Montana Department of Fish, Wildlife and Parks
Fisheries Division

Job Progress Report

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JOB: Northeast Montana Warmwater Ponds and River Investigations

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ABSTRACT

Northeast Montana provides anglers with diverse fishing opportunities from iconic Fort Peck Lake to the relatively underutilized Milk and Missouri Rivers to numerous small impoundments both on public and private lands. From 2013 to 2015 Fish, Wildlife & Parks (FWP) conducted a variety of fisheries related efforts to improve recreational opportunity, monitor existing fisheries and inventory "new" waters. This report summarizes FWP's fisheries management activities in the eastern management district of Region 6 (Figure 1.) This management zone includes Valley, Daniels, Sheridan, Roosevelt and portions of Richland, McCone and Dawson Counties. This report does not include Fort Peck Reservoir, as it is a separate management entity.

Eastern Montana observed varied water conditions from 2013 to 2015. Most small impoundments were at or near full pool in 2013 and held their water through the summer of 2015 due to significant rains that occurred during the fall of 2014. Discharge in the Milk River saw a large amount of variability from 2013 to 2015, with 2013 being an above average water year with strong spring and early summer flows to a below average water year in 2015 (Figure 2). The Missouri River had an early summer pulse during 2013 due to inputs from the Milk River and also observed a large pulse of water during the fall of 2014 due to large prairie rain events (Figure 3). On the other hand, 2015 was a low water year for both the Missouri and Milk rivers, where little to no flow pulses were observed.

In general, fish populations and angler opportunities were good throughout the region from 2013 to 2015. Summer and overwinter survival in small impoundments were relatively good due to high water conditions. The river fisheries benefitted from the recruitment of sauger and walleye as well as other game fish that were produced during the higher water years of 2010 to 2013.

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INTRODUCTION

The quality of many Eastern Montana fisheries are closely tied to water conditions. Prairie ponds benefit from wet years by holding more water, which helps buffer daily fluctuations in water temperature and dissolved oxygen. High water often increases spawning and rearing habitat and increases prey abundance by flooding terrestrial vegetation. The majority of small ponds throughout the eastern district of Region 6 had “good” water conditions from 2013 to 2015. Higher than average water years occurred in 2013 and 2014 and while 2015 was relatively dry, most ponds were full going into 2015 and maintained their water throughout the spawning season. During this period, summer and overwinter survival of stocked rainbow trout ponds was high and production of self sustaining fish populations such as yellow perch, largemouth bass and “bait” fish were good.

Similar to prairie ponds, the Milk River fishery benefits from above average water years. Several species of game and non-game fish spawn during the spring and early summer with the occurrence of spring pulses form prairie runoff and later mountain runoff. These pulses increase the number of fish that migrate to spawning grounds and increase survival of eggs and larvae to young-of-the-year fish. An observed difference in the densities of sauger, walleye, paddlefish, and other fishes exists in the Milk River during “good” and “bad” water years, with abundance being higher during years with more water. There are likely biological reasons that fish migrate into the Milk River during higher water periods. For example, paddlefish lay their eggs on hard substrates such as gravel and cobble, which is only exposed in the lower Milk River when discharge is great enough to place fine substrates into suspension. These spring flows help expose gravel bars where an abundance of fish spawn.

The Milk River observed varied water conditions from 2013 to 2015. The 2013 water year was above normal with several spring and early summer pulses topping out at over 8,000 cfs. However, during both 2014 and 2015, short early spring pulses occurred, but the duration of these events was relatively short. The 2014 year had one large pulse of near 12,000 cfs, but it occurred during September due to high prairie rain events.

The Missouri River is heavily managed by the operations of Fort Peck Dam. Fort Peck Dam greatly dampens spring and early summer flow pulses. However, the Milk River significantly influences the magnitude of flows in the Missouri on above water years. While 2013 had slight increases in flow during the early spring and early summer months due to inflows from the Milk River, both 2014 and 2015 were relatively stagnant water years in the Missouri, with the exception of the September pulse in 2014 from prairie rains.

This report summarizes FWP fisheries management work conducted in the east portion of Region 6 for the 2013 to 2015 field seasons. Pallid sturgeon work done out of the Fort Peck office is summarized in three annual reports that are submitted to the United States Army Corps of Engineers. Those reports evaluate not only pallid sturgeon, but other native and non-native fishes residing in the Missouri River.

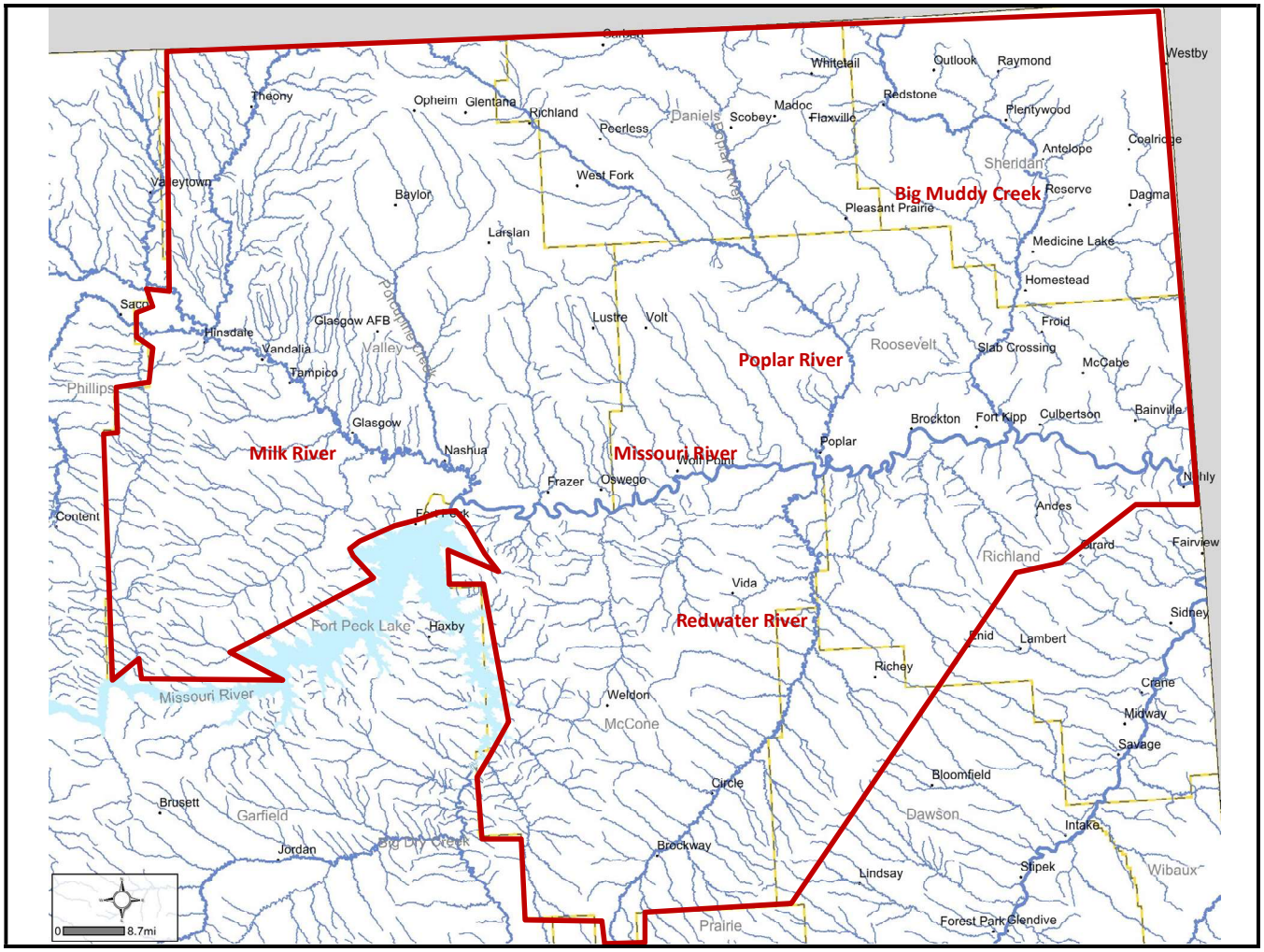

Figure 1. Map of the northeast Montana fisheries management district, including Valley, Daniels, Sheridan, Roosevelt, McCone and parts of Richland and Dawson Counties. Red line is approximate border of the management district.

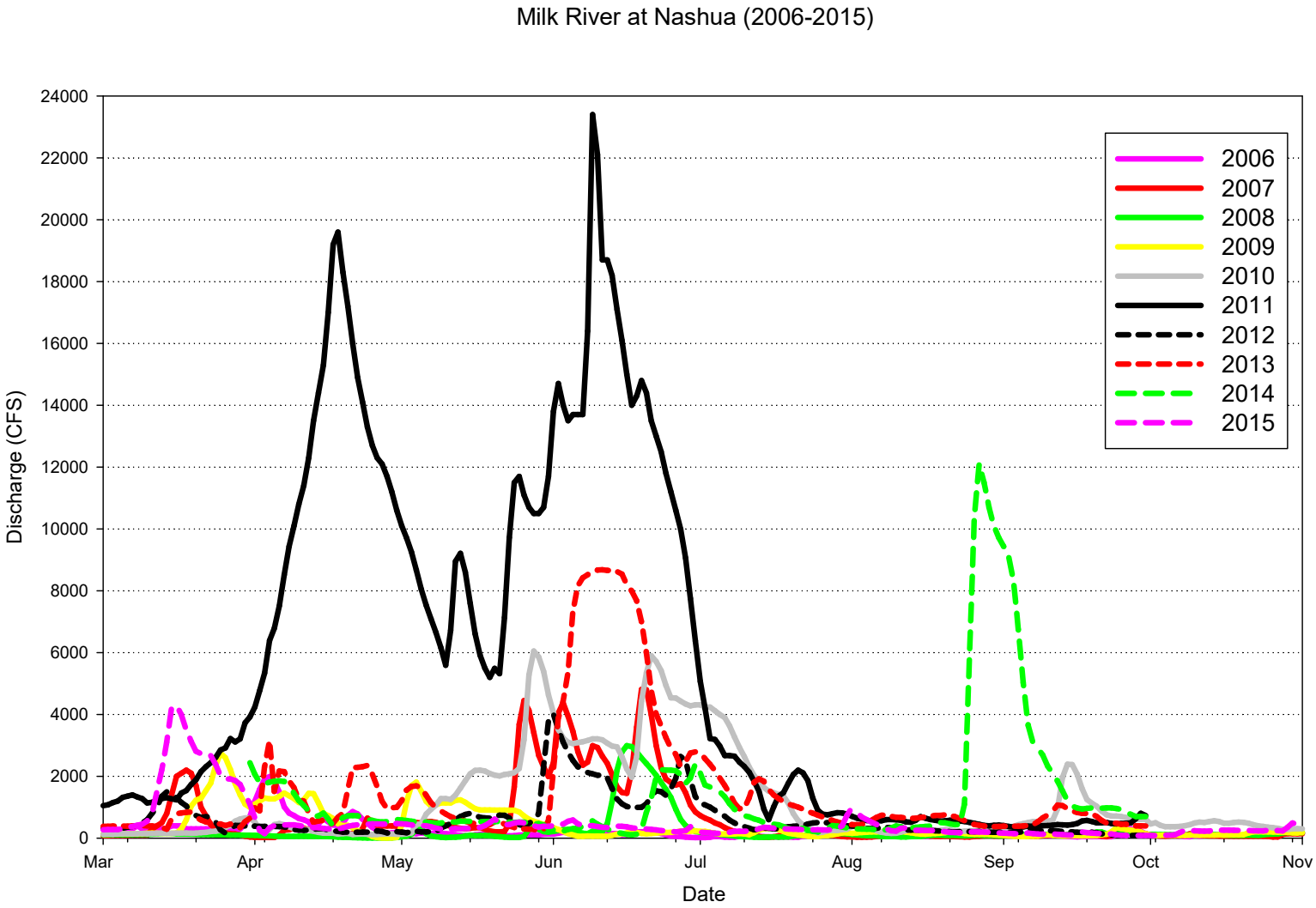

Figure 2. Hydrograph of the Milk River at Nashua, MT. March through November 2006-2011 and March through September for 2012 to 2015. Source USGS.

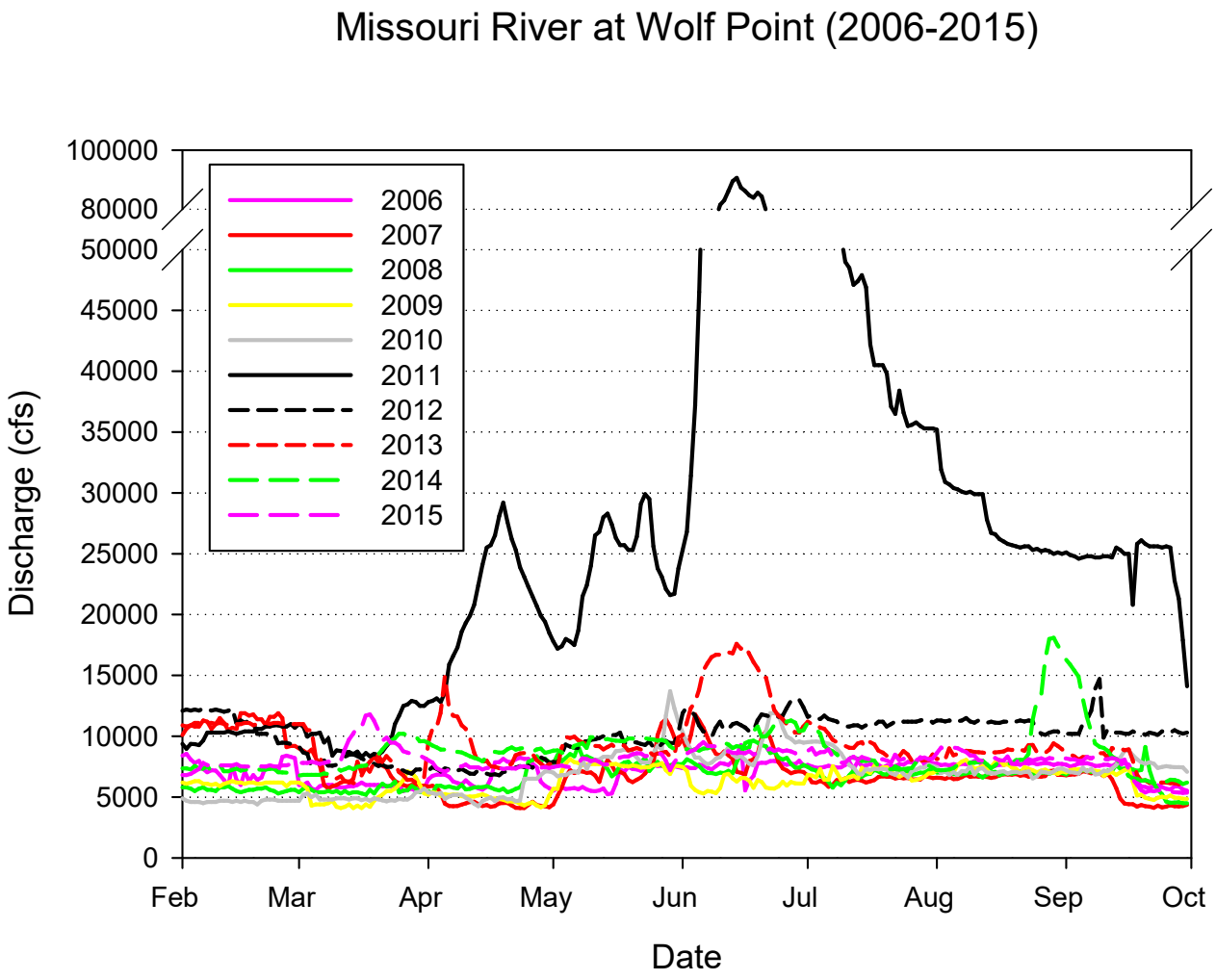

Figure 3. Missouri River hydrograph at Wolf Point, February through September, 2006-2015. Notice the break in the Y-axis from 50,000 to 80,000 cfs. Source USGS.

