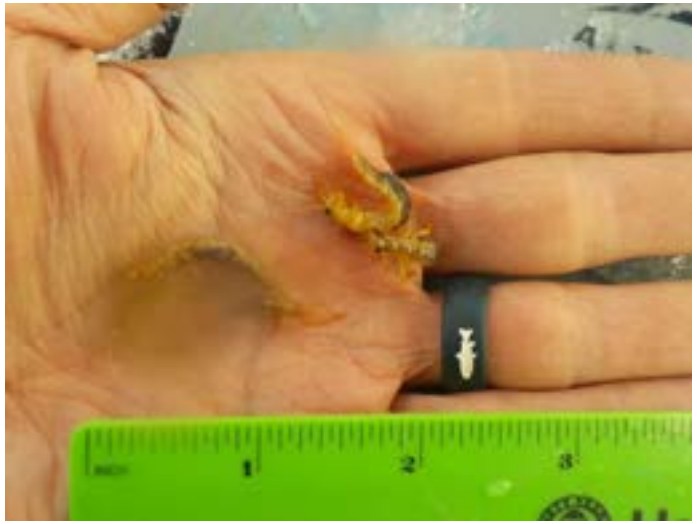
Cross section of a 2.01-m, 70.78-kg sturgeon 82 years old (Wisconsin DNR photo)

Lake Sturgeon

- Sturgeon can jump and jump very well. BUT for some reason don’t attempt jumping to get over obstacles. They will lift their head up and slide over them.
- Sturgeon breach like whales. Activity increases with water temperature peaking in summer. Why they do it has never been definitively proven.

Sturgeon Diet

- Benthic Generalists-Prefer invertebrates that live in the lake sediment (think vacuum cleaner) like insect larvae, but will also take live or dead fish, frogs, mussels, crayfish, near bottom. Don't target fish eggs.

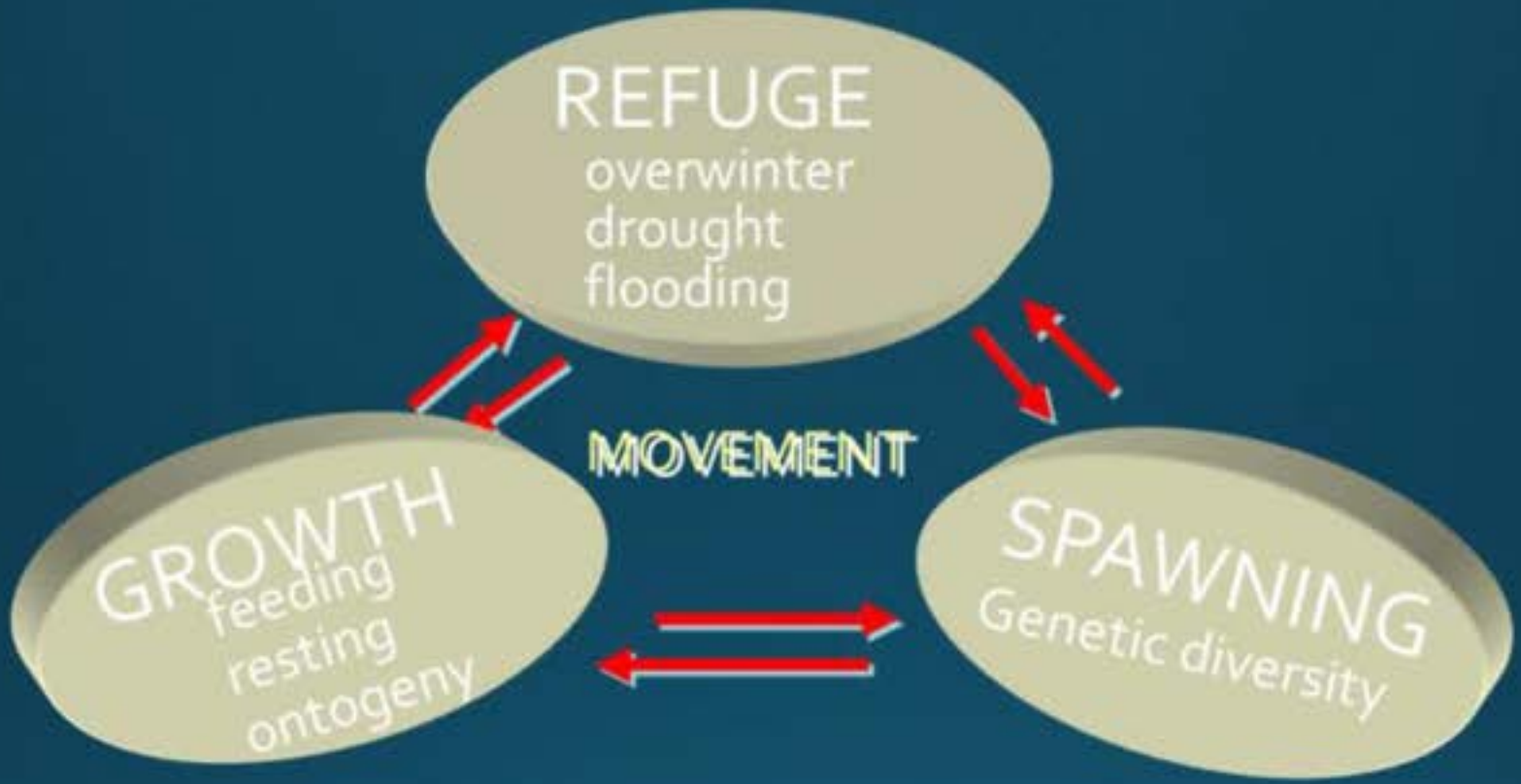


Butternut Lake Example

Has historic low density sturgeon population with open connection to North Fork Flambeau.

