MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS
FISHERIES DIVISION

JOB PROGRESS REPORT

State of Montana

Project No. F-11-R-27 Name Northeast Montana Fisheries Study

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

Period Covered April 1, 1979 through March 31, 1980

ABSTRACT

Beach seining conducted at Nelson Reservoir in 1979 indicated fair to poor walleye reproduction, but reproductive success of yellow perch was rated as good to excellent. Commercial seining at Nelson Reservoir yielded a poor catch of buffalo and carp. Fresno Reservoir was sampled by beach seining to evaluate reproductive success of sport fishes and forage abundance. Excellent reproduction of northern pike and yellow perch was indicated, while walleye reproduction was rated as fair to good. Smallmouth bass were introduced into Fresno Reservoir in 1976, but no survival has been found. The overall fish population in the Fort Peck Dredge Cuts and tailwater area was sampled by gill nets and seining. Gill netting at 12 sites produced a catch of 11 species. Goldeye were the most abundant species taken comprising 43.3 percent of the catch followed by shovelnose sturgeon which comprised 34.7 percent of the catch. Beach seining at 20 stations revealed low numbers of young-of-the-year and forage fishes in the dredge cut/tailwater area. Eleven seine hauls with a 550-foot x 18-foot seine produced a catch of 159 paddlefish, 140 smallmouth buffalo, 105 river carpsucker, 78 bigmouth buffalo, 43 carp, 3 blue sucker, 1 shorthead redhorse, and 1 channel catfish. Seining and trapping at Flat Lake revealed an abundance of yellow perch, carp, and white suckers. Box Elder Reservoir was sampled to evaluate rough fish and rainbow trout populations for possible rehabilitation with rotenone. Electrofishing of Frenchman, Rock, and Willow (tributary of Rock Creek) Creeks was conducted to evaluate smallmouth bass introductions made in 1976 and 1977. No smallmouth bass were taken, but a good population of walleye and northern pike was found immediately below Frenchman Dam. Beaver Creek was sampled by electrofishing at one station to determine the presence of walleye and other fishes. Seining was conducted on Sand, Prairie Elk, and Porcupine Creeks to obtain baseline information on the overall fish population. Streams originating in the Little Rocky Mountains was surveyed by electrofishing to determine fish populations

prior to reactivation of gold and silver mining. Fair to good populations of brook trout were found in Lodgepole, Beaver, and Little Peoples Creeks. No fish were found in Montana Gulch, presumedly due to pollution from historical mining activity. Tributaries to the Big Dry Arm of Fort Peck Reservoir were sampled to determine the overall fish population and use by sport fishes. Young walleye and channel catfish were common in the lower portions of Big and Little Dry Creeks. Larval fish sampling was conducted on the Milk River at 11 stations and several tributaries to evaluate production of various species and identify important stream reaches. Sampling results are presented for Salmo, Whitetail, Wards, Berreth, Kwasney, Dix (VR 147), Bear Track, BR 12, Nichels and Grasshopper Reservoirs, plus Glasgow Air Base Pond. Miscellaneous pond survey work of varying intensity was conducted on 53 waters to determine their status and suitability for fish.

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 fish populations and success of northern pike and bass introductions in satellite lakes on the Medicine Lake National Wildlife Refuge.

(3) To determine larval fish abundance in portions of the Milk River and some tributaries to identify spawning sites.

(4) To determine fish populations in Rock Creek and Frenchman Creek to evaluate smallmouth bass introductions.

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

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

FINDINGS

Nelson Reservoir

This reservoir covers approximately 4,000 surface acres. It is utilized for off-stream storage of irrigation water. A ditch which diverts water from the Milk River is the primary source of water. Water levels in the reservoir fluctuate several feet annually depending on Milk River flows and demands for irrigation water.

Nelson Reservoir contains an excellent self-sustaining fishery for walleye and yellow perch. Although the average size of walleye taken is approximately one pound, several trophy-sized walleye in the 10- to 14-pound class are taken each year. Yellow perch approaching one pound are common in the fishery. Northern pike now appear in the catch in moderate numbers. Northerns enter the reservoir via the Milk River, largely from migrations out of Fresno Reservoir during high draw-down years. In the 1960's northern pike were found in Nelson Reservoir in extremely small numbers; however, they now constitute a significant segment of the sport fishery. Northern pike reproduction is almost nil in the reservoir and they are expected to decline.

In 1979, beach seining was conducted at two sites to determine reproductive success of sport fish and forage fish abundance. The seine utilized was 100-foot x 9-foot x 1/4-inch square mesh. Two duplicate samples were made at two sites; Station I comprised 340 yards of shoreline and Station II comprised 170 yards.

The catch of young-of-the-year walleye (Table 1) was rated as fair to poor in 1979. However, reproductive success for yellow perch was good. In 1978 yellow perch reproductive success was rated as good to excellent. This was confirmed by the high catch of yearling perch in 1979 sampling. Species diversity was high in 1979, although this did not significantly affect the overall numbers of forage fish taken. Crappie sp., although reported to be abundant historically, were again taken in very small numbers. Two sample trials were conducted at each station in an attempt to reduce the high degree of catch variability that has been witnessed in the past. In general, the catch for most species in these two trials was highly comparable.

Table 1. A summary of shoreline seining results at Nelson Reservoir, 1979.

Species	STATION I		STATION II	
	Sample Trial & Date		Sample Trial & Date	
	1 (7-30)	2 (8-1)	1 (7-30)	2 (8-1)
Walleye (y-of-y)	13	18	7	8
Yellow perch (y-of-y)	1678	1558	103	324
Yellow perch (yrlg.)	1190	1413	138	335
Northern pike (y-of-y)	1	2	---	---
Northern pike (yrlg.)	2	---	---	---
Emerald shiner	360	317	119	25
Lake chub	---	---	2	1
Northern redbelly dace	1	---	---	---
Crappie sp. (y-of-y)	3	3	---	---
White sucker (y-of-y)	88	113	14	50
White sucker (yrlg.)	---	1	2	---
Longnose sucker (y-of-y)	6	3	---	1
Shorthead redhorse (y-of-y)	14	5	1	---
Bigmouth buffalo (y-of-y)	29	37	16	4
Smallmouth buffalo (y-of-y)	5	5	16	3

There was considerable commercial fishing at Nelson Reservoir in 1965 through 1967 (Needham, 1969); however, buffalo and goldeye populations could not sustain the levels of harvest imposed and no significant commercial harvest of any species has occurred since. In 1979 one day was spent seining with commercial fishermen to evaluate the status of dominant commercial species, i.e., buffalo sp., goldeye, and carp. Three areas in the vicinity of the supply ditch were sampled with a 600-foot seine. The overall catch was poor as summarized in Table 2.

