MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS
FISHERIES DIVISION

JOB PROGRESS REPORT

State of Montana

Project No. F-11-R-28 Name Northeast Montana Fisheries Study

Job No. I-a Title Inventory and Survey of Waters of the Project Area

Period Covered April 1, 1980 through March 31, 1981

ABSTRACT

Larval fish sampling was conducted in the Milk River, but evaluation of results was difficult due to abnormally low spring flows. Size data obtained from rainbow trout in Bear Paw Lake showed a significant increase in growth following rehab in 1979; however, large numbers of suckers were taken. Mark-and-recapture population estimates for trout were made in three sections of Beaver Creek. A lack of older, adult trout was found in some areas and a lack of Age 0+ fish in Section 02 will be investigated in detail in the future. Aquatic insect populations were sampled on four streams in the Bear Paw Mountains. Gill netting in Fort Peck Reservoir demonstrated an increase in walleye. A total of 71 seine hauls were made in Fort Peck Reservoir to evaluate young-of-the-year and forage fish abundance. The catch for young walleye and northern pike in 1980 was extremely poor. Gill netting conducted at 10 sites in the dredge cut/tailwater area below Fort Peck Dam showed a significant increase in walleye and sauger which was apparently due to the migration of rainbow smelt into the area. Box Elder Reservoir was sampled with frame traps. Eight trap-days produced a catch of 15,069 yellow perch, 194 white suckers and 4 northern pike. Gill netting conducted at Flat Lake showed good survival and excellent growth of walleye. Gill netting was conducted at Beaver Creek Reservoir to evaluate rainbow trout abundance and growth. Trout taken were in poor condition and have exhibited a significant decrease in size since 1974. Seining in this reservoir revealed a good population of forage fish for predator fish. Gill netting or seining was conducted at North Faber, Salmo, Ross, Lyons, Cowboy, Davey (bass), and BR 12 Reservoirs to evaluate the status of fish populations. Five bass reservoirs in south Phillips County were seined to determine winterkill and overall status. Seining was conducted in Battle Creek to evaluate brook trout and smallmouth bass introductions. Miscellaneous survey work of varying intensity was conducted on 56 reservoirs and 4 streams.

RECOMMENDATIONS

Recommendations for each phase of this job are made as the findings for individual waters are discussed.

OBJECTIVES

The purpose of this project is to determine the physical, chemical, and biological characteristics of the waters of immediate or potential importance to the recreational fishery of the project area, and to recommend measures for improving the fishery.

Job objectives were:

(1) To determine reproductive success of walleye, yellow perch, and forage fishes in Nelson Reservoir.

(2) To determine larval fish abundance in the Milk River and tributaries to identify spawning sites.

(3) To determine growth rates of rainbow trout in Bear Paw Lake to evaluate drainage and rehab in 1979.

(4) To determine rainbow, brook, and brown trout populations in streams originating in the Bear Paw Mountains and acquire information on benthos abundance in these streams.

(5) To determine information on distribution and reproduction of fishes in Fort Peck Reservoir with emphasis on walleye and northern pike.

(6) To determine fish populations in numerous small and intermediate size reservoirs to evaluate winterkill, species combinations, and stocking needs.

(7) To survey new reservoirs and lakes to determine their suitability for stocking.

FINDINGS

Nelson Reservoir

This 4,000-surface acre reservoir near Malta is utilized as off-stream storage for irrigation water. Reservoir levels are maintained by diverting water from the Milk River. The reservoir contains an excellent fishery for walleye, northern pike, and yellow perch.

Shoreline seining is conducted annually to determine reproductive success of various species and evaluate factors that contribute to the fish

population. In 1980 seining could not be conducted due to closure of the reservoir to all use as a result of toxins associated with high concentrations of blue-green algae. The reservoir was closed by health officials from July 23 to August 20. The closure occurred one day before beach seining was scheduled to commence. Sampling was not conducted after the closure ended since previous data has revealed a substantial decline in the catch of young-of-the-year walleye by mid-August.

Milk River Larval Fish

During the spring of 1980, larval fish sampling was conducted in the Milk River system to determine areas utilized for reproduction by various species. Sampling was conducted with 0.5-meter nets of #00 mesh. Sampling was distributed from the mouth upstream 452.8 miles to the Goldstone Bridge as summarized in Table 1.

Due to abnormally low spring flows, it is difficult to evaluate the sampling results. Spawning success and larval fish abundance may have been reduced by low flows; however, sampling included a much higher percent of the flow volume and therefore may have inflated catch values.

No larval fish of any species were collected at the Goldstone Bridge above Fresno Reservoir indicating low spawning use and recruitment from this upper river area. Sampling at Fresno Dam (river mile 437.3) was done in the discharge water from Fresno Reservoir. The larval walleye catch at this site indicates that reproduction from the reservoir provides a significant contribution to the downstream fishery.

Discussion and Recommendations: Several large irrigation diversions are located on the Milk River. As a result of low river flows, irrigation ditches were diverting a high percent of the flow. At Vandalia Dam the flow being diverted into Vandalia Canal was greater than the flow in the river. Larval fish sampling in several of these diversion canals revealed a high loss of larval fish as illustrated in Table 1. Future larval fish sampling is recommended to identify key reproduction areas and evaluate the effect of various spring flow levels. Major tributaries to the Milk River should be sampled. These streams were not sampled in 1980 due to low flows. Information on larval fish production in the Milk River will contribute to investigations on the Missouri River being conducted under Federal Aid Project FW-2-R.

Bear Paw Lake

This 47-surface acre reservoir is located on Beaver Creek in the Bear Paw Mountains south of Havre. Due to poor trout growth and an over-abundance of suckers, the reservoir was drained and treated with rotenone in August, 1979. A total kill was accomplished. During drawdown two 125-foot experimental gill nets were fished for 7 hours to gather size data on rainbow trout. The catch consisted of 27 rainbow trout, 179 white suckers

Table 1. A summary of larval fish taken per 1,000 m^3 in the Milk River system, 1980.

