## Montana Department of Fish, Wildlife and Parks Fisheries Division

#### Job Progress Report

## STATE: Montana PROJECT: Statewide Fisheries Management

TITLE: Eastern Region 6 Pond, Stream, and River Sampling

JOB: Northeast Montana Warmwater Ponds and River Investigations

FEDERAL GRANT:

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### INTRODUCTION

From the diverse and complex Milk and Missouri Rivers to ponds and small reservoirs less than an acre in size, a wide array of angling opportunities exist in Region 6's Eastern fisheries management district. In 2021, a variety of fisheries surveys were conducted within the management district which includes Valley, Daniels, Sheridan, and Roosevelt counties as well as portions of Richland, McCone and Dawson counties. Waterbodies under Montana Fish, Wildlife & Parks (FWP) management in Eastern Region 6 include the Milk River east from Rock Creek to the mouth, the Missouri River from the Fort Peck Dam to the North Dakota border, and all ponds, reservoirs, and prairie streams from Rock Creek east to the North Dakota Border (Figure 1). FWP does not manage any fisheries contained within the Fort Peck Indian Reservation.

2021 saw the fourth driest year on record for Northeast Montana (Associated Press 2021), and as a result many of the diverse fisheries throughout the management district were negatively impacted. Low water levels and high water temperatures were observed in many ponds, small reservoirs, and prairie streams during the summer, and fish assemblages in these systems likely suffered. Additionally, Milk River discharge was historically low, with flows not exceeding 400 cfs at any time from March – December 2021 (Figure 2). Unlike the Milk River, the Missouri River within the Eastern management district is somewhat resilient to drought conditions due to hypolimnetic discharge out of Fort Peck Reservoir. Operation of Fort Peck Dam by U.S. Army Corps of Engineers results in stable flows throughout the year even during drought conditions, while hypolimnetic discharge results in less extreme water temperatures than surrounding systems (Figure 2).

This report summarizes FWP fisheries management work conducted within the Eastern Region 6 fisheries management district during the 2021 field season. Management of Fort Peck Reservoir and Pallid Sturgeon management is not included in this report.



Figure 1. Map depicting the Eastern Region 6 fisheries management district.



Figure 2. Missouri River near Wolf Point, MT and Milk River at Nashua, MT hydropgraphs, March 2021 through December 2021.

### PROCEDURES

## POND AND SMALL RESERVIOR SAMPLING

Many ponds and small reservoirs were sampled throughout late spring, summer, and early fall 2021 as part of FWP's long-term monitoring program. To survey these ponds hook and line sampling, experimental sinking gillnets (125' x 6', multifilament), fyke nets (3' x 4' hoop, 3' x 50' lead), and mini-fyke (2' x 3' hoop, 2' x 25' lead) nets were used in combination depending on size of the waterbody being sampled. When using gillnets, fyke nets, or mini-fyke nets gear were deployed, left to soak overnight, and retrieved the following morning. When hook and line sampling was utilized two anglers fished for 1 hour each – resulting in two hours of angling effort. Relative abundance was quantified in terms of fish/net (catch per unit effort; CPUE) for net sampling or fish/hour (catch rate) for hook and line sampling. All fish were measured, weighed, and stomach contents examined when applicable. Aging structures (otoliths) were collected from Yellow Perch and Bluegill at four locations to provide information regarding age and growth rates.

In addition to fisheries sampling, limnological measurements were obtained during the field season for most waterbodies throughout the Eastern fisheries management district. Elevation, maximum depth (ft), water clarity (ft), and temperature (°F) was recorded during fisheries sampling, and dissolved oxygen levels (mg/L) were recorded during December and January.

#### BOXELDER RESERVOIR SAMPLING

Boxelder Reservoir in Sheridan County is one of the larger reservoirs (78 ac) in Eastern Montana and provides one of few fishing opportunities for residents and non-residents near Montana's northeastern-most corner. Due to the complexities of managing this system in the past, and an absence of long-term monitoring data from 2016-2020, FWP sampled Boxelder with a gear-

intensive approach in 2021. In early June four sinking experimental gillnets (125' x 6', multifilament), one floating experimental gillnet (125' x 6', multifilament), two fyke nets (3' x 4' hoop, 3' x 50' lead), and two mini-fyke nets (2' x 3' hoop, 2' x 25' lead) were set, left to soak overnight, and retrieved the next morning. All fish collected were measured and weighed, and stomach contents were examined if applicable. Relative abundance (fish/net; CPUE) and condition ( $W_r$ ) were also quantified.

