Thompson Falls Reservoir Gillnetting:

2005–2017

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Introduction

Thompson Falls Reservoir is a 9.8 mile, 968-acre impoundment of the Clark Fork River in northwest Montana. The reservoir is a result of the construction of Thompson Falls Dam completed in 1916 and is immediately adjacent to the town of Thompson Falls, MT. Thompson Falls Dam is a run-of-the-river project and because the reservoir is not for storage it maintains many riverine characteristics. Depth varies from 0-90 feet, much of the littoral habitat is in the upstream and downstream portions of the reservoir where sediment deposits have created more variable habitat.

Thompson Falls Reservoir is a locally popular sport fishery for Northern Pike, Smallmouth Bass, and salmonids including Brown Trout and Rainbow Trout. There are limited locations to fish for Northern Pike, but this is the most popular fishery in all seasons. The reservoir is residentially developed on both sides for much of its length. Many homeowners have docks and boating is common during the warmer months.

Methods

Thompson Falls Reservoir has been sampled annually with gillnets at 10 standardized locations since 2005 (Figure 1). Montana experimental 6' twine (multi-filament) nets are set at all locations with mesh sized 0.75–2.0-inch bar-measure (0.75, 1.0, 1.25, 1.5, and 2.0-inch mesh sizes). We used total catch for analysis because it was directly proportional to CPUE during this period due to standardized sampling effort (CPUE = total catch/10). Size structure was evaluated by using proportional size distribution (PSD) categories for gamefish, and relative weights (W_r) for species with standard weight equations was used as an indication of plumpness, nutritional status, and food availability. PSD lengths for game fish are determined according to the world record size of each species. The W_r for each species is determined using size data from across a species distribution, but many W_r equations are biased at the extremes of large and small for each species. Standard weight equations are typically based on the 75^{th} percentile and therefore averages near 100 represent a balanced population (Anderson 1980). This passive sampling is an effective way to look at changes in species composition and size structure over time. This allows evaluation of management objectives, and provides a framework to change objectives should the need arise.

Angler pressure estimates have been calculated for Thompson Falls Reservoir from the annual statewide angler interviews since 1982. The mail-in pressure surveys are conducted every other year by Montana Fish, Wildlife, and Parks by randomly sampling license holders. However, due to overlap in the definition of the three lower Clark Fork reservoirs (Thompson Falls, Noxon, and Cabinet Gorge), and the lower Clark Fork River Section 1 (Flathead River confluence to Idaho border), certain responses may represent days on adjacent waterbodies. Therefore, some care must be taken when considering angler pressure from the statewide angler surveys in the lower Clark Fork River. Angler days for the Clark Fork River Section 1 (29,000+ angler days) were probably over-estimated due to the difficulty anglers may have in determining which portions of the system are free-flowing river (generally the 30-mile reach upstream of the

Thompson River) and which portions may have included one of the three reservoirs (generally the 64-mile reach from Thompson River downstream to Cabinet Gorge Dam in Idaho). Reapportioning some of the river use to the reservoirs would certainly add to the estimated angler usage of all three reservoirs.

Results

A total of 1206 fish representing 13 species have been sampled over the 13 sampling events, including Black Bullhead, Brown Trout, Largemouth Bass, Longnose Sucker, Largescale Sucker, Northern Pikeminnow, Northern Pike, Peamouth, Pumpkinseed, Rainbow Trout, Smallmouth Bass, Westslope Cutthroat Trout, and Yellow Perch (Table 1). Total catch varied from a low of 33 fish in 2011, to a high of 231 fish in 2015.

Four species have been sampled every year including Largescale Sucker, Northern Pikeminnow, Northern Pike, and Yellow Perch. All three have been sampled at varying abundances with Largescale Sucker, Northern Pikeminnow, and Yellow Perch generally sampled at relatively low abundances (> 18 fish/year), but with low variability between years. Northern Pike have been the most consistently sampled fish with 10–49 fish sampled each year, and 340 total. Black Bullhead have been the most sampled species at 509 total, with catches being highly variable from 0–142 fish. There have been 313 Black Bullheads sampled in the last 3 years (2015–2017), and only one was sampled from 2009–2013.