Station	River Mile	Date	Vol. Sampled (m^3)	*Stizostedion sp.*	*Perca flavescens*	*Esox lucius*	*Aplodinotus grunniens*	*Cyprinus carpio*	*Catostomus commersoni*	*Moxostoma macrolepidotum*	*Carpoides carpio*	*Ictiobus sp.*	Unidentified
Near Mouth	0.5	5/9	484	--	---	-	---	---	---	--	--	-	--
		5/19	640	--	---	-	---	---	---	--	--	-	--
		6/2	384	--	---	-	18	---	---	--	--	-	--
		6/12	384	--	---	-	114	---	---	--	--	-	--
		6/27	384	--	---	-	127	---	5	--	--	8	--
Vandalia Canal	117.3	5/22	258	--	198	-	---	---	---	--	62	-	--
		6/3	398	--	8	-	173	75	---	--	--	-	--
Bjornberg Bridge	151.8	5/8	269	--	---	-	---	---	---	--	--	-	--
		5/15	269	2	---	-	---	---	---	--	--	-	--
		5/21	215	--	---	-	---	---	---	--	--	-	--
		5/30	323	--	---	-	---	---	---	31	--	-	3
Cree Crossing	176.2	5/15	377	3	---	-	---	---	---	--	--	-	--
		5/21	377	--	---	-	---	---	---	--	--	-	--
		5/30	334	--	---	-	9	---	---	--	15	-	--
Nelson Res. Outlet Canal		5/15	189	--	63	-	---	---	---	--	--	-	--
		5/21	189	5	32	5	---	---	122	--	--	-	--
		5/30	237	--	29	-	---	---	---	--	--	-	--
Dodson Canal North	274.3	5/21	323	--	---	1	---	19	---	--	--	-	--
		5/29	750	--	1	-	---	153	---	--	--	-	--
		6/3	188	--	---	-	---	---	---	--	85	-	--
Dodson Dam	274.3	5/21	121	--	---	-	---	---	---	--	--	-	--
		5/29	48	--	---	-	---	21	---	--	--	-	--
		6/3	260	--	---	-	---	4	---	--	4	-	15
Dodson Canal South	274.4	5/21	108	--	---	-	---	---	---	--	--	-	--
		5/29	97	--	---	-	---	82	---	--	--	-	--
		6/3	97	--	---	-	---	---	---	--	21	-	--
Ft. Belknap Agency Dam	333.2	5/29	161	--	---	-	---	---	---	--	--	-	--
		6/3	305	--	---	-	---	10	---	--	--	-	--
Ft. Belknap Agency Canal	333.3	5/29	161	19	6	-	---	---	---	--	--	-	--
		6/3	129	--	---	-	---	8	---	--	--	-	--
Paradise Dam	374.5	5/5	261	--	---	-	---	---	---	--	--	-	--
		5/14	161	--	---	-	---	---	---	--	--	-	--
		5/20	172	--	---	-	---	---	---	--	--	-	--
		5/29	172	--	---	-	---	---	---	--	--	-	--
		6/3	124	--	---	-	---	---	---	--	--	-	--
Paradise Canal	374.8	5/5	242	--	---	-	---	---	---	--	--	-	--
		5/14	249	8	---	-	---	---	---	--	--	-	--
		5/20	215	--	---	-	---	---	---	--	--	-	--
		5/29	135	--	---	-	---	---	---	--	--	-	--
		6/3	172	6	---	-	---	---	---	--	--	-	--
Chinook	378.7	5/9	161	6	12	-	---	---	---	--	--	-	--
Ft. Belknap Canal	393.5	5/6	363	--	---	-	---	---	---	--	--	-	--
		5/14	318	--	---	-	---	---	---	--	--	-	--
		5/20	244	--	---	-	---	---	8	--	--	-	--
		5/28	397	3	---	-	---	---	---	--	--	-	--
		6/2	247	--	4	-	---	---	---	--	--	-	--
Ft. Belknap Diversion Dam	393.5	5/6	204	--	---	-	---	---	---	--	--	-	--
		5/14	108	37	---	-	---	---	---	--	--	-	--
		5/20	145	--	---	-	---	---	---	--	7	-	--
		5/28	113	--	---	-	---	---	---	--	--	-	--
		6/2	151	--	---	-	---	---	---	--	--	-	--
Havre	418.0	5/20	151	--	---	-	---	---	---	--	--	-	--
Fresno Dam	437.3	5/23	301	7	---	-	---	---	---	--	--	-	--
		5/28	269	4	---	-	---	---	---	--	--	-	--
		6/2	95	21	11	-	---	---	---	--	--	-	--
Goldstone Bridge	452.8	5/20	344	--	---	-	---	---	---	--	--	-	--
		5/23	215	--	---	-	---	---	---	--	--	-	--
		5/28	226	--	---	-	---	---	---	--	--	-	--
		6/2	237	--	---	-	---	---	---	--	--	-	--
		7/21	68	--	---	-	---	---	---	--	--	-	--

and 2 brook trout. The trout were in poor condition and averaged only 9.8 (range 8.3-11.4) inches in total length and 0.34 (range 0.19-0.50) pounds. Immediately prior to restocking in 1980 a random sample of 222 rainbow trout were weighed and measured at the hatchery to use as a basis for growth rate evaluation. These fish averaged 8.4 inches and 0.25 pounds.

Three 125-foot experimental gill nets fished for 17 hours in October, 1980 produced 6 rainbow trout, 209 white suckers and 3 brook trout.

Discussion and Recommendations: The evaluation of trout growth was hampered by the small sample size obtained in the fall of 1980. Examination for fin erosion revealed that four of the six rainbows netted were probably wild fish. These four fish averaged 10.1 inches and 0.45 pounds while the hatchery fish averaged 13.7 inches and 1.05 pounds. In September and October of 1980, fish observed in fishermen's creels were all in excess of one pound with several approaching two pounds. A one-day creel census in January yielded four brook trout averaging 13.4 inches and one rainbow trout 15.7 inches and 1.45 pounds, and a creel check in April, 1981 revealed rainbows averaging approximately 1.5 pounds. Indications are that the growth of trout in the reservoir has been good to excellent.

Due to drought conditions in the area, Beaver and Sucker Creeks, which drain into Bear Paw Lake, had little or no flow for portions of the summer. Migrations of fish to the lake downstream probably accounts for the rapid increase of suckers and the number of wild rainbow and brook trout found in the nets and creel.

