Fish Passage at Round Lake Weir Update 6-10-23

Introduction-New USFS Staff

USFS Staff you might recognize from previous conversations

Sue Reinecke (Forest Fish Program Manager)-Retired → Joel Flory (Forest Fish/Wildlife Program Manager)
Dale Higgins (Forest Hydrologist)-Retired → Chris Ester (Forest Hydrologist)
Skip Sommerfeldt (USFS contract fish biologist)-Retired → Nick Berndt (West Zone USFS Fish Biologist)
Mike Bablick (Park Falls Wildlife/Fish Technician) -Retired → Ken Pemble (Park Falls District Wildlife Biologist)
Dan Eklund (Park Falls District Ranger)
Jim Mineau (Hydrologist)
Sara Sommer (Hydrologist)

Nick Berndt: West Zone USFS Fish Biologist

US Forest Service=Federal: Only national forest owned lands, partners with DNR for fisheries within national forest boundaries.

WI DNR=State: Manages all waters of the state. Sets regulations, stocks fish, permits use.

Help manage fisheries within the national forest across 4 western districts.

What does a fish biologist do on his days off? FISH!

Current Status of the Fish Passage Project

- ON HOLD-no actions scheduled at this time.
- 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, 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.				

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.

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.

Detailed Information for Dam Round Lake

Dam Key Seq No	1435	Field File No	50.03
Size	SMALL	NID	10458
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 None None	Structural Types	Rockfill Earth Arch

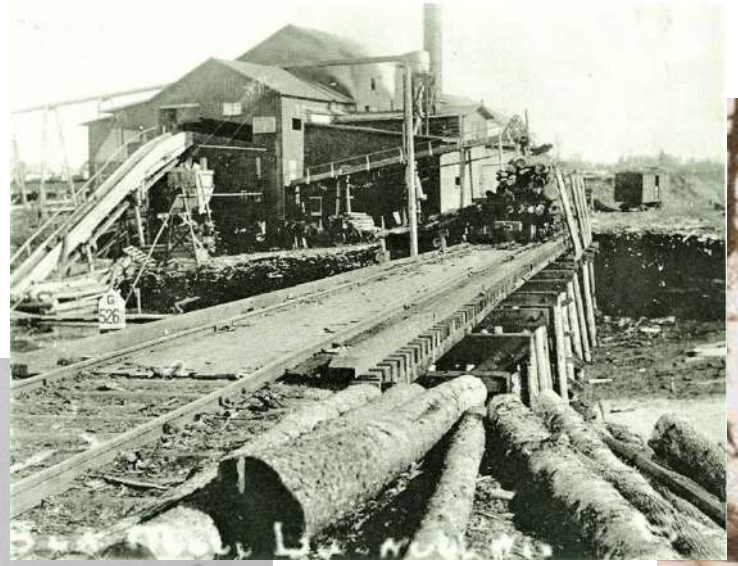
Round Lake 1938 Aerial Photo

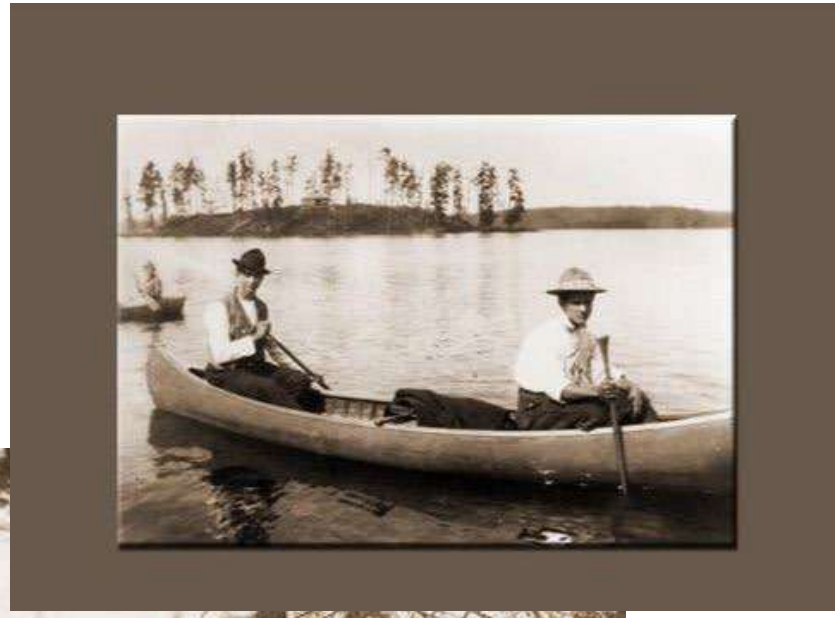
- 85 years sure flies by!
- A lot has changed