PROCEDURES

Northeast Montana Rivers and Streams

Milk River

Monitoring of the lower Milk River sauger population continued in 2013 and 2014 but was not conducted during 2015. Electrofishing occurred on four occasions during 2013 from April 9th to May 10th and on five occasions during 2014 between April 10th and May 12th. Electrofishing was conducted with booms on a jet boat using a Smith Root rectifying unit. Electrofishing runs were made in a downstream manner. For the Milk River sauger sampling, sauger and walleye were dip netted as well as other game fish species, however since the abundance of other river fishes (suckers and goldeye) would have overwhelmed dip netters, those species were not netted. However, visual estimates of other species were recorded and those observations were input into the State of Montana's Fisheries Information System (Godzilla). Water conductivity was measured during all electrofishing efforts. All captured game fish (sauger, walleye, channel catfish, etc.) were measured to total length, weighed and their reproductive state was visually assessed and recorded. Figure 4 shows the length of the Milk River sauger electrofishing reach, which begins approximately at approximately river mile 4.5 and ends where the Milk River enters the Missouri River, therefore the run is approximately 4.5 miles in length.

Missouri River Trout Sampling

Electrofishing for rainbow and brown trout in the Missouri River downstream of Fort Peck Dam occurred in 2013, 2014 and 2015. This effort is being conducted to better understand the population structure of the rainbow and brown trout population downstream of Fort Peck Dam. All electrofishing efforts occurred at night from the Boy Scout Park boat ramp in a downstream manner to just upstream of the mouth of the Milk River (Figure 7). Crews used a jet boat boom mounted system with a Smith Root electrofishing rectifying unit. Each night consisted of shocking downstream on either river right or river left and attempting to net all trout (brown or rainbow) that were encountered. The opposite river bank was subsequently sampled the following night. All trout captured were anesthetized in a tricaine methanesulfonate (MS-222) bath, measured (total length) and weighed. Trout large enough received a passive integrated transponder tag (PIT tag) (Biomark, 12mm length) in their dorsal musculature.

During 2013, electrofishing occurred on six separate nights from August 7th to September 5th. The initial two nights of sampling on August 7th and 8th were the mark run and subsequent runs were considered recapture with replacement runs. This methodology lent itself to populating a Schnabel method mark/recapture population estimate.

A similar procedure was used for 2014 and 2015. However, during 2014 four individual nights were sampled and during 2015 two nights were sampled. Using catch-per-unit-effort, data from the 2014 and 2015 sampling occasions can be compared to the population estimate conducted during 2013. Using this methodology for 2014 and 2015 reduced the amount of

shocking and handling of trout. Another full mark/recapture population estimate may be warranted in 2016.

Northeast Montana Ponds

Several small impoundments in Valley, Daniels, Sheridan, Roosevelt, McCone and Richland Counties were sampled using trap and gill nets during from 2013 to 2015. This is part of the routine sampling of the area's prairie ponds. FWP likes to get to each pond in eastern Region 6 sampled on a at least a three year basis, however certain ponds garner more public attention and those ponds are often sampled on a more frequent interval. Box Elder Creek Reservoir located in Sheridan County is an example of a higher profile water body that receives sampling on a more frequent basis.

Northeast Montana Wild Fish Transfers

Wild fish transfers are performed in northeast Montana to start, restart, or supplement fisheries in local water bodies. Fish health and aquatic nuisance species testing is done prior to fish being moved on all donor waters. Fish health testing is performed by FWP staff and samples are sent to the USFWS at the Fish Technology Center in Bozeman, MT. Aquatic nuisance species testing is also performed by FWP staff. These measures are in place to reduce the risk of infecting "clean" water bodies with aquatic pathogens and nuisance species from already contaminated waters. Several fish transfers were conducted within the management zone form 2013-2015.

RESULTS AND DISCUSSION

Survey of Northeast Montana Rivers and Streams

Milk River- Electrofishing

Sampling of sauger and walleye in the lower Milk River was conducted in 2013 and 2014 using boat electrofishing. Both sauger and walleye abundance was lower in 2014 when compared to 2013 (Figure 5 and Table 1). A total of 108 sauger were captured in five sampling efforts in 2014 and 254 were collected during 2013 in four sampling efforts. These catches translate to a total CPUE of 12.8 sauger/hour in 2014 and 39.9 sauger/ hour during 2013. While CPUE was higher throughout the sampling period in 2013 when compared to 2014, the 2013 overall CPUE was heavily influenced by the April 9th sampling effort which had a CPUE of 94 sauger/ hour. When compared to all years, this April 9, 2013 date had the highest CPUE of sauger that has been observed (Figure 5).

Similar to sauger, the relative abundance of walleye in the lower Milk River was in general lower throughout the sampling season in 2014 compared to 2013. Walleye CPUE was recorded at 1.4 fish/hour in 2014 and 4.2 fish/hour during 2013 (Figure 5). The highest overall CPUE that has been observed for walleye occurred during 2012, with four sampling dates with catch rates over 4.0 fish/hour.

The average size of both walleye and sauger were slightly smaller in 2014 than in 2013 (Table 1). Sauger averaged 13.2 inches in length and weighed on average 0.6 lbs during 2014 and averaged 14.0 inches and weighed 0.8 lbs during 2013. The length frequency histogram of sauger in Figure 6 shows the size distribution of sauger captured from 2011 to 2014. In general, the size distribution of sauger in 2014 was similar to previous years with the exception of larger sauger over 19 inches being absent. This was the first sampling year that these larger sauger did not make up at least a small proportion of the total catch.

Similar to sauger, large walleye over 19 inches were not sampled during 2014 (Figure 5). However, total walleye numbers in each sampling year are relatively low compared to sauger and few walleye during most years exceeded 19 inches in size.

Figure 5 shows a somewhat vague, but nevertheless a pattern of higher sauger densities during the early to mid portions of April and decreasing numbers from late April to the end of May. It has been somewhat hard understanding the pattern of sauger abundance in relationship to discharge, since higher discharges seem to lower capture efficiency. Flows during 2011 were extremely high, which also equated to a low sauger catch. On the other hand, flows were very low during 2012 and sauger catch rates were relatively high throughout the season. Understanding if this is a result of more sauger in the system or just higher capture efficiencies will take further evaluation. Nonetheless, we can learn a lot about the sauger population by examining the size structure of the migratory population every year to every other year to see if significant changes occur. Furthermore, looking at changes in relative weight can help us understand if there are potential resource limitations occurring in adult sauger. So far, relative weights of sauger have remained relatively constant from 2011 to 2014.

Several other game fish were captured during the electrofishing efforts of 2014 and 2013, all which occurred in higher numbers during 2013 than during 2014 (Table 1). In 2013, 25 channel catfish, 6 freshwater drum, 12 northern pike and 7 shortnose gar were caught. On the other hand, during 2014 only 16 channel catfish, 2 freshwater drum, 1 northern pike and 0 shortnose gar were captured. These lower numbers of all other game species during 2014 including sauger and walleye is interesting. The major difference in flows during the two sampling years was that 2014 had much lower flow conditions through the month of April, which may have reduced migrations of fish into the Milk River during this period of time. More years of flow and catch data should help flush the complicated relationship between flow, fish densities and capture efficiencies.

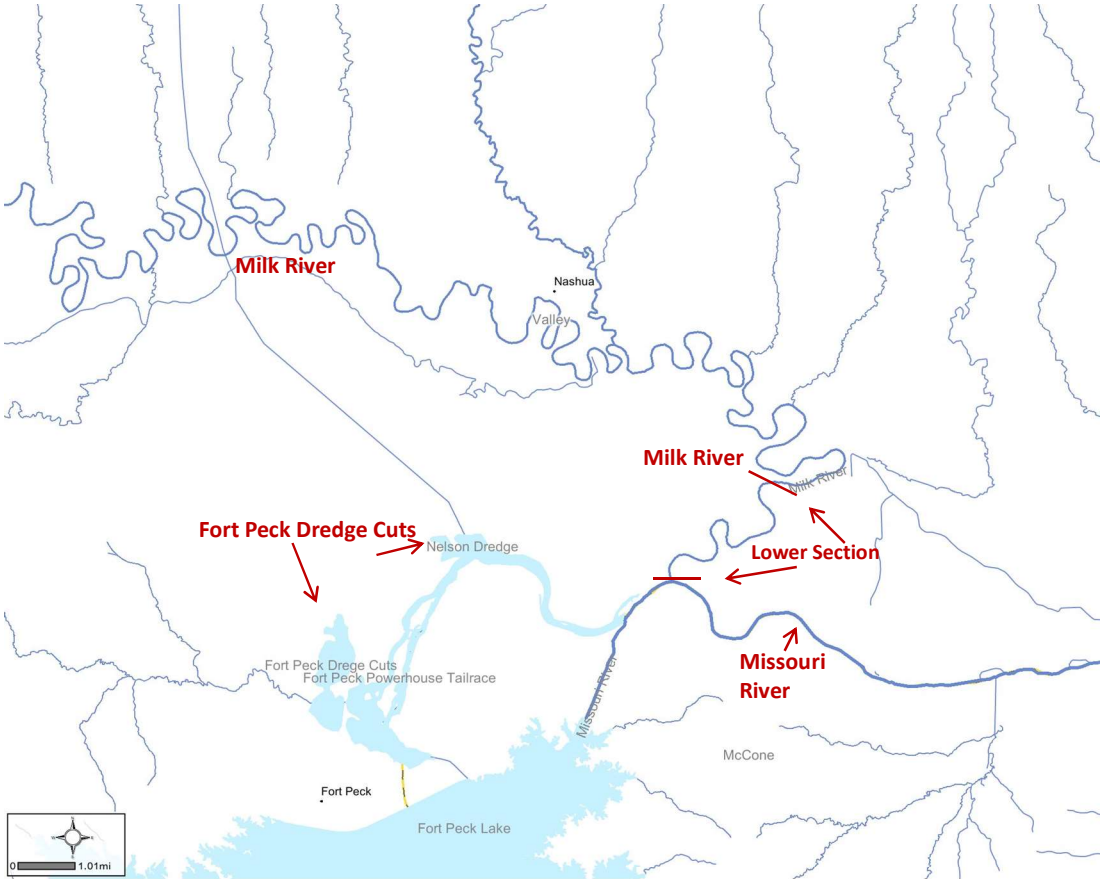

Figure 4. Map of the lower Milk River study section and the Fort Peck Dredge Cuts.

Table1. Electrofishing summary for the lower Milk River 2013 and 2014. Tables represents the total catch during four separate sampling occasions from April 9 to May 10, 2013 and five separate sampling occasions from April 10 to May 12, 2014.

Species		# Sampled	Length Avg (in)	Min Length (in)	Max Length (in)	Weight Avg (lbs)	Relative Wt Avg	CPUE (fish/hour)
Burbot	2013	0.0						0.0
	2014	0.0						0.0
Channel Catfish	2013	25.0	20.3	14.4	30.4	3.5	90.7	6.4
	2014	16.0	18.6	13.4	25.4	2.4	91.5	1.9
Freshwater Drum	2013	6.0	15.5	13.1	18.5	1.7	97.5	2.6
	2014	2.0	15.6	15.2	15.9	2.0	116.3	0.2
Northern Pike	2013	12.0	23.4	18.8	31.3	3.3	88.9	4.4
	2014	1.0	23.9					0.1
Sauger	2013	254.0	14.0	9.1	22.0	0.8	73.6	39.9
	2014	108.0	13.2	9.4	18.8	0.6	75.8	12.8
Shortnose Gar	2013	7.0	23.3	21.2	23.4	1.3	NA	2.4
	2014	0.0						0.0
Walleye	2013	18.0	16.4	8.6	30.6	2.3	83.1	4.2
	2014	12.0	14.8	6.2	18.6	1.2	86.5	1.4

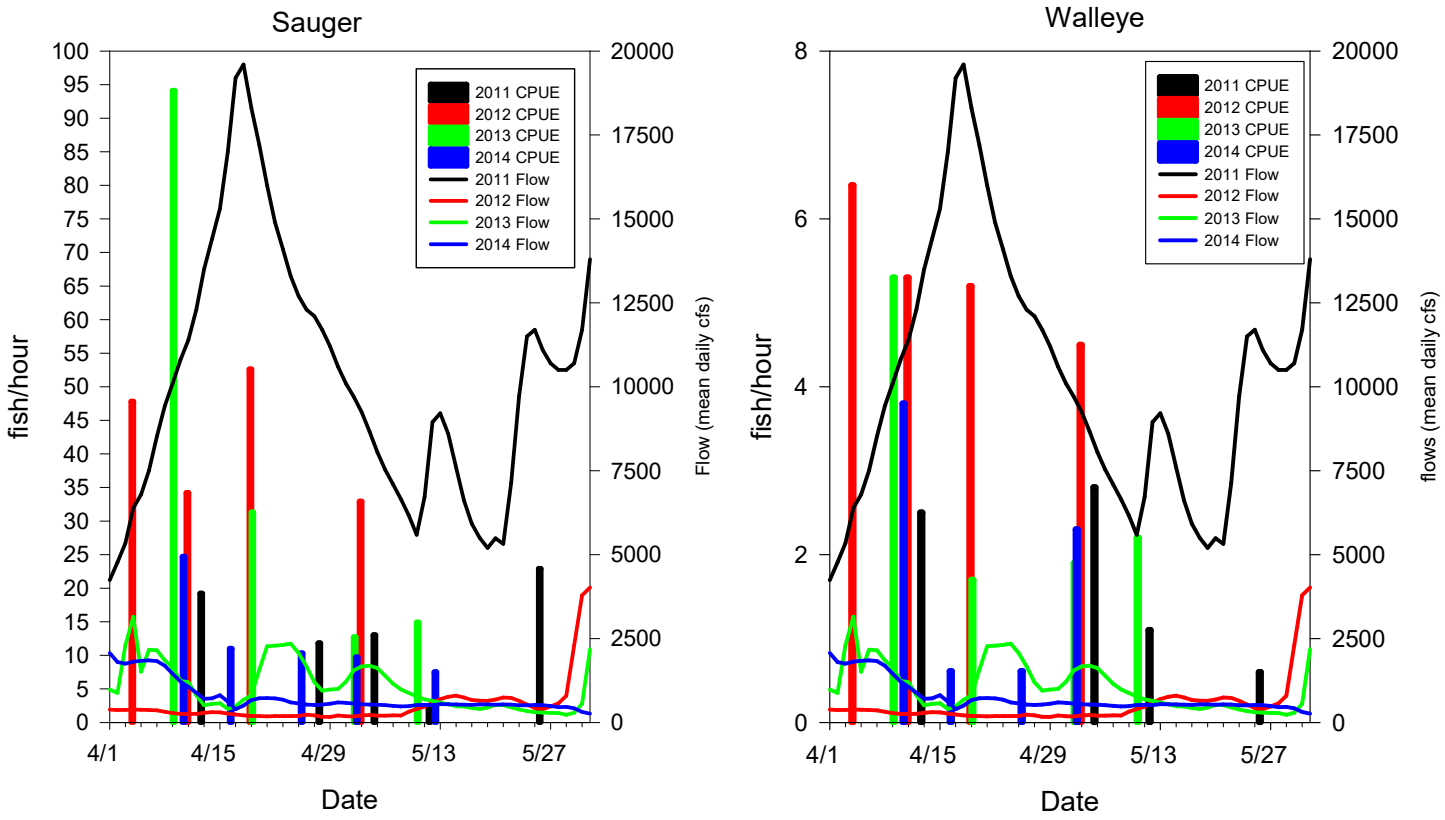

Figure 5. Electrofishing sauger and walleye CPUE and river discharge in the lower Milk River, 2011 through 2014. Note the difference in the Y-axis for the two panels.