# MISSOURI RIVER AND FORT PECK DREDGE CUT SAMPLING

The Missouri River and Fort Peck Dredge Cuts were sampled in fall 2021 as part of annual longterm monitoring of the fishery below Fort Peck Dam. Fish collected from experimental sinking gillnets (n=10; 125' x 6', multifilament) and smelt nets (n=4; 150' x 6', monofilament  $\frac{1}{2}$ " bar mesh) at 14 fixed sites (Figure 3) were used to evaluate fish assemblage, relative abundance (CPUE; fish/net), and condition (relative weight; W<sub>r</sub>) of the diverse fishes residing in the Dredge Cuts. Nets were deployed, left to soak overnight, and retrieved the following day. All collected fish were measured, weighed, and stomach contents evaluated if applicable.



Figure 3. Locations of experimental gillnets (yellow circles) and Smelt nets (blue circles) set in the Missouri River and Fort Peck Dredge Cuts in 2021. Net locations are fixed sites set annually each fall.

### PRAIRIE STREAM SAMPLING

Questions surrounding fish passage requirements at two Montana Department of Transportation bridge replacement locations prompted Spring Creek and Butte Creek in Daniels County to be sampled in early May 2021. Seining (4' x 75' long, ¼" mesh) and visual observation were used to lend insight into fish assemblages near each construction location.

Larb Creek in Valley County was sampled via seine as part of a greater South Valley Prairie Stream Inventory project in September 2021. Additionally, a contracted flight (Kestrel Aerial Services) was performed in November 2021 to inventory all habitat features, crossings, and intermittent pools from the confluence at Beaver Creek upstream to river mile (RM) 63 of Larb Creek (Appendix D).

## DREDGE CUT ARCHERY PADDLEFISH SEASON

FWP administers an archery-only Paddlefish season in the Fort Peck Dredge Cuts from July 1 to August 31 each year. Anglers are allowed to harvest one Paddlefish per year using a blue harvest tag, which can be purchased over-the-counter at any time. There is currently no limit on the number of blue harvest tags sold however, anglers may only hold one valid Paddlefish tag (blue, white, or yellow) statewide each year.

As of 2016, anglers are required by law to report harvested Paddlefish and have a variety of options to do so. New in 2021, self-creel stations (Appendix E) were installed at access points near the Dredge Cuts to provide anglers with an additional reporting option, as well as the opportunity to voluntary submit a dentary sample to FWP. Anglers submitting a dentary sample and all required harvest information received a unique Montana Paddlefish hat as a reward (Appendix E). Following the season, a phone survey of all blue tag holders is conducted to investigate additional harvest and angler preferences regarding the fishery.

## MILK RIVER SAMPLING

Limited hoop netting occurred on the Milk River in fall 2021. As an investigative effort, hoop nets  $(7 - 2.5' \text{ diameter hoops}, \frac{1}{2}'' \text{ mesh})$  baited with cheese were set at eight locations in the Milk River above and below Vandalia Dam (Figure 4). All fish collected were measured, weighed, and released.





## FISH HEALTH TESTING

Several fish species were collected from various Northeast Montana waterbodies in 2021 to be tested for disease and pathogens. Fish species from a given waterbody certified as "disease-free" can be used for wild fish transfers to supplement other fisheries in the region. FWP's fish health department requires at least 60 of a single species be submitted for testing and all fish be fresh. Therefore, 60 fish from each sampling location were collected via fyke net (3' x 4' hoop, 3' x 50' lead) or experimental gillnets (125' x 6', multifilament) set overnight and placed on ice for immediate transfer to the fish health lab in Bozeman, MT.

## REDD COUNTS

Hypolimnetic discharge out of Fort Peck creates favorable conditions for salmonid species (Rainbow Trout, Brown Trout) immediately downstream of Fort Peck Dam. As an investigative effort, redd counts were conducted in June 2021. Side channel habitat between Duck and Scout Islands along the eastern shore of the Missouri River were surveyed via visual observation by FWP staff in two kayaks. It was suspected that some, if not all Rainbow Trout spawning activity would be completed prior to our survey, therefore all observed redds were simply counted and recorded.

### **RESULTS AND DISCUSSION**

### POND AND RESERVOIR SAMPLING

In 2021, thirty ponds and small reservoirs were sampled in Northeast Montana, many of which had not been surveyed in recent years (Appendix A). Five "new" waterbodies were added for management going forward (Cory's Pond, Hose Reservoir, Ike's Fishing Pond, Johnson Reservoir, Kuester Reservoir). Additionally, FWP has decided to suspend management of two previously managed fisheries (Langen Reservoir, Salsbury Reservoir) and is closely monitoring water levels and water quality in four reservoirs (Big Muddy Reservoir, Carney Reservoir, Crusch Reservoir, Danelson Reservoir) to determine if future management is warranted (Appendix A; Appendix B).