Monitoring of trout and suckers in Bear Paw Lake should be continued to determine the relationship between sucker abundance and trout growth.

Streams in the Bear Paw Mountains

Stream Fish Populations: Beaver Creek originates in the Bear Paw Mountains and drains into the Milk River near Havre. The stream flows through a heavily used recreation area and receives considerable fishing pressure. The stream is readily divided into three distinct reaches. The lowermost reach, which includes electrofishing section 01, begins at the Havre Irrigation Company diversion and proceeds upstream approximately 9 miles to Beaver Creek Dam. The mid reach, which includes electrofishing section 02, consists of approximately 7 miles of stream between Beaver Creek Reservoir and Bear Paw Lake. The uppermost reach, which includes electrofishing section 03, proceeds from Bear Paw Lake to the Rocky Boy Indian Reservation, a distance of 6.5 miles, and thence to its headwaters. Streamflows are relatively stable in the lowermost reach due to releases from Beaver Creek Reservoir. Streamflows in the mid reach are generally below optimum for most of the year but can be supplemented to some extent by releases from Bear Paw Lake. Historically, late summer flows in the uppermost reach are less than one cubic foot per second, but the drought conditions in 1980 left much of the streambed dry for several weeks.

Table 2. Population estimates for trout and suckers in three distinct reaches of Beaver Creek, 1980.

Species	Age	Number	Mean Length (inches)	Mean Weight (pounds)	Number/ 1,000 Feet	Pounds/ 1,000 Feet
Section 01 - 815 Feet						
Rainbow trout	0	61[1]	3.1	0.02	74	1.48
Rainbow trout	I+ older	62	8.6	0.26	76	19.90
	Totals:	123(±42)	5.9	0.14	150	21.38
Suckers[2]	I+ older	635(±164)	7.4	0.21	779	163.40
Section 02 - 770 Feet						
Rainbow trout	0	21	3.2	0.02	27	0.55
Rainbow trout	I	25	5.8	0.07	32	2.20
Rainbow trout	II+ older	14	8.2	0.19	19	3.53
	Totals:	60(±9)	5.5	0.08	78	6.28
Suckers[2]	I+ older	73(±10)	7.9	0.22	94	20.70
Section 03 - 470 Feet						
Brook trout	I	84	4.5	0.04	179	7.16
Brook trout	II	62	6.6	0.13	132	17.16
Brook trout	III+ older	19	10.0	0.49	40	19.60
	Totals:	165(±20)	5.9	0.13	351	43.92
Rainbow trout	I+ older	22(±11)[1]	7.2	0.18	47	29.40
White sucker	I+ older	83(±26)	7.5	0.18	177	31.70

1. Unreliable estimate.
2. Includes white, longnose and mountain suckers.

Beaver dams are plentiful throughout all reaches and provide refuge in dry years for trout and suckers. The dams also trap much sediment, creating conditions more suitable for suckers. Riffles in the upper and lower reaches appear to be relatively clean and suitable for spawning. Gravels in the mid reach exhibit an armored, cemented condition not conducive to trout reproduction.

Electrofishing sections were established in each of the respective reaches for fish population comparisons. Population estimates were made using mark and recapture methods similar to those described by Vincent (1971). Calculations were made using Chapman's modification of the Petersen formula. Age groups were separated by length frequency whenever possible. Confidence intervals were calculated at the 80 percent level.

Population estimates were made in August for sections 01 and 02. An estimate for section 03 was made in June in anticipation of low flows later in the summer and to minimize problems associated with brook trout spawning movement in the fall. Due to the early estimate in section 03, young-of-the-year brook and rainbow trout were not large enough to capture. Electrofishing results and biomass comparisons are shown in Tables 2 and 3.

Table 3. Biomass comparisons of trout and suckers per 1,000 feet of stream in three distinct reaches of Beaver Creek, 1980.

	Biomass (lbs.)		Total Biomass (lbs.)	Biomass (lbs.)	
	Trout	Suckers	Trout & Suckers	% Trout	% Suckers
Section 01	21.38	163.40	184.78	11.6	88.4
Section 02	6.28	20.70	26.78	23.3	76.7
Section 03	73.32	31.70	105.02	69.8	30.2

Discussion and Recommendations: Although one year of population data is insufficient to draw qualified conclusions, it is evident from the year-class structure in section 02 that the population will suffer in the future from the lack of Age 0 fish. In comparison to sections 01 and 03, section 02 is also significantly lacking in numbers of Age I and older fish and the average size of these fish is smaller. Biomass comparisons show that section 02 has only 29 percent of the trout biomass found in section 01 and only 9 percent of the biomass in section 03.

It is believed that Bear Paw Lake captures much of the spring runoff necessary for the flushing and maintenance of the stream channel in section 02. Further study of this reach is necessary to define the limiting factors. Optimum streamflows need to be determined and this information correlated with a program for additional releases of water from Bear Paw Lake at critical times of the year. Improved streamflows could create better spawning and nursery habitat by increasing the wetted perimeter and cleaning the gravels of silt. Increasing flows at critical times of the year would allow available bank cover to be utilized by adult trout for longer periods of time.

Monitoring of these fish populations should continue in order to establish a data base for future management recommendations. Because this area receives heavy fishing pressure, a stream closure and/or creel census would help to evaluate summer mortality due to fishermen.

Due to low flows related to drought conditions, other streams in the Bear Paw Mountains were not sampled; however, fish population data should be obtained in the future.

Aquatic Insect Survey: Riffle invertebrate samples were collected at seven stations on four streams originating in the Bear Paw Mountains. Samples were collected with the "Water's Round" square foot sampler (Waters and Knapp, 1961). Two one-square-foot samples were taken at each station in April and July, 1980. Aquatic insects were sorted into taxonomic groups and no attempt was made to identify organisms below the family level. After sorting and enumeration, the insects were totally desiccated and weighed to the nearest one thousandth of a gram on a Mettler electronic balance. Results of the sampling are shown in Table 4.