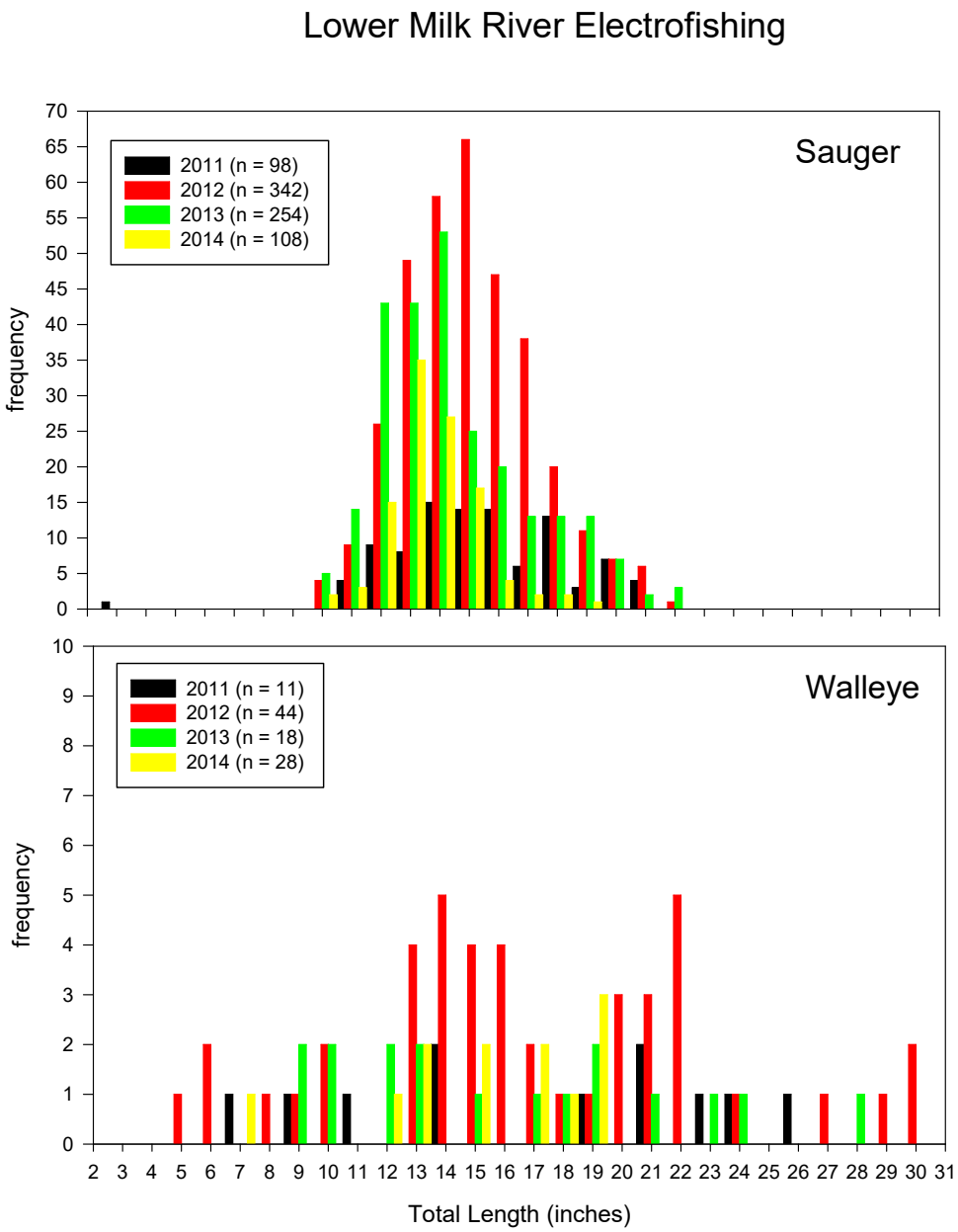

Figure 6. Length frequency histogram for sauger and walleye collected in the lower Milk River electrofishing effort, 2011 to 2014. Note the difference in the scale of the Y-axis.

Missouri River-Trout Sampling

Electrofishing for rainbow and brown trout in the Missouri River downstream of Fort Peck Dam was conducted during 2013, 2014 and 2015. Since electrofishing runs were the same length, all CPUE estimates are for fish/reach. The highest CPUE of rainbow trout was observed during 204 with 88 fish/reach, followed by 2015 with 82 fish/reach and 2013 with 65.3 fish/reach (Table 2). While CPUE varied somewhat between years, the average size of rainbow trout caught remained very similar. Rainbow trout averaged 21.1, 21.6 and 21.5 inches in length during 2013, 2014 and 2015, respectively (Table 2 and Figure 15). However, average relative weights were higher during 2013 at 100.1, when compared to 92.9 in 2013 and 89.2 during 2015. The total number of rainbow trout sampled was highest during 2013, but the total number of electrofishing runs was greater, which is accounted for in the CPUE estimates.

Brown trout total catch and CPUE estimates were relatively low compared to rainbow trout during all three sampling seasons (Table 2). Over the three year sampling period, the ratio of rainbow trout to brown trout was 9.6:1. Brown trout CPUE increased each year from 2013 to 2015, beginning at 6 fish/ reach in 2013 to 9.5 fish/reach in 2014, to 11 fish/ reach in 2015. On average, brown trout were larger in all three sampling years than rainbow trout. Brown trout averaged 23.7, 22.6 and 23.2 inches in length in 2013, 2014 and 2015, respectively. The average relative weights for brown trout were higher than rainbow trout in all years and averaged over 100 in all three years.

During 2013 a mark/recapture population estimate was performed for rainbow and brown trout. Estimates of this multiple pass mark/recapture effort are shown in Table 3. The estimates indicate that there are roughly 638 rainbow trout over 13.8 inches in length within the sampling reach, with 95% confidence intervals placing the lower end of the estimate at 460 and the upper estimate at 909. Fewer rainbow trout under 13.8 inches are estimated, with an estimate of 165 and lower and upper confidence estimates of 73 to 158.

Due to the lower number of brown trout marked and recaptured, all sizes of brown trout were lumped into one estimate. The model produced an estimate of 72 brown trout for the reach, with lower and upper confidence estimates at 36 to 158 fish/reach.

One Chinook salmon was captured during the three years of electrofishing. This one fish measured 26.3 inches and weighed 7.7 lbs.

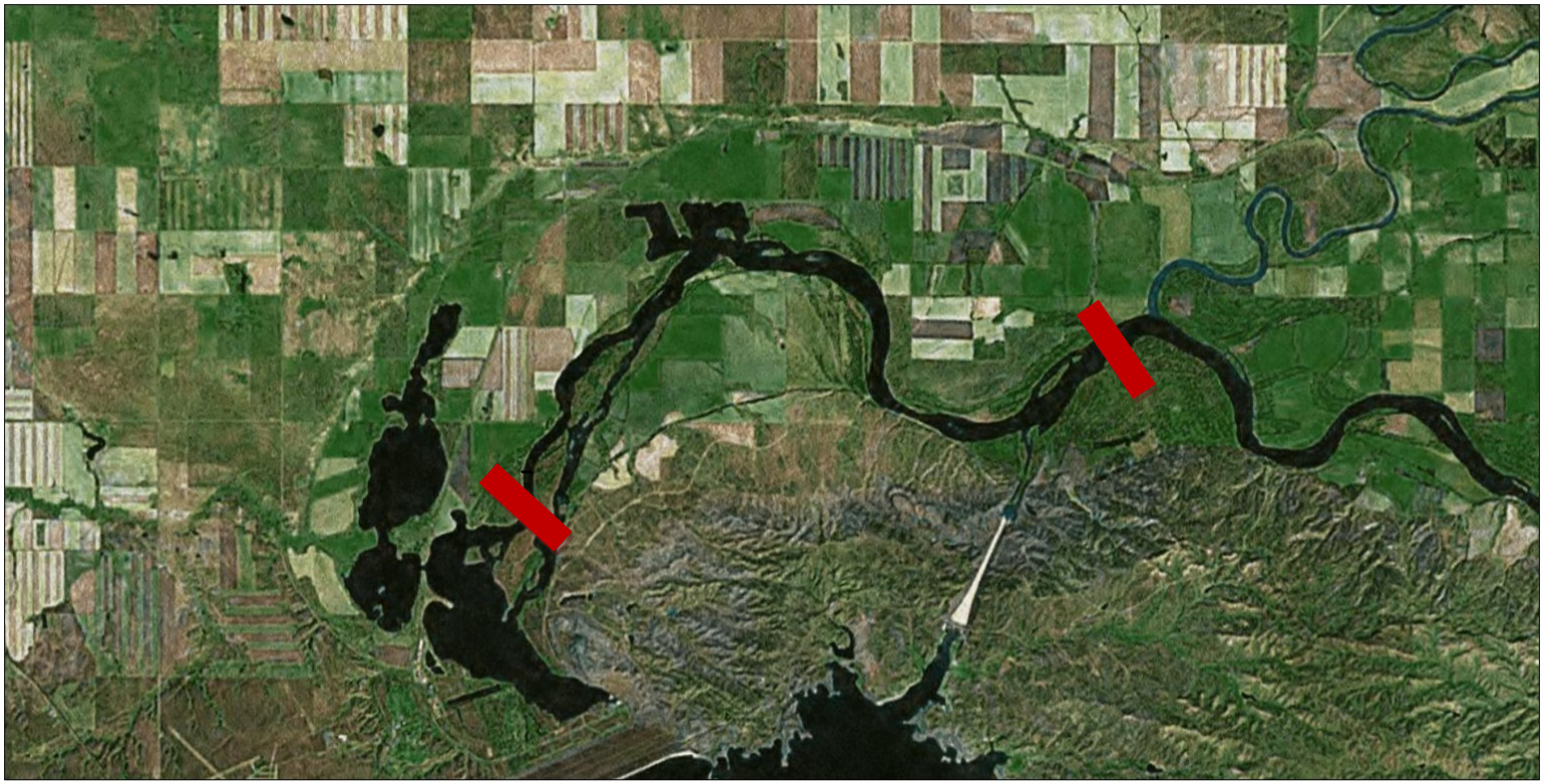

Figure 7. Location of Missouri River trout electrofishing run. Electrofishing occurred in the main channel. Upper and lower bounds of section are indicated by the red bars.

Table 2. Data summary for rainbow and brown trout sampled during six nights of mark/recapture electrofishing surveys on the Missouri River from August 7th to September 5th, 2013, four nights of electrofishing from October 15th through 23rd during 2014 and two nights of electrofishing on September 8th and 9th, 2015. CPUE= fish per full run (2 nights, right and left bank).

Species		# Sampled	Avg. Length (in)	Min Length (in)	Max Length (in)	Avg Wt. (lbs)	Avg Relative Wt.	CPUE Fish/Full Run
Rainbow Trout	2013	261	21.1	7.2	27.7	4.1	100.1	65.25
	2014	176	21.6	8.7	27.6	4	92.9	88
	2015	82	21.5	8.5	27.8	3.9	89.2	82
Brown Trout	2013	24	23.7	17.3	31.1	6.3	113.7	6
	2014	19	22.6	10.6	30.1	4.8	102.7	9.5
	2015	11	23.2	16.1	30.6	4.9	100.2	11
Chinook Salmon	2013	0						0
	2014	0						0
	2015	1	26.3	26.3	26.3	7.7	102.5	1

Table 3. Mark/recapture population estimate for rainbow and brown trout in the Missouri River during the fall of 2013.

2013 Population Estimate for trout in Missouri River from Boy Scout Park boat ramp to mouth of Milk River

Species	N	Upper 95% CI	Lower 95% CI
Rainbow Trout > 13.8 inches	638	909	460
Rainbow Trout < 13.8 inches	165	395	73
All Brown Trout	72	158	36

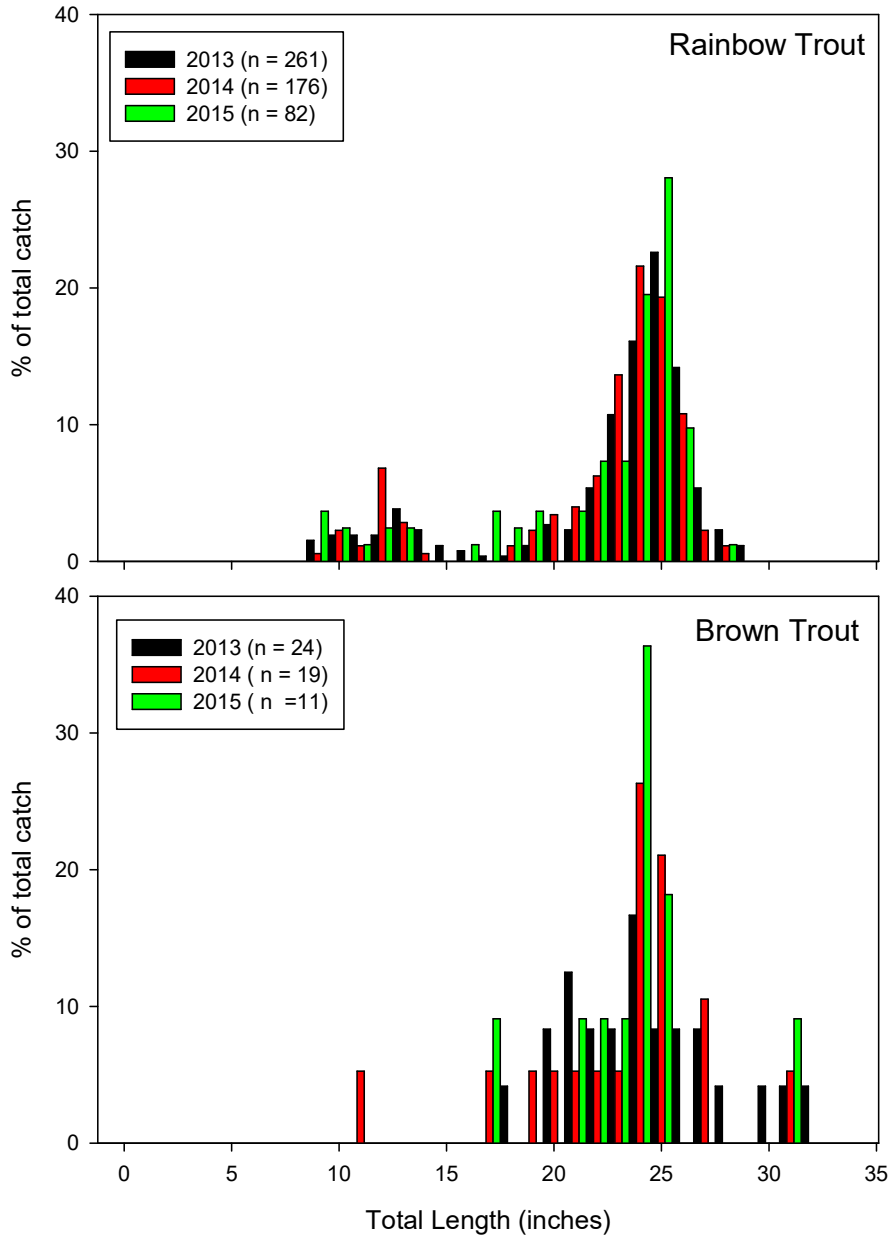

Figure 8. Length frequency of rainbow and brown trout captured in the six day mark/recapture effort on the Missouri River downstream of Fort Peck Dam in 2013 (August 7th through September 5th), a four day effort in 2014 (October 15 to 23rd) and during the two day electrofishing effort in 2015 (September 8th and 9th).