78”- Largest Jeff has handled

- Fish, including incredibly large fish, can show up in unexpected spots at any time of year.



- Multiple habitats must be provided to maximize survival, growth, and production
- Composition of community can be affected by habitat loss or inaccessibility

Partnership: Project grants and other funding opportunities are more competitive with private/public partnerships.

PIKE LAKE CHAIN LAKES ASSOCIATION
P.O.BOX 106
PARK FALLS, WI 54552

June 7, 2016

Jeff Scheirer, WDNR Fisheries Biologist
875 S. 4th Ave.
Park Falls, WI. 54552

Sue Rainecke, Chequamegon-Nicolet National Forest Service
1170 4th Ave. South
Park Falls, WI. 54552

Dear Jeff and Sue,

Please be advised that our proposed idea of building a fish passage structure at the Round Lake Dam, which has been discussed with you by Steve Ave'Lallemant, was presented at our Pike Lake Association Annual Meeting on Saturday, June 4, 2016. We also discussed Steve's information on your thoughts for the project and without reservation, the membership present unanimously voted in favor of proceeding ahead with you as partners and begin the process of permitting and proceeding ahead with this structure. There was strong support for this idea and the membership desired to begin this process as soon as possible. I would like your assistance and advice on the process and procedures necessary to advance this project so I can keep the Board and membership advised. Thank you for your support and assistance.

Sincerely Yours,

Richard Mace. President, Pike Lake Chain Lakes Association (PLCLA)

Cc: PLCLA Board members

- Requires no monetary expenditures from PLCLA

https://www.fws.gov/program/national-fish-passage

Nature-Like Fish Passage Examples on Lakes in Minnesota

Cass Lake

In 2015, the Knutson Dam structure was removed from the Mississippi River channel, restoring fish passage on the main-stem of the Mississippi River. This improved the hydrologic function of the Upper Mississippi River by installing a fixed-crest rock weir and rock rapids structure for water level management of the Cass Lake Chain. The new rock rapids structure restored fish passage in over 30 miles of the Mississippi River, its tributaries, and also inclusive of 72,000 acres of lakes. This is critically important in the restoration of migration routes for most warm water fish species on and between Cass Lake and Lake Winnibigoshish. The riffle habitat that replaces the dam will provide spawning habitat for fish species such as Walleye and White Sucker (*Catostomus commersonii*).

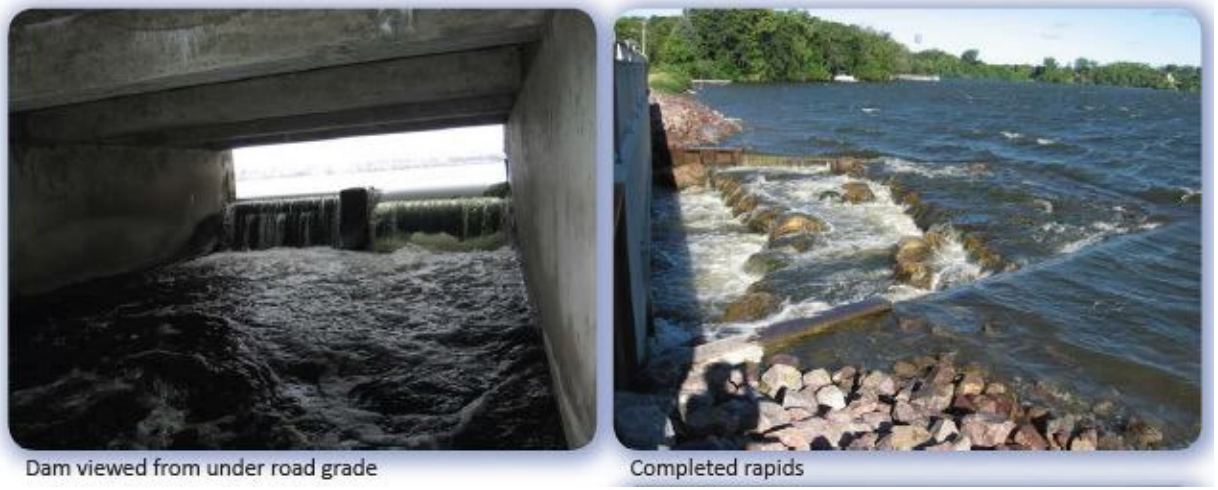
The removal of the dam also reduced lakeshore erosion on Cass Lake by minimizing the duration of high water periods, because the new structure allows higher flows during high water. Furthermore, the new structure improved recreational opportunities at the site; there is a popular Chippewa NF campground adjacent to the Cass Lake lakeshore and Mississippi River channel. Visitors will now be able to access both Cass Lake and the Mississippi River safely, fish off the banks and pier, and enjoy the more natural appearing lake, river and shorelines.

habitat.fisheries.org

The Knutson Dam on Minnesota's Upper Mississippi River blocked fish passage and caused erosion on Cass Lake