### BOXELDER RESERVOIR SAMPLING

Boxelder Reservoir currently supports one of, if not the best Yellow Perch fishery in the Eastern half of Region 6. Yellow Perch relative abundance averaged 21 fish/net in gillnets in 2021, with majority of fish greater than eight inches in length (Figure 5). Walleye relative abundance averaged 5 fish/net with an average length of 12.9 inches (Table 1). Finally, Common Carp, Black Bullhead, and Northern Pike relative abundance decreased from previous sampling in 2016 (Appendix C). Fyke nets captured four species including Walleye (n=4), Black Bullhead (n=10), Common Carp (n=2), and White Crappie (n=2).

Management concerns and consequential actions are summarized in Table 2.

		Gillnet CPUE					
Species	# Sampled	(fish/net)	Avg. TL (in)	Min TL (in)	Max TL (in)	Avg. Wt (lbs)	Avg. Wr
Black Bullhead	23	5.0	8.3	6.5	11.2	0.35	97.3
Common Carp	6	1.0	22.9	21.6	24.0	5.80	96.8
Northern Pike	3	0.8	20.1	16.1	25.6	2.35	94.7
Rainbow Trout	2	0.4	6.7	6.5	6.9	0.14	115.3
White Sucker	16	3.8	17.0	12.0	19.2	2.19	97.8
Walleye	23	5.0	12.9	11.7	15.0	0.62	81.9
White Crappie	2	0.0	10.9	10.8	11.0	0.80	115.7
Yellow Perch	84	21.0	8.8	6.1	11.2	0.40	106.6

#### Table 1. Summary of 2021 Boxelder Reservoir sampling.



Figure 5. Length-frequency of Yellow Perch captured in Boxelder Reservoir in 2021. Note the absence of fish under six inches.

Table 2. Recruitment source and management details of fish species sampled from Boxelder Reservoir in 2021. 2021 sampling data, historical data, and stakeholder input was taken into consideration for "Management Direction" decisions.

	Recruitment			Management
Species	source	Management Type	Management Concerns	Direction
Black Bullhead	Wild	General	None	-
Common Carp	Wild	Suppression	Overabundance	Suppress population, monitor abundance in response to Northern Pike stocking change
Northern Pike	Hatchery/Wild	General	None	Discontinue stocking
Rainbow Trout	Hatchery	Put - Grow - Take	Survival	Increase stocking of fingerlings, potential prey source for piscivorous species
White Sucker	Wild	General	None	-
Walleye	Hatchery	General	Lack of forage, habitat availability for reproduction and recruitment	Move from fry to OTC marked fingerlings - investigate NR contribution
White Crappie	Wild	General	None	-
Yellow Perch	Wild	General	Lack of forage, habitat availability for reproduction and recruitment	Artificial habitat implementation - increase reproduction and recruitment

## MISSOURI RIVER AND FORT PECK DREDGE CUT SAMPLING

Eighteen species were surveyed in the Missouri River and Fort Peck Dredge Cuts during 2021, including the first Blue Sucker captured since 2013 and first Pallid Sturgeon captured since 2012 (Table 3). Channel Catfish and Cisco were most abundant, followed by Walleye, Shovelnose Sturgeon, and River Carpsucker (Figure 6). Condition (W<sub>r</sub>) of most species surveyed was good with the exception of Sauger (Table 3). Walleye CPUE was above the long-term average at 2.4 fish/net (Figure 7). Sauger CPUE was at its highest since 2013 but still relatively low at 0.5 fish/net (Figure 8).

	# Sampled	Avg. TL (in)	Min TL (in)	Max TL (in)	Avg. Wt (lbs)	Avg. Wr
Blue Sucker	1	28.2	28.2	28.2	7.9	-
<b>Bigmouth Buffalo</b>	3	21.3	16.9	28.7	5.9	-
Channel Catfish	87	16.8	14.5	24.3	1.6	92.2
Common Carp	5	20.5	18.2	23.3	4.3	98.4
Cisco	64	10.2	4.4	17.4	0.4	-
Goldeye	5	13.8	12.4	14.8	0.9	-
Lake Whitefish	3	19.8	18.9	21.1	3.3	-
Northern Pike	7	26.0	21.2	31.0	5.0	107.9
Pallid Sturgeon*	1	16.5	16.5	16.5	0.6	-
Rainbow Smelt	5	6.2	5.4	6.9	0.1	-
River Carpsucker	13	17.2	14.3	19.2	2.6	-
Shovelnose Sturgeon*	18	25.6	20.4	30.6	2.9	105.7
Sauger	5	12.2	10.1	14.5	0.5	75.6
Shorthead Redhorse	3	15.7	12.9	19.1	1.9	-
Smallmouth Buffalo	3	20.0	18.3	21.9	4.7	88.3
White Sucker	12	16.3	7.2	20.4	2.2	98.6
Walleye	24	14.7	10.1	22.4	1.2	90.6
Yellow Perch	5	6.7	5.6	8.3	0.2	103.9

Table 3. Summary of Fort Peck Dredge Cut sampling in 2021.



Figure 6. Capture location summary of species sampled in the Fort Peck Dredge Cuts in 2021.



