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1997 ANNUAL REPORT

Abstract: Fisheries data were gathered on Hauser and Holter reservoirs to provide information needed to: 1) manage the fishery of the two reservoirs; 2) evaluate impacts of reservoir operations on the sport fishery; and 3) evaluate the success of the hatchery stocking program. In Hauser Reservoir, 762 anglers were surveyed during the 1997 summer creel (April through October). Angler catch rates for kokanee were the lowest on record at 0.03 fish per hour. Catch rates for rainbow trout improved slightly from 1996 (0.05) to 0.08 fish per hour while yellow perch fishing success fell sharply from 1996 (0.31) to 0.07 fish per hour. Poor fishing in general resulted in only 11.9% of the anglers responding that they were either satisfied or very satisfied with the quality of fishing on Hauser Reservoir. Conversely, 57.1% of the anglers reported they were dissatisfied or very dissatisfied with fishing on Hauser reservoir. In 1997, combined harvest of kokanee and rainbow trout in Hauser Reservoir was approximately 21,300 fish, well below the 1989-management goal of 80,000. Record high water runoff throughout the upper Missouri drainage in 1997 had a dramatic effect on the Hauser kokanee fishery.

Gill net catches in Hauser Reservoir were similar to previous years with kokanee and rainbow dominating the catch in floating and vertical gill nets, while white and longnose suckers dominated the sinking gill net catch. Kokanee caught in summer vertical gill nets (July through September) was down markedly from 1996. The decline was due to a weak year class of age-1 kokanee produced in 1996 and suspected flushing losses that occurred due to record high runoff

in 1997 (average annual discharge at Toston was 46.4% above the long-term average, Ron Schields, USGS, personal communication). Water was spilled over Hauser dam every day in 1997. Hydroacoustic estimates of pelagic fish abundance in Hauser Reservoir declined by half from 1996 (400,000 to 200,000).

In Holter Reservoir, 878 anglers were interviewed during the summer creel survey. Rainbow trout dominated angler catch (51%), with yellow perch displacing kokanee as the second most prevalent fish (33.7%), kokanee (12.1%), and walleye (2.8%). The 1997 catch rate for rainbow trout was 0.11 fish per hour, a decline from 1996 (0.21). Approximately 97% of the rainbow trout harvested by anglers were of known hatchery origin, while 71% of rainbow trout captured in gill nets were of hatchery origin. The contribution of wild fish in gill net catches increased to 29%, up from 17% in 1996 but still well below the 12-year average (42%). Answers to angler-satisfaction questions revealed that only 13.2% of the anglers were satisfied or very satisfied with the number of fish they caught, while 41.5% of anglers who caught fish were satisfied with fish size. The winter ice fishery remained slow with angler catch rates for yellow perch of only 0.38 fish per hour. The average winter catch rate for yellow perch between 1989 and 1995 was 3.3 fish per hour. Conversely, winter catch rates for rainbow trout was good at 0.24 fish per hour.

Kokanee salmon caught in spring and fall floating gill nets reached an 11-year low. Suckers (white and longnose) dominated the catch in both spring and fall sinking gill nets while yellow perch catch rates reached a 12-year low in both spring (5.0 per net) and fall (1.2 per net) sinking nets. Fall catch rates for walleye in horizontal nets were 2.6 fish per net with the average length being 18.3 inches. Kokanee captured in summer vertical gill nets (July through September) fell dramatically from 200 (87% age-2) in 1996 to 11 in 1997. Trap nets were fished for 52 net nights capturing 64 walleye. Perhaps the most surprising result from the walleye tagging effort has been the number of tagged walleye being caught in the Missouri River below Holter Dam. Since 1988, 19% (28 of 144) of tag returns were from walleye caught below Holter Dam. Since 1995, 54% (22 of 41) of tag returns were from walleye caught below Holter Dam.