Nature-Like Fish Passage Examples on Lakes in Minnesota

Barrett Lake MN



White Earth Lake MN

Before

Dam viewed from under road grade

After

Completed rapids

Barrett Lake MN

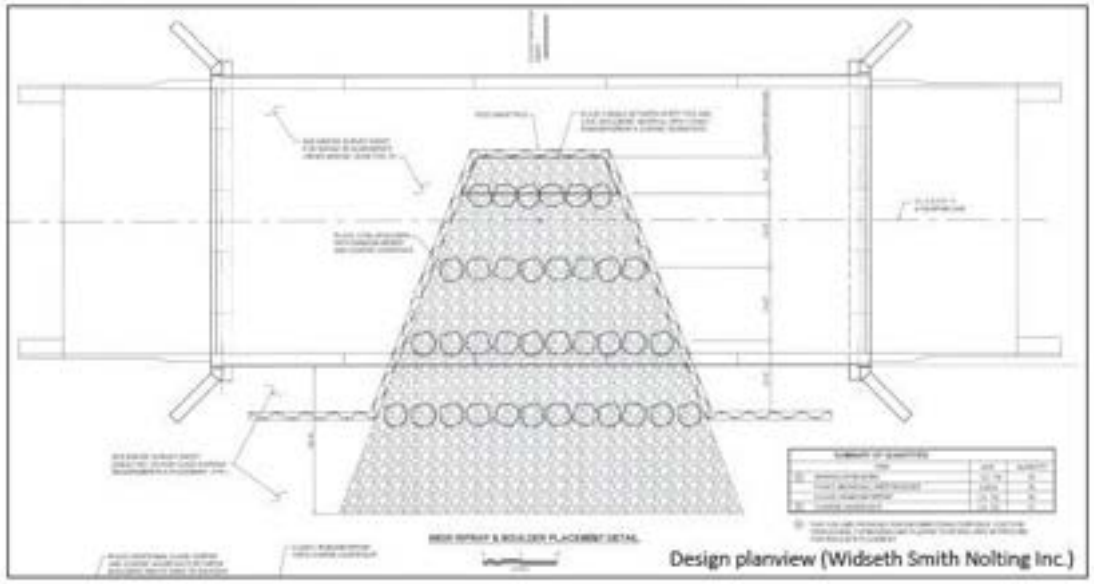
Wingwalls maintain surface elevation

Nature-Like Fish Passage Examples on Lakes in Minnesota

Potato Lake

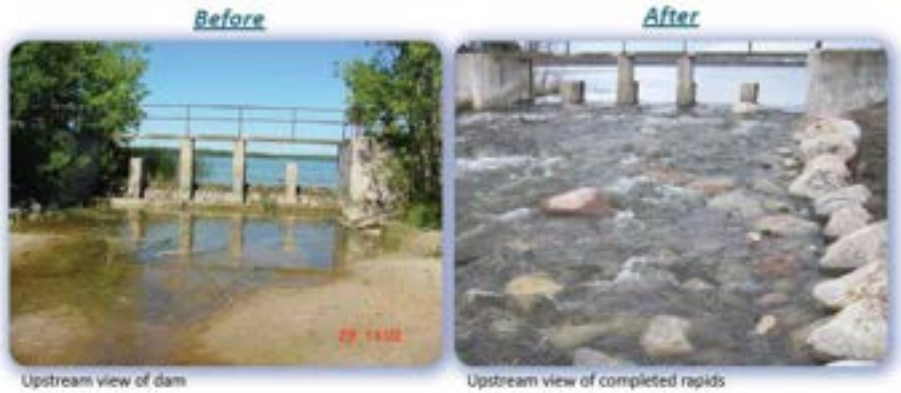
View of dam from upstream lake

Completed rapids



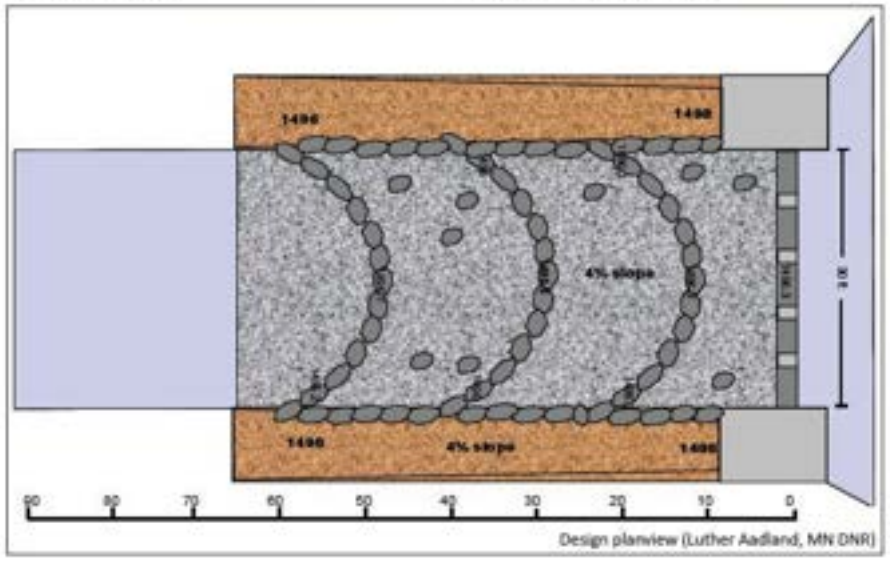
Design planview (Widseth Smith Nolting Inc.)