Figure 7. Long-term CPUE data of Walleye captured in the Missouri River and Fort Peck Dredge Cuts.



Figure 8. Long-term CPUE data of Sauger captured in the Missouri River and Fort Peck Dredge Cuts.

#### PRAIRIE STREAM SAMPLING

System	Location	Date	Effort (100 m reaches)	Species	# Captured
Butto Crook	48.82802,	E // /2021	Soino 2	Northern Pike	2
Butte Cleek	-105.60070	5/4/2021	Jeine - J	White Sucker	2
Spring Creek	48.80751, -105.64550	5/4/2021	Seine - 2	NO FISH	
				Yellow Perch	21
				lowa Darter	24
				Common Carp	60
				Fathead Minnow	353
	4831672			White Sucker	5
Larb Creek	-107.28934	9/14/2021	Seine - 6	Lake Chub	35
				Emerald Shiner	1
				Longnose Dace	1
				Smallmouth	
			Buffa		1
				Black Bullhead	13

Table 4. Summary of results of prairie stream surveys conducted in 2021.

#### DREDGE CUT ARCHERY PADDLEFISH SEASON

The 2021 Dredge Cut archery Paddlefish season saw angler days, number of tags sold, paddlefish harvested, and catch rates decrease from 2020 however, angler days and number of

tags sold were still above the long-term (10 year) average (Table 5). In 2021, the highest reporting rate (> 100%) since mandatory reporting became a requirement was observed, likely due to the installation of self-creel stations (Figure 9; Appendix E). Utilization of the self-creel stations by Paddlefish anglers was also demonstrated by the number of dentary samples submitted. Thirty-three of 36 anglers who reported Paddlefish, likely incentivized by the reward hat program, also submitted a dentary sample.

Conversations with archery anglers combined with phone survey results suggest many anglers are seeing multiple Paddlefish on singular trips, and even passing opportunities to harvest small fish. Additionally, comments received from anglers surveyed by phone suggest a subset of anglers are concerned with harvest of native Shortnose Gar and Buffalo species in the Dredge Cuts. FWP fisheries staff are working to educate archery anglers about native non-gamefish species in the Missouri River system to potentially mitigate some of this harvest before a survey of these species can be conducted.

Table 5. Summary of angler dynamics and participation in the Dredge Cut archery Paddlefish fishery. Number of fish harvested is based on phone survey data, and mandatory reporting did not begin until 2016.

	Tags	Percent Bow	Total Angler	Catch Rate	# fish	# fish	# dentary
Year	Sold	Hunted	Days	(PF/day)	harvested	reported	samples
2011	111	65.8	240	0.023	7		
2012	173	70.0	390	0.046	26		
2013	162	86.7	401	0.146	51		
2014	212	89.4	718	0.078	50		
2015	260	83.0	742	0.074	46		
2016	239	90.0	168	0.290	43	28	
2017	297	80.5	859	0.080	55	27	
2018	209	86.0	575	0.080	45	26	
2019	182	82.0	493	0.030	14	1	
2020	235	83.9	790	0.060	38	14	
2021	217	80.9	633	0.066	34	36	33



Figure 9. Phone creel estimates of Paddlefish harvest vs. actual number of Paddlefish reported each year within the Dredge Cut archery Paddlefish fishery. 2021 also includes the number of Paddlefish reported "on site" at newly constructed self-creel stations.

#### MILK RIVER SAMPLING

Table 6. Summary of fall hoop netting results above and below Vandalia Dam in the Milk River.

Reach	Location	Date	Effort (# hoops)	Species	# Captured	Avg. TL (in)
		/ /		White Crappie	1	3.5
Above Vandalia Dam	48.93788,		4	Smallmouth Buffalo	1	4.5
	-107.08300	10/13/2021	4	Channel Catfish	1	8.6
				Smallmouth Bass	2	8
				Black Crappie	2	1.7
		10/14/2021		Spottail Shiner	15	3.3
Below Vandalia	48.09883,		4	Shorthead Redhorse	1	12.7
Dam	-106.29121			Channel Catfish	2	11.2
				White Crappie	1	3.6

#### FISH HEALTH TESTING

Six waterbodies were sampled for fish health testing in 2021. Quantity of species required for testing was met in four of six waters, and all four were certified as disease free. Disease free species from these waters are eligible for wild fish transfers from 2021-2025.

Waterbody	County	Species	# Captured	Disease Free
Cory's Pond	Valley	YP	> 60	Y
Shoot Reservoir	Valley	FH MN	> 60	Y
Fort Peck Trout Pond	Valley	BG	> 60	Y
Winter Harbor Pond	Valley	BG	> 60	Y
McNab Reservoir	Valley	BL CR	< 60	-
Raymond Dam	Sheridan	YP	< 60	-

Table 7. Results of fish health testing on six waterbodies throughout Eastern Region 6 fisheries management district.