The catch for white suckers and goldeye was near normal. However, the catch for buffalo and carp was extremely poor consisting of less than one-half ton. Comparable seining efforts in the mid-1960's when commercial fishing was in effect would have produced a catch of several tons of buffalo and carp. No small buffalo were taken which was surprising, since young-of-the-year are taken in most years and a good year-class was produced in 1974 (Needham, 1975). Likewise, small carp were lacking. Two specimens in the 1- to 2-pound class were taken and returned to the water. The size of goldeye was good, but the sample lacked the 2-pound or heavier specimens which characterized the population in the past.

Table 2. A summary of commercial fish taken by seining, 1979.

Species	Number	Avg. Wt. (lbs.)	Range in Wt. (lbs.)
Bigmouth buffalo	8	21.60	11.50 - 34.00
Goldeye (Male)	62	1.02	0.77 - 1.25
(Female)	40	1.26	0.97 - 1.60
Carp	64	12.60	8.30 - 18.60
White sucker	72	2.50	1.60 - 3.60

Discussion and Recommendations: The beach seining technique used appears adequate for evaluating reproductive success of key species. No obvious relationship between water levels and spawning success has been observed. Extremely low water levels in 1978 which left most gravel and rubble shorelines above the waterline produced a record year-class of walleye. Additional efforts should be devoted to locating key walleye spawning shoals. Since yellow perch are capable of utilizing a variety of spawning substrates, correlation of reproduction with water levels will be difficult.

Commercial fishing for goldeye on a restricted basis of 1 to 2 pounds per acre may be justified. The low populations of carp and buffalo present do not warrant any commercial harvest. Carp and buffalo traditionally have been harvested by seining and harvest could be allowed since this gear has little impact on sport fish. However, fish stocks are not adequate to attract commercial fishermen.

Fresno Reservoir

Fresno Reservoir is a highly fluctuating irrigation reservoir of 5,757 surface acres (spillway elevation) located on the Milk River approximately 12 miles northwest of Havre. Walleye and northern pike are the primary species in the sport fishery.

Beach seining was conducted at 12 stations in mid-August, 1979 as a continuing effort to evaluate reproductive success of sport fishes and forage abundance (Table 3). These sampling stations have been used since 1968; however, extensive draw-downs in some years greatly alter seining sites which limits data interpretation based on comparisons from previous years.

Table 3. A summary of forage fish and young-of-the-year game and sport fish taken with a 100-foot x 9-foot x 1/4-inch square mesh beach seine in Fresno Reservoir, 1965-1979.

Date (No. seine hauls in parenthesis)	Species and Number									
	Yellow perch	Crappie sp.	Walleye	No. pike	Emerald shiner	White sucker	Silvery minnow	Lake chub	Burbot	Unident. minnows
July 1965 (7)	---	2	---	8	---	---	---	---	---	---
August 1966 (6)	---	14	---	2	---	---	---	---	---	11
August 1967 (10)	---	19	24	5	15	---	---	---	---	276
August 1968 (12)	2,909	552	16	6	147	---	---	---	---	161
August 1969 (12)	1,140	67	4	6	385	2	---	---	---	380
August 1970 (12)	10,151	883	27	45	521	1	15	107	---	---
1971[1]										
August 1972 (12)	1,005	379	102	22	205	---	72	---	---	---
1973[2]										
August 1974 (12)	1,583	1,355	13	59	29	---	25	---	---	---
August 1975 (11)	4,154	59	10	32	155	---	---	---	---	---
1976[3]										
1977[2]										
August 1978 (12)	10,684	3	22	42	12	---	---	---	---	---
August 1979 (12)	8,516	127	29	45	340	1	---	---	1	---

[1]Seining incomplete due to low reservoir levels as reported in F-11-R-19, Job I-a.
[2]No seining conducted due to low reservoir levels.
[3]No seining conducted due to favorable conditions and lack of change anticipated.

The seine utilized was 100-foot x 9-foot with 1/4-inch square mesh. The overall catch for young-of-the-year fishes was rated as good in 1979. Excellent reproduction of northern pike and yellow perch was indicated. Good numbers of yearling yellow perch were also taken which was the result of excellent reproduction recorded in 1978. Walleye reproduction was termed as fair to good. One unusual feature of seining was the capture of a young-of-the-year burbot which is the first time young of this species has appeared in this sampling. Other fishes taken during seining were 22 yearling northern pike, 1 adult northern pike, 2 adult walleye, 1 adult yellow perch, and 1 adult white sucker.

Discussion and Recommendations: Northern pike have experienced two consecutive years of excellent reproduction and should furnish outstanding fishing if severe draw-down does not occur in the immediate future. Likewise, walleye reproduction has been good and the status of adult walleye in the reservoir is good as revealed by occasional creel observations and reproduction sampling. Sport fishing would be improved for most anglers and additional fishermen would be attracted to Fresno Reservoir if the use of live minnows for bait were permitted. The reservoir remains closed to live minnow fishing due to an agreement with Alberta, Canada, to help prevent carp from gaining access to Alberta.

In 1976, 10,000 (2-inch) smallmouth bass were introduced into Fresno Reservoir. To date, no survival of these is indicated. One more introduction is recommended in an effort to broaden the sport fishery.

Fort Peck Dredge Cuts/Tailwater

This combination of lake and river habitat below Fort Peck Dam provides good fishing for a variety of species such as sauger, walleye, northern pike, paddlefish, lake trout, and channel catfish. Bow and arrow fishing for paddlefish is a unique sport in this site.