Large variations in numbers and diversity are evident not only between streams but also on different sampling dates at the same site. With the exception of the lower reach Beaver Creek station, all sampling stations showed a marked decrease in bottom organisms at the later sampling date. Because the lower reach Beaver Creek station is the only reach that has higher streamflows in July than April due to irrigation water release, it was hypothesized that streamflows are at least partially responsible for the variations. Figure 1 shows the relationships between average streamflow encountered 30 days prior to the sampling dates and the biomass (dry weight) or organisms collected on those dates in Beaver Creek. Flow records were only available for the Beaver Creek drainage. Insufficient flow measurements on the upper reach Beaver Creek station warranted an estimate of observed flows prior to the July sampling date.

Fort Peck Reservoir

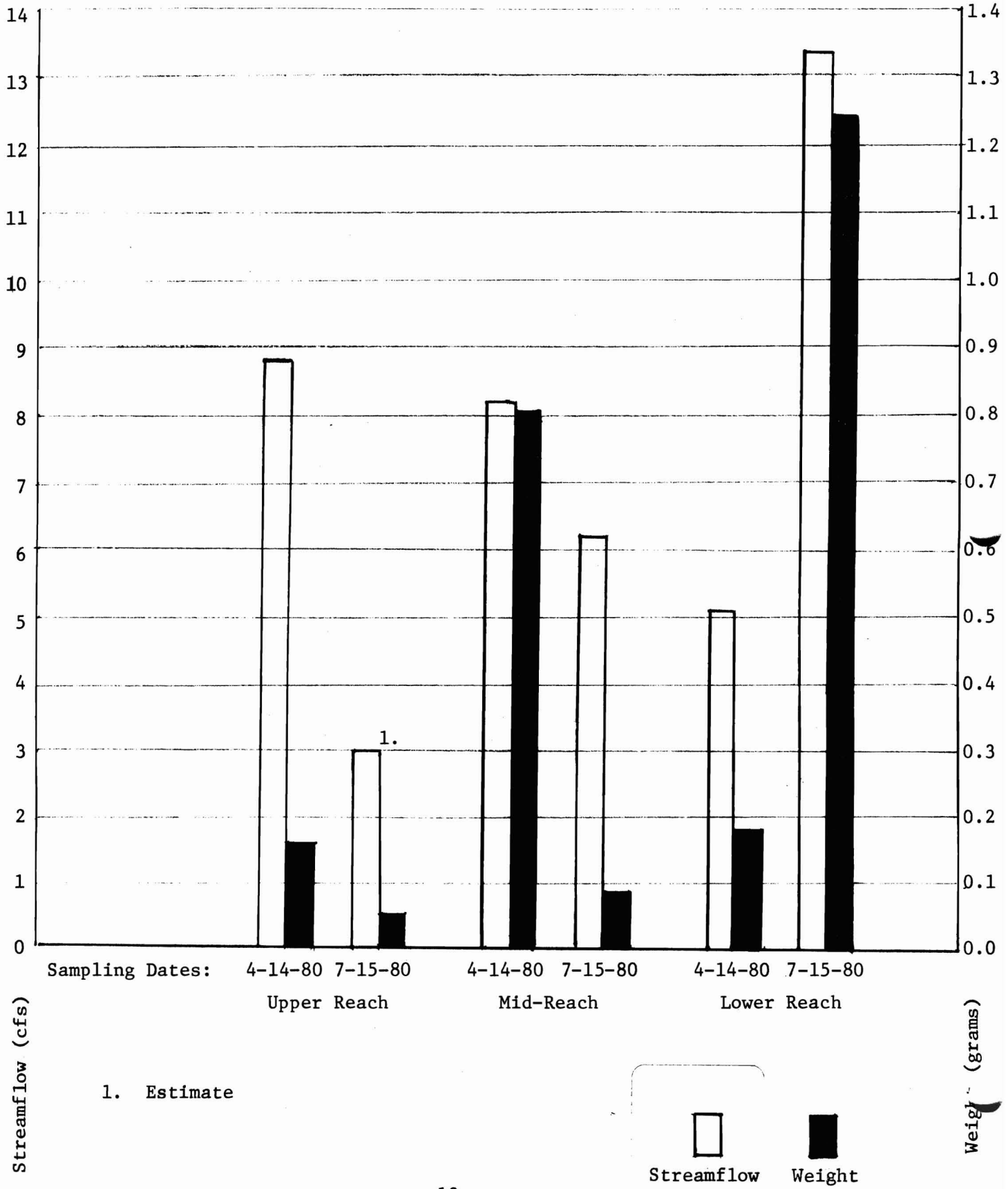
Several areas of the reservoir were sampled with 125-foot experimental gill nets in 1979 and 1980 to determine the abundance and distribution of sport fishes. A total of 26 gill net sets were made at nine sites consisting of Hell Creek, Seven Blackfoot, Timber Creek, Pines, Bear Creek, Snow Creek, South Fork Duck Creek, and three locations in the upper portion of the Big Dry Arm.

Table 4. Average number and weight (grams in parentheses) of aquatic insects collected per one square foot of stream bottom (riffle) for stations in streams originating in the Bear Paw Mountains, 1980.

Station	Date	Ephemeroptera	Plecoptera	Trichoptera	Coleptera (Elmidae)	Lepidoptera	DIPTERA					Totals
							Chironomidae	Tipulidae	Tabanidae	Simulidae	Other	
Beaver Creek lower reach 300 yds. below dam	4/14	9(.008)	2(.004)	47(.320)			29(.029)					87(.361)
	7/15	14(.020)	24(.038)	109(.824)			93(.099)	4(.259)	1(.014)	2(.003)	7(.011)	244(1.268)
Beaver Creek mid-reach at Weir	4/14	29(.030)	32(.055)	128(.587)	9(.003)	2(.004)	22(.018)	2(.112)				224(.809)
	7/15			14(.042)	3(.001)		1(Trace)	1(.046)				19(.089)
Beaver Creek upper reach at Boy Scout Camp	4/14	1(.001)	4(.095)	3(.012)	1(Trace)		2(.005)	3(.035)				14(.148)
	7/15		1(.012)	1(.001)				2(.032)				4(.045)
Sucker Creek 1.5 miles above Bear Paw Lake	4/14	38(.047)	12(.014)	65(.194)			1(Trace)	1(.062)	1(.003)		1(.005)	119(.320)
	7/15[1]											
Clear Creek near Ada School	4/14	1(.002)	1(.004)	72(.413)	1(.001)		2(.001)	6(.095)			2(.005)	85(.516)
	7/15	2(.002)	2(.001)	29(.050)	2(.001)			2(.020)				37(.074)
Little Box Elder Cr. at Highway #2	4/14			48(.095)			4(.001)	1(.003)	1(.004)	1(Trace)		55(.103)
	7/15[1]											
Little Box Elder Cr. near Faber School	4/14[2]											
	7/15		3(.027)	2(Trace)	2(Trace)		1(Trace)					8(.027)