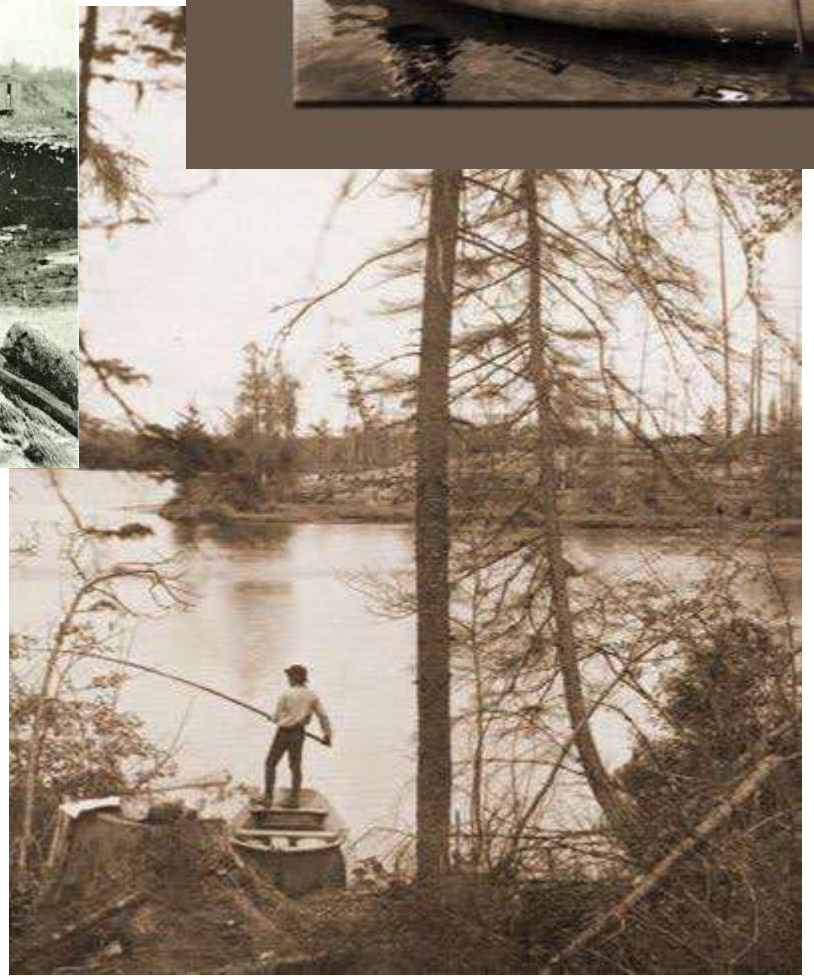
1930's WI aerial survey plane

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.





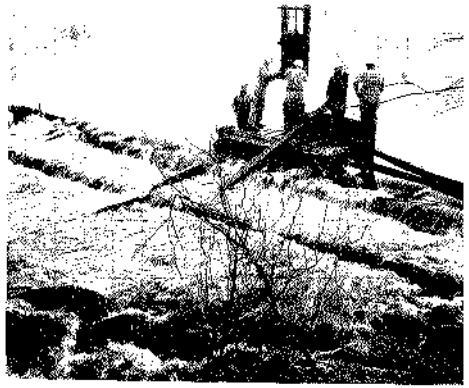


Where were all the trees in northern WI? Down the river!

- 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.

Round Lake Historic Photos

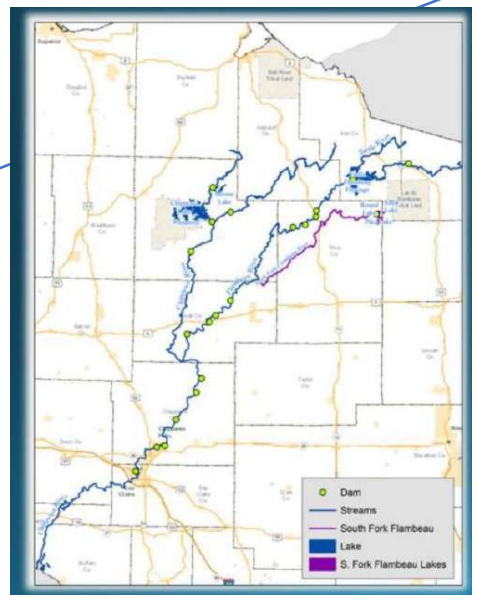
Undo past damage. We can provide fish passage and put things back as close to the way things were before an era that caused much watershed harm, while still maintaining water level and preserving the historic structure.