Due to a Corps of Engineers proposal to install an additional 185-megawatt generating capacity at Fort Peck Dam and build a reregulating reservoir approximately 8 miles downstream, efforts to obtain information on the fish population was initiated. If constructed, this project would create a barrier to fish movement and a portion of the existing dredge cuts/tailwater area would be subject to daily water level fluctuations of 10 to 14 feet.

Gill netting and seining were utilized to sample various segments of the fish population. Twelve 125-foot experimental gill nets were fished overnight. The catch from this netting is summarized in Table 4. Goldeye were the most abundant species taken comprising 43.3 percent of the catch followed by shovelnose sturgeon which comprised 34.7 percent of the catch. Some areas and habitat types in flowing water areas preferred by sauger, walleye, and lake trout could not be sampled with gill nets due to drifting filamentous algae.

Table 4. A summary of 12 experimental gill net sets in the Fort Peck dredge cut/tailwater area, 1979.

Species	Number	Av. Lgth. (in.)	Lgth. Range (in.)	Av. Wt. (lbs.)	Wt. Range (lbs.)
Goldeye	171	12.4	10.2--13.9	0.55	0.22--0.87
Shovelnose sturgeon	137	25.1	19.8--32.1	1.94	0.86--4.20
Shorthead redhorse	32	15.2	13.9--19.8	1.62	1.03--4.48
Channel catfish	14	17.8	16.1--21.0	1.75	1.17--3.59
Carp	10	17.3	14.3--21.4	2.44	1.11--4.84
Walleye	8	16.4	11.7--21.0	1.48	0.40--2.61
Sauger	7	15.3	12.8--20.1	0.96	0.55--2.08
White sucker	6	14.9	9.6--17.6	1.79	0.37--2.31
Blue sucker	5	23.2	18.0--25.3	4.05	2.63--5.25
Northern pike	3	26.8	23.5--32.3	4.33	2.46--7.80
Smallmouth buffalo	2	22.9	18.3--27.5	7.53	2.86-12.20

Beach seining was conducted with a 100-foot x 9-foot x 1/4-inch square mesh seine to sample young-of-the-year and forage fish abundance. The overall abundance of these small fishes was low. Twenty seine hauls produced a catch of 138 silvery minnow, 30 emerald shiner, 23 lake chub, 8 longnose sucker, 6 fathead minnow, 5 white sucker, 2 yellow perch, 1 carp, and 1 lake trout (1.8 inches in total length).

Paddlefish tagging efforts in the dredge cuts during mid-July utilized a 550-foot x 18-foot seine with 2 1/2-inch square mesh. The catch composition from 11 seine hauls consisted of 159 paddlefish, 140 smallmouth buffalo, 105 river carpsucker, 78 bigmouth buffalo, 43 carp, 3 blue sucker, 1 shorthead redhorse, and 1 channel catfish. Several goldeye were taken, but due to the large mesh in this seine goldeye readily passed through the mesh and were not counted. Many carp, river carpsucker, and shorthead redhorse also probably escaped through the large mesh.

Flat Lake

This 10-surface acre reservoir was constructed in 1973 by impounding a small bay of Fort Peck Reservoir. Following construction, rotenone was applied to eradicate the existing fish population and enable trout management. By 1977 illegal use of live minnows for bait had resulted in the establishment of several undesirable species.

In the spring of 1978, immediately following ice-out, 1/2-inch square mesh frame traps fished to remove unwanted species, primarily yellow perch, caught 10,670 perch in 16 trap-days. In 1979 the same traps caught only 71 yellow perch in 8 trap-days (Table 5). However, in 1979, 1/4-inch square mesh traps also fished for 7 trap-days caught 1,787 perch (99.1 percent were in the 3-inch size class). It appears that trapping in 1978 removed a large segment of the adult yellow perch population. Carp were taken in greater numbers in 1979. All of the carp taken were in the 5-inch size class and it appears they may become a greater nuisance than anticipated.

Table 5. A summary of the catch by trap nets from Flat Lake, 1978 and 1979.

		1979		1978
Species	Approx. Size (in.)	1/4-inch Traps (7 Trap-days)	1/2-inch Traps (8 Trap-days)	1/2-inch Traps (16 Trap-days)
Yellow perch	3	1,771	55	---
Yellow perch	5-10	16	16	10,670[1]
Carp	5	231	253	1
White sucker	5	19	28	---
White sucker	8-16	---	7	14
Black crappie	3	58	103	---
Black crappie	5-10	---	---	8
Burbot	20	---	---	1
Fathead minnow	2	16	---	---
Rainbow trout	7-13	5	18	28
Walleye	3-7	---	---	---

[1]Sizes were combined for total count but most were in the 5-inch size class.

In the spring of 1979, 3,000 walleye fingerlings (1 1/2-inch) were stocked to supplement the sport fishery and control rough fish. Beach seining was conducted in September to evaluate walleye survival due to predation anticipated from yellow perch. The catch from 11 seine hauls (10-foot x 9-foot x 1/4-inch square mesh) consisted of 3 walleye, 2,012 yellow perch (all but 3 were young-of-the-year and yearlings), 9 carp, 3 rainbow trout, 15 fathead minnow, 1 emerald shiner, 4 white suckers, and 50 black crappie (48 were young-of-the-year). All perch, carp, and suckers were removed.

Discussion and Recommendations: Sampling indicates adult yellow perch have been greatly reduced. Hopefully, the introduction of walleye will aid

the control of perch, carp, and suckers by predation. This reservoir was opened to the use of live minnows for bait, effective May 1980, which should contribute to the harvest of large crappie, yellow perch, and walleye. Trout growth is poor and continued stocking of 7- to 9-inch trout in moderate numbers is recommended to sustain this sport fishery.