1. Insufficient flow.
2. Unable to sample due to high water.

Figure 1. A comparison of three reaches of Beaver Creek showing relationships between mean stream flows over a 30-day period prior to sampling dates and total (dessicated) weight of aquatic insects collected per one square foot of stream bottom.



1. Estimate

A summary of the catch is presented in Table 5 along with earlier netting efforts as reported by Phenicie (1950), Alvord (1953 and 1957), Posewitz (1965 and 1967). Most notable in the 1979 and 1980 data is the catch of 31 walleye, a species not previously taken by extensive sampling. Walleye were first stocked in 1951 when nearly 1 million were introduced. Additional walleye stocking did not occur until 1977. In the spring of 1970 good catches of adult walleye were made by trapnets in the upper portion of the Big Dry Arm. Walleye abundance has been greatest in the Big Dry Arm; however, their distribution in the reservoir is increasing. Walleye were taken in all areas gill-netted in 1979 and 1980.

Beach seining was conducted with a 100-foot x 9-foot seine with 1/4-inch square mesh to evaluate young-of-the-year and forage fish abundance. Sampling consisted of 71 seine hauls at eight locations as summarized in Table 6.

The catch for young-of-the-year walleye and northern pike was extremely poor. The lack of northern pike may have been due to low reservoir levels in the spring which did not rise to flood shoreline vegetation. Reservoir water levels associated with walleye reproduction are not understood. However, in 1979 good reproduction occurred which was believed to be partially attributable to high spring flows from tributaries in the Big Dry Arm. Due to a lack of snow and drought conditions in 1980, flows from these tributaries were nil.

A wide variety of forage species were taken, but only yellow perch appeared in significant numbers. Yellow perch are widely distributed in Fort Peck Reservoir and are probably the most important forage species.

Discussion and Recommendations: Most of the gill-netting conducted to date has been in the lower reservoir. Although much of this netting represents a general duplication of areas, this type of sampling permits only limited conclusions about the fish population. The lack of northern pike taken prior to 1964 and the lack of walleye prior to 1979 are significant but should not be interpreted to represent absolute periods of population increase.

Beach seining should be continued to monitor reproduction success of sport and forage fishes. More information on water levels and areas utilized for walleye reproduction is needed. In 1979 young-of-the-year walleye were taken in Big Dry Creek. Spawning use by various species and associated flows in this stream and the Mussellshell River should be evaluated.

Fort Peck Dredge Cuts/Tailwater

Gill-netting was initiated in this combination of lake/river habitat below Fort Peck Dam in 1979 to determine the overall fish population. The Corps of Engineers have proposed to construct an additional 185-megawatt hydropower unit at Fort Peck Dam and build a reregulating dam approximately

Table 5. A summary of gill net sampling in Fort Peck Reservoir.

Species	1949 (27 Nets) Phenicie	1953 & 1956 (20 Nets) Alvord	1964 & 1965 (58 Nets) Posewitz	1979 & 1980 (26 Nets)
Yellow perch	1,169	145	932	235
Goldeye	1,108	854	1,343	854
Sauger	113	163	299	158
Sucker sp.	70	13		
White sucker			64	8
Shovelnose sturgeon	24	10	5	1
Burbot	19	2	1	
Carp	17	50	130	21
Channel catfish	7	12	40	41
Rainbow trout	9	6		
Kokanee		5		
Brown trout	1	1		
Buffalo sp.	1	16		
Smallmouth buffalo			84	4
Bigmouth buffalo			1	
Black bullhead	1			
Crappie sp.		1		
Black crappie	1		27	1
White crappie			31	3
Freshwater drum	1	7	31	3
River carpsucker		2	28	11
Flathead chub	4	1		
Shorthead redhorse		8	89	13
Paddlefish		1		1
Northern pike			62	49
Walleye				31
Totals:	2,545	1,297	3,167	1,434

Table 6. A summary of young-of-the-year and forage fishes taken by seining in Fort Peck Reservoir, 1980.

Species	Sampling Locations (No. of Hauls in Parentheses)							
	Hell Creek (8)	Spillway (12)	Marina-Shanks (15)	Upper Big Dry (9)	Nelson Big Dry (8)	Lonetree Big Dry (6)	McGuire Big Dry (6)	Lost Big Dry (7)
Walleye (y-y)		1	1		1			
Walleye (Juv)			1					
Northern pike (y-y)		1	1	1				
Northern pike (Juv)		4	1					
Sauger (y-y)			3					
Yellow perch (y-y)	5,657	1,035	1,009	34	360	103	582	592
Crappie sp. (y-y)	376	137	160			2		1
Freshwater drum (y-y)	12	3	2	32	18	26	1	2
White sucker (y-y)	3	111	46					
Emerald shiner	81	10	89	9	9		4	9
Fathead minnow	3							
Sand shiner	1							
Longnose dace	1				2			
Carp (y-y)		5	5	1		1	2	1
Lake chub		1		9	5	1	2	3
Buffalo sp. (y-y)		17	2					
Goldeye (y-y)			5					3
Sil./Pl. minnow				3	2			
Channel catfish (y-y)				3				
Shorthead redhorse (y-y)					3			
Brassy minnow					1			
No. redbelly dace					1			
Unident. minnows[1]	86	11		21	21	1	6	12

1. Juvenile minnows that were difficult to field sort and identify.

8 miles downstream. If constructed, this project would create a barrier to fish movement and a portion of the existing dredge cuts/tailwater would be subject to daily water level fluctuations of 10 to 14 feet.

