ESTABLISHMENT OF AQUATIC BASELINES IN LARGE INLAND IMPOUNDMENTS

Segment 3 Report

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ABSTRACT

A total of 1,264 fish were trapped and tagged in the Big Dry Arm during spring, 1979. Walleye and northern pike were the predominate species captured and comprised almost 50 percent of the total fish caught. Walleye recaptures from previous years tagging were about 18 percent and northern pike recaptures were about 15 percent. The total number of all species captured was considerably fewer than in previous years trapping efforts. Substantial numbers of walleye eggs and larvae were captured in Big Dry Creek, the only major tributary of the Big Dry Arm. Highs of 244.8/m^3 walleye eggs were sampled on May 11 and 301.1/m^3 larval walleye were taken May 15. Walleye larvae were also sampled near the head of the Big Dry Arm indicating larval drift from Big Dry Creek into the reservoir. Numbers ranged from an average of 2.8 to 221.2/m^3. Other species of larval fish captured in the Big Dry Arm were yellow perch, freshwater drum, buffalo, and burbot. Late summer seining in Big and Little Dry Creeks indicate the presence of Age 0 walleye and channel catfish in both streams. An abundance of various forage species were also captured. Beach seining in several areas of the reservoir to assess reproduction in 1979 indicated the presence of Age 0 yellow perch in all areas sampled and ranged from an average of 1.9 to 564.2 per haul. Crappie sp. were the next most abundant species captured and ranged from an average of 2.8 to 25.8 per haul. Forage minnow and commercial species appeared to be relatively scarce in all areas seined. Monitoring of commercial fish populations, particularly goldeye, was continued. Samples of commercial goldeye landings indicated females comprised over 90 percent of the total catches from upper and lower areas of the reservoir. The total goldeye harvest made up about 52 percent of the total commercial landings of about 500,000 pounds.

INTRODUCTION

Efforts were directed towards obtaining baseline information on fisheries and related aquatic aspects in the Big Dry Arm of Fort Peck Reservoir during 1979. Objectives during this segment's work were: 1) Monitor and tag fish during spring spawning movements near the head of the Big Dry Arm, 2) Assess reproductive success of sport, commercial and forage species in tributaries of the Big Dry Arm and various areas in the reservoir, 3) Monitor water temperature in the Big Dry Arm, 4) Monitor commercial fish populations, particularly goldeye, and commercial fish harvest data, 5) Determine water quality and sample plankton and benthos in the Big Dry Arm, and 6) Production of a commercial fishing film of Fort Peck Reservoir.

Trapping and tagging of primarily adult fish was done near the head of the Big Dry Arm mainly during May because of late ice-out conditions. Walleye eggs and larvae were collected in Big Dry Creek and sampling of larval fish was done in the Big Dry Arm during May and June. Age 0 fish were captured by beach seining in several areas of the reservoir to assess reproduction of sport, commercial and forage species. Thermographs were installed in two areas of the Big Dry Arm to monitor water temperatures primarily from May through September. Goldeye in the lower portion of the reservoir were sampled with floating gill nets at standard sampling sites. Commercial goldeye catches were checked to obtain size and sex information of goldeye from upper and lower areas of the reservoir. Commercial harvest data was compiled and analyzed to obtain information regarding species composition, size, and total commercial landings from Fort Peck Reservoir. Water quality data was not collected since the U. S. Corps of Engineers is currently monitoring water quality at two sites on the reservoir which will later be published. Plankton and benthos samples were not collected due to lack of proper sampling and analysis equipment and budget restrictions. No further efforts to produce a commercial fishing film on Fort Peck Reservoir will be made due to lack of necessary additional funding.

TRAPPING AND TAGGING

Movements of fish near the head of the Big Dry Arm were monitored using frame traps from April 28 through June 1, 1979. Trapping efforts were delayed due to late ice-out conditions and the lack of any appreciable rise in the reservoir level after trapping began. The total rise in reservoir level during the period of trapping was 0.9 of a foot. However, the reservoir did rise 5.5 feet during March but thereafter remained relatively stable.

A total of 75 trap-days caught 1,264 fish for an average of 16.8 fish per trap-day (Table 1) at 14 locations. Traps were frequently moved due to a general paucity of fish in all areas trapped.

Walleye were the most abundant species captured with a total of 325. This was the least number of walleye caught in six trapping seasons near the head of the Big Dry Arm. However, the delay in trapping caused by late ice-out conditions was probably responsible for this occurrence. It is likely the

Table 1. Species and number of fish caught in 75 trap-days during spring, 1979 from areas near the head of the Big Dry Arm. Number of fish caught per trap-day is shown in parenthesis.