Box Elder Reservoir

This 90-surface acre reservoir near Plentywood has been stocked and managed for rainbow trout fishing since 1964. Due to increased reports of yellow perch catches by fishermen, sampling was conducted in the spring of 1978 with three 125-foot experimental gill nets set overnight. The catch consisted of 1,120 yellow perch, 328 white suckers, and 4 rainbow trout. Yellow perch taken were in the 5- to 8-inch size class and averaged 6.7 inches in total length.

Arrangements were subsequently begun for chemical rehabilitation with rotenone in 1978. The city of Plentywood was requested to provide a partial draw-down to lower toxicant costs and aid rehab success. However, due to a pending lawsuit over water rights, the city was unable to release water and immediate rehab plans were not pursued.

In the spring of 1979, trout stocking was conducted with 7- to 9-inch fish rather than traditional 3-inch fingerlings. Early spring trapping of perch was conducted to evaluate the affects of partial removal until a permanent solution could be achieved.

Spring was extremely late in 1979 and trapping was initiated May 11, as soon as ice-out permitted boat launching. At this time the reservoir was still approximately 80 to 90 percent ice covered. Frame traps fished for 21 trap-days produced a catch of 8,224 yellow perch, 1,194 white suckers, 145 black crappie, 19 rainbow trout, 2 northern pike, and 1 Iowa darter.

Discussion and Recommendations: The small number of perch and suckers removed probably had little impact on the overall population. It was estimated that 90 percent of the perch had spawned by the time trapping was initiated. Spawned-out fish probably moved out to deeper water and were less vulnerable to trapping. Similar spring trapping is anticipated in 1980 for catch comparisons under normal spring conditions.

Communication will be maintained with city officials in Plentywood in an effort to acquire a partial draw-down to facilitate rehab or to induce winterkill.

Bear Paw Lake

This 47-surface acre reservoir is located on Beaver Creek in the Bear Paw Mountains south of Havre. The reservoir receives heavy fishing pressure and is stocked annually with 7- to 9-inch rainbow trout. Fingerling (3-inch) trout are normally stocked in reservoirs of this type in the area, but trout growth is almost nil in Bear Paw Lake due to an infestation of white suckers.

A total draw-down of the reservoir was undertaken in August, 1979 to remove suckers and promote improved growth of stocked trout. Prior to re-filling, rotenone was applied to complete the rehab process. During draw-down two 125-foot experimental gill nets were fished for 7 hours during mid-day to collect fish for size determinations. The catch consisted of 27 rainbow trout, 179 white suckers, and 2 brook trout. Rainbow trout had an average total length of 9.8 inches (range 8.3 to 11.4 inches) and an average weight of 0.34 pounds (range 0.21 to 0.50 pounds). Suckers were generally in poor condition and ranged in size from 6.3 to 14.2 inches total length. Size data was obtained from 167 suckers for future reference.

Discussion and Recommendations: Restocking with 7- to 9-inch rainbows is scheduled for 1980. At the time of stocking, size data will be obtained so growth can be evaluated. Suckers located upstream in the drainage will repopulate the reservoir; however, the duration impact of sucker removal will be observed. A moderate number of cutthroat trout is also scheduled for stocking in 1980 in an effort to develop a reproducing population and reduce the need for stocking catchable-sized trout.

Frenchman Creek

Frenchman Creek, one of the largest tributaries to the Milk River, has received introductions of smallmouth bass in an effort to establish a self-sustaining population. Stocking consisted of 3,000 fingerlings in 1976 and 10,288 in 1977. In the fall of 1979, electrofishing was conducted at two sites to evaluate the success of these introductions.

The uppermost area sampled consisted of approximately 1 mile of stream immediately below Frenchman Dam. This is 30.5 stream miles upstream from the confluence with the Milk River. No smallmouth bass were taken, but a good population of walleye and northern pike was found. Forty walleye and 11 northern pike were taken in this sample area. Other species common to this site were carp, white sucker, yellow perch, and shorthead redhorse. One adult goldeye was taken and fathead minnow, lake chub, and silvery/plains minnow were common. The largest walleye taken was 4.92 pounds and it appeared that all age-classes were present. The northern pike taken averaged 4.11 pounds in weight (range 1.32 to 6.90 pounds).

The lower station sampled was at the Brooke Bridge (T32N, R34E, S14) approximately 10 miles upstream from the confluence with the Milk River. Approximately 1 mile of stream was sampled at this location. Game fish

consisted of 1 walleye (4.5-inch) and 7 northern pike. Species common to this area were goldeye, white sucker, yellow perch, carp, river carpsucker, and shorthead redhorse. One bigmouth and one smallmouth buffalo was found. Several stonecat and longnose dace were also taken, but the sampling technique was not designed to collect small fish.

Discussion and Recommendations: No additional stocking of smallmouth bass is recommended. In the fall of 1979, fishermen reported catches of smallmouth bass at Vandalia Dam approximately 36 miles downstream from the mouth of Frenchman Creek, which may be due to downstream migration out of Frenchman Creek following stocking. At the time of stocking, releases of bass were also made in Frenchman Reservoir and the stream above, but no sampling has been conducted at these sites to determine survival.

Rock Creek

Rock Creek, which originates in Saskatchewan, Canada, was stocked with 3,000 smallmouth bass fingerlings in 1976 and 10,000 in 1977. Electrofishing and seining were conducted in 1979 to evaluate the success of these introductions. Two stream reaches were sampled; one in T32N, R36E, S35 south of the Funk Ranch and one just upstream from the Pratt Ranch in T34N, R36E, S7. No smallmouth bass were taken. Species collected were white sucker, flathead chub, fathead minnow, lake chub, longnose dace, shorthead redhorse, carp, black bullhead, and stonecat (Table 6).

Willow Creek, a tributary of Rock Creek received a portion of the smallmouth bass stocked. Seining on this stream in T33N, R36E, S24 where stocking was conducted failed to take any bass, but species collected were white sucker, lake chub, flathead chub, fathead minnow, longnose dace, and silvery/plains minnow (Table 6).