In the summer of 1980, gill net sampling was again conducted at 10 stations utilized in 1979 as summarized in Table 7. One of the most outstanding results of this sampling was the collection of 29 rainbow smelt, a species never previously found in this area. Netting in 1980 revealed a significant increase in sauger and walleye at netting sites in the lower (Nelson) dredge cut. The catch of shovelnose sturgeon decreased considerably in 1980, and little is known regarding the movement and distribution of this species in the area.

Discussion and Recommendations: The high increase in the catch of sauger and walleye is believed to be associated with the presence of smelt, which appeared to constitute a large percent of the diet as indicated by stomach sample analysis. However, a similar increase in northern pike would have also been expected but this did not occur. The capture of tagged fish during netting and subsequent tag returns by anglers revealed that many fish tagged at the mouth of the Milk River approximately 5 miles downstream migrated upstream to the dredge cut as a result of predation on smelt.

A concern exists regarding the impacts smelt may have on the fish population in Fort Peck Reservoir. Although an increase in forage fish abundance would improve growth rates for many species, apprehension exists regarding predation dense numbers of smelt could have on reproduction of lake trout, paddlefish, and walleye. The fish population in Garrison Reservoir (Lake Sakakawea), North Dakota, where smelt were introduced, is similar to Fort Peck Reservoir and information on long range impacts will be maintained. In an effort to prevent premature introductions of smelt into Fort Peck Reservoir, regulations were passed making it illegal to use live smelt for bait anywhere in the state, effective May 1, 1981.

Box Elder Reservoir

This 90-surface acre reservoir has provided excellent fishing for rainbow trout since 1964. However, illegal introductions of yellow perch, which resulted in an increase of this species, contributed to reduced growth rates of trout. Attempts to eradicate the fish population were considered in 1978, but were not achieved due to rising toxicant costs and legal problems associated with water withdrawal from the reservoir.

Gill-netting and spring trapping has been conducted in 1978, 1979, and 1980 to acquire information on the status of the fish population which could be used to evaluate various management options. In the spring of 1980, four trap nets were fished on April 15 and 16 (8 trap-days) as summarized in Table 8. The increased catch of yellow perch in 1980 was due to earlier trapping which corresponded with spawning activity.

Table 7. A summary of ten experimental gill net sets in the Fort Peck dredge cut/tailwater area, 1979 and 1980.

Species	1979 No.	1979 Av. Lgth. (in.)	1979 Av. Wt. (lbs.)	1980 No.	1980 Av. Lgth. (in.)	1980 Av. Wt. (lbs.)
Sauger	7	15.3	0.96	67	14.7	1.03
Walleye	8	16.4	1.48	27	16.8	1.80
Shovelnose sturgeon	137	25.1	1.94	66	25.4	2.15
Rainbow smelt	---	---	---	29	6.9	0.08
White sucker	5	13.6	1.78	7	14.6	1.57
River carpsucker	32	15.2	1.62	23	15.6	1.75
Shorthead redhorse	---	---	---	6	15.0	1.45
Goldeye	150	12.4	0.55	255	12.5	0.55
Carp	9	17.3	2.41	9	17.6	2.66
Longnose sucker	---	---	---	7	13.3	1.43
Channel catfish	13	17.8	1.77	5	20.6	2.68
Blue sucker	5	23.2	4.05	1	23.8	4.46
Northern pike	3	26.8	4.33	1	28.5	6.90
Smallmouth buffalo	1	27.5	12.20	---	---	---

Table 8. A summary of total catch from trap nets fished in Box Elder Reservoir, 1979 and 1980.

Species	1979 (21 Trap-days)	1980 (8 Trap-days)
Yellow perch	8,224	15,069
White sucker	1,194	194
Black crappie	145	---
Rainbow trout	19	---
Northern pike	2	4
Iowa darter	1	---

Discussion and Recommendations: Many of the perch taken were of acceptable size to satisfy fishermen, and although not taken by sampling, black crappie of acceptable size also contribute to the sport fishery. All fish taken by trapping were removed to help promote improved growth rates of all species comprising the fishery. Anglers report fair growth of stocked trout and immediate plans for management will include continued stocking of rainbow trout; however, stocking rates will be approximately one-third of the traditional number planted. Continued sampling should be conducted to evaluate growth and relative abundance of all species in the sport fishery.

Flat Lake

This 10-surface acre reservoir was created in 1973 by impounding a small bay at Fort Peck Reservoir. Management has consisted of annual rainbow trout stocking. However, by 1977 illegal use of live minnows by anglers resulted in establishment of undesirable species. In 1978 and 1979, spring sampling with trap nets was conducted to evaluate the fish population. Carp, suckers, and yellow perch taken by trapping were removed to improve growth of rainbow trout, yellow perch, and crappie.

In the spring of 1979, 3,000 walleye fingerlings (1½-inch) were stocked to supplement the sport fishery and control rough fish. One 125-foot experimental gill net was set overnight in late August of 1980 to determine the

survival and growth of stocked walleye. The catch consisted of 12 walleye, 4 black crappie, 5 carp, and 2 white suckers. Walleye taken averaged 13.2 inches in total length (range 10.8-14.3 inches) and 0.87 pounds (range 0.41-1.06 pounds).

Discussion and Recommendations: Rainbow trout stocking consists of 7- to 9-inch fish. The growth of stocked trout is nil; however, continued stocking is recommended since they comprise a major segment of the sport fishery. The reservoir was opened to the use of live minnows for bait in May, 1980 to facilitate angling for yellow perch, crappie, and walleye; however, significant catches of these species have not materialized. Although excellent growth of walleye has produced acceptable size for anglers, walleye have not contributed to the sport fishery. Yellow perch was expected to dominate the gill-net catch but none were taken. Trapping in the spring indicated a sharp decline in yellow perch numbers.

Beaver Creek Reservoir

This impoundment was constructed on Beaver Creek south of Havre in 1973 and filling occurred in 1974. The reservoir was authorized for flood control, irrigation and fish and wildlife under Public Law 566. The fish and wildlife pool consists of 117 surface acres while the flood water pool contains 204 surface acres.