Nine species sampled have established PSD categories and ten have W_s equations including: Black Bullhead (Gabelhouse 1984; Bister et al. 2000), Brown Trout (Milewski and Brown), Cutthroat Trout (Kruse and Hubert 1996), Largemouth Bass (Gabelhouse 1984; Henson 1991), Northern Pike (Gabelhouse 1984; Anderson and Neumann 1996), Northern Pikeminnow (Parker et al. 1995), Pumpkinseed (Gabelhouse 1984; Liao et al. 1995), Rainbow Trout (Simpkins and Hubert 1996), Smallmouth Bass (Gabelhouse 1984; Kolander et al. 1993), and Yellow Perch (Gabelhouse 1984; Willis et al. 1991). Many of the nine species with PSD categories were sampled in low numbers (Table 2). Average W_r varied from 82 (Westslope Cutthroat Trout) to 150 (Pumpkinseed; Table 2).

The Northern Pike fishery has been the most stable fishery monitored with the annual gillnets. Northern Pike have been sampled every year of monitoring, and multiple size classes have always been present (Figure 2). The PSD categories for Northern Pike length in mm are: stock 350–530, quality 530–710, preferred 710–860, memorable 860–1120, and trophy >1120 (Gabelhouse 1984). There have been only 3 species sampled with an individual greater than “preferred” size; Brown Trout, Northern Pike, and Smallmouth Bass (Table 2). Angler days varied from an estimated low of 146 in 2011, to a high of 4,621 in 2013.

Discussion

Results from gillnet sampling in Thompson Falls Reservoir may not entirely represent all sportfish present. Smallmouth Bass, while only absent from 3 surveys, are sampled at very low numbers. Smallmouth Bass are a popular sport fish in the reservoir, and with the Floy tagging

done at the Thompson Falls Fish Ladder we have sampled more fish in the past 3 years (2015-2017) via tag returns (n = 13) than have been sampled in the gillnets. Bass in general are notoriously net-shy, and our sampling may be an indication they are in Thompson Falls Reservoir as well, or maybe the nets are not located in areas conducive to Smallmouth Bass sampling. Overall, the size structure of Smallmouth Bass is good, and this fishery provides opportunity for fish "preferred" or larger (Gabelhous 1984).

The size structure of Northern Pike indicates there are fish of multiple size-classes, ranging from young-of-the-year to "memorable" class fish (Gabelhouse 1984). The Northern Pike fishery provides the best opportunity for a "trophy" fish, in addition to having the largest fish sampled in the reservoir. The population of Northern Pike has increased recently, and while down a little from the peak in 2016, many large fish are still present.

Relative weight calculations for ten species of fish with established standard weight equations indicate a range of conditions, from well-nourished (PUMP) to poor condition (N PMN). Results from species with low sample numbers may not be entirely representative of the actual population, but generally salmonids have low relative weights while most other species are close to what is considered "normal" or a generally healthy population.

The salmonid fishery in the reservoir appears to be consolidated primarily to the mouths of the Thompson River and Cherry Creek, as reported by anglers. We suspect this is because of the temperature differential between the streams and reservoir, and salmonids are vulnerable to exploitation while seeking thermal refuge. In 2017, a tagging program to investigate the exploitation of salmonids passed over the Thompson Falls Fish Ladder was initiated. This effort may derive information on salmonid habitat use and harvest in Thompson Falls Reservoir, as there is little information on salmonids obtained from our gillnet data.

The Yellow Perch fishery is difficult to characterize in Thompson Falls Reservoir. While Yellow Perch are sampled every year, and have decent size structure, they do not appear to be a popular fishery. Based on gillnet catch, their abundance in Thompson Falls Reservoir is considerably lower than in Noxon Reservoir. The Yellow Perch fishery in Noxon Reservoir is very popular, but the Thompson Falls fishery is not, and reasons for this difference should be investigated further, but is suspected to be related to abundance of littoral habitat.