Discussion and Recommendations: No evidence of smallmouth bass has been found in Rock Creek and additional stocking is not recommended. In the fall of 1979, fishermen reported catches of a few smallmouth bass at Vandalia Dam on the Milk River a few miles downstream from Rock Creek. Smallmouth bass stocked have either migrated downstream into the Milk River or failed to survive. Rock Creek is one of the larger Milk River tributaries. Overall quality based on volume of flow, pool development and depth, cover, and substrate appears to be high. Comparisons of habitat with other prairie streams in the area would indicate suitable habitat for northern pike and walleye but none were found.

Beaver Creek

Beaver Creek, which enters the Milk River near Hinsdale, originates in the Little Rocky Mountains and is 200 miles in length. A few miles in the headwaters contain a fair to good population of brook trout, but most of the stream is typical of a prairie stream and contains an abundance and diversity of warm water species.

Table 6. A summary of species composition from streams sampled by seining, 1979.

Stream and Sampling Location	Length Sampled (feet)	Date	Carp	Silvery/Plains Minnow	Fathead Minnow	Lake Chub	White Sucker	Brook Stickleback	Brassy Minnow	Black Bullhead	Longnose Dace	Northern Pike	Pumpkinseed	River Carpsucker	Stonecat	Shorthead Redhorse	Flathead Chub
W. Fork Sand Cr. T25N, R47E, S21	240	7-25	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-
Prairie Elk Cr. (U)[1] T22N, R46E, S17	---	7-25	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
Prairie Elk Cr. (M) T24N, R46E, S18	225	7-25	X	X	X	-	X	-	-	X	-	-	-	-	-	-	-
Prairie Elk Cr. (L) T26N, R46E, S23	300	7-25	X	X	X	X	X	-	-	-	X	-	-	-	-	-	-
Porcupine Cr. (U) T32N, R41E, S5	375	7-23	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-
Porcupine Cr. (L) T28N, R41E, S2	210	7-24	X	-	-	X	X	-	-	-	X	X	-	-	-	-	-
Beaver Creek (Phillips Co.) T28N, R32E, S30	205	9-11	X	-	X	X	X	-	X	X	-	-	X	X	-	-	-
Rock Creek (U) T34N, R36E, S7	---	9-13	X	-	X	X	X	-	-	X	X	-	-	-	-	X	-
Rock Creek (L) T32N, R36E, S35	---	9-13	-	-	X	X	X	-	-	-	X	-	-	-	X	X	X
Willow Creek T33N, R36E, S24	---	9-13	-	X	X	X	X	-	-	-	X	-	-	-	-	-	X

[1] U = Upper, M = Middle, L = Lower.

Electrofishing and beach seining were conducted in T28N, R32E, S30 to determine the overall fish population. The stream receives extremely light fishing pressure, but fair to good catches of walleye have been reported from several locations. Information on species composition from seining is presented in Table 6. Electrofishing gear did not function properly and sampling results were poor. Two walleye were taken along with small numbers of carp, river carpsucker, shorthead redhorse, white sucker, bigmouth buffalo, black bullhead, and lake chub.

Sand Creek (West Fork Sand Creek)

The West Fork of Sand Creek was seined in 1979 to obtain fish population data due to potential impacts from energy related development and pipeline construction. One station 240 feet in length was sampled. Although an abundance and diversity of non-game fish species were found (Table 6), no use by game or sport fishes was indicated. The production of forage fish species is undoubtedly important to predator species such as northern pike, walleye, sauger, and burbot which inhabit the Missouri River.

Prairie Elk Creek

Seining was conducted on Prairie Elk Creek at three stations to gather baseline information on the fish population in anticipation of energy related development and pipeline construction. Three stations were sampled but only non-game forage-type species were taken (Table 6). No use by game fish species was indicated, but forage fish production undoubtedly contributes to the food supply of the Missouri River predatory game fish species. Stream flows were well above normal in 1979 which should have created optimum conditions for spawning migrations by Missouri River fishes, but no use was indicated.

Porcupine Creek

Two stations were sampled on Porcupine Creek to determine the fish population (Table 6). Moderate numbers of forage fish and northern pike were taken in the lower reach. The upper portion (above Midway Dam) is used extensively by northern pike for spawning. Although small numbers of forage fish were observed in the upper portions where sampling occurred, none were taken, apparently due to intensive predation by northern pike which was the only species present in seining samples.

Little Rocky Mountains -- Stream Survey

Streams originating in the Little Rockies were sampled by electrofishing to determine fish populations prior to reactivation of mining activities. New pit-type mining activities for gold and silver will occur in the Landusky and Zortman areas. Metals will be extracted by a cyanide leeching process.

Fair to good populations of brook trout were found in several streams (Table 7). No fish were found in Montana Gulch, presumedly due to pollution from historical mining activity. The watershed of Little Peoples Creek is subject to direct mining influences; however, the Lodgepole Creek and Beaver Creek drainages are located out of areas for proposed mining.

The upper station sampled in Lodgepole Creek (just below Emerson Creek) appeared to be marginal habitat for fish due to low natural flows; however, surprisingly high numbers of brook trout were found in the habitat available. The upper station on Beaver Creek (at Bear Gulch Trailhead) supported a high population of young-of-the-year brook trout. Adult brook trout also appeared to be abundant at this station but were found in large, deep beaver ponds and could not be sampled. The lower Beaver Creek station (0.4 miles below the Fort Belknap Indian Reservation boundary) consisted of only a single beaver pool.

Discussion and Recommendations: Areas subject to potential mining influence should be observed and sampled annually. The location of cyanide leeching sites will also dictate needs for future sampling. Fish specimens were collected and sent to Dr. Clancy Gordon, University of Montana, for heavy metals and arsenic analysis. Dr. Gordon and associates sampled invertebrates in these streams. Invertebrates, water quality, and stream sediments were also collected for heavy metals and arsenic by Dr. Gordon.

Fort Peck Reservoir -- Big Dry Arm Tributaries

The primary tributaries flowing into the Big Dry Arm of Fort Peck Reservoir were sampled by seining to: 1) determine their importance to the fish population in the reservoir, and 2) collect population data needed to evaluate anticipated energy related development and pipeline construction (Northern Tier). A summary of fishes taken is presented in Table 8.