Initial stocking with rainbow trout produced excellent fishing, however by 1976 growth rates and fisherman success had declined. Decreasing the stocking rates in 1978 and 1980 had little effect on growth rates.

Population sampling was conducted with three 125-foot experimental gill nets in the fall of 1980. The nets were placed to duplicate the netting performed in 1974 and 1977. Results of this sampling are shown in Table 9. The catch of trout and suckers decreased from 1977 and resembles the 1974 netting results. The average length and weight of trout has not changed significantly from 1977, however, a significant decrease in average weight since 1974 is apparent which supports observations of poor growth rates and condition factors.

Table 9. A summary of fish taken by three experimental gill nets in Beaver Creek Reservoir, 1974, 1977 and 1980.

	Rainbow Trout			White Sucker	Longnose Sucker
Year	No.	Mean Length (in.)	Mean Weight (lbs.)	No.	No.
1974	72	10.7	0.60	247	22
1977	105	10.1	0.39	340	7
1980	70	10.1	0.35	246	4

In July, 1980 beach seining was conducted at five stations with a 100-foot x 9-foot x 1/4-inch bar mesh seine to evaluate forage fish abundance. The catch consisted of 650 white suckers, 41 fathead minnows, 26 lake chub, 14 longnose dace, 3 brassy minnow, 3 silver/plains minnow, and 1 longnose sucker.

Discussion and Recommendations: Competition from suckers is believed to be responsible for poor growth of rainbow trout. No practical means of reducing suckers in this reservoir is known. The introduction of a predator species such as walleye, bass or crappie should be considered to utilize the abundant forage fish base and decrease sucker competition with trout. Continued sampling of forage fishes should be considered.

The white suckers were found to be heavily infested with the tapeworm Ligula intestinalis. All fish were opened to determine the extent of the infestation. Only white suckers were parasitized and 56 percent were found to have at least one tapeworm. Some fish were filled to bursting with the worms.

Ester Reservoir

This relatively shallow reservoir of approximately 90 surface acres is utilized for off-stream storage of irrigation water along Big Warm Spring Creek southwest of Malta. Walleye and northern pike have been stocked periodically to maintain a sport fishery, however, the relatively sparse game fish population does not attract large numbers of anglers.

In May of 1980, two 125-foot x 6-foot experimental gill nets were fished for 31 hours to assess survival and growth of walleye and northern pike stocked in 1977. Results of this netting are shown in Table 10.

Table 10. A summary of fish taken in two experimental gill nets in Ester Reservoir, May 1980.

Species	Number	Avg. Length (in.)	Avg. Weight (lbs.)
Northern Pike	19	17.8	1.74
Walleye	1	14.3	0.96
Yellow Perch	20	9.6	0.42
Black crappie	3	4.8	0.05

Discussion and Recommendations: The establishment of viable populations of northern pike and walleye was anticipated to suppress the yellow perch population and increase the average size of this forage fish. Predation by walleye and northern pike has apparently been successful in increasing the average size of perch. In September of 1969, yellow perch averaged 7.4 inches and 0.17 pounds. Predation may also be responsible for the absence of white suckers and carp in the catch which were present in the 1967 and 1969 netting.

Periodic stocking of walleye and northern pike should be continued to maintain the sport fishery.

North Faber Reservoir

One 125-foot experimental gill net was fished overnight in October, 1980. The catch consisted of 19 rainbow trout, 22 white suckers, and 1 longnose sucker. Sixteen of the trout were Age 0+ fish and averaged 7.6 inches in total length and 0.17 pounds. Three Age 1+ trout averaged 13.9 inches and 0.98 pounds. The trout were in fair condition. The presence of suckers in this reservoir has not been previously documented by netting or fishermen reports. The entire catch of suckers consisted of large adult fish averaging 13.9 inches and 1.11 pounds. Future netting will be utilized to determine increases in sucker numbers and rehab needs for this reservoir.

Salmo Reservoir

This relatively new reservoir was first planted with rainbow trout in 1978. By the fall of 1979 occasional trout of three to five pounds were being taken by fishermen. Stocking rates of 3-inch fish were increased in 1979 and 1980 in an attempt to improve the catch rate. The catch rate appears to have improved and fish continue to grow rapidly. A gill net set in October, 1980 produced 13 Age 0+ rainbow trout and 1 Age 1+ trout. The Age 0+ fish averaged 9.7 inches in total length and 0.43 pounds. The Age 1+ fish was 15.8 inches long and 2.01 pounds. The present stocking rate appears sufficient to meet fishermen demand without impairing the excellent growth rates. Limited carry-over from year to year should continue to provide fishermen with some "bragging-size" trout.

Ross Reservoir

Several reports of poor fisherman success prompted an investigation of this reservoir. A 125-foot experimental gill net was fished for one and a half hours. The catch consisted of 13 cutthroat trout and 10 white suckers. The trout averaged 12.7 inches and 0.74 pounds and appeared to be in fair condition. Fishermen success was probably hampered by low water levels, abundant aquatic vegetation and a typical mid-summer decline in feeding activity associated with high water temperatures. Future sampling should be conducted to determine if natural reproduction of cutthroat trout is occurring in the feeder creek to this reservoir and to evaluate increases in the sucker population.

Lyons Reservoir

This reservoir of approximately 10 surface acres was planted in the 1960's with rainbow trout until an abundance of suckers and declining growth rates warranted a species change. In 1971 walleye were introduced to take advantage of the dense sucker population. Growth rates were good but the fishery was not utilized by fishermen. The walleye did not survive the winter of 1978-79 due primarily to a severe winter drawdown of the reservoir for stock water. In July, 1980 the reservoir was stocked with 8,000 1- to 2-inch smallmouth bass. Beach seining was conducted in September, 1980 to determine survival and growth of these bass. Three bass measuring 2.4, 2.5 and 3.2 inches were taken. The catch was predominated by large numbers of white suckers. Also present in the catch was fathead minnows, lake chubs, brassy minnows, Iowa darters, and brook sticklebacks. The bass were in good condition and excellent growth is anticipated due to the large and diverse forage fish base.