Date	No. of Trap Days	SPECIES[1]											
		WE	NP	C	RC	GE	SB	SG	B	YP	WS	SRS	Total[2]
4/28-6/1	75	325 (4.3)	283 (3.8)	161 (2.1)	139 (1.8)	121 (1.6)	119 (1.6)	39 (0.5)	30 (0.4)	15 (0.2)	13 (0.2)	11 (0.1)	1,264 (16.8)

[1]WE - walleye
NP - northern pike
C - carp
RC - river carpsucker
GE - goldeye
SB - smallmouth buffalo
SG - sauger
B - burbot
YP - yellow perch
WS - white sucker
SRS - shorthead redhorse sucker

[2]Total includes 5 black bullhead, 3 channel catfish, 1 mountain whitefish, 2 bigmouth buffalo; less than 0.1 fish captured per trap-day for each of these species.

majority of adult walleye had moved towards the head of the Big Dry Arm under the ice and possibly into Big Dry Creek to spawn and were thus unavailable to trapping efforts. Males comprised 77 percent of the adults captured (204 fish) and averaged 16.7 inches total length (range 12.9 to 20.9 inches) and 1.50 pounds (range 0.60 to 2.84 pounds). Females made up 23 percent of the total (61 fish) and averaged 22.1 inches total length (range 16.1 to 26.5 inches) and 3.40 pounds (range 1.18 to 6.65 pounds). Traps were fished in five different areas of Nelson Bay between May 1 and May 10 (12 trap-days) and only 11 walleye were captured. The majority of the walleye (about 99 percent) were trapped between April 28 and May 8 near the head of the Big Dry Arm. Recaptures from previous years tagging amounted to 17.8 percent of the total walleye captured.

Northern pike were the next most abundant species captured with a total of 283 fish. Males averaged 25.9 inches total length (range 17.9 to 32.9 inches) and 3.92 pounds (range 1.23 to 8.65 pounds) and comprised about 65 percent of the total catch (147 fish). Females averaged 31.8 inches total length (range 14.7 to 45.2 inches) and 8.75 pounds (range 0.79 to 26.2 pounds) and made up about 35 percent (80 fish) of the northern pike trapped. About 15 percent of the northern pike caught were recaptures from previous years tagging.

Other species captured included 161 carp, 139 river carpsucker, 121 goldeye and 119 smallmouth buffalo. About four percent of the river carpsucker and one percent of the smallmouth buffalo had been tagged in previous years. Thirty-nine sauger, 30 burbot and 8 shorthead redhorse suckers were also trapped and 2.6, 3.3 and 12.5 percent were recaptures, respectively. No other previously marked fish were observed in the other species trapped.

A total of 265 walleye and 227 northern pike were tagged with color-coded, numbered Floy tags. All fish were weighed and measured prior to tagging and release. Fishermen tag returns amounted to 9.1 percent for walleye and 12.8 percent for northern pike of those tagged in 1979. Other species were tagged with color-coded, unnumbered Floy Flag tags and not weighed or measured. The following species and totals were tagged in this manner: carp, 161; river carpsucker, 133; goldeye, 119; smallmouth buffalo, 118; sauger, 30; burbot, 23; white sucker, 10; shorthead redhorse sucker, 7; yellow perch, 6; black bullhead, 5; channel catfish, 3; bigmouth buffalo, 2; mountain whitefish, 1.

TEMPERATURE

Thermographs were installed at two locations in the Big Dry Arm in 1979. One site was near the head of the Big Dry Arm on April 28 and the other was in Nelson Creek Bay on April 26; both were removed October 9, 1979. The results are shown in Table 2. Unseasonably cool weather persisted into early June and subsequently water temperatures also remained cool. Minimum water temperatures in Area I during May ranged from 45-66°F. and averaged 54.5°F. while maximums ranged from 48-70°F. and averaged 67.8°F.

Table 2. Average minimum and average maximum temperatures (°F.) recorded in the Big Dry Arm during 1979. Temperature ranges in parentheses.

Month	I - Rookery		II - Nelson Bay	
	Average Minimum °F.	Average Maximum °F.	Average Minimum °F.	Average Maximum °F.
April	50.3 (50-51)	53.3 (52-55)	37.4 (36-40)	40.6 (39-43)
May	54.5 (45-66)	58.7 (48-70)	48.3 (41-57)	52.3 (42-68)
June	64.3 (59-70)	67.8 (62-75)	59.3 (53-65)	64.1 (57-72)
July	70.8 (67-74)	75.8 (70-82)	66.0 (57-71)	70.9 (63-78)
August	67.3 (60-72)	71.7 (63-76)	67.7 (63-72)	70.0 (64-75)
September	61.6 (57-68)	65.9 (61-73)	62.9 (59-67)	64.6 (61-71)
October	53.3 (50-57)	57.8 (56-60)	55.2 (53-58)	56.7 (54-59)