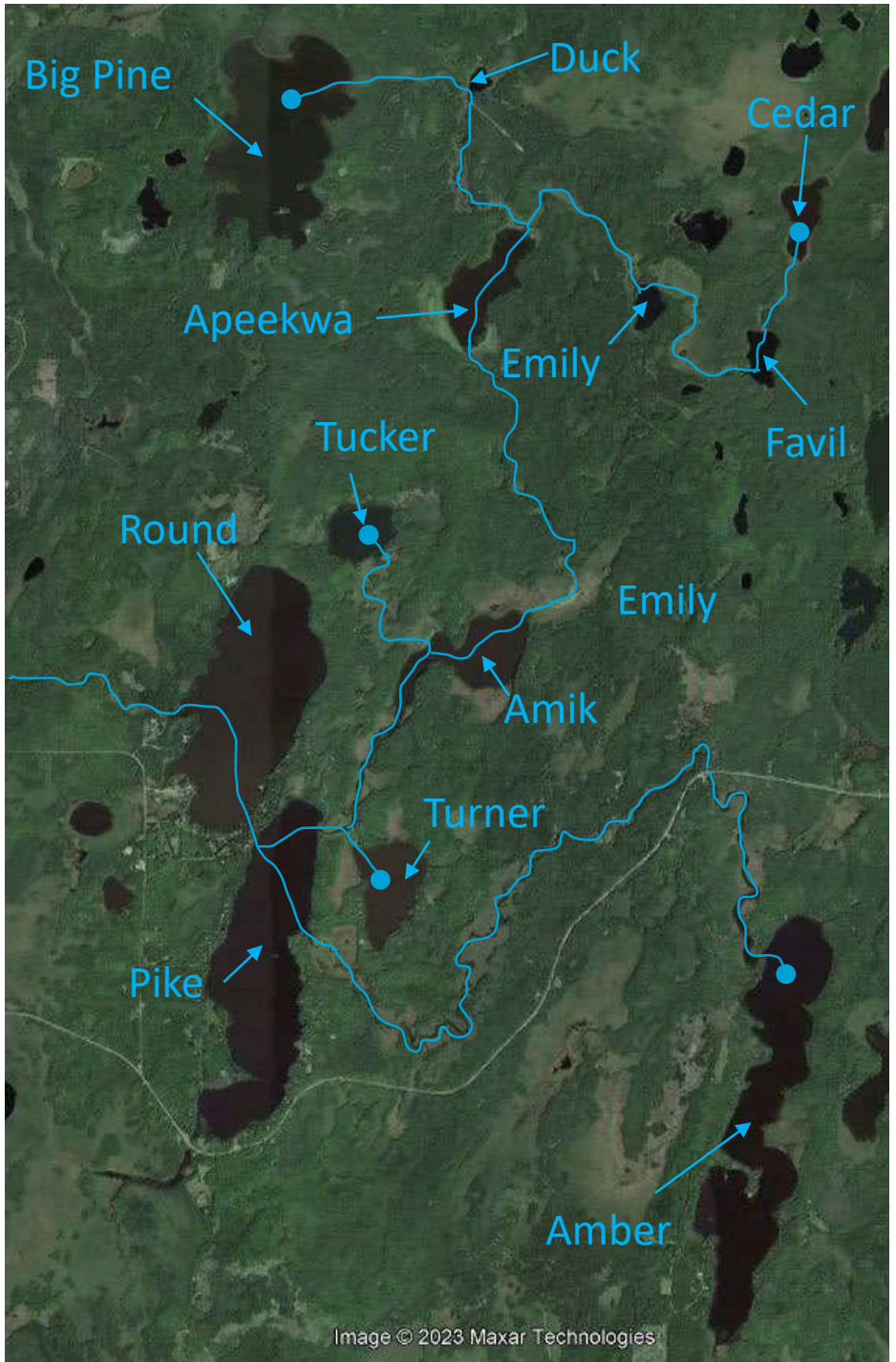


It's All Connected: The Headwater Lakes of the South Fork Flambeau River

- 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.

73 miles undammed to N. Fork Flambeau





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, PR
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 timb
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.

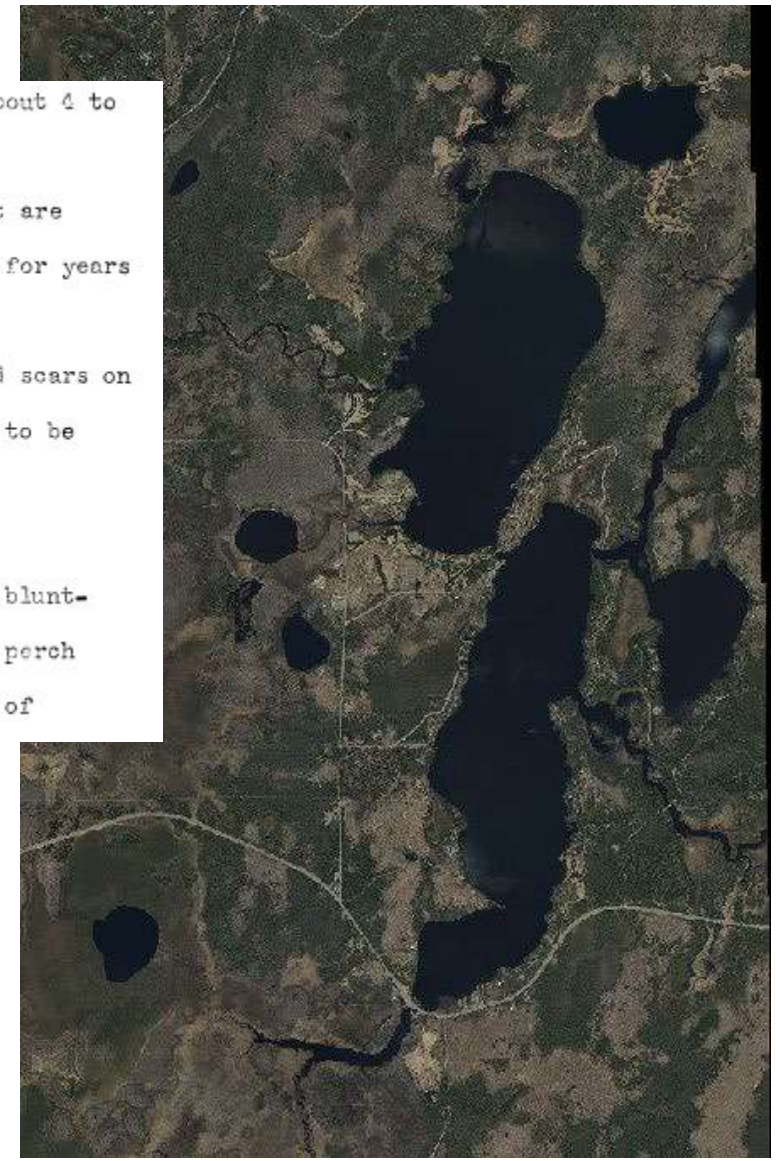
Both inlet and outlet have a dam.

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



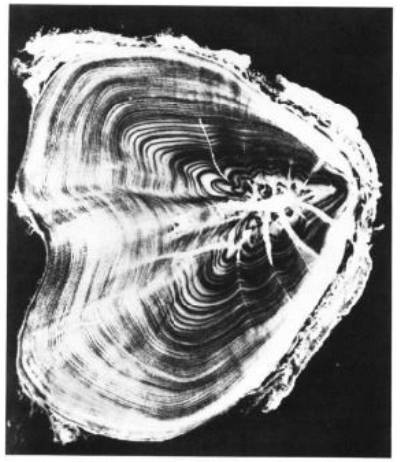
- Connection benefits Tucker and other lakes in the Chain
- Natural musky and walleye movement in Tucker Lake.
- 1988: 45” musky caught in conibear beaver set in Tucker Creek moving between Amik and Tucker