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PROCEDURES

The study area has been previously described by Rada (1974), Berg and Lere (1983) and MFWP (1985). A map of the two reservoirs is presented in Figure 1. Reservoir fish were sampled with floating and sinking 6 x 125-foot experimental gill nets (0.75 to 2-inch mesh). Nets were set in each reservoir during the spring and fall in similar locations to those used between 1986-1996. Distribution of fish species by depth was determined by using a gang of six vertical gill nets that are 150 feet deep and 12 feet wide (0.5, 0.75, 1, 1.25, 1.5 and 2.0 inch mesh). Vertical nets were set monthly from April through October at permanent sampling stations located at the lower end of each reservoir (the Dam station on Hauser Reservoir and the Jackson station on Holter Reservoir). Single-lead trap nets (4 x 6 foot frame with either 1" or ½" mesh) were used to sample yellow perch and walleye on Holter Reservoir in spring 1998. A partial creel census was conducted on Hauser and Holter reservoirs from April through October. Procedures for this partial creel census are described in Lere (1987). An additional partial creel survey was conducted during ice cover on the two reservoirs from January through March. Hydroacoustic methods used to estimate pelagic fish densities and total fish abundance are described in Skaar and Humphrey (1995). In 1997, hydroacoustic surveys were completed between 25 and 27 August.