This area, located near the head of the Big Dry Arm, is generally characterized by shallow, turbid water which warms considerably faster than waters in areas further down the Big Dry Arm. Minimum water temperatures in Area II during May ranged from 41-57°F. and averaged 48.3°F. while maximums ranged from 40-68°F. and averaged 52.3°F. This area, Nelson Bay, is generally typical of embayments in the Big Dry Arm with deeper, clearer water and therefore warms more slowly than water in the area near the head of the Big Dry Arm. The highest average maximum temperature was during July in both areas, 75.8°F. in Area I and 70.9°F. in Area II. Thereafter, a general cooling occurred with lower minimum temperatures in Area I than in Area II, although maximums remained higher in Area I during this period.

LARVAL FISH SAMPLING

Sampling for larval walleye was done in Big Dry Creek May 3, 11 and 15, 1979. The sampling site was located about two miles from the confluence of Big Dry Creek with Fort Peck Reservoir. Half-meter nets (#00 mesh) were staked in a riffle area for 30 minutes on each sampling date. A flow meter was mounted at the net-mouth of each net to aid in determination of water volume sampled.

No larval fish were captured the first two sampling dates but an average of 55.9 and 244.8 eggs/m^3 of water were sampled on May 3 and May 11 and mean flows were 176 and 188 cfs, respectively. Water temperatures were 52°F. on May 3 and 59°F. on May 11 at time of sampling. On May 15, 301.1/m^3 walleye larvae and 7.0 eggs/m^3 were captured and the water temperature was 60°F.; mean flow on this date was 96 cfs. The larvae were in the prelarval stage with the yolk sac still evident and averaged about 7 mm in length. The majority of eggs in all samples appeared fertile and eyed-eggs were also observed. The general size and appearance of the eggs indicated they were walleye spawn.

Flows in Big Dry Creek averaged 1,268 cfs (max. 4,000 cfs) during March and 826 cfs (max. 2,340 cfs) in April (USGS Water-Date Report). During March, 1979, the reservoir level rose 5.5 feet and was within four feet of maximum storage capacity. Also, it rose an additional foot in April. These high reservoir levels together with the strong inflows from Big Dry Creek provided access for migrating adult walleye for spawning on the numerous gravel riffles and bars in this stream. It is known walleye spawn in water temperatures ranging from 40°F. to 50°F. and hatching usually occurs in 12 to 18 days (Brown, 1971). Although a spawning run of walleye in this creek has not been previously documented, it is certain that in 1979 walleye from Fort Peck Reservoir spawned in Big Dry Creek since a resident population of adult walleye does not exist in this stream.

Larval fish were sampled in upper, mid and lower areas of the Big Dry Arm during May and June, 1979. Sampling was done by towing paired half-meter nets for 10 minutes at approximately three miles per hour at selected sites, usually near the head of embayments. Surface water temperature and a Secchi disc reading were taken after each tow.

Three areas near the head of the Big Dry Arm were sampled during the period May 14 to June 28. Area I was located less than one mile from the mouth of Big Dry Creek due to the high reservoir level. Areas II and III were located about 1.7 and 4.5 miles, respectively, below Area I.

The results, shown in Table 3, indicate no larval fish were collected prior to May 14. However, larval walleye averaging 208.3/m^3 of water were captured on this date in Area I only, which indicated the larvae were drifting into Big Dry Arm from Big Dry Creek. Larval walleye continued to appear in Area I samples with decreasing frequency through May 24, but were not found there after this date. Walleye larval appeared in Area II and Area III samples May 18, and averaged 93.2/m^3 and 8.5/m^3, respectively. They were captured in Area II through May 31 but were sampled only once more in Area III which was on May 24. The peak number of larval walleye was collected in Area II on May 24 and averaged 221.2/m^3. These results show there was a gradual dispersion and down-reservoir movement of larvae from their source in Big Dry Creek. The importance of the upper areas in the Big Dry Arm to walleye larval stages and the necessity of high spring reservoir levels and adequate flows in Big Dry Creek are apparent.

Only two other species of larval fish were collected in upper areas during the sampling period. Yellow perch were first captured May 14 in area II only and were present in the rest of the May samples from this area. They were captured once in Area I samples, on May 31, and were collected in Area III samples from May 18 through June 15. The peak number sampled was also in Area III with an average number of 402.3/m^3. Larval freshwater drum were collected only in Areas I and II on June 28 and averaged 17.0/m^3 and 23.0/m^3, respectively. These were the only areas in the Big Dry Arm where this species was captured in 1979.

Nine embayments in mid and lower areas of the Big Dry Arm were sampled for larval fish during Spring, 1979. Mid areas included Nelson, McGuire and Lonetree bays and lower areas sampled were the North and South Forks of Rock, Box, Sand Arroyo, Box Elder and Spring bays. The results are given in Table 4.