### REDD COUNTS

Conditions were favorable for visual observation of redds during our count in late June. Calm winds and sunny skies allowed for twenty-one Rainbow Trout redds to be counted during our survey. As expected, no active redds were observed.

# References

Associated Press. 2021. Montana Comes off 4<sup>th</sup> Driest Year on Record Amid Drought. Published online: December 24, 2021. Accessed: February 12, 2021.

### APPENDIX

Appendix A. 1. Summary	y of all	ponds and small	reservoirs samp	oled in Valle	County in 2021.
	/				

	Sampling			Species					
Waterbody	Effort	Date	Purpose	Captured	Gillnet CPUE	Fyke Net CPUE	Avg. TL (in)	Range TL (in)	Management Recommendations/Comments
Fort Peck Trout Pond	Gillnet - 2 Fyke Net - 1 Mini Fyke - 1	9/16/2021	Long Term Monitoring	BG, CCAT, CARP, NP, YP	BG - 7/net CCAT - 0.5/net CARP - 0.5/net NP - 0.5/net YP - 0.5/net	BG - 59/net	BG - 4.0 CCAT - 19.4 CARP - 23.9 NP - 26.1 YP - 5.9	BG 3.3 - 5.0 CCAT - 19.4 CARP - 23.9 NP - 26.1 YP - 5.9	Candidate for increased abundance predator species due to high abundance of small (<5") Bluegill
Glasgow Base Pond	Gillnet - 1 Mini Fyke - 1	5/5/2021	Long Term Monitoring	NP, RB, YP	NP - 27/net RB - 4/net YP - 1/net	-	NP - 21.0 RB - 14.6 YP - 13.3	NP 15.8 - 34.5 RB 13.5 - 15.5 YP - 13.3	Candidate for increased harvest of Northern Pike and wild transfer of Yellow Perch
VR 009 Reservoir	Gillnet - 1 Mini Fyke - 1	5/5/2021	Long Term Monitoring	NP, RB, YP	NP - 7/net RB - 6/net YP - 2/net	-	NP - 21.6 RB - 15.3 YP - 11.3	NP 14.1 - 25.4 RB 13.5 - 16.9 YP 11.0 - 11.6	Candidate for wild transfer of Yellow Perch
Home Run Pond	Hook and Line	6/2/2021	Long Term Monitoring	BL BH, CARP, RB, YP	-	-	BL BH - 5.8 CARP - 9.2 RB - 10.9 YP - 9.8	BL BH 5.5 - 6.0 CARP 5.1 - 15.9 RB 7.2 - 12.8 YP 8.8 - 11.0	Sampled during Glasgow kids fishing day, catch rates were not calculated (~45 angler hours) Total of each spp. captured: BLBH N=2, CARP N=6, RB N=42, YP N=6
Langen (Forsman) Reservoir	Hook and Line	5/7/2021	Long Term Monitoring	NO FISH	-	-	-	-	No longer managing
McNab Reservoir	Gillnet - 1 Fyke Net - 2 Mini Fyke - 2	5/13/2021	Long Term Monitoring	BL CR, FH MN	BL CR - 6/net	BL CR - 112/net FH MN - 1,119/net	BL CR - 3.3	BL CR 2.0 - 8.3	Good abundance of YOY Black Crappie, Fathead Minnow, and <i>Gammarus</i> spp., windmill aerator installed August 2021
O'Juel Reservoir	Gillnet - 1 Fyke Net - 1 Mini Fyke - 1	5/17/2021	Long Term Monitoring	BR SB, FH MN, RB, W SU	W SU - 15/net	BR SB - 17.5/net FH MN - 733.5/net RB - 1/net W SU - 1.5/net	RB - 15.2 W SU - 14.9	RB 14.1 - 16.2 W SU 13.1 - 17.7	Productive reservoir, high (>120) relative weights of Rainbow Trout and White Sucker
Paulo Reservoir	Gillnet - 1 Mini Fyke - 1	4/30/2021	Long Term Monitoring	BG, CARP, LMB	BG - 4/net CARP - 1/net LMB - 1/net	BG - 5/net	BG - 5.8 CARP - 20.8 LMB - 11.7	BG 2.9 - 9.2 CARP - 20.8 LMB - 11.7	Windmill aerator installed August 2021, stocked for first time with fingerling BG and LMB in July 2021
Shoot Reservoir	Gillnet - 1 Mini Fyke - 1	4/30/2021	Long Term Monitoring	FH MN, RB	RB - 7/net	FH MN - 23,600/net	RB - 15.7	RB 14.0 - 18.6	Large forage base, high average relative weight of Rainbow Trout (118.6), concerns with lack of adequate depth
Troika Reservoir	Hook and Line	12/9/2021	Long Term Monitoring	YP	-	-	YP - 8.6	YP 7.4 - 9.6	High catch rate (15.6/hour), aging structures collected from subsample (N=30), stomach contents evaluated - lack of FH MN concerning
Valley Reservoir	Fyke Net - 1	5/11/2021	Long Term Monitoring	NO FISH	-	-	-	-	Sampling results as well as low winter D.O. levels suggest fish no longer present, concerns with lack of adequate depth
Winter Harbor Pond	Fyke Net - 1	8/2/2021	Long Term Monitoring/ Fish Health Collection	BG, LMB, W SU	-	BG - 96/net LMB - 2/net W SU - 1/net	BG - 4.4 LMB - 5.1 W SU - 18.3	BG 1.6 - 6.1 LMB 3.9 - 6.2 W SU - 18.3	Anecdotal data suggest moderate-high abundance of adult (>14") Largemouth Bass, subsample of Bluegill aging structures (N=30) collected