Lake Sturgeon

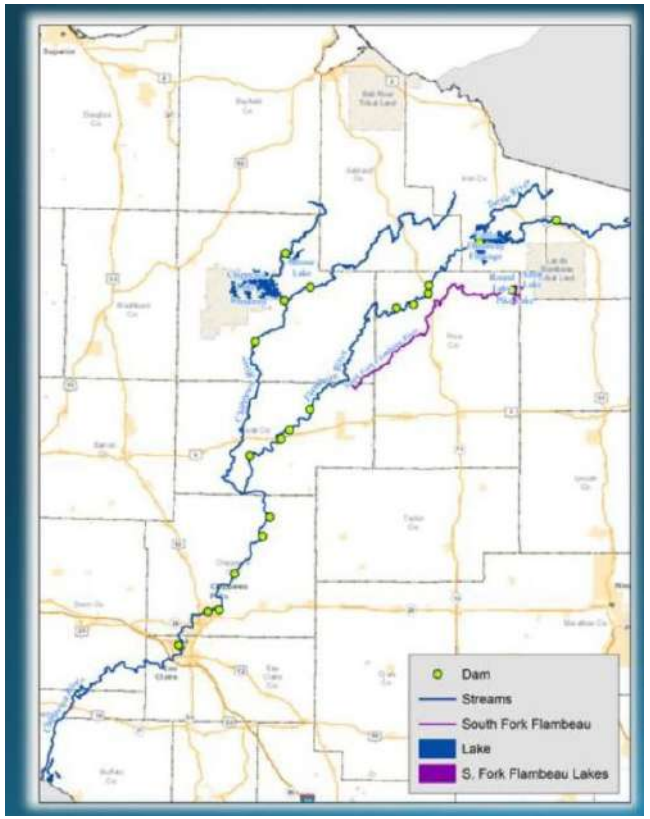
- Long lived (80+ years) WI record (that's known) 120 years, slow growing, slow maturing.
- Regional Forest Sensitive Species targeted for conservation measures
- Populations in the Chippewa and N.F. Flambeau River are fragmented because of hydroelectric generation.
- The S.F. Flambeau River population 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.

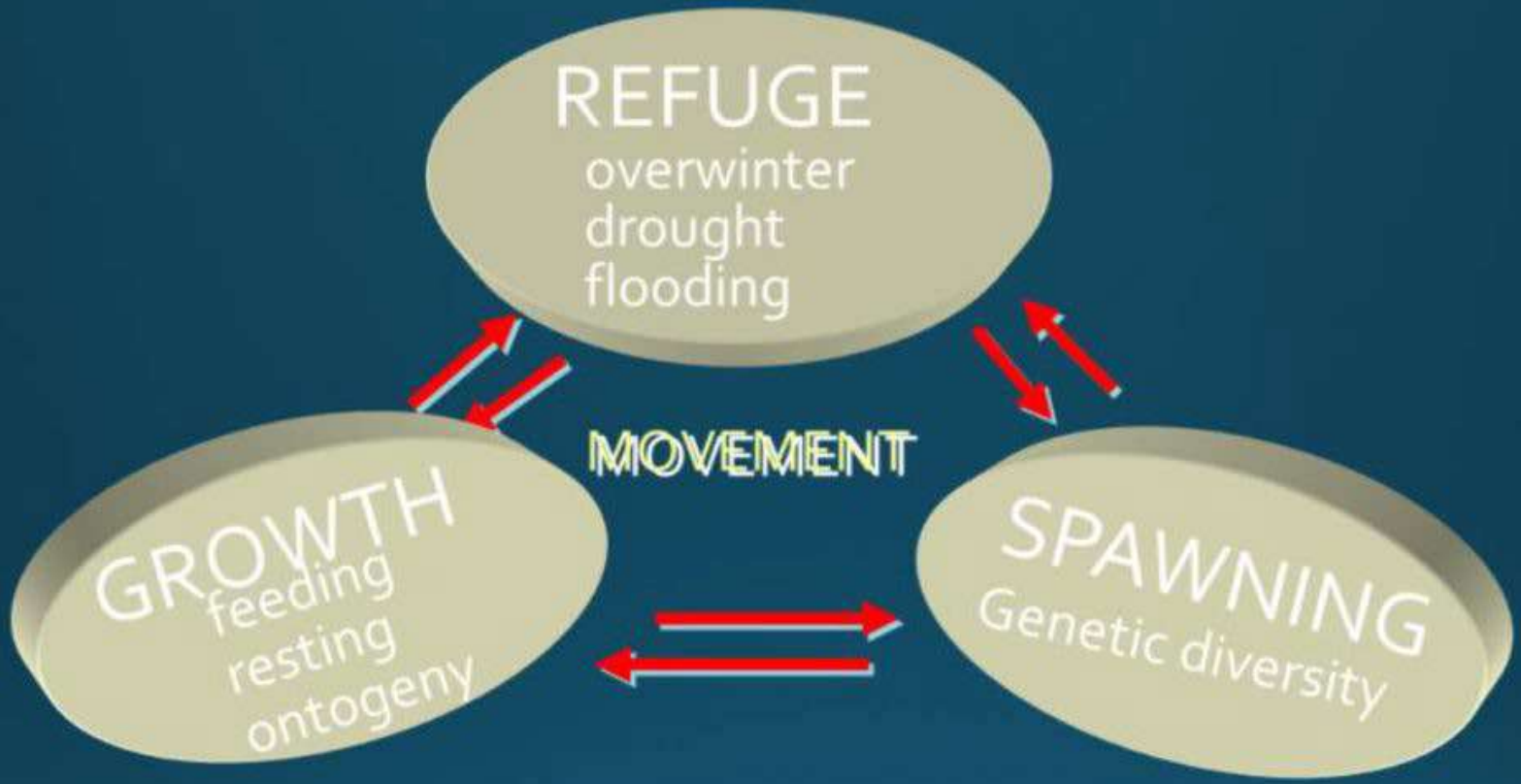
Why do sturgeon need to get past the dam if they are already living in the river?