Ten stations sampled on Big Dry and Little Dry Creeks indicated these streams are important to walleye and channel catfish. All the walleye taken were young-of-the-year except at Big Dry Creek Stations #4 near the confluence of Little Dry Creek and #7 approximately 1 mile upstream from Fort Peck Reservoir where five and one yearling, respectively, were found. Comparable numbers of channel catfish young-of-the-year and yearling were taken at these 10 stations, but no adults.

Three stations seined on Timber Creek, two on Nelson Creek, and one on McGuire Creek revealed only non-game fish such as white suckers and a variety of minnows.

Discussion and Recommendations: Future sampling such as seining and larval netting should be conducted in Big Dry and Little Dry Creeks to better determine their importance and use by walleye and channel catfish. High flows which occurred in 1979 and later than normal ice-out on Fort Peck Reservoir may have contributed to greater use by walleye for spawning.

Table 7. Little Rocky Mountains electrofishing survey, 1979.

Location of Study Section	Date	Sect. Lgth. (ft.)	Brook Trout /100' Stream	Brook Trout Age 0+ Mean Lgth. (in.)	Brook Trout Age 0+ Range (in.)	Brook Trout Age 0+ No./100' Stream	Brook Trout Age ≥ 1+ Mean Lgth. (in.)	Brook Trout Age ≥ 1+ Range (in.)	Brook Trout Age ≥ 1+ No./100' Stream	Other* Species Observed
1--Lodgepole Creek (at town of Lodgepole) T26N, R25E, S5 SW¼	8-29	290	53	2.7	2.0-3.9	44	7.4	5.9-10.1	9	WSu,MSu, LND, LC, NRD
2--Lodgepole Creek (cabin just below Emerson Cr.) T26N, R25E, S30 SW¼	8-29	315	44	3.1	2.5-3.8	26	7.0	5.0-8.8	18	NONE
3--Little Peoples Creek (downstream from Hays) T26N, R24E, S13 SW¼	8-30	200	125	3.7	2.6-5.2	114	7.9	5.7-11.4	11	LND, WSu
4--Little Peoples Creek (near Natural Arch) T26N, R24E, S32 NW¼	8-30	200	64	3.1	2.4-3.7	40	6.2	4.7-8.4	24	NONE
5--N.Fork L. Peoples Cr. (near S.Fork confluence) T26N, R24E, S33 SW¼	8-30	200	58	3.4	2.5-3.9	21	6.7	4.9-9.8	37	NONE
6--Beaver Creek (0.4 mi. below Reserv. boundary) T26N, R25E, S36 NW¼	8-31	175	28	3.1	2.3-4.7	20	11.7	10.8-12.7	8	NONE
7--Beaver Creek (at Bear Gulch Trailhead) T25N, R25E, S4 NE¼	8-29	220	372	2.4	1.8-3.8	350	5.9	4.4-8.1	22	NONE
8--Montana Gulch (BLM Campground) T24N, R24E, S28 NE¼	8-30	100	NO FISH OBSERVED							

*White Sucker (WSu), Mountain Sucker (MSu), Longnose Dace (LND), Lake Chub (LC), Northern Redbelly Dace (NRD).

Table 8. A summary of fishes taken by seining in Fort Peck Reservoir--Big Dry Arm Tributaries, 1979. The number of fish taken are shown only for walleye and channel catfish.

Stream	Length Sampled (feet)	Date	Walleye	White Sucker	Yellow Perch	Channel Catfish	Black Bullhead	Buffalo sp.	Shorthead Redhorse	Silvery/Plains Minnow	Lake Chub	Flathead Chub	Fathead Minnow	Sand Shiner	Longnose Dace	Freshwater Drum	Carp	Goldeye	River Carpsucker
Big Dry Creek #1 (Upper) T18N, R40E, S9	120	8-22	-	X	-	12	X	-	X	X	X	X	X	X	X	-	-	-	-
Big Dry Creek #2 T19N, R41E, S32	60	8-22	2	X	-	4	-	-	X	X	X	X	X	X	X	-	X	X	X
Big Dry Creek #3 T18N, R42E, S6	150	8-22	12	X	-	7	-	-	X	X	X	X	-	X	X	-	-	-	-
Big Dry Creek #4 T18N, R42E, S3	300	8-16	11	X	X	31	-	-	X	X	-	X	-	X	-	-	X	-	X
Big Dry Creek #5 T19N, R42E, S15	170	8-16	2	X	-	6	-	-	-	X	-	X	-	X	-	-	-	-	X
Big Dry Creek #6 T20N, R42E, S23	200	8-16	13	X	-	73	X	-	-	X	-	X	-	X	X	X	X	-	-
Big Dry Creek #7 (Lower) T20N, R42E, S13	200	8-15	11	X	X	6	-	-	X	X	X	X	-	-	X	X	X	-	X
Little Dry Creek #1 (Upper) T16N, R43E, S12	160	8-21	-	X	-	3	-	-	-	X	X	X	X	X	X	-	-	-	-
Little Dry Creek #2 (Middle) T17N, R42E, S1	120	8-22	-	X	-	4	X	-	X	X	X	X	X	X	X	-	X	-	X
Little Dry Creek #3 (Lower) T18N, R42E, S22	160	8-21	3	X	X	6	-	-	X	X	X	X	X	X	X	-	X	-	-
Timber Creek (Highway 200) T18N, R44E, S18	160	8-31	-	X	-	-	-	-	-	-	X	-	X	X	-	-	X	-	-
Timber Creek (Highway 24) T19N, R43E, S13	40	8-31	-	X	-	-	-	-	-	X	X	-	X	X	X	-	-	-	-
Timber Creek (Lower) T20N, R43E, S27	105	8-15	-	X	-	-	-	-	-	X	X	-	X	X	X	-	X	-	-
Nelson Creek (Highway 24) T20N, R44E, S5	220	8-31	-	X	-	-	-	-	-	X	X	-	X	X	X	-	-	-	-
Nelson Creek (Lower) T21N, R43E, S28	120	8-31	-	X	X	-	-	X	-	X	X	X	X	X	X	-	X	-	-
McGuire Creek (Highway 24) T22N, R43E, S35	99	5-9	-	X	-	-	-	-	-	-	X	-	X	X	-	-	X	-	-

Milk River -- Larval Fish Sampling

Throughout the spring of 1979 larval fish sampling was conducted in the Milk River to determine production of various species and identify the importance of stream reaches. Sampling was conducted with 1/2-meter nets of #00 mesh. Eleven stations were sampled from the mouth of the Milk River to Chinook (river mile 374.5). A total of 38 samples were taken as summarized in Table 9.