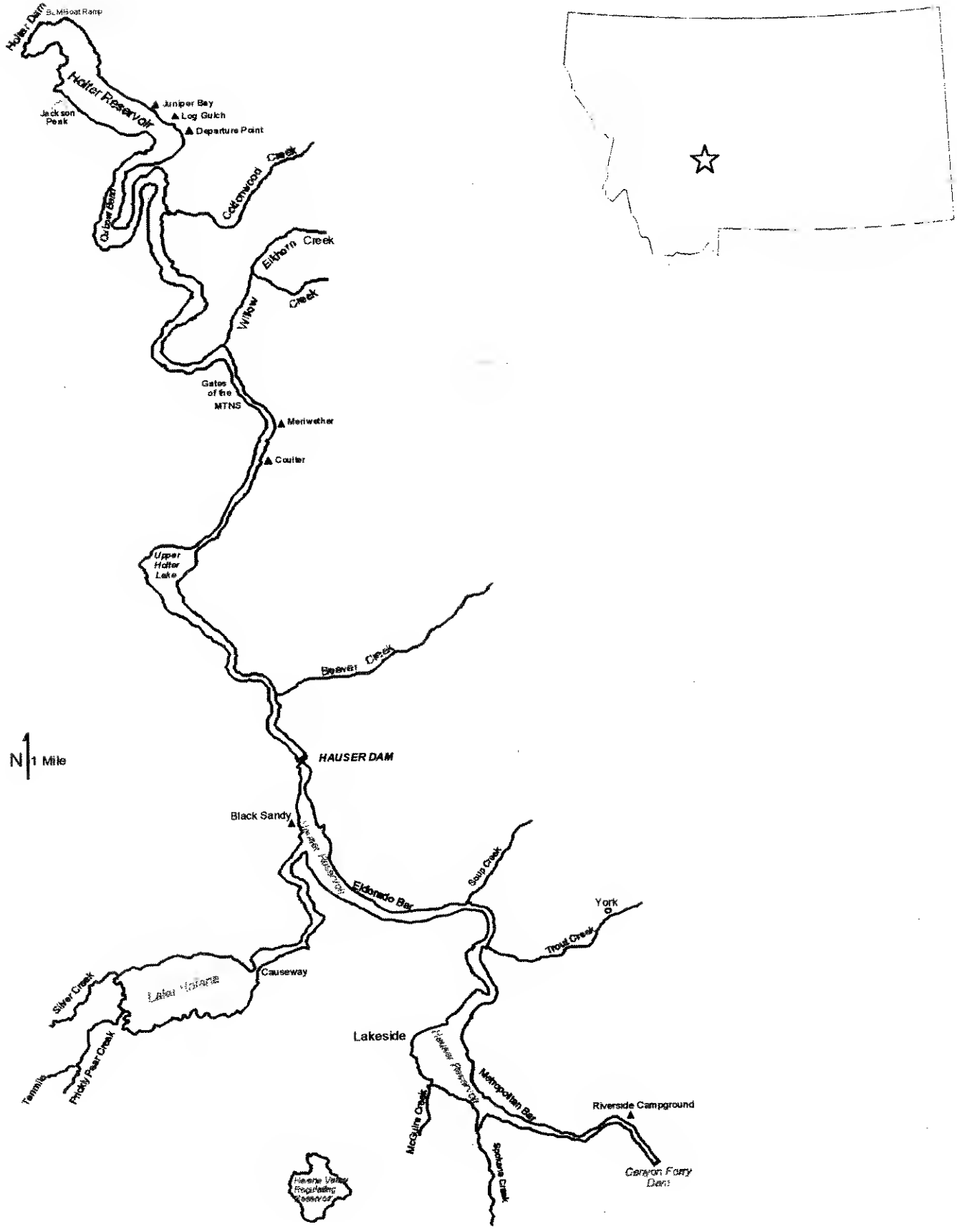

Figure 1. Map of Hauser, Holter and the Helena Valley Regulating Reservoirs.

Hauser Reservoir

Creel Surveys

Summer Creel : In 1997, 762 anglers were interviewed during the weekend summer creel on Hauser Reservoir. Average time spent fishing was 2.8 hours for shore anglers (40 interviews) and 4.2 hours for boat anglers (155 interviews). Total catch was 154 yellow perch, 70 kokanee, 167 rainbow, and 8 brown trout. Catch rates for each species varied greatly by season (Figure 2). Kokanee fishing, although relatively poor throughout the year, was best in June. Yellow perch catch rates peaked in September followed by rainbow trout in October.

Angler catch rates for rainbow trout remained stable at 0.08 fish per hour; slightly below the twelve-year average (0.11) (Table 1). Angler catch rates and harvest for rainbow trout have dropped sharply since the late 1980's following reductions in numbers planted each year (200,000 fish in the late 1980's to roughly 100,000 in recent years) (Figure 3). However, angler catch rates declined one year prior to the reduction in stocking and spring floating gill net catches do not corroborate this trend as the reduction in rainbow caught in gill nets occurred prior to the reduction in stocking (Appendix J). Further complicating this analysis is that angler catch rates for kokanee salmon peaked during this period (Table 1) which may have compensated for the low rainbow catch rates. The mean length for rainbow in the creel decreased slightly in 1997 from 17.5" to 16.9". Of the 31 rainbow trout checked during the summer creel, 96.8% were of known hatchery origin and 3.2% were classified as wild.

Kokanee harvest in Hauser Reservoir declined from an estimated high 141,000 in 1991 to only 7,400 in 1997 (Table 1). The 1997 catch rate plummeted to 0.03 fish per hour, a twelve-year low and significantly below the twelve-year average of 0.20 fish per hour. However, the average length of kokanee harvested increased from 14.1" to 16.8". The increase in size was due to the dominance of age-2 kokanee in the creel with 65.3% of fish harvested being 16 to 17.9 inches. The largest fish creeled was 20.8 inches and 3.03 pounds.

Angler responses to questions regarding satisfaction with the fishing at Hauser Reservoir were consistent with the low catch rates. The majority of respondents (57.1%) were either dissatisfied or very dissatisfied with the number of fish caught (Table 4). However, the majority of anglers possessing fish (53.3%) were satisfied or very satisfied with overall fish size.

Table 1. Summer catch rates, mean size, and harvest of selected species in Hauser Reservoir. Harvest estimates include winter ice fishing.