- <u>Spawning:</u> There could be unknown spawning areas further up the Chain.
- <u>Food:</u> Large expanses of soft lake sediment provides more of the invertebrate food sturgeon prefer. Ex: Lake Winnebago "worm beds"
- <u>Wintering habitat:</u> 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: Bear Lake, Blaisdell Lake, Black Lake Michigan, Winnebago system.
- <u>Habitat Choice:</u> More available habitat offers built in resilience.



Cross section of a 2.01-m, 70.76-kg sturgeon 82 years old (Wisconsin DNR photo)





- 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 Reinecke, Chequamegon-Nicolet National Forest Service
1170 4th Ave. South
Park Falls, Wi. 54552

Dear Jeff and Sue,

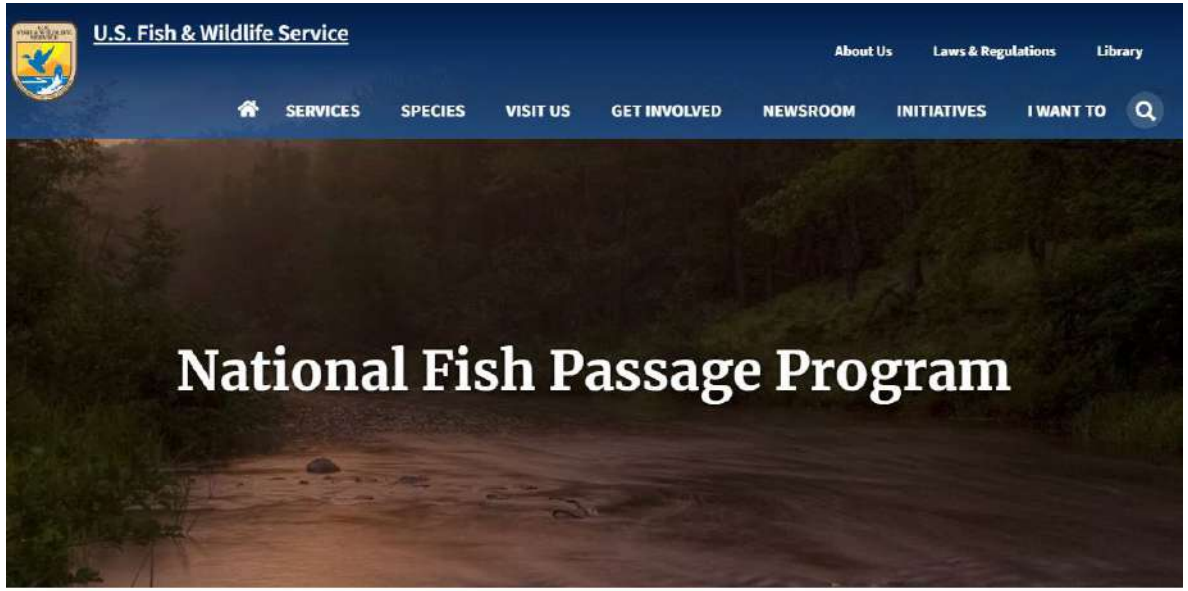
Please be advised that our proposed idea of building a fish passage structure at the Round Lake Dam, which has been discussed with you by Steve Ave'Lallemant, was presented at our Pike Lake Association Annual Meeting on Saturday, June 4, 2016. We also discussed Steve's information on your thoughts for 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

Before

Upstream view of dam

After

Upstream view of completed rapids (2003)

Upstream view of completed rapids (spring 2009)