Many Point Lake



Upstream view of dam

Upstream view of completed rapids

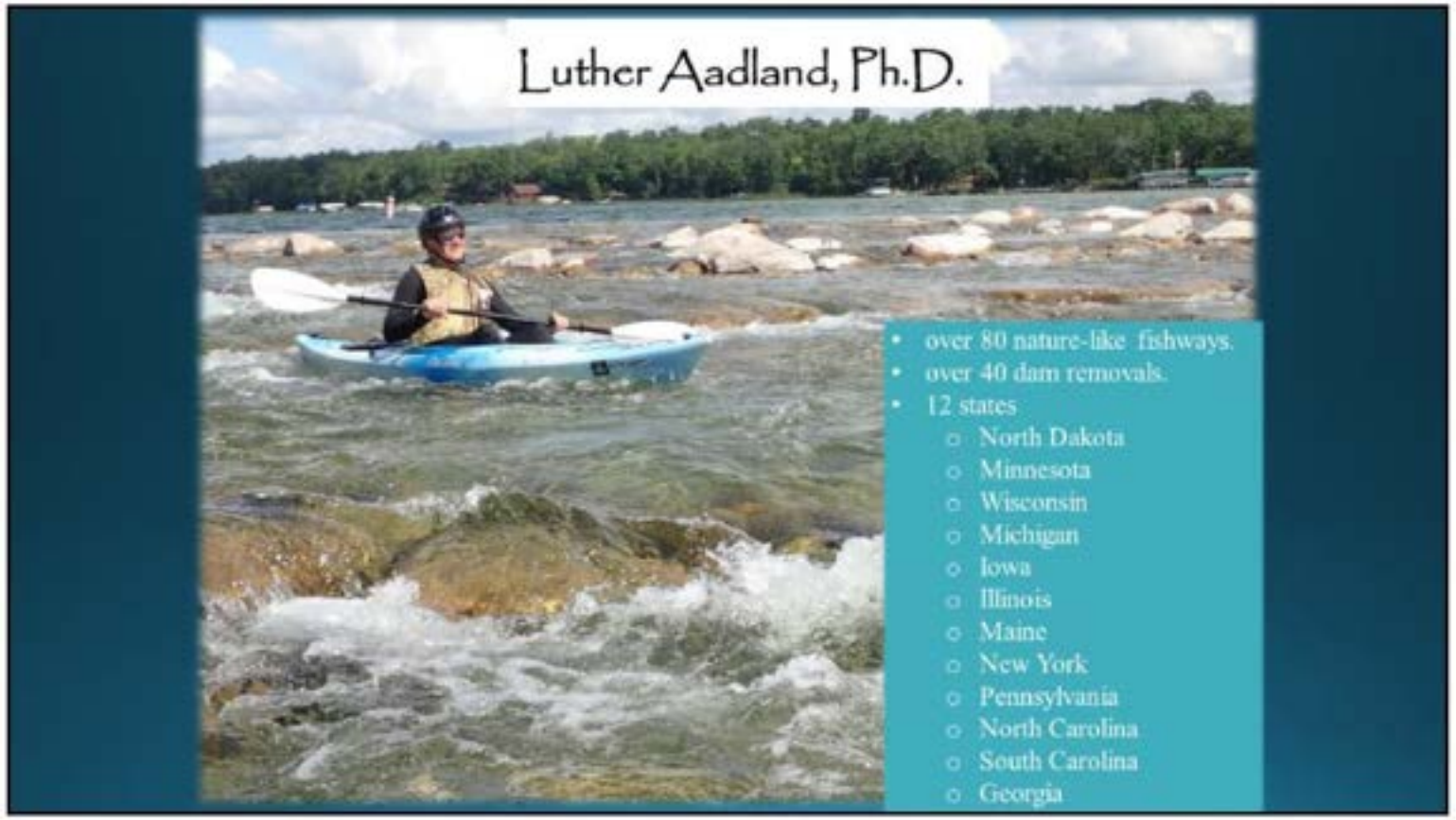


Design planview (Luther Aadland, MN DNR)

2017 Round Lake Engineering Review

Examples of fish passageways designed by luther. Round lake proposal would be similar, like a series of steps in an amphitheater.