Burbot was the first species collected and occurred May 22 in Nelson bay with an average number of 2.8/m^3 of water. This species was captured in three of the lower sampling areas but only on June 11. The average number sampled was 2.7/m^3 in Box, 5.5/m^3 in Sand Arroyo, and 67.7/m^3 in Box Elder. These were all probable areas of burbot spawning activity the previous winter.

Yellow perch larvae were collected at all sampling sites in mid and lower areas except Box Elder bay. The first collection of this species occurred May 31 in Nelson bay. The colder than normal spring and slow warming water temperatures are thought to have delayed the spawning and/or hatching of yellow perch. The greatest number sampled was 1,247.9/m^3 in the South Fork of Rock on June 11.

Table 3. Mean number of larval fish (number per 1,000 m^3) captured near the head of the Big Dry Arm during May and June, 1979.

Area	Date	Water Temp. °F.	Walleye	Yellow Perch	Freshwater Drum
	5/4	50			
	5/9	54			
	5/14	62	208.3		
I	5/18	61	84.5		
	5/22	60	14.3		
	5/24	70	33.9		
	5/31	64		16.9	
	6/15	70			
	6/28	72			17.0
	5/4	50			
	5/9	52			
	5/14	59		2.7	
II	5/18	60	93.2	58.2	
	5/22	59	60.6	190.5	
	5/24	64	221.2	128.0	
	5/31	64	23.5	82.1	
	6/15	69			
	6/28	70			23.0
	5/9	51			
	5/14	56			
III	5/18	61	8.5	8.5	
	5/24	61	2.8	402.0	
	5/31	62		8.4	
	6/15	64		2.8	

Table 4. Mean number of larval fish (number per 1,000 m^3) captured in mid and lower areas of the Big Dry Arm during May and June, 1979.

Area	Date Sampled	Surface Water Temp. °F.	Date	Walleye	Date	Yellow Perch	Date	Burbot	Date	Buffalo
MID										
Nelson	5/9	48								
	5/14	56								
	5/22	57								
	5/31	60			5/31	202.4				
	6/15	70			6/15	494.4				
	6/28	67			6/28	195.5	5/22	2.8		
McGuire	5/22	53								
	6/15	66			6/15	684.0				
	6/28	66			6/28	20.7				
Lonetree	6/15	61			6/15	289.2				
	6/28	68			6/28	172.1				
LOWER										
NF Rock	6/11	68			6/11	417.6				
	6/21	66	6/21	2.9	6/21	519.9				
SF Rock	6/11	70			6/11	1,247.9				
	6/21	65			6/21	406.7				
Box	6/11	61			6/11	2.7	6/11	2.7		
	6/21	59			6/21	112.3				
Sand Arroyo	6/11	63			6/11	150.8	6/11	5.5		
	6/21	64			6/21	204.3			6/21	8.5
Box Elder	6/11	60					6/11	67.7		
Spring	6/11	67			6/11	26.0				

Two other species, walleye and buffalo, were captured only once, both on June 21. One larval walleye (2.9/m^3) was taken in the North Fork of Rock and three larval buffalo (8.5/m^3) were sampled in Sand Arroyo bay.

REPRODUCTION AND FORAGE FISH ASSESSMENT

Sampling of Age 0 fish and forage minnows was done in the Pines area during August and in the Big Dry Arm, Dam-Duck Creek areas, and Timber and Hell Creek bays during September, 1979. The results are shown in Table 5.

Yellow perch was the most abundant species captured in all areas except Timber Creek bay where an average of only 1.9 were captured per haul. The greatest average number per haul, 564.2, was found in the Pines area. Walleye and smallmouth buffalo young-of-the-year were found only in the Big Dry Arm and averaged 0.2 and less than 0.1 per haul, respectively. Sauger were captured only in Timber Creek bay and averaged 0.3 fish per haul. Age 0 northern pike averaged less than 0.1 fish per haul in the Big Dry Arm and 0.2 and 1.5 per haul in the Dam-Duck Creek and Pines bays, respectively. Fingerling plants of northern pike were made in the latter two areas during June, 1979 and it is probable some of the northern pike captured were a result of these plants. Crappie species were found in all areas seined except the Big Dry Arm and the highest average, 25.8 per haul, was found in Hell Creek bay. Age 0 freshwater drum were captured in three areas with the highest average of 2.2 per haul in the Big Dry Arm. Age 0 white suckers were found in only two areas.

Forage minnows were found in all areas seined and averaged the highest in Hell Creek bay, 21.5, and the lowest in the Pines area, 0.3 per haul. Emerald shiner was the only species captured in all areas seined.