2013-2015 Survey of Northeast Montana Ponds

Several prairie ponds were sampled in Valley, Daniels, Sheridan, Roosevelt, Richland and McCone counties from 2013 to 2015. Below is a brief summary of some of those ponds, however all data is put into tabular form in Tables 4 through 6.

Daniels County

During 2013 a total of four ponds were sampled in Daniels County, Carney Pond, Killenbeck Reservoir and Whitetail Reservoir (Table 4).

During 2014 only Buer Pond was sampled within Daniels County (Table 5).

In 2015, four ponds were sampled within Daniels County, Buer Pond, Danelson Pond, John King Reservoir and Whitetail Reservoir (Table 6).

John King Reservoir is a small (~2 acres) private pond located north of Peerless on private land at Latitude 48.973007, Longitude -105.874801. The pond was sampled to see if it was a candidate for fish stocking to create a sport fishery. Analysis of the pond indicated that it was relatively shallow with a maximum depth of approximately 10.7 ft. In addition, the pond had a very small area of deep water and was severely choked with aquatic macrophytes. Trap nets were set to survey any possible fish that may already be in the pond, however no fish were caught. This pond provides marginal habitat for a fishery and coupled with its remote location it is not slated for stocking anytime soon.

Whitetail Reservoir is one of our larger ponds in northeast Montana and has a maintained Montana Fish, Wildlife and Parks Fishing Access Site (FAS). Sampling in both 2013 and 2015 indicate a large population of small northern pike. Northern pike captured in gill nets averaged 17.0 inches during 2015, down from the average of 23.1 inches in 2013. Yellow perch are present although in relatively low numbers.

McCone County

No ponds were sampled in McCone County during 2013 or 2014. Floyd Yarger Pond was sampled during 2015. This is a small (~ 6 acres) private pond located northwest of Circle, MT. Analysis of this pond indicated that the pond had a maximum depth of 8.5 ft and a small area of deeper water. Trap nets were set to survey any fish that may be present, but no fish were captured. This pond has sub-marginal habitat for a potential fishery.

Richland County

No ponds were sampled in Richland County during 2013 or 2014. During 2015 two ponds were sampled in Richland County to evaluate their potential as sport fisheries. The larger of the two ponds was what is referred to as Church Pond, located on land owned by the local

church but managed by Mary Steppler. This pond is situated at Latitude 47.99726 Longitude -104.84763 and sits adjacent to Tolksdorf Reservoir, a reservoir that used to be managed by FWP as a fishery. This pond has significant potential for a sport fishery, with an area of around 12 acres and a maximum depth of at least 20 ft. Three trap nets and one gill net were deployed to characterize the existing fishery and hundreds of fathead minnows and 10 Iowa darters were captured. With this pond showing extremely good potential, we transferred yellow perch into the pond from Buer Pond in Daniels County during October. In the future, we would like to begin stocking rainbow trout on an annual basis.

The other pond in Richland County that was evaluated for its potential as a sport fishery is currently referred to as Steppler State Section Pond. This pond is located at Latitude 47.91760, Longitude -104.87424 and is situated on DNRC land, but requires access through Mary Steppler's property. The pond was small at approximately 3.3 acres, and had a maximum depth of 11 ft. The pond had a small area of deep water, which may preclude it from being a significant fishery. One gill net and two trap nets were deployed, but no fish were captured. This pond has marginal potential for a fishery.

Roosevelt County

During 2013 two Roosevelt County ponds were sampled, Bainville Pond #1 (East) and Bainville Pond #2 (West). During 2014 Hofman Pond was sampled and during 2015 Knudsen Brothers Pond was evaluated as a potential sport fishery.

Knudsen Brothers Pond, which used to be managed by FWP is currently owned by Chris Hansen. Analysis of the pond indicated it had high potential for a sport fishery. The pond is approximately 13.75 acres with a maximum depth of at least 15 ft. The pond was set with one gill net and four trap nets. No fish were captured in the gill net, however thousands of fathead minnows, approximately 100 brassy minnows and 100 plains minnows and a few brook sticklebacks were also caught. Due to the size, depth and abundance of small fishes, this pond has great potential as a sport fishery. Yellow perch were transferred into the pond during October from Buer Pond in Daniels County. This pond will likely get rainbow trout stocked into it during the late spring or early summer of 2016.

Sheridan County

Other than Box Elder Creek Reservoir, only one other pond in Sheridan County was sampled from 2013 to 2015, which was Wagner Pond during 2015. Wagner Pond received a windmill during the summer of 2015, due to apparent summer kills of stocked rainbow trout. The results from Wagner Pond sampling are located within Table 6. The Box Elder Creek Reservoir section is below.

Table 4. Fish species sampled by gear for ponds sampled in northeast Montana during 2013.

County	Reservoir Name	Date	Gear	# Nets	Species	# Sampled	Avg. Length (In.)	Min. Length (In.)	Max Length (In.)	Avg. Wt. (lbs)	Relative Wt Avg
Daniels	Buer Pond	10/7/2013	Trap	3	YP	637	6.5	5.6	8		
Daniels	Carney Pond	10/9/2013	Gill	1	RB	10	6.78	5.9	7.8		
					W SU	2	14.3	13.7	14.9		
Daniels	Killenbeck Reservoir	10/9/2013	Gill	1	RB	11	17.16	8.6	20.8		
					YP	10	9.76	8.3	11.3		
			Trap	2	FH MW	116	2.68	2.6	2.8		
					RB	8	15.84	8.1	19.8		
					YP	37	4.2	3.3	9.8		
Daniels	Whitetail Reservoir	10/8/2013	Gill	1	NP	18	23.09	10.6	28.5		
			Trap	2	FH MN	2	2.1	2.1	2.1		
					NP	2	21.85	20.3	23.4		
					YP	3	3.13	2.9	3.6		
Roosevelt	Bainville Pond #1 (East)	10/2/2013	Gill	1	NP	12	23.14	12.6	30.9		
					YP	7	5.86	5.1	6.5		
			Trap	3	YP	42	4.19	2.7	6.1		
Roosevelt	Bainville Pond #2 (West)	10/2/2013	Gill	1	CARP	1	10.1	10.1	10.1		
					NP	16	19.04	8.7	23.2		
					YP	15	6.53	5.4	8.7		
Valley	Fort Peck	6/27/2013	Gill	4	BG	58	3.86	3.5	4.3	0	0

County	Reservoir Name	Date	Gear	# Nets	Species	# Sampled	Avg. Length (In.)	Min. Length (In.)	Max Length (In.)	Avg. Wt. (lbs)	Relative Wt Avg
	Trout Pond				NP	14	23.47	19.7	28.3	3.2	98.5
					SH RH	1	19.7	19.7	19.7	3.64	0
					SMB	1	9.7	9.7	9.7	0	0
					W SU	25	13.06	8.4	18.6	1.38	104.31
					WE	5	20.3	15.9	25.7	3.37	95.84
					YP	62	6.71	5.6	8.5	0	0
					BG	262	2.61	1.5	3.4	0	0
			Trap	4	W SU	1	20.4	20.4	20.4	0	0
					YP	1033	3.49	3.2	3.9	0	0
Valley	Troika Reservoir	7/7/2013	Trap	3	FH MW	2,000					
		10/15/2013	Trap	3	FH MW	1,000					
					YP	25	10.32	8.3	12.4		
Valley	Valley Reservoir	7/17/2013	Trap	3	FHMW	2,000					

Table 5. Fish species sampled by gear for ponds sampled in northeast Montana during 2014.

County	Reservoir Name	Date	Gear	# Nets	Species	# Sampled	Avg. Length (In.)	Min. Length (In.)	Max Length (In.)	Avg. Wt. (lbs)	Relative Wt Avg
Daniels	Buer Pond	9/26/2014	Trap	3	YP	105	6.86	5.9	8.1	0	0
Roosevelt	Hofman Reservoir	8/18/2014	Trap	2	RB	8	8.3	5.7	13.8		
					FH MN	1,000					
Sheridan	Wagner Reservoir	8/19/2014	Trap	3	No Fish						
Valley	Glasgow Base Pond	5/22/2014	Gill	1	NP	9	21.8	17.8	27.6	0	0
					RB	4	15.43	14.4	16.7	0	0
			Trap	2	YP	1	4.4	4.4	4.4		
Valley	O'Juel Lake	7/2/2014	Gill	1	RB	37	12.28	8.5	14.4	0.25	0.06
					W SU	14	12.04	6.5	16.1	0.47	0.26
			Trap	4	RB	4	13.35	12.4	14	0.03	3.48
					W SU	7	7.87	5.1	17	0.04	5.36
Valley	Paulo Reservoir	6/11/2014	Gill	1	BG	4	4.6	4.1	5.7	0	0
			Trap	2	BG	7	2.61	1.4	4.3	0	0
					FH MN	1	2.6	2.6	2.6	0	0
Valley	Shoot Reservoir	6/11/2014	Trap	2	FH MN	1070	0	0	0		
					RB	16	12.68	6.4	15.5		
Valley	Troika Reservoir	6/19/2014	Gill	1	YP	3	7.6	6.2	8.7	0	0
			Trap	3	FH MN	331					

County	Reservoir Name	Date	Gear	# Nets	Species	# Sampled	Avg. Length (In.)	Min. Length (In.)	Max Length (In.)	Avg. Wt. (lbs)	Relative Wt Avg
Valley	Fort Peck Trout Pond	8/13/2014	Electro	NA	BG	12	4.02	3.6	4.5	0	0
					C CAT	2	28.05	27.4	28.7	10.47	120.09
					CARP	4	25.75	25.1	26.4	7.94	94.71
					LMB	1	14.9	14.9	14.9	1.85	103.13
					NP	2	24.75	21.5	28	3.16	83.12
					W SU	4	16.08	11.5	19.4	1.79	90.13
					YP	2	4.55	4.4	4.7	0	0
Valley	VR 009 (Lower Base Pond)	5/22/2014	Gill	1	NP	14	11.75	8.8	28.3	0	0
					RB	4	16.33	15.9	16.6	0	0
			Trap	2	No Fish						
Valley	Winter Harbor Pond	6/25/2014	Gill	1	BG	13	4.58	3.7	6.3	0.06	87.63
					LMB	3	10.17	9	10.8	0.44	80.73
					W SU	5	17.56	16.6	18.4	2.59	108.62
					YP	3	8.2	7.5	9.1	0.23	77.5
			Trap	4	BG	3	3.97	3.6	4.4	0.07	142.54

Table 6. Fish species sampled by gear for ponds sampled in northeast Montana during 2015.

County	Reservoir Name	Date	Gear	# Nets	Species	# Sampled	Avg. Length (In.)	Min. Length (In.)	Max Length (In.)
Daniels	Buer Pond	7/31/2015	Trap	4	LMB	24	4.8	3.3	7.5
					YP	277	7.1	4.2	9.2
	Danelson Reservoir	7/16/2015	Trap	3	BR SB	9	1.5	0.6	1.9
					W SU	2	12.8	12.6	13
	John King Reservoir	7/17/2015	Trap	3	NO FISH				
	Whitetail Reservoir	7/14/2015	Gill	2	NP	27	17	12.3	23.6
					YP	5	7.1	6.6	7.5
			Trap	4	FH MN	3	2.2	2.1	2.3
					NP	22	4.5	3.7	5.4
					YP	23	3.8	2.1	8.1
Richland	Church Reservoir	6/17/2015	Gill	1	NO FISH				
			Trap	3	FH MN	600	2.5		
					IOWA	10	3		
	Steppler State Section	6/16/2015	Gill	1	NO FISH				
			Trap	2	NO FISH				
Roosevelt	Knudsen Bros	6/5/2015	Gill	1	NO FISH				
			Trap	4	BR MN	100			
					BR SB	10			
					FH MN	3000			
					PL MN	100			
McCone	Floyd Yarger	6/18/2015	Trap	3	NO FISH				
Valley	Paulo Reservoir	6/24/2015	Trap	2	BG	18	3.7	2.2	4.9
					BL BH	2	7	3.9	10

County	Reservoir Name	Date	Gear	# Nets	Species	# Sampled	Avg. Length (In.)	Min. Length (In.)	Max Length (In.)
			Gill	2	BG	31	5.1	3.6	6.8
					BL BH	2	9.8	9.8	9.8
					CARP	4	16.8	15.6	17.6
					LMB	8	12.1	9.8	15.7
	McNab	6/25/2015	Gill	1	NO FISH				
			Trap	4	BL CR	2	7.9	7.9	7.9
					FH MN	1524	2.3	1.5	3

Box Elder Creek Reservoir

Box Elder Reservoir is the largest reservoir in northeastern part of Region 6 with approximately 74 surface acres. The reservoir has a maximum depth of approximately 30 ft. Box Elder Reservoir has been sampled seven of the past 10 years using a variety of netting and electrofishing techniques. The reservoir had been stocked with walleye on almost an annual basis since 1985 to 2011. The largest number of walleye stocked was in 2006, with just over 100,000 fish consisting of about half fingerlings and half fry.

The current management objective of Box Elder Reservoir is to bring back a sustainable yellow perch fishery. Over the past several decades the yellow perch fishery in Box Elder Reservoir has deteriorated from an excellent ice fishery to an almost non-existent fishery. In an attempt to bring back the perch fishery, walleye stocking was reduced in 2010 to 25,000 walleye fry and no walleye were stocked in 2012 or 2013. In addition, adult yellow perch stockings occurred from 2010 to 2012. In all, a total of approximately 10,700 adult perch were stocked. A daily bag limit of 25 yellow perch was implemented in 2012.

Even with the decrease in walleye stocking and the significant input of adult yellow perch from 2010 to 2013, sampling data indicated that few yellow perch were present. In addition, walleye and northern pike also seemed to decrease in the reservoir, which may have been due to a large winter kill of fish including common carp that was reported during the winter of 2012-2013. Due to the apparent lack of game fish, walleye and northern pike stocking commenced in 2014 with the addition of rainbow trout. However, recent sampling has shown little to no indication that these stockings have taken.