2017 Engineering Review



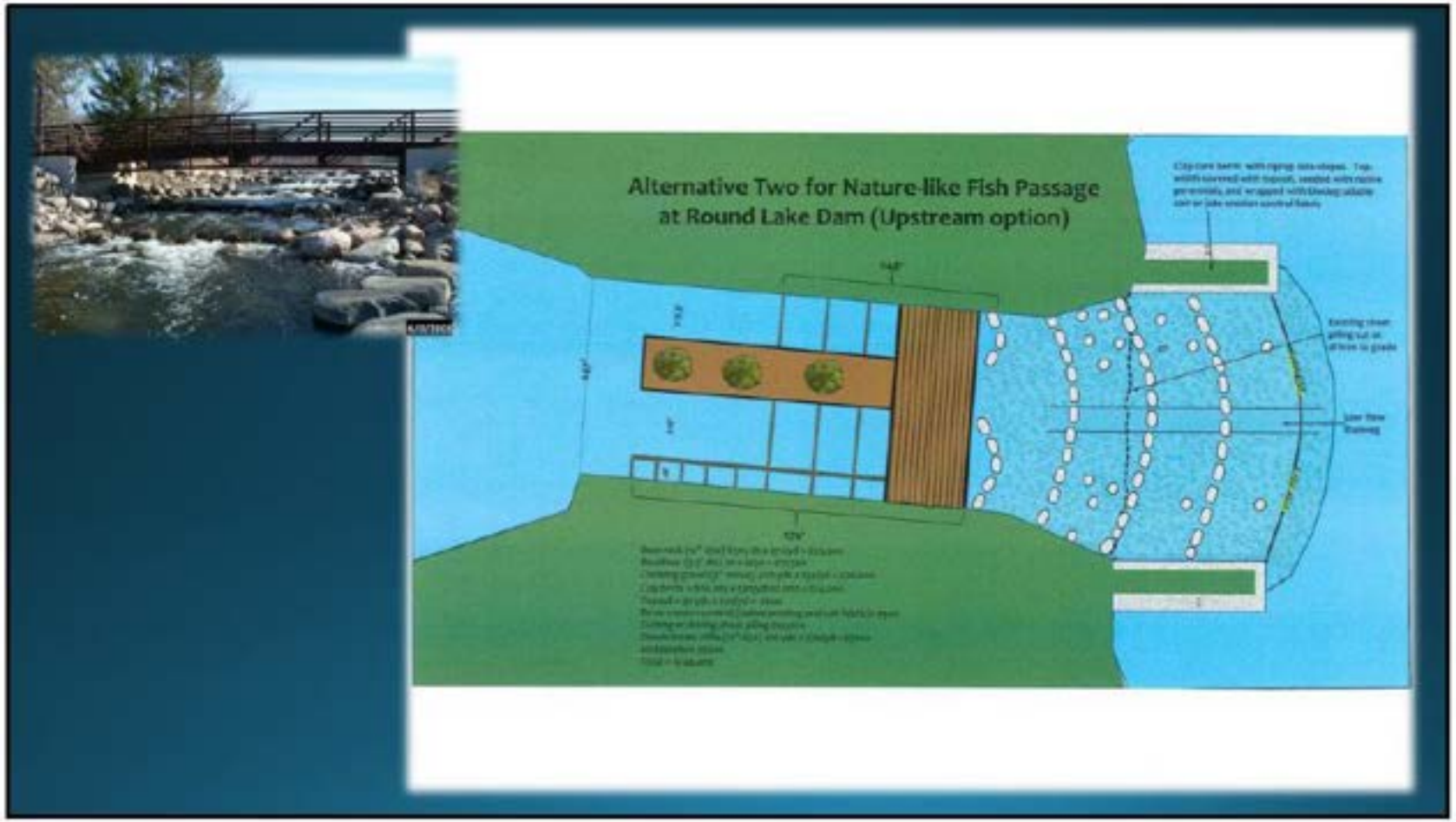
Based on the Lake Association letter of support and feedback received during the June 2017 presentation. The WDNR was able to get a grant to contract with Luther Aadland to develop a conceptual design to provide fish passage at the outlet of round lake. FS and WDNR have worked with Luther at Winter hydro. He is the premier designer for low head fish passageways in the country.