The best catches of walleye/sauger were made during late May. No larval walleye were taken above Saco (river mile 166.6); however, less sampling was done at the uppermost stations. Adult walleye are common in these upper areas and additional sampling effort in the future will be required to better define spawning areas throughout the system.

Larval fish sampling was also conducted on several Milk River tributaries such as Porcupine, Rock, Beaver (at river mile 131.0), Frenchman, and Battle Creeks (Table 10). No game fish were taken in any of these samples although Porcupine Creek contains an abundance of northern pike, and Beaver and Frenchman Creeks contain fair numbers of walleye.

Discussion and Recommendations: Additional sampling should be conducted to better identify areas utilized for spawning. In 1978, larval paddlefish were taken at the mouth of the Milk River. Intensified sampling of the upper Milk River reaches and tributaries will be required to evaluate spawning activity. Milk River larval fish work will be helpful in contributing to knowledge about the Missouri River where similar work was conducted in 1979 under Federal Aid Project FW-2-R-9.

Miscellaneous Investigations

Salmo Reservoir: This new 5-surface acre reservoir was first stocked with rainbow trout in the spring of 1978. Initial stocking utilized both fingerling and 7- to 9-inch rainbows. Due to complaints from fishermen regarding a lack of fish, one 125-foot experimental gill net was set overnight in the spring of 1979. The catch consisted of 16 rainbow, the largest of which was 15.4 inches in total length and weighed 1.90 pounds. Growth of all fish was excellent and stocking rates were increased in 1979.

Whitetail Reservoir: Two 125-foot experimental gill nets were set for three hours during ice-out in the spring of 1979 to evaluate winterkill due to observations of dead northern pike and yellow perch. Ten northern pike and four yellow perch were netted. Winterkill appeared to affect only the larger northern pike and a small segment of the perch population.

Glasgow Air Base Pond: The overall fish population was sampled in August, 1979 with one 125-foot experimental gill net set overnight. The catch consisted of 85 rainbow trout. In the fall of 1978, 2,000 channel

Table 9. A summary of ichthyoplankton collected per 1000m^3 from the Milk River, 1979.

Station	River Mile	Date	Vol. Sampled (m^3)	*Stizostedion sp.*	*Perca flavescens*	*Hiodon alosoides*	*Notropis atherinoides*	*Cyprinus carpio*	*Ictiobus sp.*	*Catostomidae sp.*	*Cyprinidae sp.*	*Unidentified*
Near Mouth	0.2	6/5	392	--	--	--	--	--	--	26	28	--
		6/11	392	--	--	--	--	--	--	--	339	--
		6/20	261	--	--	--	--	--	15	--	--	--
		6/22	392	--	--	--	--	--	--	--	13	--
		7/3	392	--	--	3	18	--	--	--	8	--
		7/10	392	--	--	--	--	15	36	--	--	138
Pelican Rapids	9.6	5/30	376	5	--	--	--	--	--	8	--	--
		6/5	392	--	--	--	--	--	--	46	--	115
Nashua Bridge	23.0	5/3	125*	--	--	--	--	--	--	--	--	--
		5/16	125*	--	--	--	--	--	--	--	--	--
		5/22	200*	5	--	--	--	--	--	--	--	--
		5/24	350*	14	--	--	--	--	--	--	--	--
		5/30	324	3	--	--	--	--	--	3	--	--
		6/4	266	--	--	--	--	--	--	--	--	--
Glasgow	65.0	5/22	180*	11	--	--	--	--	--	--	--	--
		5/24	275*	4	--	--	--	--	--	--	--	--
		6/4	199	--	--	--	--	--	--	--	5	--
Tampico	98.2	6/4	110	--	--	--	--	--	--	27	--	--
		6/11	310	--	--	--	--	--	--	--	--	--
		6/29	323	--	12	--	--	--	--	--	--	--
Vandalia	110.1	5/24	266	11	--	--	--	--	--	--	--	--
		5/30	133	--	--	--	--	--	--	8	--	--
		6/4	74	--	--	--	--	--	--	--	41	--
Hinsdale	130.0	5/22	83	12	--	--	--	--	--	--	--	12
		5/24	170	29	--	--	--	--	--	--	--	--
		5/31	170	--	--	--	--	--	--	6	--	--
		6/6	144	--	--	--	--	--	--	--	7	--
Bowmans Crossing	152.0	6/6	415	--	--	--	--	--	--	--	--	--
		6/11	398	--	--	--	--	--	--	5	--	--
		6/29	332	--	--	--	--	--	--	81	--	--
Saco	166.6	5/25	177	6	--	--	--	--	--	--	--	--
		5/31	266	--	--	--	--	--	--	8	--	--
		6/29	332	--	--	--	--	--	--	--	--	--
Dodson	269.0	5/25	188	--	--	--	--	--	--	--	--	--
		6/6	188	--	--	--	--	5	--	--	--	--
Chinook	374.5	5/25	300*	--	--	--	--	--	--	--	--	--
		6/6	300	--	--	--	--	--	--	13	--	--
		6/18	310	--	--	--	--	--	--	6	--	--

*Flows estimated due to meter malfunction.

Table 10. A summary of ichthyoplankton collected per $1000m^3$ from tributaries of the Milk River, 1979.