During 2013 and 2015, no walleye were captured in gill nets (Table 7 and Figure 9). The lack of walleye in the gill nets is likely an indicator of a near complete die off of walleye in the reservoir. Similarly, it seems that little to no survival of stocked walleye from 2014 or 2015 has occurred. While walleye numbers have crashed to a non-detectable level, a few northern pike are still being caught in our gill netting efforts. During 2015 a total of 6 northern pike averaging 25.3 inches in length were captured in four gill nets. CPUE for northern pike was essentially the same in 2015 with 1.5 fish/net night when compared to 1.6 fish/net night during 2013.

The only bright spot in the fisheries data from Box Elder Creek Reservoir was found with yellow perch. During 2015 a total of 10 yellow perch were captured in gill nets, which is an increase from basically no yellow perch being captured before our adult fish transfers occurred from 2010 to 2012. This was an increase in yellow perch when compared to 2013, when only 2 were captured in five gill nets. Yellow perch captured in 2015 averaged 7.3 inches in length.

While common carp were relatively abundant during some of our past sampling efforts, their numbers were quite low in 2015 in both gill and trap nets. Common carp CPUE was lower in 2015 with an estimate of 1.75 fish/net night, compared to 5.4/net night in 2013. Similarly, trap nets only captured four common carp in 2015, which correlated to a CPUE of 1 fish/net night.

The one species that seems to remain quite abundant in the system and may be on the increase is black bullheads. Black bullhead CPUE for trap nets was at 232.8 fish/net night in

2015, an almost tenfold increase from 2.8 fish/ net night in 2013. Similarly, gill net CPUE increased from 5 fish/net night in 2013 to 30.8 fish/net night in 2015.

Due to the lack of apparent survival of stocked walleye, northern pike and rainbow trout, we believe that the reservoir could be facing some water quality issues. Starting in 2015, water quality sampling was initiated. Water quality sampling, which consisted mainly of measuring the dissolved oxygen (DO) content of the water column was conducted on four different dates from September 30, 2015 to February 10, 2016. Dissolved oxygen profiles indicated that during the September sampling occasion, DO levels were very low at two locations within the reservoir at deeper depths (Figure 11.) The lowest DO readings occurred near the middle of the reservoir with DO under 2 mg/l near the bottom. The second lowest reading occurred near the inlet of the reservoir at under 3 mg/l, again near the bottom of the reservoir. Interestingly, the other two profiles one in the middle of the reservoir and one near the West Boat Ramp had DO profiles that were above 4 mg/l. Similarly, the two October sampling periods all had DO profiles that looked to be sufficient for fish. The February sampling occasion showed suppressed DO readings from just above 3 mg/l near the surface to between 3 mg/l to ~1.5 mg/l near the bottom. These readings don't seem to be too low however, the sampling occasion occurred near the middle of the day when DO would naturally be higher do to oxygen being produced due to photosynthesis in the water body. It is possible that DO concentrations during the late night and early morning hours could be much lower, which may hamper fish survival.

More DO profiles throughout the year and during varying times within a day are likely needed to get a better handle on how DO concentrations may be affecting sport fish in Box Elder Reservoir.

Table 7. Summary of gill netting data for Box Elder Creek Reservoir June 13, 2013 (5 experimental gill nets) and April 14, 2015 (4 nets).

Species	Year	# Sampled	Length Avg. (in)	Min Length (in)	Max Length (in)	Relative Wt Avg	CPU (fish/net night)
Black Bullhead	2013	25	8.8	6.6	11.7	60	5
	2015	123	8.5	5.2	10.8		30.75
Common Carp	2013	27	13.5	12.1	15.9	100.3	5.4
	2015	7	21.6	17.2	25.9	119.6	1.75
Northern Pike	2013	8	31.2	22.9	63	86.1	1.6
	2015	6	25.3	16.8	41.3	270	1.5
White Sucker	2013	33	14.4	9	19.8	80.3	6.6
	2015	24	15.6	13	18.4	99.1	6
Yellow Perch	2013	2	6.9	6.1	7.6	102.3	0.4
	2015	10	7.3	5.5	10.8	86	2.5

Table 8. Summary of trap netting data for Box Elder Creek Reservoir June 13, 2013 (4 trap nets) and April 15, 2015 (4 nets).

Species	Year	# Sampled	Length Avg. (in)	Min Length (in)	Max Length (in)	CPU (fish/net night)
Black Bullhead	2013	11	9	6.6	11.7	2.75
	2015	931				232.75
Common Carp	2013	1	NA	15.7	15.7	0.25
	2015	4				1
White Sucker	2013	0				0
	2015	4				1
Yellow Perch	2013	0				0
	2015	1	9.9	9.9	9.9	0.25

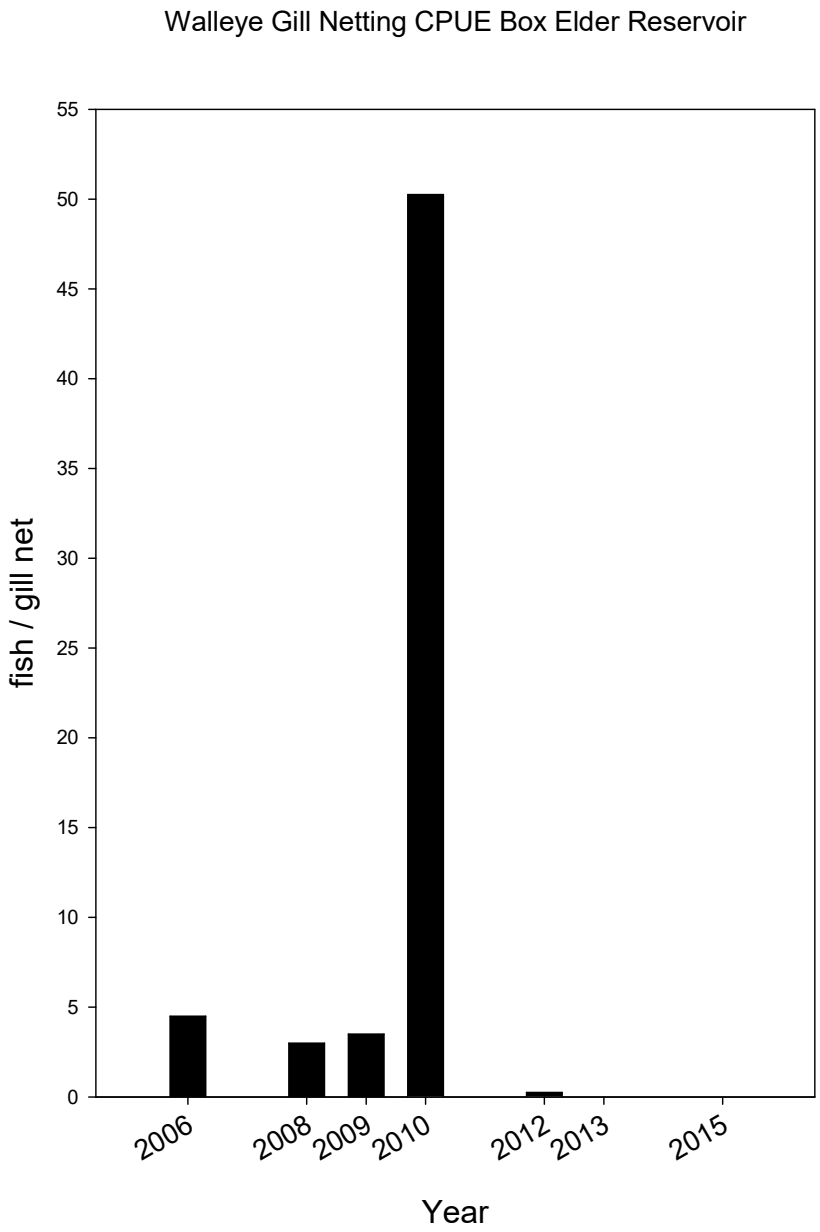

Figure 9. Box Elder Reservoir gill net walleye CPUE 2006-2013, note that no sampling occurred in 2007, 2011 or 2014.

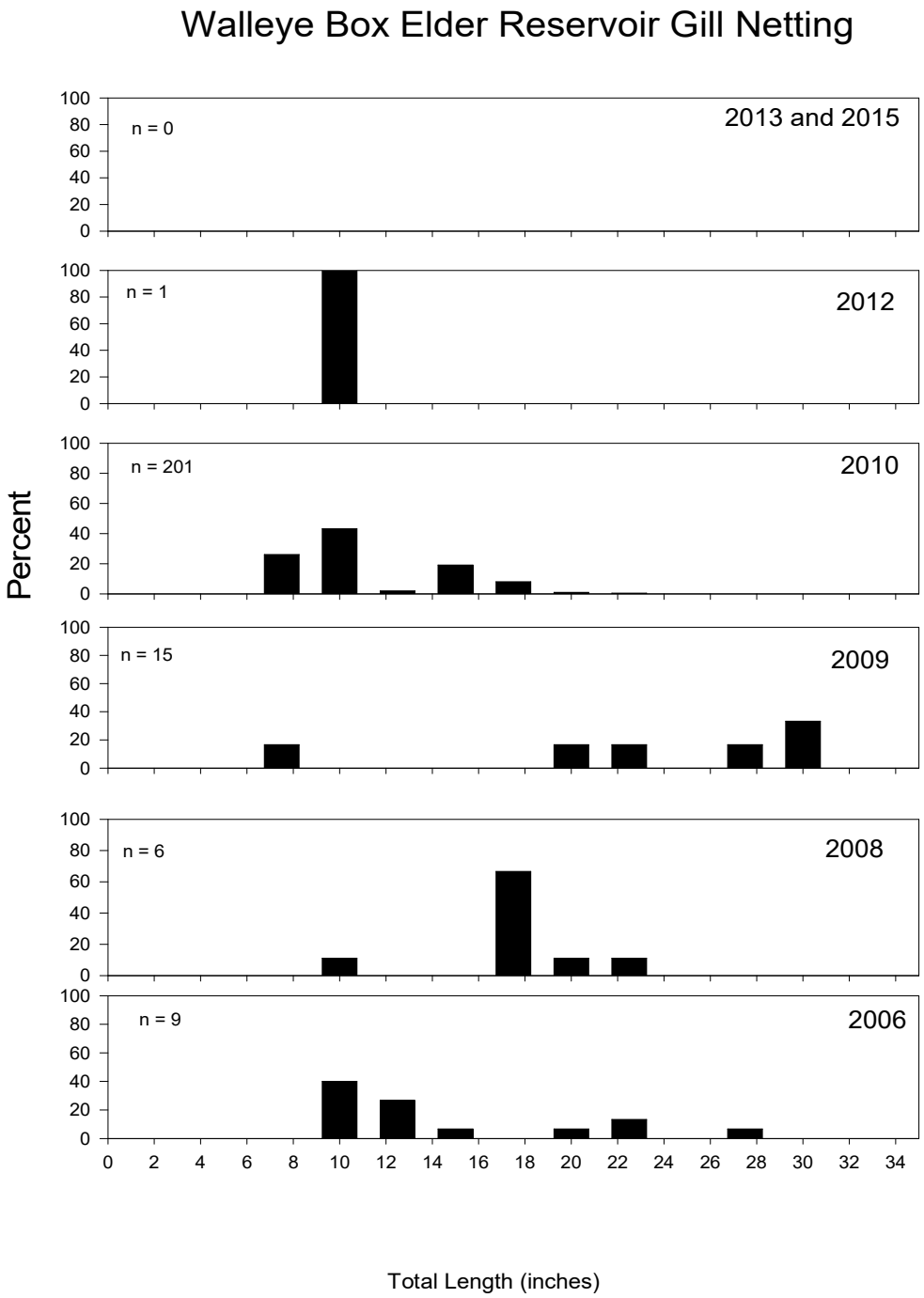

Figure 10. Length frequency histogram (percent of total catch) of walleye sampled using gill nets in Box Elder Reservoir 2006-2015. Note that no sampling occurred in 2007, 2011 or 2014.

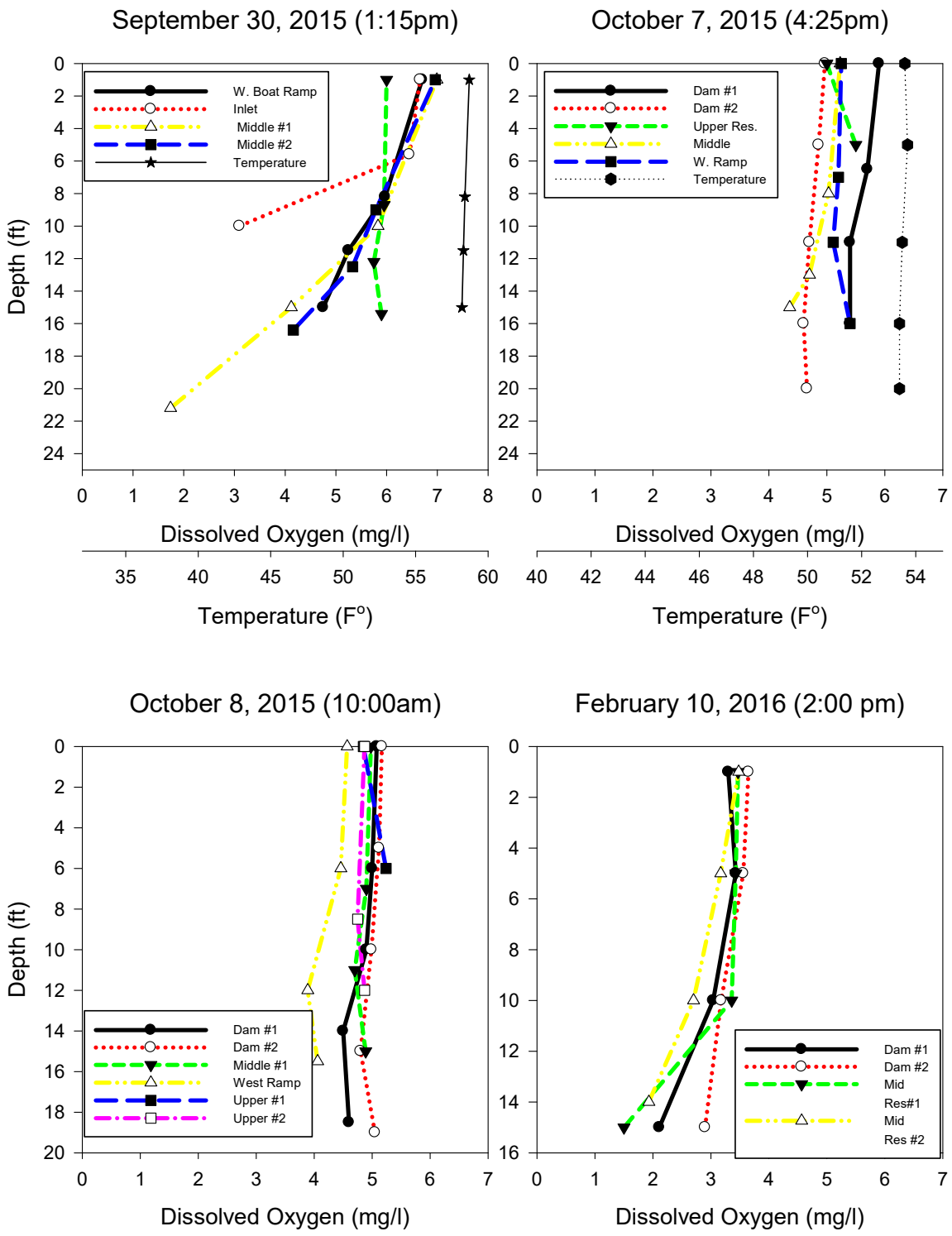

Figure 11. Dissolved oxygen concentration profiles for Box Elder Creek Reservoir during four sampling occasions from September 30, 2015 to February 10, 2016.