2017 Engineering Review

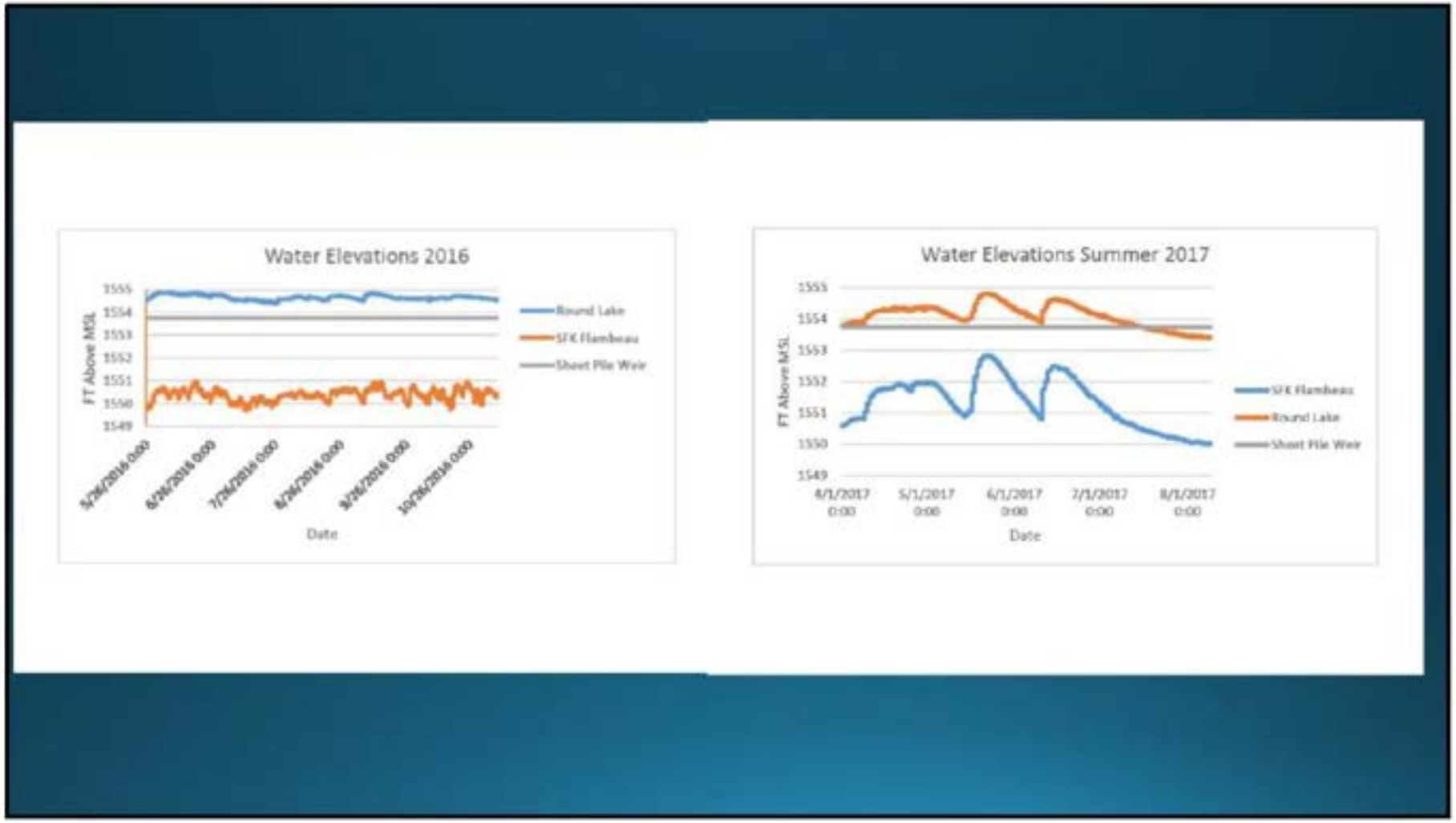
Existing Weir

- The weir crest is 4.38 feet higher than the downstream riffle.
- Studies indicate for passage effectiveness a slope of no more than 3% is needed.
- Application of this slope would yield total fishway length of about 125 feet. There is 40ft between weir and logging dam.
- Existing weir elevation set at 1554.

2017 Engineering Review



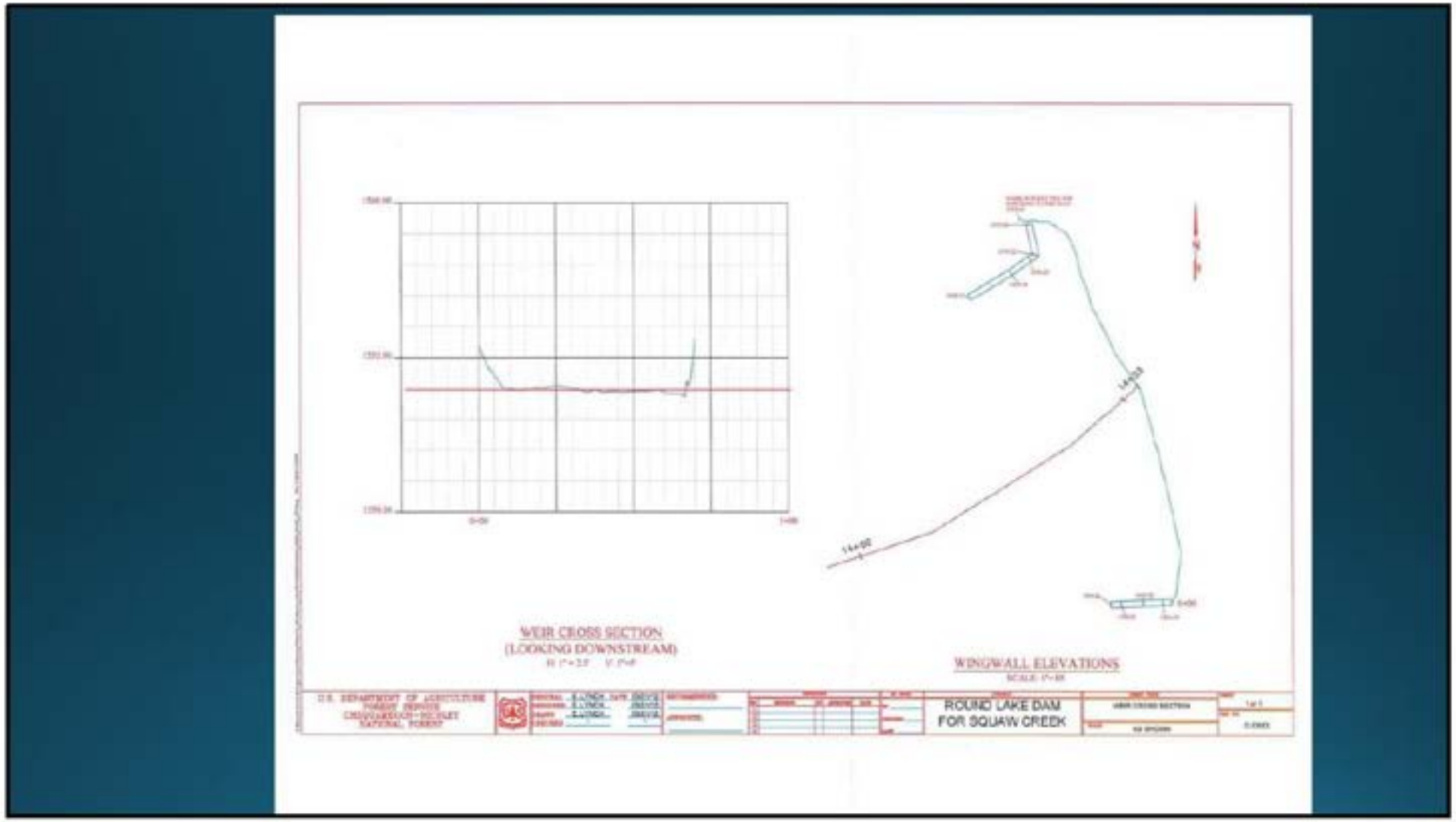
Conceptual design. 125 feet is needed, would extend (125-40) approximately 85ft into the lake. Option could be to replace clay berms with sheet pile. Length and elevation of existing sheetpile weir are maintained. Next slide discusses low flow channel.