Cory's Pond	Gillnet - 1 Mini Fyke - 1	5/3/2021	Fish Health Collection	W SU, YP	YP - 71/net	W SU - 1/net YP - 141/net	W SU - 9.0 YP - 6.5	W SU - 9.0 YP 4.8 - 8.8	Will serve as a donor pond for wild transfer of Yellow Perch from 2022-2026
Big Reservoir	Gillnet - 1 Fyke Net - 1	5/5/2021	Long Term Monitoring	FH MN, YP	-	FH MN - 500/net YP - 19/net	YP - 9.3	YP 8.7 - 11.1	Large forage base of Fathead Minnow and Gammarus spp., candidate for rehabilitation, wild transfer of 30 Black Crappie in 2021
Hose Reservoir	Did not sample	-	-	-	-	-	-	-	Stocked for first time in 2021, PALA agreement ensures public access to waterbody through 2030
Carpenter Creek Reservoir	Did not sample	-	-	-	-	-	-	-	Sampled in 2020, will serve as donor source for wild transfers of Yellow Perch through 2024

Appendix A. 2. Summary of all ponds and small reservoirs sampled in Daniels County in 2021.

				Species					
Waterbody	Sampling Effort	Date	Purpose	Captured	Gillnet CPUE	Fyke Net CPUE	Avg. TL (in)	Range TL (in)	Management Recommendations/Comments
Buer Pond	Gillnet - 1 Fyke Net - 1	6/22/2021	Long Term Monitoring	LMB, YP	LMB - 3/net YP - 35/net	YP - 7/net	LMB - 9.4 YP - 7.45	LMB 9.1 - 9.7 YP 2.9 - 9.1	Potential donor pond for wild transfer of Yellow Perch
Danelson Reservoir	Gillnet - 1 Mini Fyke - 1	6/22/2021	Long Term Monitoring	FH MN, RB	RB - 3/net	FH MN - 291/net	RB - 7.8	RB 6.8 - 9.3	Fish survival concerns, siltation/reduction in maximum depth likely contributing factor
Hatfield Reservoir	Gillnet - 1 Fyke Net - 1	7/26/2021	Long Term Monitoring	RB	RB - 3/net	-	RB - 15.1	RB 14.4 - 16.0	Fathead Minnows and inverts observed, Rainbow Trout in good condition
Killenbeck Reservoir	Gillnet - 1 Fyke Net - 1	6/22/2021	Long Term Monitoring	FH MN, YP	YP - 1/net	FH MN - 9,000/net	YP - 10.1	YP - 10.1	Good Rainbow Trout fishery previously, issues with siltation and potentially with water quality
Whitetail Reservoir	Gillnet - 1 Fyke Net - 1	7/26/2021	Long Term Monitoring	NP, YP	NP - 12/net YP - 7/net	NP - 2/net YP - 24/net	NP - 19.0 YP - 5.9	NP 5.2 - 28.8 YP 1.9 - 12.5	Seemingly adequate natural recruitment of both Northern Pike and Yellow Perch
Carney Reservoir	Did not sample	-	-	-	-	-	-	-	Unclear if FWP will manage in future

Appendix A. 3. Summary of all ponds and small reservoirs sampled in Sheridan County in 2021, with the exception of Boxelder Reservoir.