Valley County

During 2013 three prairie ponds were sampled within Valley County. During 2014 a total of six prairie ponds were sampled, and two were sampled during 2015. These totals do not include the Fort Peck Dredge Cuts, which are sampled on an annual basis and have their own section below. Fish sampling data for prairie ponds in Valley County for 2013 to 2015 can be found in Tables 4 through 6.

Paulo Reservoir

Paulo Reservoir is a small (~7.3 acre) Bureau of Land Management (BLM) impoundment located in south Valley County, MT. Montana Fish, Wildlife & Parks (FWP) has managed the fishery in Paulo Reservoir since it was built in the early 1990's, with largemouth bass and bluegill sunfish being the target game fish species. Paulo is a popular fishery in Valley County due to its close proximity to the county seat of Glasgow. Recently, common carp have been detected and expanded their population to the point that they may be negatively affecting the fishery. In addition, Paulo is a relatively shallow reservoir, with a maximum depth of approximately 12 ft near the dam. The BLM and FWP proposed to rehabilitate the reservoir by increasing the maximum depth and removing the current fish assemblage. However, the plan has been postponed and the largemouth bass and bluegill population within the reservoir was relatively strong during 2015.

During 2015 Paulo Reservoir was sampled using both gill and trap nets. Two gill nets captured a total of 8 largemouth bass, averaging 12.1 inches in length. A total of 31 bluegill averaging 5.1 inches were also captured in gill nets. Only 4 common carp were captured in the gill netting effort. In addition to net sampling, anglers are reporting good catches of largemouth bass of several different sizes.

McNab Reservoir

McNab Reservoir is a BLM reservoir located south of Hindsdale, MT. The reservoir was drained in 2012 and the head gate was fixed by the BL M. Approximately 75 adult black crappie were transferred into the pond during 2013. Sampling in 2015 indicated that at least some of those fish are still present. A total of 2 black crappie averaging 7.9 inches in length were caught during 2015. The lack of small crappie was concerning, which suggests limited recruitment to the population.

Due to the lack of spawning structure in the reservoir, artificial habitat structures were placed in McNab Reservoir during the summer of 2015. These structures were produced by Pond King. Two types of structures were placed in the reservoir, one was a Honey Hole Shrub, which is a polyethylene dome with 26 inch limbs and the other was a Honey Hole Tree which consists of a polyethylene cone with 36 inch limbs. Both the trees and the shrubs are shown in Photograph 1. A total of 14 trees and 5 shrubs were placed into McNab to provide spawning and rearing habitat for black crappie. The trees and shrubs were placed in clusters of three or four trees and two to three shrubs. The specific location where these structures were placed into the reservoir can be found in Figure 12 and Table 9.

Photograph 1. Technician John Hunziker standing next to a Honey Hole Tree. Note the Honey Hole Shrubs on the far right of the photograph.

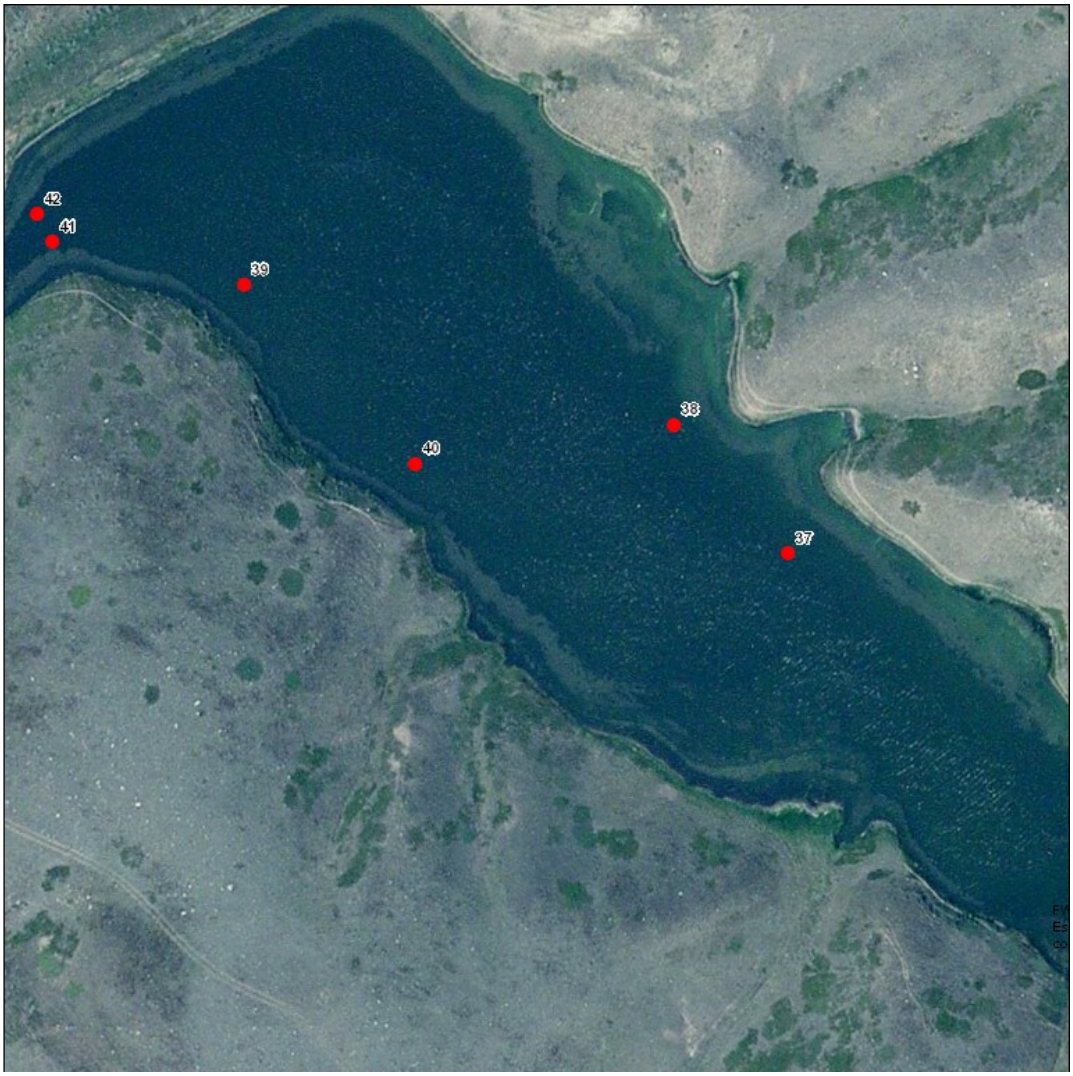

Figure 12. Diagram of McNab Reservoir and the location of artificial structures placed in the reservoir on August 21st, 2015.

Table 9. Description of the artificial habitat structures placed into McNab Reservoir during August 2015.

Waypoint	# of Trees	# of Shrubs	Depth (ft)	Latitude	Longitude
37	3	-	19	48.32374	107.20975
38	3	-	16	48.32407	107.20975
39	4	-	20	48.32443	107.21185
40	4	-	20	48.32454	107.21119
41	-	3	12.7	48.32454	107.21259
42	-	2	12.8	48.32461	107.21265

Missouri River Dredge Cuts

The Missouri River Dredge Cuts have been sampled annually using both experimental and smelt gill nets since 1979. The monitoring began as a tool to evaluate the fishery since a re-regulation dam downstream of Fort Peck Dam was being proposed. Until 2010 the dredge cuts and the Fort Peck Dam tailrace were sampled twice a year, once in June and once in September using 10-125 ft experimental mesh and 4-100 x 6 ft gill nets with ½ inch mesh nets (smelt nets). In 2010 the spring sampling was eliminated, given that an evaluation of the data showed redundancy. However, due to the spill that occurred from Fort Peck Reservoir during 2011, the spring sample event was conducted from in 2011 and 2014 to get a better understanding of how spill may affect the species composition and relative abundance in the Dredge Cuts. During 2015, only a fall sampling event took place, which will likely be the standard for the foreseeable future, barring another spill event from Fort Peck Reservoir.

Due to the hypolimnetic withdrawals from Fort Peck Dam the tailrace area can be characterized as a relatively stable area with cold summer water temperatures and warm winter temperatures as well as low productivity due to Fort Peck Reservoir acting as a nutrient sink. The Dredge Cuts are connected to the Missouri River, but a much higher retention time equates to warmer summer water temperatures and a more diverse littoral area. Both areas have become very popular recreation areas with anglers, boaters and water skiers.

All gill netting data for fall sampling from 2013 to 2015 is summarized in Tables 10, 11, and 12. During the sampling period of 2013 to 2015, walleye and sauger gill net CPUE remained relatively constant (Figure 13). During 2015, sauger CPUE was estimated at 0.2 fish/net night for the fall, which is comparable to the 0.5 fish/net night observed in 2014 and 0.4 fish/net night in 2013. These estimates are comparably low when compared to 2007, which had the highest observed CPUE since 1993 with an estimate of 4.9 sauger/net night. During 2015, sauger averaged 17. 3 inches in length and had an average relative weight of 67.3. Since 2010, the average relative weight of sauger has been showing a declining trend (Figure 14).

Similar to sauger, walleye CPUE was similar through the last three years of sampling with estimates of 1.3, 1.1 and 1.1 walleye/net night during 2015, 2014 and 2013, respectively (Figure 13). Since 1993 walleye had the highest CPUE during 2011 with a rate of 4.3 walleye/net night. During 2015, walleye averaged 15.3 inches in length and had an average relative weight of 85.3 (Table 12). The average relative weight of walleye showed a decrease from the 23 year high observed in 2014.

Northern pike CPUE in 2015 was about half of that recorded in both 2014 and 2013. During 2015 northern pike had an average CPUE of 0.6 fish/net night, when compared to 1.3 fish/ net night during both 2014 and 2013. Northern pike averaged 26.8 inches in total length during 2015 with an average relative weight of 92.5. The relative weight for northern pike was down from the 23 year high recorded in 2013 (Figure 14).

Channel catfish catch rates showed a large decline in 2015 from the two year high of 2013-2014 (Figure 13). During 2015 channel catfish CPUE was estimated at 4.9 fish/net night, which is similar to the long-term average. The record high CPUE observed in 2013 and 2014 cannot be explained. Interestingly, the high catch rates of channel catfish witnessed in both 2013 and 2014 corresponded to the highest average relative weights over the past 23 years of sampling (Figure 14).

Several other species of game and non-game fish were captured during the Dredge Cut sampling from 2013 to 2014.

Table 10. Missouri River Dredge Cuts gill netting summary data, 2013.

	Spring June 5 & 6 (10 experimental gill nets and four smelt nets)						Fall September 25 & 26 (10 experimental gill nets and 4 smelt nets)					
Species	# Sampled	Ave. Length (in)	Min Length (in)	Max Length (in.)	Weight Ave. (lbs)	Relative Wt Avg	# Sampled	Ave. Length (in)	Min Length (in)	Max Length (in.)	Weight Ave. (lbs)	Relative Wt Avg
Blue Sucker	1	25.1	25.1	25.1	4.4	0.0	0					
Channel Catfish	59	17.5	14.1	24.0	1.7	87.1	138	17.5	13.5	22.4	1.9	97.5
Common Carp	0						4	21.1	14.4	26.2	6.7	101.1
Cisco	33	12.1	8.9	18.2	0.5	0.0	27	11.3	5.0	15.0	0.7	0.0
Freshwater Drum	1	15.8	15.8	15.8	1.9	101.9	0					
Shortnose Gar							2	22.0	20.8	23.1	1.4	0.0
Goldeye	65	13.8	12.0	15.5	0.8	0.0	77	13.9	12.4	16.3	0.9	0.0
Lake Whitefish	10	18.0	15.2	21.8	2.3	0.0	3	20.3	19.3	21.3	3.4	0.0
Northern Pike	32	25.4	20.1	35.9	4.0	93.4	13	27.8	23.6	33.1	5.6	102.6
Paddlefish	0						1					
Rainbow Smelt	0						2	5.9	5.8	5.9	0.0	0.0
River Carpsucker	15	17.0	13.2	20.7	2.8	0.0	13	17.7	15.1	19.8	2.6	0.0
Shovelnose Sturgeon	73	24.8	20.3	29.5	2.5	100.1	7	27.2	23.1	31.0	3.7	101.4
Sauger	10	16.0	12.7	18.1	1.1	75.3	4	16.6	13.7	21.5	1.2	66.9
Shorthead Redhorse	3	15.5	14.9	15.9	1.5	0.0	2	19.1	17.8	20.3	2.0	0.0

	Spring June 5 & 6 (10 experimental gill nets and four smelt nets)						Fall September 25 & 26 (10 experimental gill nets and 4 smelt nets)					
Species	# Sampled	Ave. Length (in)	Min Length (in)	Max Length (in.)	Weight Ave. (lbs)	Relative Wt Avg	# Sampled	Ave. Length (in)	Min Length (in)	Max Length (in.)	Weight Ave. (lbs)	Relative Wt Avg
Smallmouth Buffalo	1	19.0	19.0	19.0	3.7	81.4	3	17.6	17.4	17.8	3.5	96.5
White Sucker	31	15.7	12.9	19.6	1.8	99.7	19	16.1	11.4	20.0	2.3	102.4
Walleye	15	17.2	13.2	21.8	1.8	95.4	11	16.8	9.6	28.7	2.1	76.1
Yellow Perch	0						5	5.1	3.8	7.7		0.0

Table 11. Missouri River Dredge Cuts gill netting summary data, 2014.

	Spring June 24 and 25 (10 experimental gill nets and four smelt nets)						Fall September 17 and 18 (10 experimental gill nets and four smelt nets)					
Species	# Sampled	Ave. Length (in)	Min Length (in)	Max Length (in)	Ave. Weight (lbs)	Relative Wt Avg	# Sampled	Ave. Length (in)	Min Length (in)	Max Length (in)	Ave. Weight (lbs)	Relative Wt Avg
Bigmouth Buffalo	3.0	22.0	19.5	24.2	6.3		2.0	12.3	12.0	12.6	1.1	
Channel Catfish	55.0	18.7	15.0	26.6	1.9	78.0	153.0	16.8	13.9	27.4	1.7	100.3
Common Carp	2.0	16.3	15.8	16.8	2.0	89.5	4.0	17.8	14.7	20.4	2.9	97.4
Cisco	23.0	12.7	8.3	17.2	0.6		31.0	12.6	7.8	15.4	0.7	
Chinook Salmon							1.0	29.4	29.4	29.4	9.9	95.3
Freshwater Drum							1.0	14.8	14.8	14.8	1.1	73.5
Shortnose Gar	3.0	24.5	21.7	27.2	2.0		3.0	21.9	20.7	22.9	1.2	
Goldeye	17.0	13.9	12.6	15.4	0.8		65.0	13.9	9.6	15.4	0.9	
Lake Whitefish	4.0	18.7	16.3	21.5	2.5		1.0	18.0	18.0	18.0	2.3	
Northern Pike	18.0	24.7	16.5	33.4	3.3	85.3	13.0	27.3	19.9	34.6	5.5	98.5
River Carpsucker	15.0	17.4	14.8	22.0	2.4		11.0	18.2	15.4	27.6	2.8	
Shovelnose Sturgeon	51.0	24.4	20.5	28.5	2.2	96.3	8.0	24.8	20.4	29.9	2.3	94.9
Sauger	13.0	16.7	13.9	20.3	1.2	69.3	5.0	14.6	11.9	16.6	0.8	74.5
Smallmouth Buffalo	8.0	21.2	17.1	25.6	5.4	79.2	0.0					
White Bass	1.0	10.5	10.5	10.5	0.5	90.3	0.0					
White Sucker	30.0	16.6	13.1	19.7	2.0	93.6	12.0	16.3	13.6	19.0	2.2	110.0
Walleye	12.0	16.2	12.0	21.7	1.5	80.5	11.0	13.7	9.2	18.4	0.9	97.9
Yellow Perch	0.0						2.0	6.1	5.8	6.4		

Table 12. Missouri River Dredge Cuts gill netting summary data, 2015.