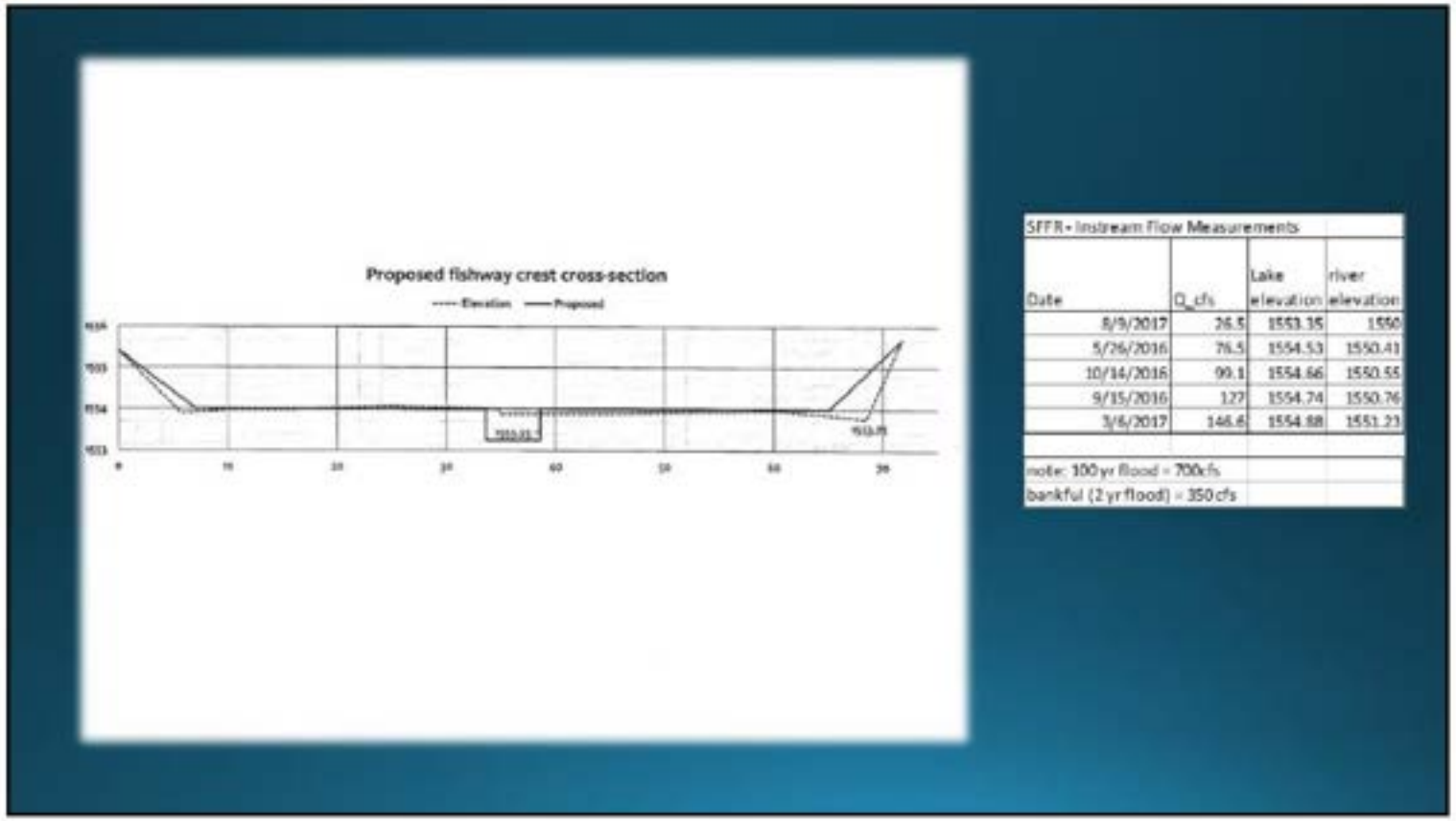
The Forest has water level recorders in both round lake and the SFFR. Water level measurement are taken every 15 minutes. During the summer of 2017 the lake fluctuated 1.5 ft and approached the elevation of the proposed lowflow channel.

2016 was a high water year.

Pictures of the weir and logging dam area in 2008, drought period. Note weir section on the left compared to weir on the right. Section on the left is the area that is sitting below 1554 elevation.