White Earth Lake MN

Before

Dam viewed from under road grade

After

Completed rapids

Before

Upstream view of dam

After

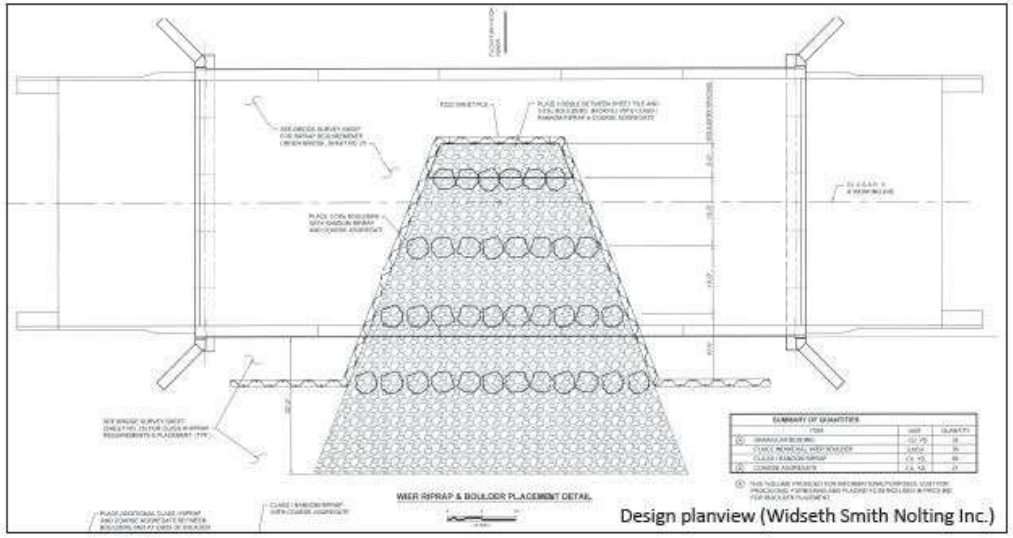
Upstream view of completed rapids

Nature-Like Fish Passage Examples on Lakes in Minnesota

Potato Lake

View of dam from upstream lake

Completed rapids

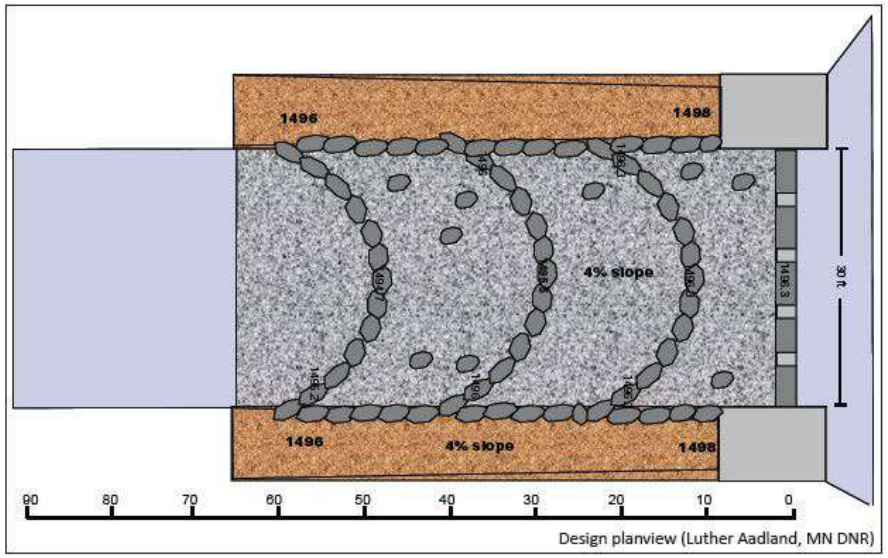


Design planview (Widseth Smith Nolting Inc.)

Many Point Lake

Upstream view of dam

Upstream view of completed rapids

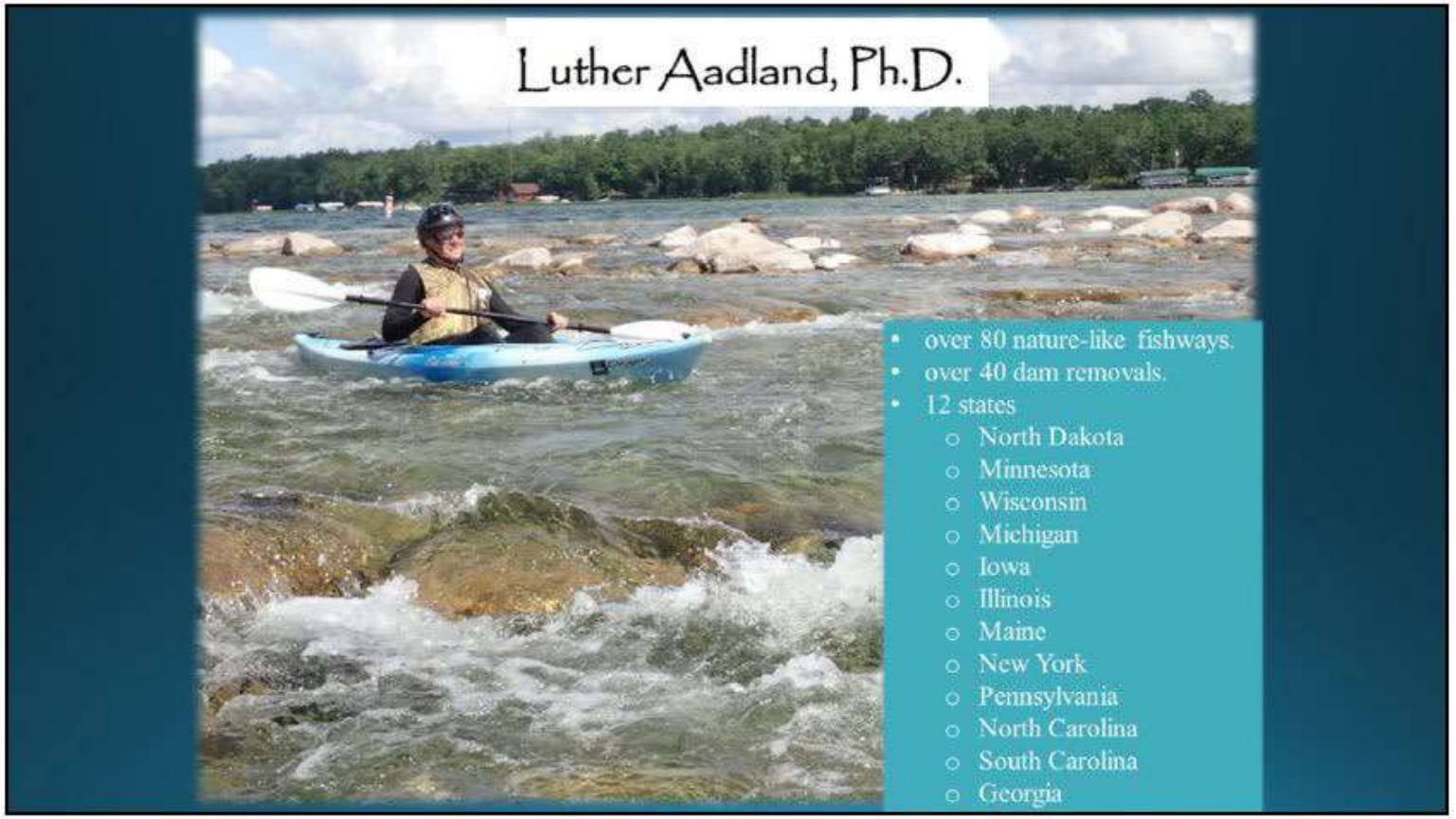


Design planview (Luther Aadland, MN DNR)