	RAINBOW			KOKANEE			YELLOW PERCH		
Year	Catch rate (fish/hr)	Mean Size (inches)	Harvest (X 1000)	Catch rate (fish/hr)	Mean Size (inches)	Harvest (X 1000)	Catch rate (fish/hr)	Mean Size (inches)	Harvest (X 1000)
1986	0.25	13.5	-	0.10	16.6	-	0.13	8.6	-
1987	0.24	14.2	-	0.13	15.6	-	0.12	9.7	-
1988	0.24	15.8	-	0.24	16.3	-	0.06	9.6	-
1989	0.12	13.7	25.5	0.42	14.6	101.4	0.10	7.7	27.2
1990	0.10	14.9	27.8	0.22	15.7	60.9	0.17	8.9	38.9
1991	0.02	15.3	7.8	0.46	14.7	141.3	0.08	8.1	36.8
1992	0.05	15.1	13.0	0.22	15.8	78.4	0.16	9.0	55.4
1993	0.05	16.3	16.5	0.22	16.0	89.3	0.05	9.0	49.4
1994	0.02	16.6	4.2	0.15	14.8	37.1	0.15	10.6	38.2
1995	0.05	17.5	11.5	0.11	17.0	29.1	0.16	8.9	23.2
1996	0.05	17.5	14.8	0.10	14.1	17.4	0.31	9.4	35.0
1997	0.08	16.9	13.9	0.03	16.8	7.4	0.07	8.4	19.0
Mean	0.11	15.6	15.0	0.20	15.7	62.5	0.13	9.0	35.9

Harvest estimates for 1986 - 88 were not estimated because creel surveys were not completed during winter months.

Winter Creel: Ice fishing in 1997 saw a modest rebound in angling success from low 1996 levels (Table 2). The majority (78%) of the 297 anglers interviewed were from the Helena area spending an average 2.28 hours fishing. Yellow perch were the principal species targeted with a catch rate of 0.34 fish per hour; below the nine-year average (0.45 fish per hour). Perch in the creel averaged 7.6" with 9.2" and 0.4 pounds being the largest fish. Rainbow averaged 15.2" with the largest fish creeled being 20.3" and 3.55 pounds. Rainbow catch rates improved to 0.08 fish per hour, slightly above the nine year average (0.07 fish per hour). Kokanee, brown trout and burbot remained scarce; only six, zero and two were checked respectively.

Table 2. Total catch, number of interviews and angler catch rates from winter creel surveys on Hauser Reservoir.

			Catch Rates (fish per hour)			
Year	**# of Interviews**	**Total Fish**	**Rainbow**	**Brown**	**Kokanee**	**Perch**
1989	573	882	0.18	0.01	0.23	0.20
1990	300	337	0.11	<0.01	0.18	0.20
1991	451	723	0.08	0.01	0.18	0.60
1992	566	1177	0.02	<0.01	0.30	0.45
1993	635	2234	0.04	0.01	0.47	0.88
1994	197	457	0.01	0.02	0.03	0.76
1995	323	624	0.04	<0.01	0.06	0.45
1996	247	141	0.04	<0.01	<0.01	0.15
1997	297	281	0.08	0.00	0.01	0.34
Mean	399	762	0.07	0.01	0.16	0.45

Trend Netting and Hydroacoustic Estimates of Fish Abundance

***Floating Gill Nets*:** Species composition collected in spring and fall horizontal gillnets are shown in Appendix A - D. In 1997, spring catch in floating nets was 3.1 rainbow trout per net while fall netting yielded 2.3 rainbow per net. Rainbow trout classified as wild accounted for 15% of the total rainbow catch in spring and fall floaters. This is slightly above the long-term average of 10%.

Vertical Gill Nets: Total catch of age-1 and age-2 kokanee reached a record low in 1997. High water releases from Hauser dam (turbine discharge plus spill) is suspected in flushing a large percentage of the kokanee population out of Hauser in 1995, 1996 and 1997 (Figure 4).