	Sampling			Species					
Waterbody	Effort	Date	Purpose	Captured	Gillnet CPUE	Fyke Net CPUE	Avg. TL (in)	Range TL (in)	Management Recommendations/Comments
Carlson Pond	Hook and Line	7/27/2021	Long Term Monitoring	NO FISH	-	-	-	-	Rainbow Trout observed surfacing, fish present just did not capture any
Christensen Dam	Hook and Line	7/27/2021	Long Term Monitoring	RB	-	-	RB - 12.7	RB 12.0 - 13.4	Moderate catch rates (1.5/hour)
Holtan Reservoir	Gillnet - 1 Mini Fyke - 1	7/26/2021	Long Term Monitoring	RB	RB - 1/net	-	RB - 13.8	RB - 13.8	Small Fathead Minnows observed, lack of Rainbow Trout captured a concern
Raymond Dam	Gillnet - 1 Mini Fyke - 1	5/4/2021	Long Term Monitoring/Fish Health Collection	BR SB	-	-	-	-	Fish kill in 2019, Bluegill fingerlings stocked August 2021
Wagner Reservoir	Did not sample	-	-	-	-	-	-	-	-

### Appendix A. 4. Summary of all ponds and small reservoirs sampled in Roosevelt County in 2021.

Waterbody	Sampling Effort	Species Date Purpose Capture		Species Captured	Gillnet CPUE	Fyke Net CPUE	Avg. TL (in) Range TL (in)		Management Recommendations/Comments	
Bainville East	Gillnet - 1 Fyke Net - 1	8/24/2021	Long Term Monitoring	NP, YP	NP - 7/net YP - 5/net	YP - 11/net	NP - 21.5 YP - 5.0	NP 19.9 - 23.6 YP 3.7 - 7.6	Concerns with littoral habitat availability	
Bainville West	Gillnet - 1 Fyke Net - 1	8/24/2021	Long Term Monitoring	CARP, FH MN, NP, YP	CARP - 2/net NP - 5/net	CARP - 1/net FH MN - 4/net YP - 27/net	CARP - 23.8 NP - 21.7 YP -2.9	CARP 20.8 - 28.1 NP 18.7 - 23.9 YP 1.9 - 6.4	Concerns with littoral habitat availability	
Hofman Reservoir	Gillnet - 1 Mini Fyke - 1	8/24/2021	Long Term Monitoring	BR SB, FH MN, LK CH, RB, W SU	RB - 1/net W SU - 11/net	BR SB - 1/net FH MN - 400/net LK CH - 14/net	RB - 8.8 W SU - 12.4	RB - 8.8 W SU 11.7 - 13.3	Good bait collection source, concerns with survival of stocked Rainbow Trout due to siltation/low water levels	
Knudsen Bros. Reservoir	Gillnet - 1 Mini Fyke - 1	8/24/2021	Long Term Monitoring	FH MN, RB	RB - 5/net	FH MN - 600/net	RB - 8.2	RB 6.0 - 9.3	Survival concerns with low water levels	
Big Muddy Reservoir	Did not sample	-	-	-	-	-	-	-	Low water (< 4') prevented sampling	
Crusch Reservoir	Did not sample	-	-	-	-	-	-	-	Low water (< 4') prevented sampling	
Ike's Fishing Pond	Did not sample	-	-	-	-	-	-	-	New waterbody - anecdotal data suggests catcl rates of Rainbow Trout remained high throughout summer and fall	

Sampling Species Effort Date Purpose Captured Gillnet CPUE Fyke Net CPUE Avg. TL (in) Range TL (in) Management Recommendations/Comments Waterbody Long Term Productive fishery, spring influence seems to Candee Gillnet - 1 8/23/2021 RB - 35/net RB RB - 12.2 RB - 14.4 Pond Fyke Net - 1 Monitoring maintain water levels Gillnet - 1 Receiving wild transfer of Yellow Perch and Kuester Long Term 8/24/2021 FH MN FH MN - 4,650/net \_ Fyke Net - 1 Monitoring Reservoir Walleye in 2022 Verschoot Did not -Low water (< 4') prevented sampling -----sample Reservoir No public access, unable to contact landowner, Salsbury Did not -------Reservoir sample no longer managing Miscommunication of previous stocking Johnson Did not location led to the correct Johnson Reservoir ---\_ sample Reservoir being stocked for the first time in 2021

Appendix A. 5. Summary of all ponds and small reservoirs sampled in Richland County in 2021.