With the exception of the 5.5-foot increase in reservoir level which occurred during March, the reservoir remained fairly stable from April through June, rising a total of only about 1.4 feet and thereafter receded the remainder of the year. The March rise was probably beneficial to members of the Percidae family and possibly to northern pike provided the latter species found flooded vegetation from the previous year's growing season to use as spawning substrate. The paucity of young-of-the-year buffalo is probably due to the relatively stable reservoir level which occurred during May and June. Forage minnows appeared to be severely lacking in almost all areas seined.

Major tributaries of the Big Dry Arm were seined during August, 1979, to determine the importance these streams might have for reproduction and rearing of species common to the reservoir. Figure 1 shows stations seined in Big and Little Dry Creeks. Four areas were seined in Big Dry Creek below the confluence of Big and Little Dry Creeks. The approximate distance from Highway 200 to Station A is approximately 13 miles by road. Three areas each were sampled in Big and Little Dry Creeks above their confluence. The approximate distance to Station G on Big Dry Creek is 16 miles by road from the Highway 200 bridge across Little Dry Creek. The distance to Station J

Table 5. Average number of Age 0 fish and adult forage minnows captured by beach seining in Fort Peck Reservoir during August and September, 1979.

Area	Month	No. of Hauls	SPECIES[1]								
			YP	WE	SG	FD	NP	CR	WS	SB	FM
Big Dry Arm	Sept.	27	76.6	0.2	---	2.2	<0.1	----	---	<0.1	3.3
Dam-Duck Cr. Bay	Sept.	17	43.3	---	---	---	0.2	5.5	0.8	---	1.9
Pines Bay	Aug.	6	564.2	---	---	---	1.5	2.8	---	---	0.3
Timber Cr. Bay	Sept.	9	1.9	---	0.3	1.6	---	25.8	---	---	21.5
Hell Cr. Bay	Sept.	8	69.2	---	---	0.2	---	3.4	0.2	---	5.9

[1]YP - yellow perch
WE - walleye
SG - sauger
FD - freshwater drum
NP - northern pike
CR - crappie sps.
WS - white sucker
SB - smallmouth buffalo
FM - forage minnows: emerald shiner, longnose dace, lake chub, fathead minnow, silvery minnow, sand shiner