Beach Seine: Walleye captured in beach seines on Hauser in 1997 were the highest ever recorded (Table 3). Possible explanations for this anomaly are that transplanted Canyon Ferry walleye (Appendix M) or resident Hauser walleye were successful in spawning. In addition, young-of-the-year walleye may have flushed from Canyon Ferry during the record high water of 1997. Yellow perch and sucker captured in beach seines fell sharply from 1996 levels however, these trends continue to fluctuate widely on an annual basis.

Table 3. Number of fish per beach seine in Hauser Reservoir 1990-1997.

		Number per Tow		
Year	Number of Tows	Yellow Perch	Suckers	Walleye
1990	2	15.5	---	0.0
1991	20	36.6	---	0.0
1992	20	1153.1	107.6	0.0
1993	20	145.0	1105.9	0.0
1994	20	52.8	729.6	0.0
1995	20	47.0	187.5	0.1
1996	19	232.0	573.6	0.0
1997	20	58.0	81.5	2.7
Mean	18	217.5	464.3	0.4

Hydroacoustic Estimates of Kokanee Abundance:

Hauser reservoir hydroacoustic transects were esonified from Eldorado Bar downstream to the Dam including the lower half of the Causeway Arm to estimate kokanee abundance (areas described are shown in Figure 1). Upper sections of the reservoir were excluded from analysis because very few kokanee were sampled in gill nets above Eldorado Bar. Target densities ranged from 7 to 176 fish per acre with the highest values around Eldorado Bar and lowest around Black Sandy. Total fish abundance in the lower section of the reservoir was 200,000 ± 100,000. Results from vertical gill nets indicated that 36.9% of the targets were kokanee. Sucker species (longnose and white) (56.4%), rainbow trout (3.9), brown trout (1.9%) and walleye (0.9%) accounted for the remainder of the targets. The 1997 kokanee population is estimated to be 73,800; a decline of 249,800 (77%) from 1996. Based on these data the rainbow trout population also declined from 19,200 in 1996 to 7,800 in 1997. An estimated 3,800 brown trout and 1,800 walleye were counted during the 1997 hydroacoustic effort.

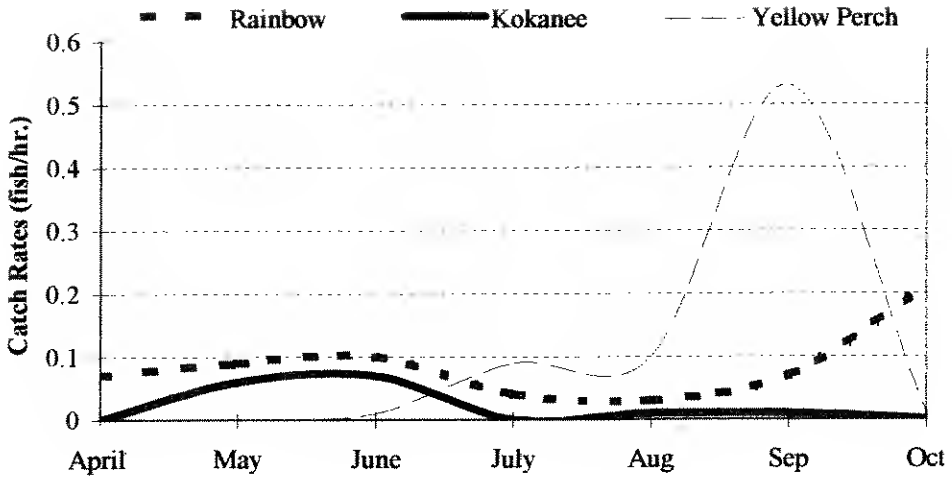

Figure 2. Angler catch rates by season for selected species in Hauser Reservoir. Walleye catch rates for 1997 (all months combined) was 0.001 fish per hour.