2017 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



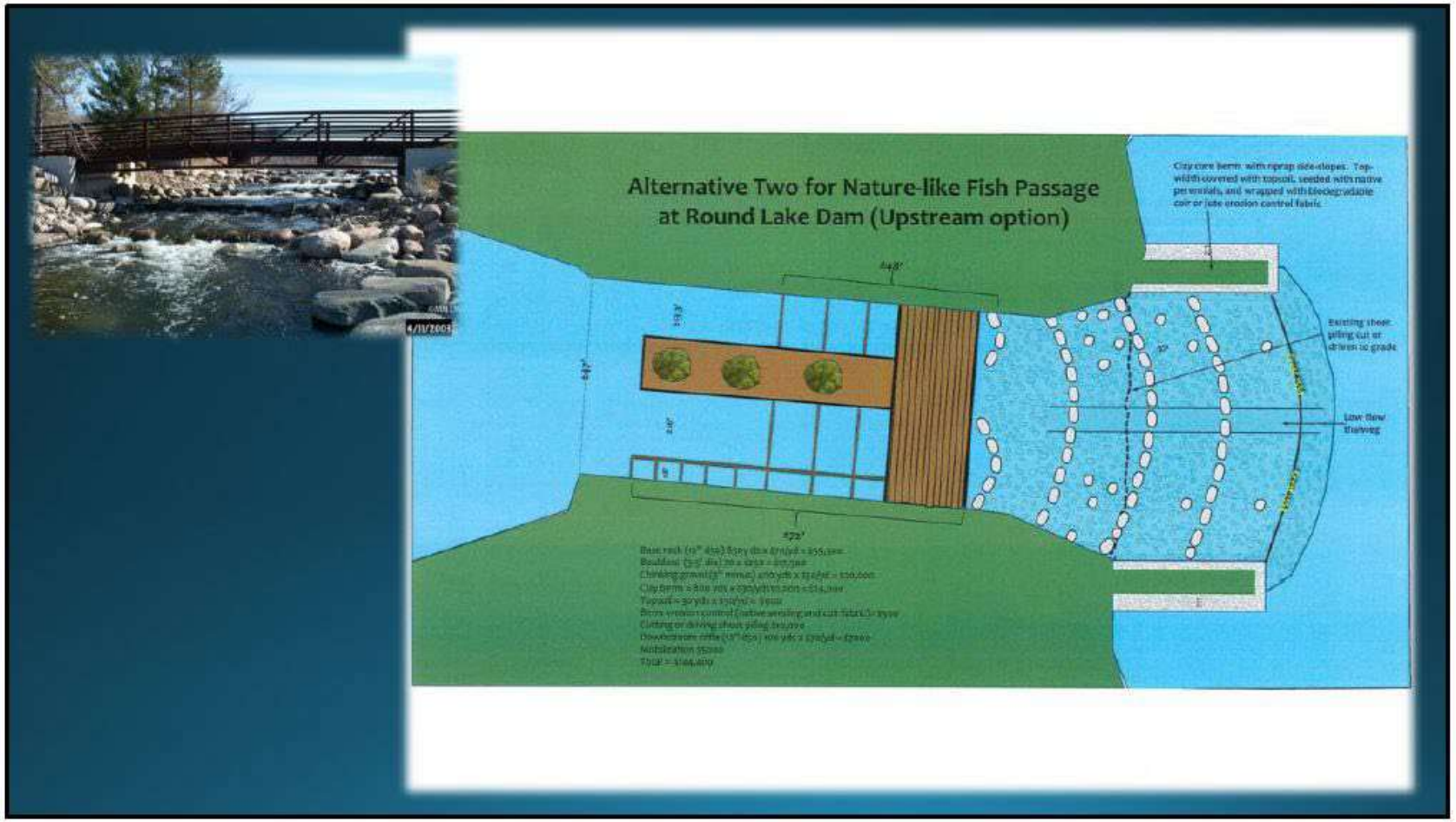
Based on the Lake Association letter of support and feedback received during the June 2017 presentation. The WDNR was able to get a grant to contract with Luther Aadland to develop a conceptual design to provide fish passage at the outlet of round lake. FS and WDNR have worked with Luther at Winter hydro.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