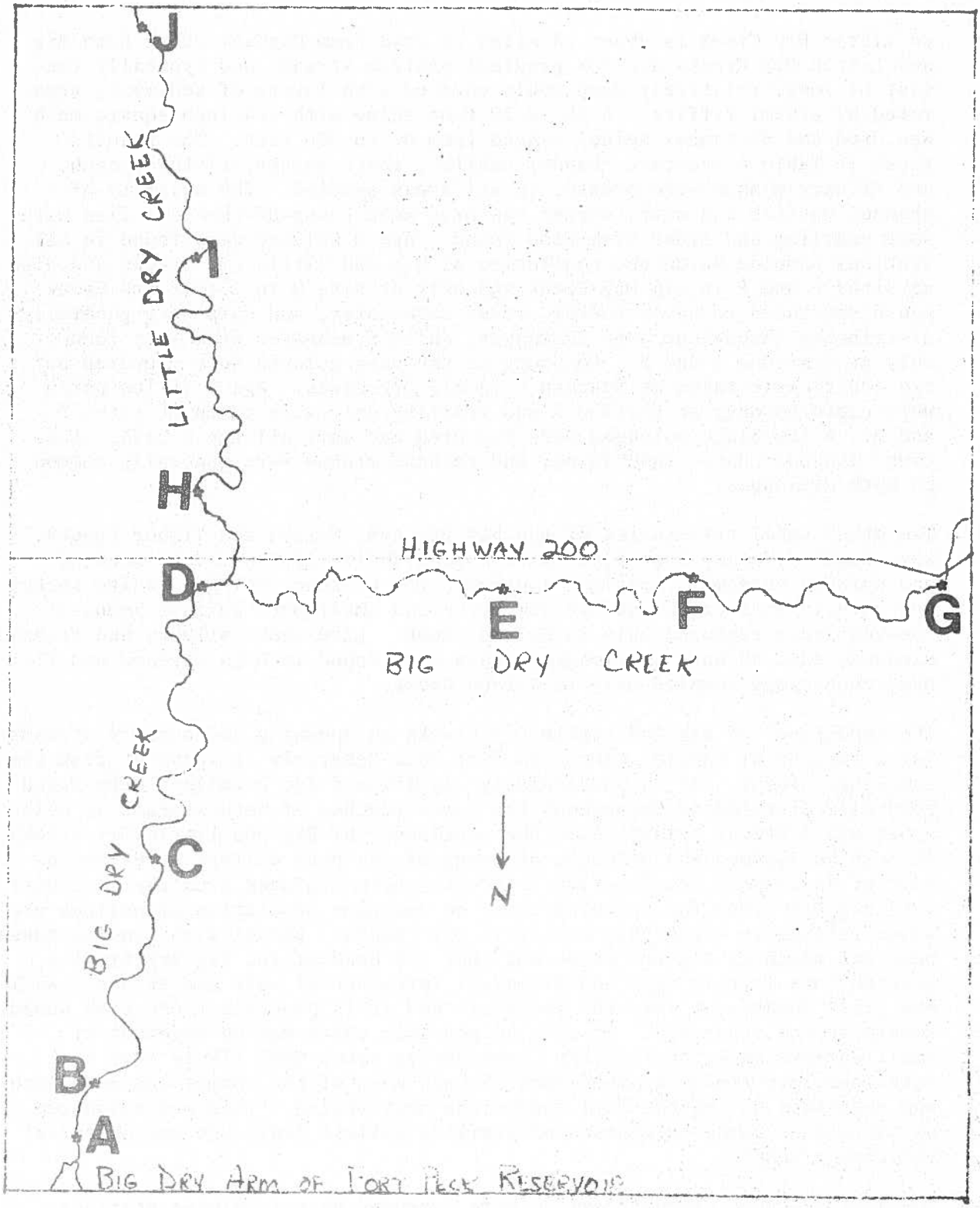

Figure 1. Stations seined in Big Dry and Little Dry Creeks to determine presence of fish species common to Fort Peck Reservoir.

on Little Dry Creek is about 14 miles by road from Highway 200. Both Big and Little Dry Creeks are low gradient prairie streams and typically consist of long, relatively deep pools covered with layers of sediment, separated by gravel riffles. A 25- x 10-foot seine with 1/4-inch square mesh was used and distances seined ranged from 60 to 300 feet. The results shown in Table 6 indicate channel catfish, white sucker, flathead chub, and silvery minnow were present in all areas sampled. The majority of channel catfish and white sucker captured were young-of-the-year fish with some yearling and older fish also found. Age 0 walleye were found in all stations sampled below the confluence of Big and Little Dry Creeks and also at sites E and F in Big Dry Creek and only at site H in Little Dry Creek. Age 0 shorthead redhorse sucker, river carpsucker, and carp were generally distributed throughout both drainages, while freshwater drum were found only at Stations A and B. No young-of-the-year goldeye were captured but two adults were taken at Station F in Big Dry Creek. Age 0 yellow perch were captured only at Station A and yearling only were taken at sites D and H. A few black bullhead were captured and were all Age 0 fish. Lake chub, longnose dace, sand shiner and fathead minnow were generally common in both drainages.

Two other small tributaries of the Big Dry Arm, Nelson and Timber Creeks, were sampled during August, 1979 to assess their importance as spawning and nursery streams. Sampling indicated the presence of Age 0 white sucker and carp in both creeks and yellow perch and smallmouth buffalo young-of-the-year were captured only in Nelson Creek. Lake chub, silvery and fathead minnows, sand shiner, and longnose dace were found in both streams and flathead chubs were sampled only in Nelson Creek.

The importance of Big and Little Dry Creeks as spawning and nursery streams for a variety of species common to Fort Peck Reservoir is apparent from the sampling efforts. It is particularly significant Age 0 walleye were found generally distributed throughout the lower reaches of both streams as well as at all stations seined below the confluence of Big and Little Dry Creeks. It must be assumed the presence of young-of-the-year walleye were the result of successful reproduction by adults which migrated from the reservoir into Big Dry Creek for spawning since no resident population of walleye are known to inhabit either Big or Little Dry Creeks. Larval fish samples taken near the mouth of Big Dry Creek and near the head of the Big Dry Arm indicated both fertile eggs and prelarval (presence of yolk sac evident) walleye drift downstream into the reservoir and it is probable these fish would remain in the reservoir. It is also possible there may be movement of small walleye back into Big Dry Creek but it seems more likely that some larval walleye remain in the creek through most of the summer and move into the reservoir during the fall and/or the next spring. This was evidenced by the almost complete absence of yearling walleye (only one was captured) in seining samples.

Young-of-the-year channel catfish were captured at all seining stations and were especially abundant at several of these sites. While no major movements of adult channel catfish from the reservoir into Big Dry Creek have been documented, interviews with fishermen and the landowner adjacent to the lower end of this stream indicated such a movement occurs during

Table 6. Species seined in Little and Big Dry Creeks during August, 1979 (X indicates presence).