Cowboy Reservoir

This reservoir had been stocked privately for many years. In 1979, 1,815 5-inch rainbow trout were stocked by the department. Access is poor and reflects on fishermen usage. One 125-foot experimental gill net was fished overnight in September, 1980. The catch consisted of one trout 19.2 inches long and three tiger salamanders. Low water levels and heavy cattle use around the shoreline have aided the development of large masses of littoral vegetation. These factors make this reservoir susceptible to winterkill and future stocking should be reevaluated on this basis.

Davey (bass) Reservoir

Four hauls were made with a 100-foot x 9-foot x 1/4-inch seine in this 2-acre reservoir to determine the status of largemouth bass stocked in 1979. No bass were netted, but other species captured included three crappie, an abundance of fathead minnows, Iowa darters and brook sticklebacks. The presence of crappie indicates suitable conditions for bass, but the poor condition of the hatchery bass at stocking may have been responsible for their failure. Future stocking is not recommended at this time due to landowner conflicts in the area.

BR 12

Frequent winterkill problems have plagued this shallow 35-acre reservoir in recent years. In 1978, 5,000 channel catfish (3-inch) were introduced. The hardiness of this species became apparent as the catfish survived the long harsh winter of 1978-79. Although 1979-80 winter dissolved oxygen testing revealed concentrations less than 1 ppm, 2 gill nets set the following spring captured 13 catfish ranging in size from 6.3-10.0 inches. Growth rates are consistent with other temperate region populations. Future sampling will be conducted to evaluate spawning success in this reservoir.

Bass Pond Survey

A survey of five bass ponds in south Phillips County was conducted in May, 1980 to evaluate winterkill and present species composition.

Dogtown Reservoir: The water condition in this reservoir was extremely low and clear. No fish were observed in a visual shoreline survey of the pond.

Paleface Reservoir: This reservoir was sampled using a 100-foot x 9-foot x 1/4-inch mesh seine. No fish were captured.

Ulrich Reservoir: A seine haul produced one rainbow trout and an abundance of fathead minnows. This reservoir has since been deleted from the stocking program at the request of the landowner.

PR 20: This reservoir contained many bass ranging in size from 9.1-10.5 inches. Crappies were once common but none were taken by seining.

PR 18: At least two year classes of largemouth bass were observed in this reservoir. Several fish over one pound were noted.

Discussion and Recommendations: Difficulty in obtaining accurate size of largemouth bass was due to abundant aquatic vegetation which rolled the seine and the innate ability of bass to jump the seine. This provided us with only a quick estimate of their size. Some fish were taken more easily by hook and line.

All of the reservoirs exhibited extremely low water levels. Drought conditions throughout the summer of 1980 may result in winterkill of these reservoirs. Resampling of these reservoirs in the near future should be done to determine the extent of winterkill and determine if water levels are sufficient for restocking.

Battle Creek

This tributary of the Milk River has a large drainage area extending into Canada. Summer flows are highly dependent on releases of irrigation water from dams in Canada. Several attempts to establish brook trout have been made without success. Forage fish known to inhabit the upper and mid reaches are white suckers, northern redbelly dace, longnose dace, fathead minnow, lake chub, stonecat and black bullhead. Spring migrations of northern pike, walleye and carp from the Milk River have distributed these species throughout the drainage. A substantial sport fishery does not exist at present.

In 1980, 10,000 1- to 2-inch smallmouth bass were planted in hopes of establishing a resident game fish population. Two months after the initial plant, 100 feet of the creek was electrofished near the planting site. Two bass of 3.1 and 4.5 inches were captured indicating excellent growth. Large

concentrations of bass were not found indicating a good dispersal or high mortalities. Stream morphology and water temperatures should be suitable for natural reproduction of this species. Future sampling should be continued to monitor their progress.

Miscellaneous Surveys

A total of 56 reservoirs were surveyed at various intensities to determine their status and suitability for fish. Most of this survey work involved reservoirs that support fish or have received fish introductions. Eight reservoirs were surveyed to evaluate their potential for initial stocking and only two of these appeared to have adequate depth. Investigative work on most waters involved only observations to obtain information on water levels, turbidity, size, and depth. However, six reservoirs were sampled by gill net, seines, or traps to evaluate fish populations. In addition, four streams were seined to determine species abundance. Winter dissolved oxygen (D.O.) tests were conducted on 22 reservoirs to evaluate winterkill and habitat suitability. Due to exceptionally mild winter temperatures and lack of snow cover in 1980-81, D.O. concentrations were high. Those high D.O. levels occurred in spite of low water levels caused by low spring run-off and low rainfall in 1980.

Data collected on all waters was transferred to the region file for permanent reference. An abbreviated list of background data is maintained on waters of questionable value for long-term management. When it become apparent that a given water has sufficient value, a permanent file is developed. It is recommended that survey work and data recording procedures on waters of this type be continued.

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Waters referred to:

15-6480-05	Nelson Reservoir
15-2680-02	Milk River Section 1
15-2720-02	Milk River Section 2
15-2760-02	Milk River Section 3
15-2800-01	Milk River Section 4
15-2840-01	Milk River Section 5
15-2880-01	Milk River Section 6
15-4560-05	Bear Paw Lake
15-0280-01	Beaver Creek Section 1
15-0320-01	Beaver Creek Section 2
15-0360-01	Beaver Creek Section 3
15-3960-01	Sucker Creek
15-0960-01	Clear Creek
15-2080-01	Little Box Elder Creek
16-5140-06	Fort Peck Reservoir
16-2460-01	Fort Peck Dredge Cuts (Missouri River Section 3)
16-4495-07	Box Elder Reservoir
16-5110-07	Flat Lake
15-4570-03	Beaver Creek Reservoir
15-5120-08	Ester Reservoir
15-6535-07	North Faber Reservoir
15-9175-05	Salmo Reservoir
15-9160-07	Ross Reservoir
15-6095-20	Lyons Reservoir
15-5695-30	Cowboy Reservoir
15-4620-30	Davey (Bass) Reservoir
15-6940-08	BR 12
16-4910-08	Dogtown Reservoir
16-7399-07	Paleface Reservoir
16-8655-05	Ulrich Reservoir
16-7780-20	PR 20
15-7040-20	PR 18
15-0200-01	Battle Creek

Prepared by: Robert G. Needham and Kent W. Gilge

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