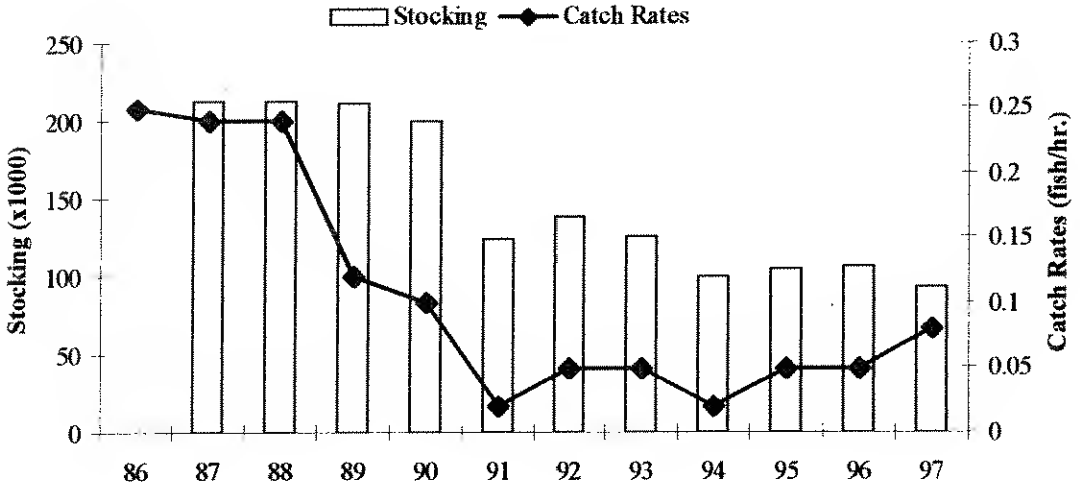

Figure 3. Rainbow planting records and angler catch rates in Hauser Reservoir. Planting records were offset one year to reflect the period when the plant has the greatest impact on the fishery.

Table 4. Angler satisfaction with total catch and size of fish caught in Hauser Reservoir 1996 and 1997. Satisfaction with size of fish dealt only with anglers possessing fish.

	Number of Fish		Size of Fish	
	1996	1997	1996	1997
Very satisfied	21.6%	0.6%	58.4%	4.8%
Satisfied	1.6%	11.3%	2.9%	48.6%
No strong Opinion	18.3%	30.9%	0.0%	31.5%
Dissatisfied	2.1%	42.8%	5.2%	0.0%
Very Dissatisfied	56.4%	14.3%	33.5%	15.1%

Miscellaneous Fisheries Management Activities

Yellow Perch habitat enhancement:

Yellow perch spawning habitat structure was placed in the Causeway arm of Hauser reservoir during the summer of 1997. This project was a cooperative effort involving Helena Chapter of Walleyes Unlimited and MFWP. Twenty-two juniper structures (weighted, bundled juniper trees) were placed at a target depth of 20 feet approximately eight to ten feet apart.

Walleye Relocation:

Fifty-nine adult walleye (35 females, 24 males) were transplanted from Canyon Ferry to the Causeway arm during late April and early May of 1997. These fish were removed from Canyon Ferry in an attempt to reduce the reproductive potential of this illegally introduced species. Average length and weight of these fish was 23.8" and 6.6 pounds respectively. These fish ranged from age-2 to age-11. Fifty-four of these fish were spawning ripe or gravid condition. All fish were monel (jaw tagged) tagged prior to release.

Water Retention:

Hauser reservoir experienced record low water retention times in 1997 as a result of record runoff. Record snowpack, rapid snowmelt runoff accompanied by heavy rains created the highest recorded inflows into Canyon Ferry reservoir during the April through July 1997 measurement period. June inflows to Canyon Ferry were 209% of average. As a result, Hauser dam spilled water continuously throughout 1997 (Appendix M).