2017 Engineering Review

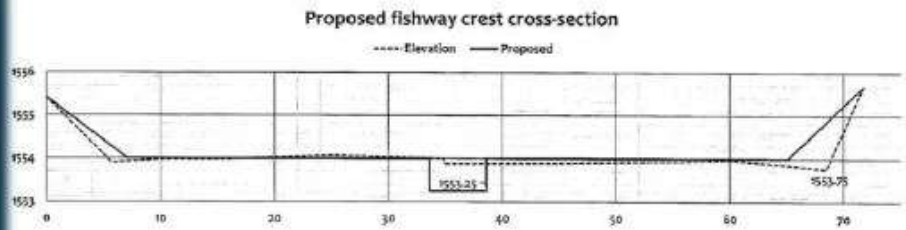
Existing Weir

- 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



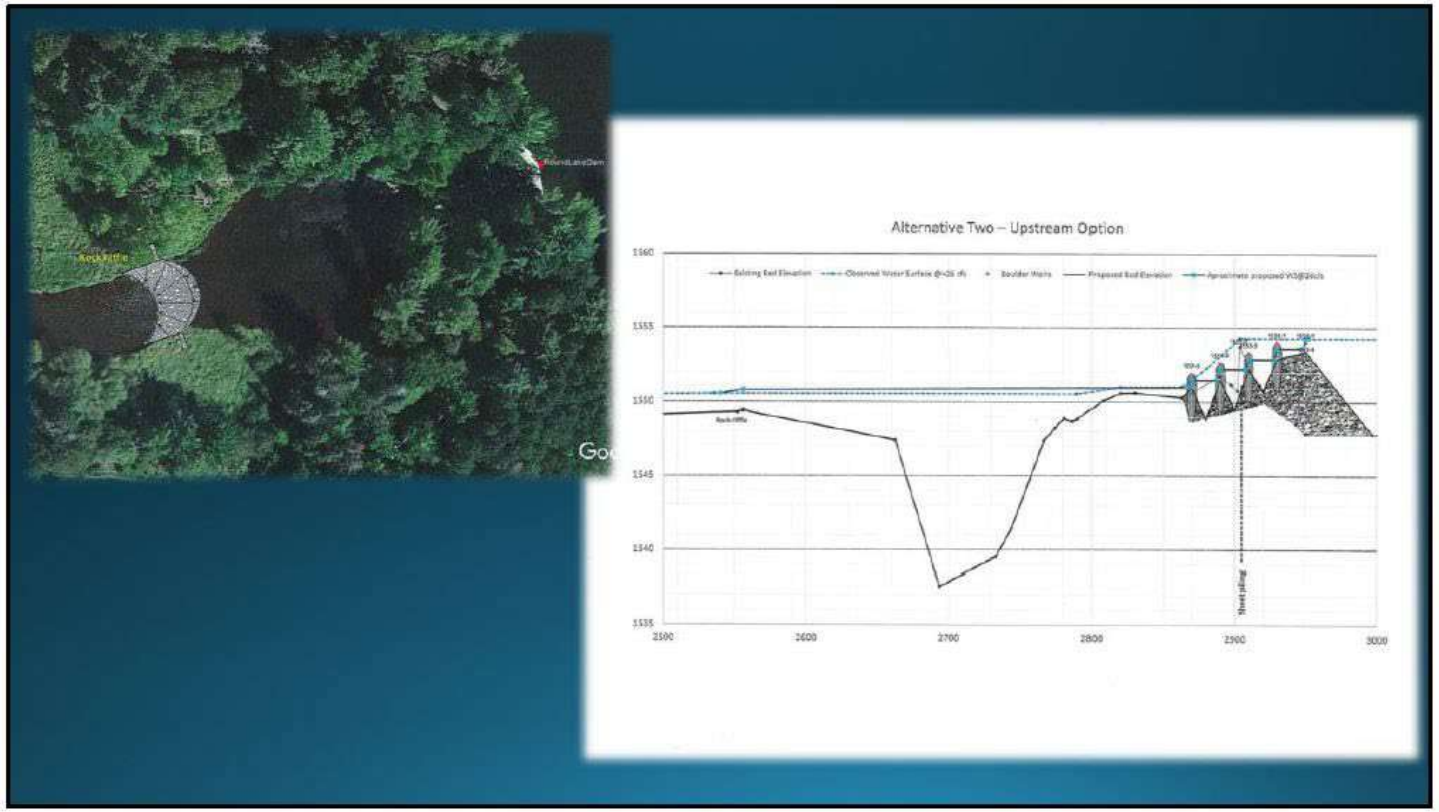
Conceptual design. 125 feet is needed, would extend (125-40) approximately 85ft into the lake. Option could be to replace clay berms with sheet pile. Length and elevation of existing sheetpile weir are maintained. Next slide discusses low flow channel.



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: 100 yr 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



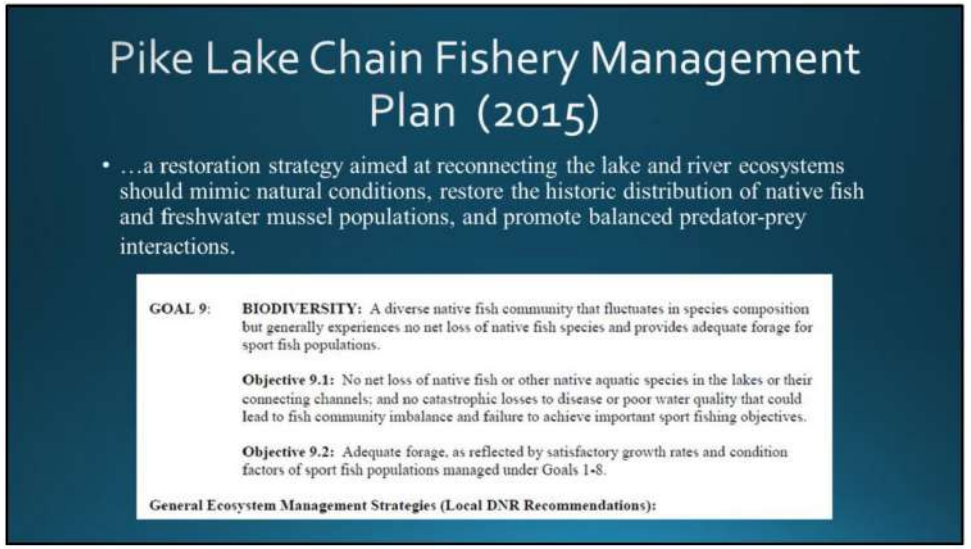
This diagram depicts a longitudenal profile of the conceptual design. Shows the series of constructed steps above the logging dam. The downstream rock riffle shown in the picture. The design calls for raising the water level within the dam raceways up a foot. The gravel bar on the outlet of the plunge 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

Water level Maintenance?

- This was addressed in the 2017 analysis. Maintaining water at the current level is critical. Designs will only be evaluated if it balances the needs of the fish and addresses concerns from lake residents and users about water level.

How will this affect the fishery in the chain?

- Long term data trends are important in fish management. Since the lake has been impounded since 1878 and there is no data pre-dam, it will take years to see any trends emerge. Similar lakes are encouraging.
- Completed nature-like fish passage in other states have shown no net adverse effects to their current fisheries.
- Escapement of fish is already happening at Round Lake and any lake with a weir. With passage, fish could get back
- Providing fish passage aligns with goals of the 2015 Pike Lakes Chain Management Plan



In Review

- The fish passage project is ON HOLD. No construction planned at this time.
- 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.
- Chequamegon-Nicolet Forest Plan guidelines state that infrastructure be maintained in a way to minimized disruption of fish and aquatic life migration and movement.