Fall September 1 and 2 (10 experimental nets and 4 smelt nets)

Species	# Sampled	Ave. Length (in)	Min Length (in)	Max Length (in)	Ave. Weight (lbs)	Relative Wt Ave.
Bluegill	1	3.7	3.7	3.7	0.0	
Bigmouth Buffalo	1	20.3	20.3	20.3	5.1	
Channel Catfish	49	17.18	14.4	31.5	1.5	90.5
Common Carp	3	15.77	14.9	16.7	2.2	106.73
Cisco	21	12.16	7.8	15.7	0.7	
Shortnose Gar	2	25.25	24.5	26	1.6	
Goldeye	35	13.94	12.5	14.7	0.8	
Lake Whitefish	5	16.98	10.7	20.1	1.9	
Northern Pike	6	26.77	22	34.3	5.0	92.53
River Carpsucker	13	18.16	16.3	23.3	2.8	
Shovelnose Sturgeon	11	25.58	23.1	28.2	2.7	100.11
Sauger	2	17.25	16.6	17.9	1.3	67.29
Smallmouth Buffalo	3	22.93	19.2	28.7	6.5	67.77
White Sucker	10	15.67	7.1	19.1	2.0	102.43
Walleye	13	15.13	12.4	18.8	1.1	85.27
Yellow Perch	2	6.3	5.5	7.1	0.1	101.18

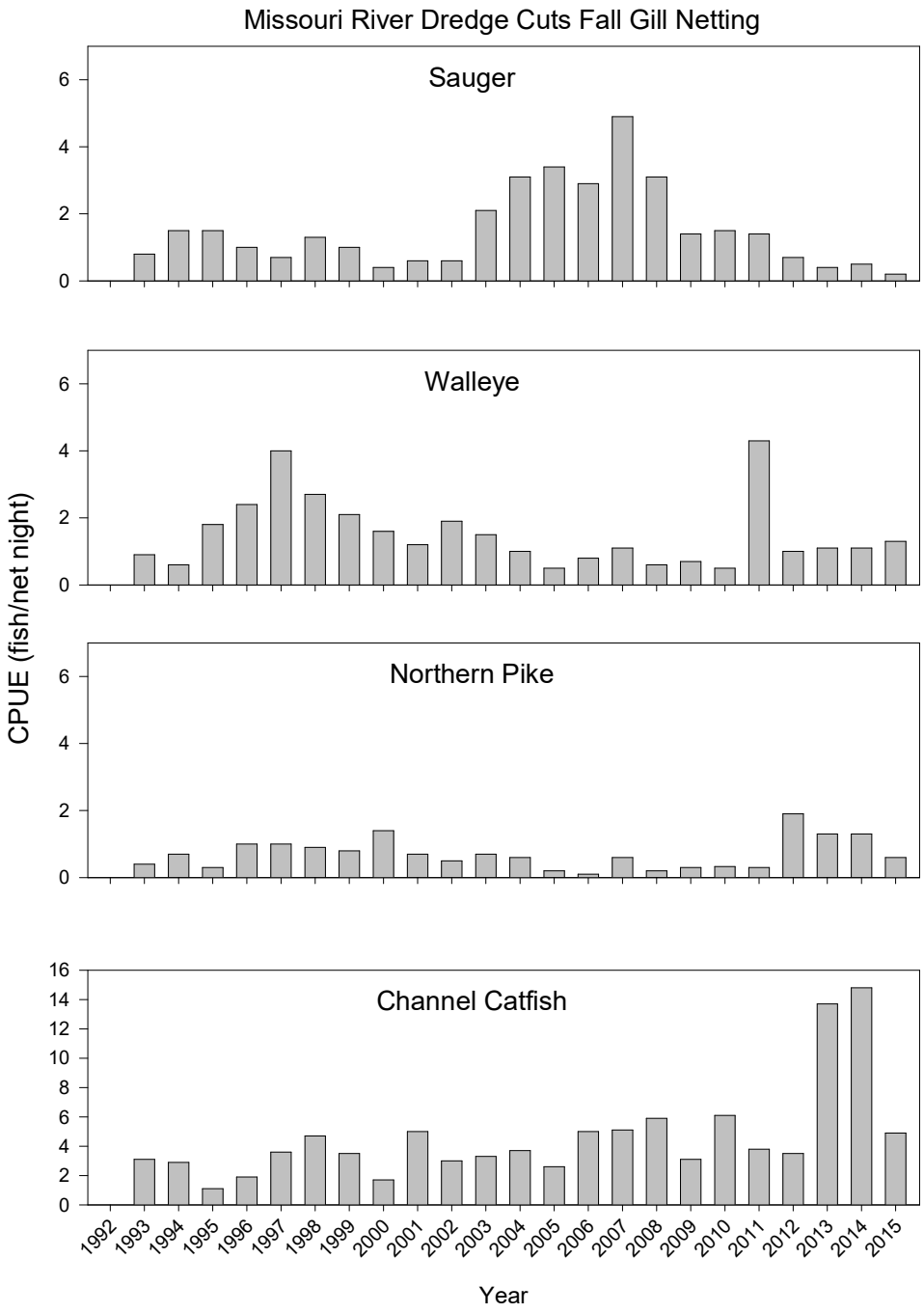

Figure 13. Fall gill netting CPUE of sauger, walleye, northern pike and channel catfish in the Missouri River Dredge cuts from 1993-2015.

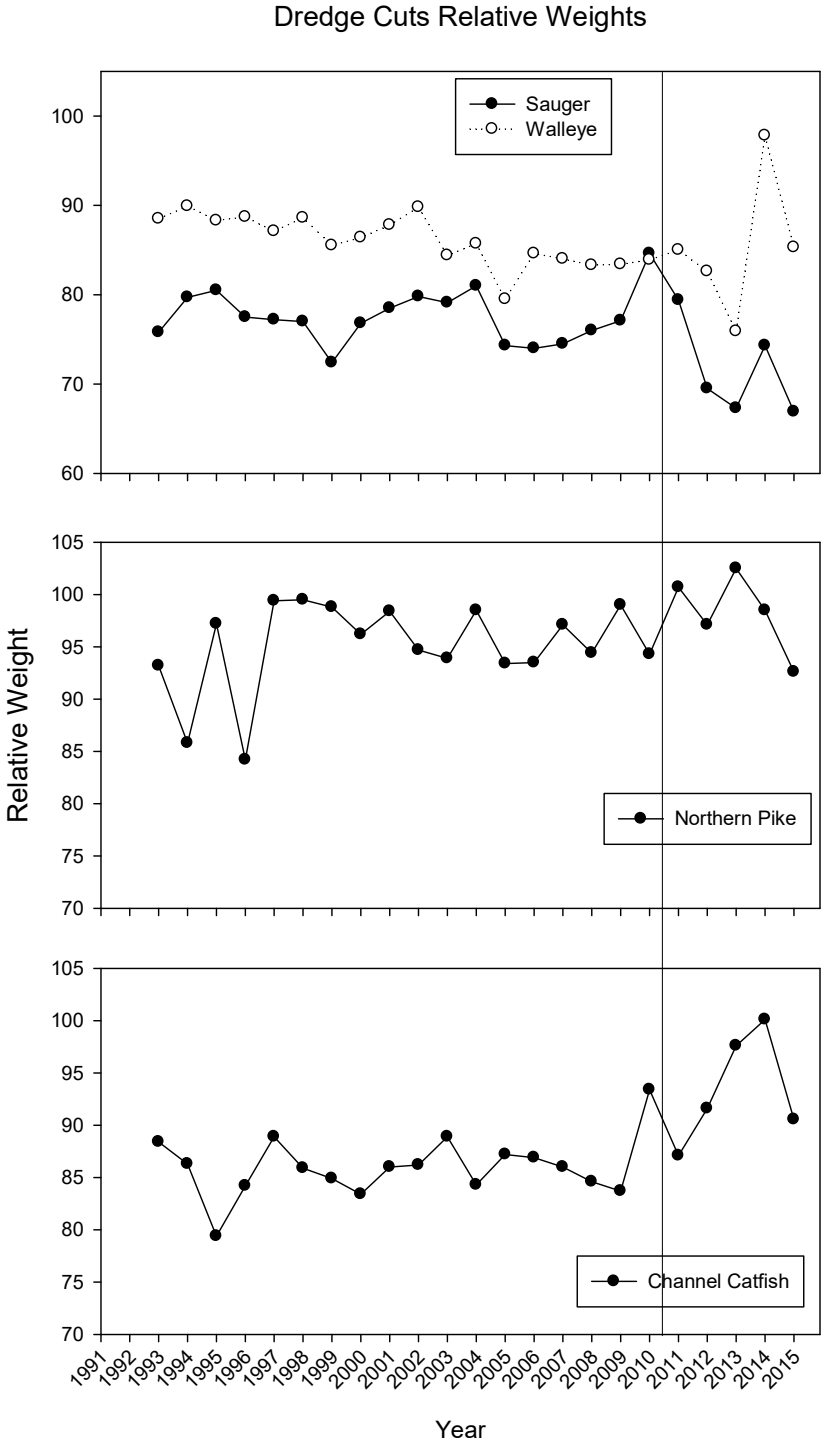

Figure 14. Relative weights of sauger and walleye (top panel), northern pike (middle panel) and channel catfish (bottom panel) captured in the Missouri River Dredge Cuts 1993-2015. Fall and spring samples combined from 1993 to 2010. Fall only samples from 2011 to 2015 (Indicated by the vertical line).

Redwater River

The Redwater River is one of the largest tributaries to the lower Missouri River in Montana. The Missouri and Redwater River's contain an extremely high diversity of fishes, including several Montana species of special concern. Species of special concern that have been documented in the Redwater River include northern redbelly dace, sauger, Iowa darter and sturgeon chub. Game fish that have been documented include channel catfish, northern pike, walleye and sauger. The Nickwall Crossing fish barrier currently precludes fish from migrating up the Redwater River on "normal" water years (Photograph 2). The barrier is situated just 1.25 river miles upstream from the confluence of the Missouri River. During the high water year of 2011, when water was toppling over the concrete structure, several game fishes, including native sauger were documented above the crossing. This was an extremely rare event, since the elevation of the Missouri River was high enough that water crossing the Nickwall structure had lower than normal water velocities and there was little elevation difference upstream and downstream of the structure. Although it was a rare event where fish could pass this structure, it provided solid evidence that if passage is available, several native fish species would utilize the Redwater River upstream of the current barrier.

Having free river passage for all species of fish within the Redwater River would likely benefit a plethora of species. During times of drought fish would be able to seek refuge in pools or in extreme cases seek refuge in the Missouri River. New spawning habitats would likely be opened up for fish migrating out of the Missouri River into the Redwater River.

FWP is planning on constructing fish friendly culverts at the Nickwall Crossing on the Redwater River in 2016. During 2015 the Redwater River just upstream and downstream of Nickwall Crossing was sampled using a bag seine. The results of that sampling effort is displayed in Table 13. During 2015, a total of 12 species were sampled in the overall effort. Of the total, seven species were collected upstream of the crossing and 11 species were collected downstream of Nickwall Crossing. Of the seven species collected upstream of the crossing, only one species, the plains minnow was not collected in the downstream site. On the other hand, of the 11 species collected in the downstream section, 6 species were collected that were not found in the upstream site (Figure 15). These data lend further evidence that the Nickwall Crossing is likely impacting the ability of fishes to move upstream of the crossing. More data will be collected in 2016 before construction of the new culverts begins and monitoring of the area will be conducted into the future after construction is completed.

Photograph 2. Nickwall Crossing on the Redwater River.

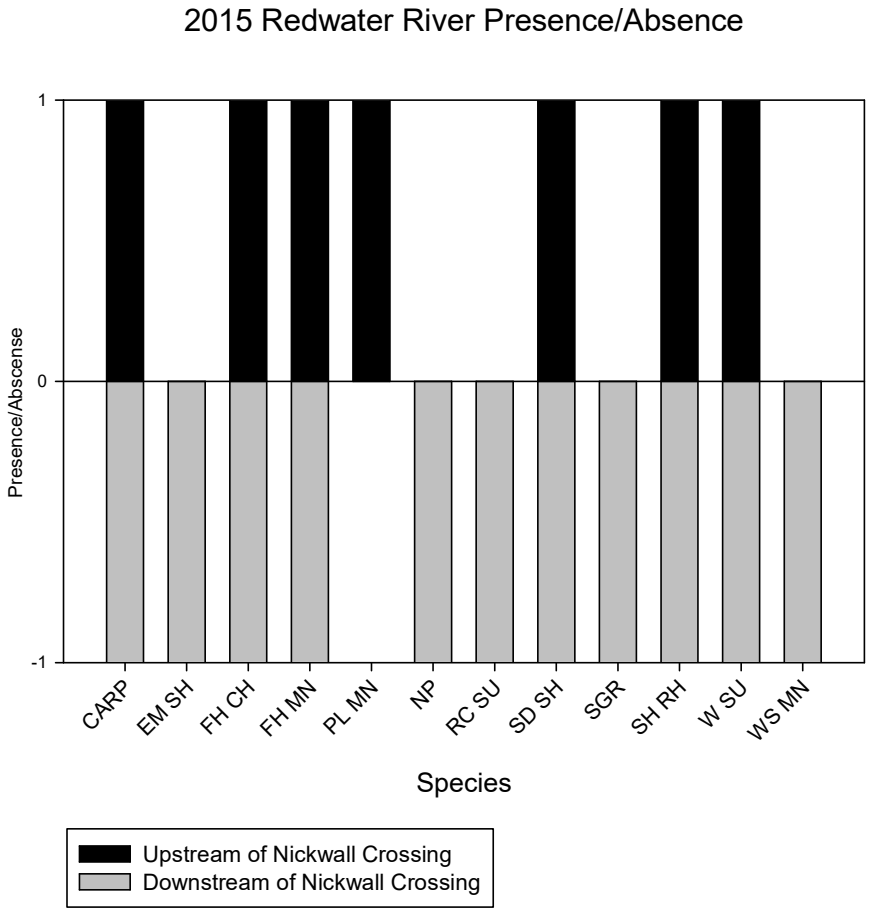

Figure 15. Diagram indicating the presence and absence of species collected in the Redwater River during 2015 upstream (above the middle line) and downstream (below the middle line) of Nickwall Crossing. A bar above the middle line indicates the species was present upstream of the crossing, while a bar below indicates a species was present downstream.