There were noticeably less fish sampled in 2008 and 2011, both years with high spring flows. The 2011 sampling had the lowest total catch, coinciding with the high spring flows, and lowering of the reservoir for dam repair. The reservoir was lowered for two months during the summer of 2011, which eliminated nearly all littoral habitat in the reservoir and likely reduced abundance of littoral species through either direct mortality or elimination of habitat. Since then, species associated with littoral habitat such as Northern Pike, Yellow Perch, and Black Bullhead have been captured at historically high abundances. Increases in overall catch can be mostly attributed tothe return of Black Bullhead in large numbers the last few years. A 2015 creel survey in the adjacent Noxon Reservoir found that only 1% (13/1324) of interviewed anglers targeted bullheads (Blakney 2017). There is no data on the Black Bullhead fishery in Thompson Falls, and with their return in large numbers this could be an area for further investigation.

While there have been many Largescale Sucker and Northern Pikeminnow passed over the Thompson Falls Fish Ladder, there have been few sampled in the reservoir. We hypothesize that these species are migrating through the reservoir to more suitable habitat upstream. Schmetterling and McFee (2006) found Largescale Suckers average migration to be 55 km but varied from 5.1–159.2 km after passage upstream of Milltown Dam.

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Figures

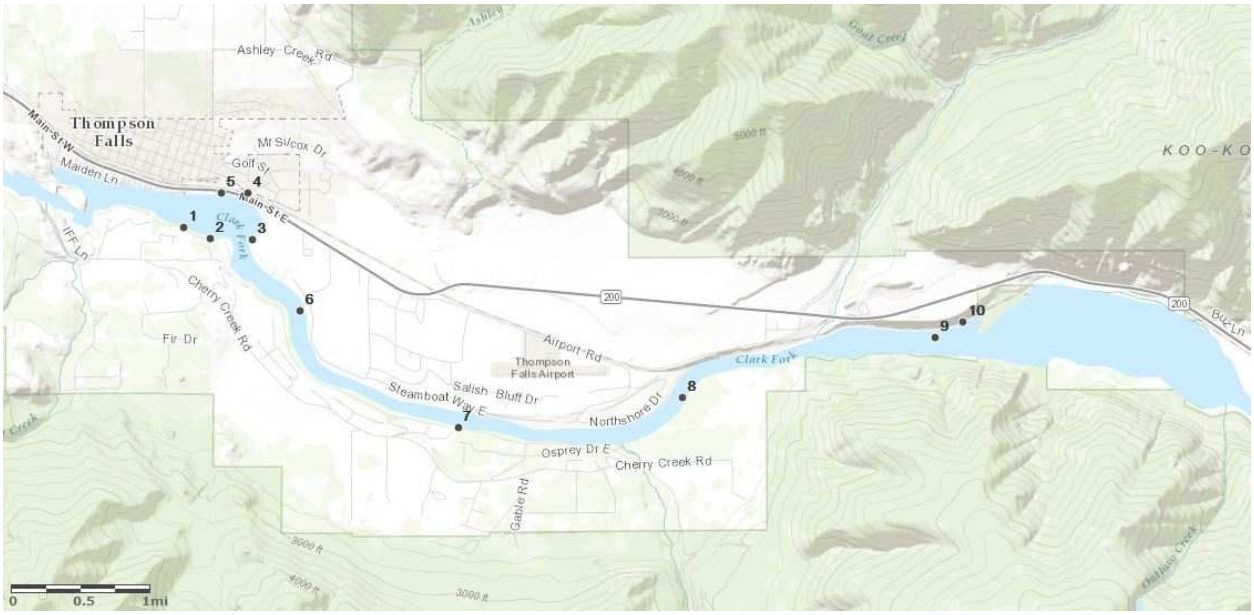

Figure 1. Thompson Falls Reservoir with locations of nets set from 2005-2017.