Station	Approx. Feet Seined	Species																
		Walleye	Yellow Perch	Channel Catfish	Black Bullhead	White Sucker	Shorthead Redhorse Sucker	River Carpsucker	Carp	Freshwater Drum	Goldeye	Flathead Chub	Lake Chub	Longnose Dace	Sand Shiner	Silvery Minnow	Fathead Minnow
A	200	X	X	X		X	X	X	X	X		X	X	X		X	
B	200	X		X	X	X			X	X		X		X	X	X	
C	170	X		X		X		X				X			X	X	
D	300	X	X	X		X	X	X	X			X			X	X	
E	150	X		X		X	X					X	X	X	X	X	
F	60	X		X		X	X	X	X		X	X	X	X	X	X	X
G	120			X	X	X	X					X	X	X	X	X	X
H	160	X	X	X		X	X		X			X	X	X	X	X	X
I	120			X	X	X	X	X	X			X	X	X	X	X	X
J	160			X		X						X	X	X	X	X	X

years of substantial spring flows. Adult fish are commonly captured by seining and hook and line throughout the summer in both Big and Little Dry Creeks indicating there may be a resident population in these streams.

GOLDEYE MONITORING

Two standard goldeye sampling sites in the North Fork of Duck Creek bay were monitored once each month from June through October, 1979. This bay was closed the entire year to all commercial fishing. Two 300-foot floating monofilament gill nets were used in sampling and were set in the afternoon of one day and picked the following morning. These nets consisted of three 100-foot panels, each of a different mesh size to sample various ages and size groups of goldeye. Net I mesh sizes were 1 1/2-, 1 5/8-, and 1 3/4-inch bar mesh and Net II panels were 1 1/4-, 1 1/2-, and 1 3/4-inch bar mesh.

The results in Table 7 show that Net I caught an average of 137.0 fish per set (67.0 percent females) as compared to 99.2 per set (63.5 percent females) in Net II with the greatest percentage of fish (44.0) caught in the 1 1/4-inch bar mesh panel in Net II. Slightly larger fish were caught in the 1 1/2-and 1 3/4-inch bar mesh sizes in Net II and surprisingly, males were of a smaller average size in the 1 5/8-inch bar mesh panel in Net I than in the 1 1/2-inch bar mesh panel in Net II. The results also show that males averaged smaller than females in all mesh sizes in both nets and made up about one-third of the total number of fish sampled. This is typical of goldeye population in this area of the reservoir and indicates the population is not being overharvested by commercial fishing.

Commercial catches of goldeye were sampled at a cleaning and storage plant site each month from June through October, 1979. Catches from the lower 30 miles of the reservoir were sampled during June and October and catches from other areas further than 30 miles up the reservoir were sampled in July, August and September. The catches were harvested by the use of only floating monofilament gill nets of 1 3/4-inch bar mesh. The results in Table 8 show that females comprised over 90 percent of the catches in both areas and were of a larger average size in the lower area. Males from both areas were about the same size.

COMMERCIAL FISHING

Three commercial fishing permits were issued during 1979 which allowed commercial fishing in Fort Peck Reservoir; one of the permittees did not fish in the reservoir. The entire reservoir was open to commercial fishing with the exceptions of the Big Dry Arm, and several areas around the reservoir in the vicinity of cabin developments or popular recreational fishing sites. Also, the approximate lower 30 miles of the reservoir was closed to goldeye netting on June 15 and reopened on September 10. This was primarily done to minimize possible sport-commercial fishing conflicts during the summer months.

Table 7. Results of goldeye sampling at standard monitoring sites in Duck Creek Bay using 300- x 8-foot floating monofilament gill nets during Summer and Fall, 1979.

NET I

No. of Sets	1 1/2-inch Bar				1 5/8-inch Bar				1 3/4-inch Bar				Total No. Fish	Avg. No. Per Net
	Sex	No.	Avg. T.L.	Avg. Wt.	Sex	No.	Avg. T.L.	Avg. Wt.	Sex	No.	Avg. T.L.	Avg. Wt.		
5	M	106	12.6	0.66	M	99	12.7	0.68	M	21	12.8	0.74	226	45.2
	F	135	13.0	0.76	F	180	13.2	0.81	F	144	13.3	0.83	459	91.8
	Total	241	12.8	0.71		279	13.1	0.76		165	13.2	0.82	685	137.0

NET II

	1 1/4-inch Bar				1 1/2-inch Bar				1 3/4-inch Bar					
5	M	100	12.5	0.65	M	61	12.8	0.72	M	20	12.9	0.76	181	36.2
	F	118	13.0	0.78	F	110	13.2	0.80	F	87	13.4	0.85	315	63.0
	Total	218	12.8	0.72		171	13.1	0.77		107	13.3	0.83	496	99.2

Table 8. Sampling results of commercial goldeye catches from upper and lower areas of Fort Peck Reservoir from June through October, 1979.