Table 13. Summary of 2015 seining data for the Redwater River. Data are broken into upstream and downstream of Nickwall Crossing. Asterisks (*) indicate that the particular species was only found in that site.

2015 Bag Seining Redwater River				
Upstream of Nickwall Crossing				
Species	# Sampled	Length Avg (in)	Min Length (in)	Max Length (in)
Common Carp	36	2.21	1.8	2.8
Flathead Chub	8	2.59	1.5	5
Fathead Minnow	1	2	2	2
Plains Minnow*	1	2.5	2.5	2.5
Sand Shiner	118	2.04	1.8	2.5
Shorthead Redhorse	2	2.85	2.2	3.5
White Sucker	17	2.21	1.8	2.5
Downstream of Nickwall Crossing				
Common Carp	6	1.85	1.5	2.2
Emerald Shiner*	69	2.91	2.5	3.8
Flathead Chub	1	1.2	1.2	1.2
Fathead Minnow	2	1.1	1	1.2
Northern Pike*	1	14	14	14
River Carpsucker*	10	3.66	1.5	8.5
Sand Shiner	4	1.75	1.5	2
Sauger*	1	13	13	13
Shorthead Redhorse	1	7.8	7.8	7.8
White Sucker	13	2.09	1.2	2.5
Western Silvery Minnow*	1	3.5	3.5	3.5

Northeast Montana Wild Fish Transfers

Three wild fish transfers were performed in Northeast Montana during 2015, all of which were the movement of yellow perch. All yellow perch were captured in Buer Pond in Daniels County. Yellow perch were transferred to Wagner Pond in Sheridan County, Knudsen Brother's pond in Roosevelt County and Church Reservoir in Richland County. All fish health and aquatic nuisance species protocols were followed. The water in the fish transport tanks was taken from the Fort Peck Hatchery.

Prepared by: Tyler M Haddix

Date: April 2015

Waters referred to:

Box Elder Creek Reservoir	16-4495
Missouri River Section 05	16-00AK
Missouri River Dredge Cuts	
Milk River	
Redwater River	

Keywords

Small ponds	Shovelnose sturgeon
Yellow Perch	Largemouth bass
Northern pike	Bluegill
Rainbow trout	Walleye
Black bullhead	Fathead minnow
Brook stickleback	

Appendix A. Fish species sampled by gear for ponds sampled in northeast Montana during 2012 (numbers in parentheses under gear represent the # of deployments).

County	Reservoir Name	Date	Maximum Depth (ft)	Gear	Species	Total Number Sampled	Mean Length (in)	Length Range (in)	Mean Weight (lbs)
Daniels	Hatfield Reservoir	9/5/2012	12	Gill (1)	Rainbow trout	11	10.31	7.2-14.8	0.73
				Trap (2)	Brook Stickleback	3			
					Rainbow trout	3	9.8	7.3-13.9	
Daniels	Whitetail Reservoir	8/16/2012	10	Gill (1)	NP	17	19.53	17.8-22.7	1.91
					RB	1	18.1		2.65
				Trap (3)	FH MN	550			
					NP	5	20.32	18-24.2	2.06
					YP	1	9.1		0.5
Valley	Glasgow Air Force Base Pond	8/14/2012	14	Gill (1)	Northern Pike	3	17.03	15.5-17.8	0.75
					Rainbow trout	17	12.69	9.2-17.1	1.21
					Yellow Perch	1	10.4		
				Trap (2)	Northern Pike	1	5.8		
Sheridan	Holtan Reservoir	9/5/2012		Gill (1)	No Fish				
				Trap (2)	Brook Stickleback	90			
					Fathead Minnow	271			

Appendix A continued.

County	Reservoir Name	Date	Maximum Depth (ft)	Gear	Species	Total Number Sampled	Mean Length (in)	Length Range (in)	Mean Weight (lbs)
Valley	Paulo Reservoir	8/14/2012	12	Gill (1)	Bluegill	14	5.0	3.5-5.9	
					Black Bullhead	2	9.4	7.7-11	
					Common Carp	12	14.3	13.3-16	
					Largemouth Bass	9	8.1	7.4-11.4	
				Trap (3)	Bluegill	146	4.4	0.9-7.3	
					Black Bullhead	19	7.2	2.1-11.4	
					Common Carp	6	13.6	12.1-14.3	
					Largemouth Bass	1	6.9		
					White Sucker	1	14.1		
Valley	VR009	8/14/2012		Gill (1)	Northern Pike	4	25.1	24.5-25.7	3.81
					Rainbow trout	16	12.2	8.9-14.7	0.73
				Trap (1)	Fathead Minnow	1,000			

Appendix B. Fish species sampled by gear for ponds sampled in northeast Montana during 2011 (numbers in parentheses under gear represent the # of deployments).

County	Reservoir	Date	Gear	Species	Total Number Sampled	Mean Length (in)	Length Range (in)
Daniels	Buer Pond	6/28/2011	Trap (4)	Creek Chubs	18	4.9	4.8-5.0
				Yellow Perch	637	5.3	4.1-7.0
Daniels	Whitetail Reservoir	8/22/2011	Gill (2)	Northern Pike	13	17.5	9.7-20.9
				Rainbow Trout	7	10.1	9.1-11
			Trap (2)	Fathead Minnow	200	2.3	1.7-2.8
Sheridan	Holtan Reservoir	9/15/2011	Trap (2)	Brook Stickleback	300		
				Fathead Minnow	5,000		
Valley	Glasgow Airforce Base Pond	6/8/2011	Gill (1)	Yellow Perch	1	6.0	
			Trap (2)	No Fish			
Valley	Big Reservoir	6/21/2011	Gill (1)	No Fish			
			Trap (3)	No Fish			
Valley	Burke Pond	9/28/2011	Gill (1)	Yellow Perch	89	9.6	5.3-13.9
			Trap (2)	Fathead Minnow	340		
				Yellow Perch	23	10.2	7.3-13.1
Valley	Homerun Pond	5/26/2011	Seine	Black Bullhead	1	6.0	
				Fathead Minnow	161		
				Yellow Perch	2	5.0	
Valley	Hose Reservoir	9/8/2011	Gill (1)	No Fish			
			Trap (2)	Fathead Minnow	700		
Valley	Langen Reservoir	9/26/2011	Gill (1)	Largemouth Bass	4	5.3	5.1-5.5
			Trap (2)	Fathead Minnow	125	2.5	1.8-3.4
				Largemouth Bass	1	5.4	
Valley	McNabb Reservoir	8/17/2011	Gill (1)	No Fish			
			Trap (2)	Fathead Minnow	25,000		
Valley	O'Juel Reservoir	9/26/2011	Gill (1)	Rainbow Trout	10	7.8	6.2-10.0
				White Sucker	12	12.3	8.8-16.3

County	Reservoir	Date	Gear	Species	Total Number Sampled	Mean Length (in)	Length Range (in)
			Trap (2)	Brook Stickleback	100		
				Fathead Minnow	100		
				Rainbow Trout	60	7.4	5.8-9.2
				White Sucker	19	13.0	7.3-15.4
Valley	Paulo Reservoir	8/10/2011	Gill (1)	Bluegill	2	5.0	4.8-5.1
				Largemouth Bass	1	5.6	
			Trap (3)	Bluegill	148	3.4	1-6.5
				Black Bullhead	246	2.4	1.2-10.5
				Common Carp	4	9.4	8.1-10
				Fathead Minnow	1	2.7	
				Largemouth Bass	20	1.9	1.2-4.0
				White Sucker	1	9.5	
Valley	Troika Reservoir	6/28/2011	Trap (2)	Fathead Minnow	1,282		
Valley	Valley Reservoir	9/28/2011	Gill (1)	Yellow Perch	3	8.0	7.2-8.6
			Trap (2)	Fathead Minnow	1,500		
				Yellow Perch	3	7.7	6.9-8.7
Valley	VR009 (Lower Base Pond)	6/8/2011	Gill (1)	No Fish			
			Trap (2)	Fathead Minnow	4	2.2	2.0-2.4
Valley	Winter Harbor Pond	6/9/2011	Gill (1)	Bluegill	9	4.5	3.8-6.0
				Largemouth Bass	1	15.1	
				Yellow Perch	5	7.2	7.0-7.4
			Trap (3)	Bluegill	79	5.3	3.0-8.3
				Yellow Perch	2	7.1	6.5-7.7

Appendix C . Fish species sampled by gear for ponds sampled in northeast Montana during 2010 (numbers in parentheses under gear represent the # of deployments).

County	Reservoir Name	Date	Maximum Depth (ft)	Gear	Species	Total Number Sampled	Mean Length (in)	Length Range (in)	Mean Weight (lbs)
Daniels	Buer Pond	10/12/2010		Gill net (1)	Yellow Perch	22	6.0	5.2-7.5	
				Trap (2)	Yellow Perch	521	5.5	4.5-7.5	0.1
					Creek Chubs	19	4.9	4.1-5.4	
Daniels	Carney Pond #1	8/5/2010		Gill net (2)	White Sucker	236	7.2	6.0-9.5	0.2
				Trap (2)	White Sucker	50	7.2		
					Fathead Minnow	25	2.6		
					Brook Stickleback	35	1.8		
Daniels	Chabot Reservoir	10/12/2010	10	Gill net (1)	Rainbow Trout	42	9.6	8.5-11.5	0.48
				Trap net (1)	Rainbow Trout	5	9	8.3-9.6	
Daniels	Danelson Reservoir	8/6/2010	14	Gill net (1)	No Fish				
				Trap net (1)	Brook Stickleback	11	1.3	0.9-1.6	
Daniels	Hatfield Reservoir	10/14/2010	12	Gill net (1)	Rainbow Trout	50	9.5	7.5-11.5	0.46
				Trap net (2)	Rainbow Trout	11	9.1		0.49
					Brook Stickleback	126	1.7	1.2-3.0	
Daniels	Killenbeck Reservoir	8/5/2010	11	Gill net (2)	Rainbow Trout	105	9	5.0-11.5	0.3
				Trap (2)	No Fish				
Richland	Keuster	11/3/2010	7	Gill net (2)	Yellow Perch	2	8.6	8.5-8.6	0.35
				Trap (2)	Fathead Minnow	48	2.4		

Appendix C. continued.

County	Reservoir Name	Date	Maximum Depth (ft)	Gear	Species	Total Number Sampled	Mean Length (in)	Length Range (in)	Mean Weight (lbs)
Sheridan	Box Elder Reservoir	9/20/2010	25+	Gill net (4)	Walleye	201	9.8	7.1-20.9	1.02
					Northern Pike	24	17.3	13.3-38.0	1.78
					Yellow Perch	32	9.1	7.3-10.1	0.38
					White Sucker	14	17.3	16.0-19.2	2.25
					Black Bullhead	22	8.9	5.0-12.2	0.53
					Carp	5	4.7	4.1-4.9	0.03
				Trap net (2)	Walleye	1	7.3		
					Black Bullhead	858	3.8		
					Carp	222	2.9		
					White Sucker	4	13.3		
Sheridan	Raymond Dam	9/20/2010	15	Gill net (1)	Rainbow Trout	8	11	8.6-12.7	0.69
				Trap (1)	Fathead Minnow	346	2.3		
Valley	Atlas Reservoir	10/5/2010	12	Gill net (2)	No Fish				
				Trap net (2)	Fathead Minnow	1,400	2.2	1.8-2.7	
Valley	Big Reservoir	9/2/2010	14	Gill net (1)	No Fish				
				Trap (2)	Black Crappie	70	4.2	2.8-10.4	0.11
					Fathead Minnow	167	2.7		
Valley	Burke Reservoir	8/9/2010	9	Gill net (1)	Yellow Perch	93	7.5	0.8-12.0	0.3
				Trap (1)	Yellow Perch	28	4.6	3.0-7.1	
					Fathead Minnow	32	2.2		

Appendix C. continued.

County	Reservoir Name	Date	Maximum Depth (ft)	Gear	Species	Total Number Sampled	Mean Length (in)	Length Range (in)	Mean Weight (lbs)
Valley	Dredge Cuts Trout Pond	10/6/2010	20+	Gill Net (3)	Yellow Perch	52	6.6	0.07-8.1	0.13
					Northern Pike	6	22.2	19.2-32.0	3.23
					Bluegill	1	3.9		
					Carp	5	26.3		8.25
					White Sucker	1	17.4		
				Trap (2)	Bluegill	150	1.7	1.4-2.0	
Valley	Glasgow Air Force Base Pond	8/4/2010	14	Gill net (1)	Yellow Perch	19	6.6	5.9-7.0	
					Northern Pike	1	23.2		
					Rainbow Trout	2	10.7	10.2-11.2	
				Trap (1)	Northern Pike	1	16.1		
Valley	Langen Reservoir	9/3/2010		Gill net (2)	Largemouth Bass	9	10.7	9.5-12.9	0.83
				Trap net (2)	Fathead Minnow	562	2.4	2.2-2.9	

Appendix C. continued.

County	Reservoir Name	Date	Maximum Depth (ft)	Gear	Species	Total # Sampled	Mean Length (in)	Length Range (in)	Mean Weight (lbs)
Valley	Missouri River Dredge Cuts	9/1 & 9/2/2010	20+	Gill Nets (10)	Walleye	3	14.5	11.2-19.3	1.1
					Sauger	9	15.1	12.4-17.0	1
					Northern Pike	2	31.3	21.7-40.9	9.1
					Channel Catfish	61	16.3	13.0-22.6	1.4
					Shovelnose Sturgeon	8	24.4	22.6-26.1	2.1
					Yellow Perch	2	5.9	5.5-6.3	0.1
					Lake Whitefish	4	18.3	17.7-18.7	2.6
					Cisco	43	11.6	4.7-14.7	0.7
					River Carpsucker	12	16.9	15.0-18.1	2.3
					Carp	6	21.1	18.0-29.4	5.1
					Rainbow Smelt	2	6	5.9-6.0	0.07
					Goldeye	25	13.9	12.6-17.1	0.8
					White Sucker	59	15.3	6.4-18.5	1.9
					Spottail Shiner	1	4.1		
Valley	Paulo Reservoir	9/15/2010		Gill net (2)	Largemouth Bass	6	9.9	6.9-11.7	0.54
					Bluegill	9	5.8	4.0-7.2	0.18
					Black Bullhead	1	10		0.56
				Trap (2)	Largemouth Bass	2	2.6	1.7-3.5	
					Bluegill	94	4.4	1.1-7.2	0.12
					Black Bullhead	3	9.9	8.7-10.8	0.56

Appendix C continued.

County	Reservoir Name	Date	Maximum Depth (ft)	Gear	Species	Total Number Sampled	Mean Length (in)	Length Range (in)	Mean Weight (lbs)
Valley	Shoot Reservoir	9/3/2010		Gill net (1)	Rainbow Trout	5	8.6	8.4-9.3	
Valley	Troika Reservoir	10/6/2010	11	Gill net (2)	No Fish				
				Trap Net (2)	Fathead Minnow	3,500	2.7	2.1-3.1	
Valley	Valley Reservoir	8/9/2010	12	Gill net (1)	Yellow Perch	82	7.2	5.3-10.0	0.21
				Trap (1)	Yellow Perch	2			
				Trap (1)	Fathead Minnow	5	2.7		
Valley	VR 009	8/4/2010	< 5	Visual	Extremely low water				