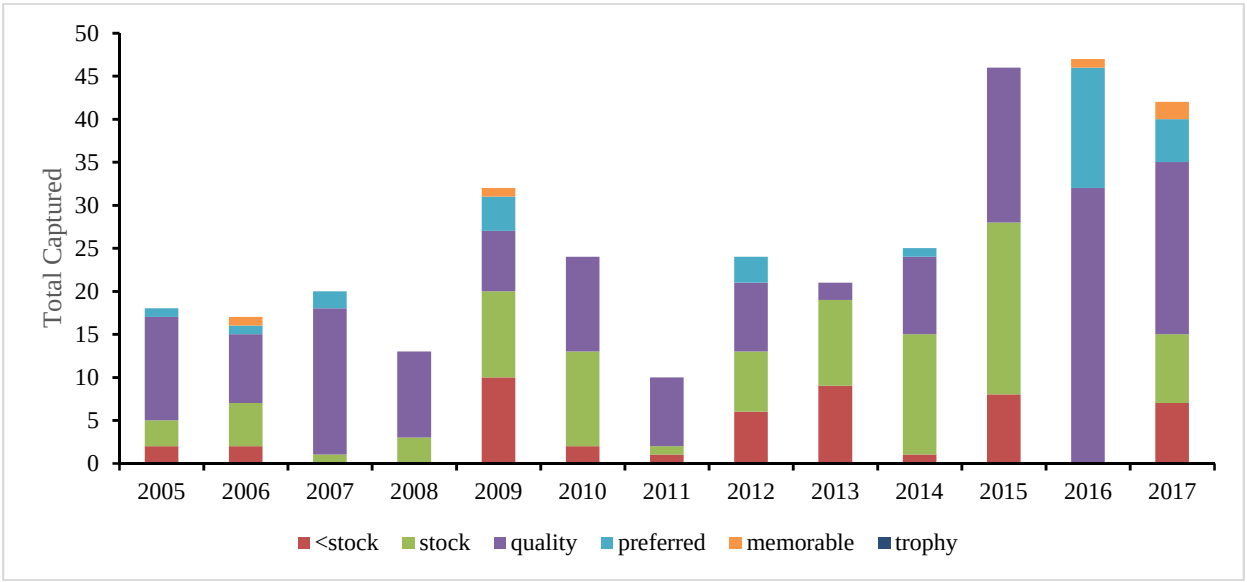

Figure 2. Proportional stock densities of total catch for Northern Pike from 2005-2017.

Species	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
BL BH	34	83	60	6					1	12	142	59	112	509
LL								2						2
LMB			3				1			1	2			7
LN SU						1	5			1			1	8
LS SU	13	7	10	8	12	8	6	13	6	8	8	2	5	106
N PMN	3	5	5	2	8	3	3	3	5	5	10	2	9	63
NP	18	17	20	13	31	24	10	24	21	25	46	49	42	340
PEA	1	1	1			1	1							5
PUMP	1	2	5	18	1	1					4	6		38
RB					2	2		4						8
SMB	1		5	1		1	1	3	1	4	1		4	22
WCT							2						1	3
YP	7	1	12	2	1	9	4	4	5	6	18	12	14	95
Total	78	116	121	50	55	50	33	53	39	62	231	130	188	1206

Table 1. Total catch of each species and for each year of gillnetting in Thompson Falls Reservoir. Species abbreviations in the order they appear in the table are: Black Bullhead, Brown Trout, Largemouth Bass, Longnose Sucker, Largescale Sucker, Northern Pikeminnow, Northern Pike, Peamouth, Pumpkinseed, Rainbow Trout, Smallmouth Bass, Westslope Cutthroat Trout, and Yellow Perch.

Size	<Stock	Stock	Quality	Preferred	Memorable	Trophy	Wr	Max	Min
BL BH	40	314	88	1			98	50	166
LL			1		1			82	76
LMB	3	3	1				115	108	121
N PMN							84	68	112
NP	48	125	144	18	5		101	66	155
PUMP		32	6				150	80	195
RB	1		7				93	80	111
SMB		3	10	7	2		102	94	120
WCT		3					82	73	89
YP		40	40	15			90	48	124

Table 2. Proportional size distribution (PSD) categories and total catch in gillnets for species with PSD classifications from 2005-2017. Average Wr along with maximum and minimum values for species with Ws equations. Please refer to Table 1 for species abbreviations.