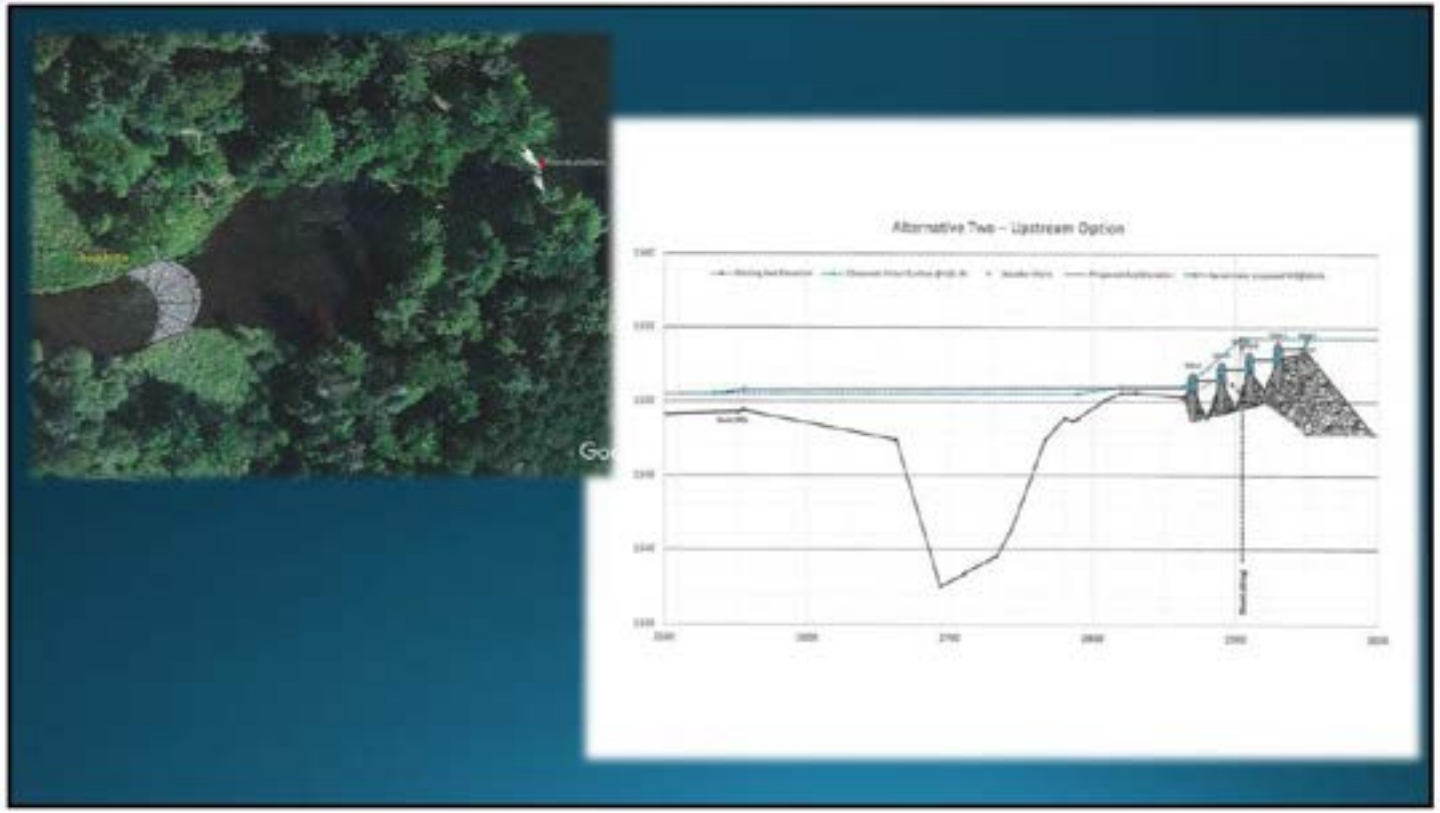
A cross section of the existing sheet pile weir. Note that the set elevation of the weir is 1554 but in reality there are sections of the weir where the set elevation is below 1554 down into the 1553.xx range.



SFFR - Instream flow Measurements			
Date	Q_cfs	Lake elevation	river elevation
8/9/2017	26.5	1553.35	1550
5/26/2016	76.5	1554.53	1550.41
10/14/2016	99.1	1554.66	1550.55
9/15/2016	127	1554.74	1550.76
3/6/2017	146.6	1554.88	1551.23
note: 100yr flood = 700cfs			
bankful (2 yr flood) = 350 cfs			

Luther did do preliminary water level modelling based on elevations taken when discharge measurements were done (2017). This graph shows the cross section of the proposed crest. The dashed line is the existing weir elevations. Solid line shows the proposed elevation with low flow channel. In this scenario the low flow channel elevation is 1553.25. Which translates to up to .5ft lower during very low to zero flow input. Low flow channel width is 5ft. Note: in august of 2017 lake level was only .1ft higher than the elevation of the low flow channel. Because of the uneven nature of the existing crest height the chain water levels have been fluctuating similarly to what would occur under this scenario.

2017 Engineering Review



This diagram depicts a longitudenal profile of the conceptual design. Shows the series of constructed steps above the logging dam. The downstream rock riffle shown in the picture. The design calls for raising the water level within the dam raceways up a foot. The gravel bar on the outlet of the plunge pool will be reconfigured so that it raises the water level in the raceways up to a foot. This is being done to make it easier for fish to move through the logging dam. It also less makes it less of an elevation change that needs to be made up to match lake elevation

In Review

- The fish passage project is ON HOLD. No construction planned at this time. No designs have been finalized. Funding being explored through national fish passage programs.
- Chequamegon-Nicolet Forest Plan guidelines state that infrastructure be maintained in a way to minimized disruption of fish and aquatic life migration and movement. Concurs with WDNR Chain management plan.
- USFS needs to maintain dam in a way that doesn't dry up the South Fork Flambeau during times of drought. WDNR minimum flows are set to protect downstream users and habitat.
- USFS is requesting PLCLA partnership the same as in 2016.
- Official comment period would be after a proposed action has been finalized and NEPA process has started. This process has not started yet.

Slide Review and Questions