Area	Month Sampled	Sex	No.	Avg. T.L.	Avg. Wt.	Percentage of Catch
Lower	June, October	M	43	12.6	0.73	9.3
		F	419	13.5	0.85	90.7
	Total		462	13.4	0.83	100.0
Upper	July, August, September	M	65	12.7	0.72	7.6
		F	787	13.2	0.83	92.4
	Total		852	13.2	0.82	100.0

Commercial landings (round weight) for 1979 were: buffalo (smallmouth and bigmouth), 224,200 pounds; river carpsucker, 12,862 pounds; carp, 4,475 pounds; goldeye 258,780 pounds. Table 9 shows the total commercial harvest from Fort Peck Reservoir for years 1957 through 1979.

DISCUSSION

The finding of walleye eggs and prolarvae in Big Dry Creek indicates the importance of this stream to the walleye fishery of Fort Peck Reservoir. However, it is apparent successful reproduction occurs only in years where substantial runoff and adequate reservoir levels coincide to allow fish passage into the stream for spawning. Future investigations should try to determine the extent of walleye migration and reproduction in Big and Little Dry Creeks and also more intensive sampling of larval fish should be done. Seining indicated these streams importance as nursery areas, not only for walleye but for several other species common to the reservoir as well. Tagging of these fingerling fish should be done to determine specific movements and contribution to fishery populations in the Big Dry Arm. With future water withdrawals from Big and Little Dry Creeks for irrigation and perhaps industrial usage a distinct possibility, this information will be useful in making recommendations regarding withdrawals from these streams.

Although the total number of fish trapped and tagged was considerably fewer than in previous years due to a late start in trapping, it is evident that most of adult walleye spawning population had migrated to Big Dry Creek before ice-out occurred. The moderately high number of recaptures (almost 18 percent) out of a total 325 trapped, may be an indication of a relatively small adult population. Continued spring trapping should be done to closely monitor this population in the Big Dry Arm.

The total commercial harvest from Fort Peck Reservoir was just over 500 thousand pounds in 1979 of which about 52 percent were goldeye. This substantial increase in goldeye landings resulted from one licensee switching efforts from catching primarily buffalo to goldeye. Good market conditions in Canada and higher buyer prices have been primarily responsible for the increased harvest of this species. Since the landings are comprised of mainly females, this species should be closely monitored to prevent overharvesting. It is possible quotas or other restrictions will have to be imposed in the near future to reduce the harvest of goldeye.

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Table 9. Total pounds (round weight) of commercial species harvested from Fort Peck Reservoir by commercial fishermen for years 1957 through 1979.

Year	Buffalo sp.	River Carpsucker	Carp	Carp & R.* Carpsucker	Channel** Catfish	Goldeye	Freshwater Drum	Sucker sp.	Total
1957	15,308	7,200	1,500	---	---	---	---	---	24,008
1958	176,091	---	---	25,837	100	17	107	---	202,152
1959	154,770	2,687	13,850	---	462	---	1,875	62	173,706
1960	26,435	11,500	50	---	585	---	---	---	38,570
1961	15,950	950	610	---	790	---	---	---	18,300
1962	130,842	---	---	---	22,215	---	---	---	153,057
1963	263,696	3,440	5,707	---	15,576	49	688	---	289,156
1964	145,706	3,775	1,012	---	7,492	---	1,350	---	159,335
1965	184,003	---	1,400	---	11,666	---	550	---	197,619
1966	266,142	---	---	22,935	16,879	42	2,581	---	308,579
1967	389,083	---	---	35,775	10,066	56,050	4,012	---	494,986
1968	452,230	---	---	100,774	7,749	53,318	5,445	1,625	621,141
1969	323,648	64,718	13,719	---	4,503	199,279	11,759	186	617,812
1970	437,308	49,731	8,944	---	10,619	68,384	19,287	56	594,329
1971	279,831	31,658	1,403	---	13,746	186,310	8,019	1,429	522,396
1972	474,025	40,327	10,992	---	8,060	61,830	9,228	141	604,603
1973	546,657	13,045	3,975	---	2,704	130,061	8,018	---	704,460
1974	376,850	16,719	---	---	1,011	93,825	94	---	500,638
1975	274,091	6,512	---	---	668	129,299	---	---	390,252
1976	402,543	8,456	---	---	---	91,358	---	---	502,357
1977	343,930	8,500	---	---	---	121,868	---	---	474,298
1978	243,166	6,075	---	---	---	105,919	---	---	355,160
1979	224,200	12,862	4,475	---	---	258,780	---	---	500,317
Total	6,146,505	288,155	67,637	185,321	134,891	1,556,389	73,013	3,499	8,455,410

*Not differentiated by commercial fishermen when reported.
**Not allowed as commercial species after June 30, 1975.

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