Waterbody	Surface Acres Sampling Elevation (+/- Max Depth January D.O. level Aerator body (full pool) Date full pool) (ft) Secchi (ft) (mg/L; avg) Present		Comments						
Fort Peck Trout Pond	52.9	9/16/2021	0.0	24.7	4.0	11.5	Ν	Missouri River influence	
Glasgow Base Pond	7.8	5/5/2021	0.0	14.0	7.5	1.5	Ν	Spring influence	
VR 009 Reservoir	7.6	5/5/2021	0.0	13.0	9.0	-	Ν	Spring influence	
Home Run Pond	0.7	6/2/2021	-2.0	10.0	1.5	5.9	Ν	-	
Langen (Forsman) Reservoir	20.2	5/7/2021	-6.0	11.4	0.5	< 1.0	Ν	Water quality concerns - no longer managing	
McNab Reservoir	9.1	5/13/2021	-1.5	22.2	1.5	5.7	Y	Windmill installed August 2021	
O'Juel Reservoir	9.5	5/17/2021	0.0	14.7	9.5	-	Ν	Spring influence	
Paulo Reservoir	7.3	4/30/2021	-1.0	11.8	1.5	3.8	Y	Windmill installed August 2021	
Shoot Reservoir	7.3	4/30/2021	-2.0	11.0	2.5	< 1.0	Ν	7' low August 2021	
Troika Reservoir	3.9	12/9/2021	-5.0	13.9	1.5	9.1	Ν	-	
Valley Reservoir	5.7	5/11/2021	-3.0	11.0	6.5	< 1.0	Ν	Previous winterkill likely	
Winter Harbor Pond	1.3	8/2/2021	-2.0	8.0	8.0	5.4	Ν	Missouri River influence	
Cory's Pond	1.7	5/3/2021	0.0	11.1	6.0	-	N	Spring influence	
Big Reservoir	3.5	5/5/2021	-4.0	15.0	2.5	< 1.0	Ν	Winterkill concerns	
Carpenter Creek Reservoir	24.8	-	-	-	-	6.8	N	<u>-</u>	
Buer Pond	4.5	6/22/2021	0.0	13.7	9.5	-	N	Spring influence	
Danelson Reservoir	10.1	6/22/2021	-1.0	14.1	3.0	-	Ν	Water quality concerns	
Hatfield Reservoir	4.6	7/26/2021	-3.0	9.5	3.0	-	Ν	-	
Killenbeck Reservoir	36.9	6/22/2021	0.0	12.6	1.5	-	Ν	Water quality concerns	
Whitetail Resevoir	24.5	7/26/2021	-1.0	12.5	5.0	7.7	Ν	- · · · ·	
Carney Reservoir	27.3	-	-	-	-	-	Ν	-	
Boxelder Reservoir	77.9	6/3/2021	-2.0	18.0	9.0	3.3	Ν	Water quality concerns, significant algal blooms	
Carlson Pond	0.9	7/27/2021	-4.0	-	-	-	Y	-	
Christensen Dam	4.0	7/27/2021	-4.0	-	1.0	-	Y	-	
Holtan Reservoir	4.2	7/26/2021	-4.0	15.1	2.0	-	Ν	-	
Raymond Dam	21.1	5/4/2021	0.0	11.0	11.0	2.7	Ν	Phosphorus induced fish kill in summer 2020	
Wagner Reservoir	1.9	-	-	-	-	-	Ν	-	
Bainville East	5.6	8/24/2021	-4.0	11.2	2.5	2.0	Ν	-	
Bainville West	4.3	8/24/2021	-3.5	7.0	2.0	0.6	Ν	Winterkill concerns	
Hofman Reservoir	7.8	8/24/2021	-8.0	10.1	1.5	-	Ν	-	
Knudsen Bros. Reservoir	14.8	8/24/2021	-6.0	8.5	1.5	-	Ν	Winterkill concerns	
Big Muddy Reservoir	3.5	-	-	-	-	-	Ν	Water level concerns	
Crusch Reservoir	7.4	-	-	-	-	-	Ν	Water level concerns	
Ike's Fishing Pond	1.9	-	-	-	-	10.6	Ν	Well maintains water level/temperature	
Candee Pond	3.1	8/24/2021	-5.0	7.0	7.0	0.3	Ν	Spring influence	
Kuester Reservoir	66.4	8/24/2021	-6.0	18.6	1.8	-	Ν	-	

Appendix B. 1. Summary of limnological characteristics of ponds and reservoirs within region 6's eastern fisheries management district.

Verschoot Reservoir	2.9	8/24/2021	-5.0	3.5	0.0	-	Ν	Water level concerns
Johnson Reservoir	3.4	-	-	-	-	6.9	Ν	-

Appendix B. 2. Results of Montana Department of Agriculture's comprehensive water quality testing of samples submitted from three waterbodies in 2021. This evaluation tested for 100 of the most common agriculture chemicals and herbicides used in current Great Plains agricultural practices. Chemical levels at time of sampling (August) were deemed to be low enough (ppb) that fish populations were not negatively impacted in any of the three waterbodies. In the below table "ND" = not detected, and "trace" = detected at levels < 0.001 ppb.

Waterbody	2,4-D	Atrazine	Deethyl Atrazine	Hydroxy Atrazine	Imazethapyr	МСРА
Boxelder Reservoir	0.009	0.002	0.003	trace	ND	ND
Danelson Reservoir	0.019	0.003	0.003	ND	ND	0.010
Killenbeck Reservoir	0.230	0.006	0.007	ND	0.010	0.006

Appendix C. 1. Long-term gillnet trends of fish species captured in Boxelder Reservoir.



Appendix D. 1. Sample photographs taken during the Larb Creek survey flight.





Appendix E. 1. Self-creel station pictured near the Fort Peck Dredge Cuts (left) and reward hat offered to anglers for submission of a Paddlefish dentary sample (right).