Station	Date	Catostomidae sp.	Cyprinidae sp.	*Hiodon alosoides*
Porcupine Creek	5/30	5,833	---	--
	6/14	---	---	--
Rock Creek	5/22	---	---	--
	5/30	---	---	--
	6/6	---	48	--
Beaver Creek	5/8	---	---	--
	5/22	---	---	--
	5/31	---	---	--
	6/6	7	---	--
	6/15	---	18	--
	6/29	15	---	--
Lower Frenchman Creek	5/22	---	---	--
	5/31	---	17	17
	6/6	---	169	--
Battle Creek	5/31	327	---	--
	6/6	15	---	--

catfish (3-inch) were stocked, but none were netted. This reservoir was rehabed in 1975 to remove carp and yellow perch, and neither species was taken in 1979.

Wards Reservoir (VR 82): During the 1960's stocking of rainbow trout was conducted to provide a fishery. However, due to frequent winterkill, northern pike and black bullheads were stocked in the early and mid 1970's. Netting in 1978 indicated northern pike had been eliminated by winterkill and black bullheads underwent heavy losses. Netting again conducted in 1979 took no fish indicating some winters are too harsh for even bullheads. Additional efforts to establish black bullheads are recommended on a low priority basis.

Berreth Reservoir: Due to low dissolved oxygen concentrations in the winter of 1978-79, one 125-foot experimental gill net was set overnight to determine the status of the fish population. The catch consisted of 13 northern pike and 8 yellow perch.

Kwasney Reservoir: Gill net sampling was conducted in the spring of 1979 to evaluate winterkill as large numbers of dead fish were observed along the shoreline during ice-out. Two 125-foot experimental gill nets set overnight caught 2 northern pike, 1 black bullhead, 1 yellow perch, and 8 white suckers. This reservoir was once noted for excellent largemouth bass fishing and 8,000 largemouth fingerlings were stocked in July, 1979.

Dix Reservoir (VR 147): Following unsuccessful attempts to establish largemouth bass due to winterkill, 2,000 channel catfish (3-inch) were stocked in 1978. One 125-foot experimental gill net set overnight in August, 1979 took no fish. Additional efforts to establish fishing in this reservoir are not recommended.

Bear Track Reservoir: Rainbow trout stocking was discontinued after two successive winterkills. Winter dissolved oxygen concentrations indicated some hardy species would survive and 5,000 channel catfish (3-inch) were stocked in the fall of 1978. Two 125-foot experimental gill nets set for two days failed to catch any fish. This reservoir should be suitable for catfish or bullheads and future observations will be made.

BR 12: Introductions of largemouth bass, bluegill, and crappie sp. have been made from 1956 to 1972, but apparently due to frequent winterkill problems in recent years no fishing was available. In 1978, 5,000 channel catfish (3-inch) were stocked. One 125-foot experimental gill net set overnight in 1979 caught two catfish ranging in size from 7.2 to 9.5 inches. Future sampling will be conducted to evaluate the suitability of catfish in this reservoir.

Nichels Reservoir: Channel catfish were stocked in 1978 to develop a fishery. However, gill net sampling in 1979 indicated no survival. Winter dissolved oxygen tests in 1978-79 revealed suitable oxygen concentrations.

Several other reservoirs stocked with this same group of catfish showed little or no survival and it appears that the lack of fish may be attributable to stocking or transportation mortality and stress rather than habitat limitations.

Grasshopper Reservoir: This reservoir is managed with annual plants of rainbow trout fingerlings. Two 125-foot experimental gill nets were fished overnight to sample the fish population. The catch consisted of 47 rainbow trout and 330 white suckers. The trout taken were in fair to poor condition and rehabilitation with rotenone should be considered if a substantial draw-down can be achieved to reduce treatment cost.

POND SURVEYS

A total of 53 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. Investigative work on several waters involved only observations to obtain general information on water levels, turbidity, size and depth. However, six reservoirs were seined or gill netted, two were visited to determine largemouth bass survival and reproduction, and three streams were sampled by electrofishing. Winter dissolved oxygen tests were conducted on 22 reservoirs to evaluate winterkill problems. Dissolved oxygen concentrations were generally high in the winter of 1979-80 and virtually no winterkill is anticipated. This is presumedly due to an unseasonably mild, snow-free fall and winter.

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 becomes 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.

LITERATURE CITED

Needham, R. G. 1969. Inventory of Waters of the Project Area. Job Compl. Rept. for Dingell-Johnson Project F-11-R-15, Job No. I, 20 p. (mimeo).

_____. 1975. Inventory of Waters of the Project Area. Job Progress Rept. for Dingell-Johnson Project F-11-R-22, Job I-a, 11 p. (mimeo).

WATERS REFERRED TO

15-6480-05	Nelson Reservoir
15-5240-05	Fresno Reservoir
16-2460-01	Fort Peck Dredge Cuts (Missouri River Section #3)
16-5110-07	Flat Lake
16-4495-07	Box Elder Reservoir
15-4560-05	Bear Paw Lake
15-1680-01	Frenchman Creek
15-3340-02	Rock Creek
15-4403-02	Willow Creek
15-0400-01	Beaver Creek
16-3230-02	Sand Creek
16-2880-02	Prairie Elk Creek
15-3255-02	Porcupine Creek
15-2280-01	Lodgepole Creek
15-2120-01	Little Peoples Creek
15-2020-01	Kings Creek
15-3060-01	North Fork Little Peoples Creek
16-2570-10	Montana Gulch
16-0245-02	Big Dry Creek
16-1990-02	Little Dry Creek
16-3790-02	Timber Creek
16-2650-02	Nelson Creek
16-2270-02	McGuire Creek
16-2420-02	Milk River Section #1
16-2440-02	Milk River Section #2
16-2460-02	Milk River Section #3
15-0200-01	Battle Creek
15-9175-07	Salmo Reservoir
16-8860-08	Whitetail Reservoir
15-5340-07	Glasgow Air Base Pond
15-8240-07	Wards Reservoir
16-4435-08	Berreth Reservoir
16-7710-08	Kwasney Reservoir
15-9610-08	Dix Reservoir (VR 147)
15-4565-07	Bear Track Reservoir
15-5960-08	BR 12
16-7220-08	Nichels Reservoir
15-5380-07	Grasshopper Reservoir

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