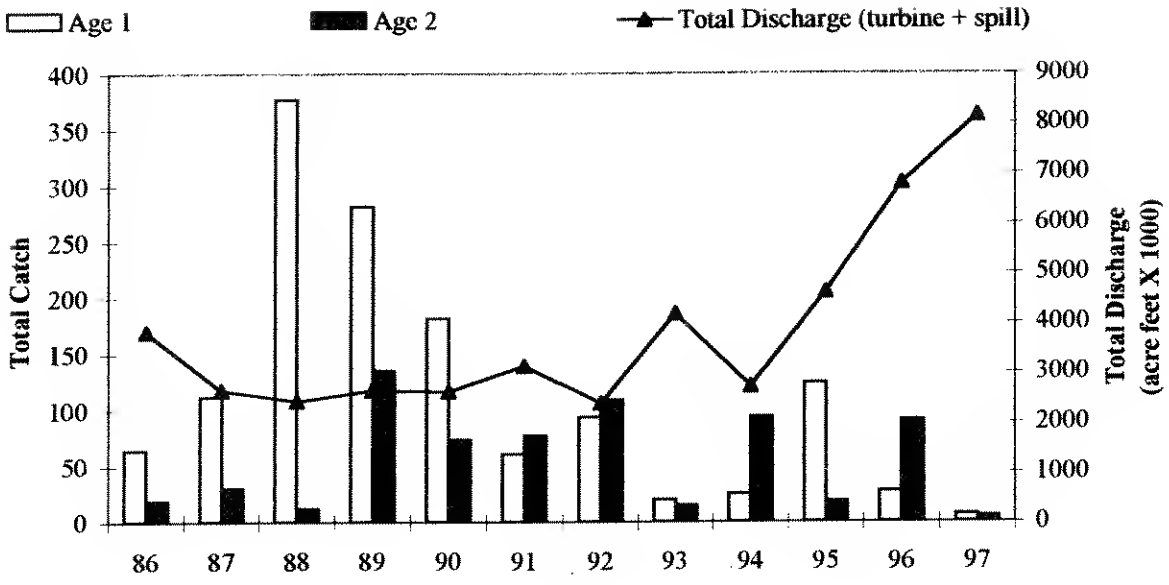

Figure 4. Total number of kokanee salmon captured in summer (July through September) vertical gillnets in Hauser Reservoir and total discharge (turbine plus spill) from Hauser dam, 1986 through 1997.

HOLTER RESERVOIR

Creel Surveys

Summer Creel: A total of 878 anglers were interviewed during the weekend summer creel on Holter Reservoir. Most of the anglers (58%) traveled from Great Falls and spent an average 4.1 hours fishing. Total creeled catch was 328 rainbow trout, 78 kokanee salmon, 217 yellow perch, 18 walleye, and 2 brown trout. Catch rates (fish per angler hour) were 0.11 for rainbow trout, 0.02 for kokanee and 0.07 for yellow perch. Monthly catch rates for rainbow trout, kokanee salmon and yellow perch were consistently poor during the summer creel (Figure 6). The only exception in the seasonal pattern was good rainbow fishing in April and May (0.25 and 0.22 fish per angler hour; Figure 6). Yellow perch showed a slight peak in June (0.16 fish per hour) but overall catch rates were dramatically lower than 1996 levels

Catch rates and total harvest for rainbow trout are shown in Table 5. An estimated 38,400 rainbow trout were harvested in 1997; a decline of nearly 9,000 from 1996. Creeled rainbow trout averaged 15.5 inches and 1.48 pounds, which is similar to the 10-year average.

Wild rainbow trout have comprised between 0% and 14% of the fish harvested by anglers in Holter Reservoir since 1990. In 1997, an estimated 10.4% of the rainbow trout harvested were classified as wild fish (Figure 7). In an effort to increase the wild component of the Holter fishery, Eagle Lake strain rainbow have been stocked since 1996, replacing the more domesticated Arlee strain. Eagle Lakes were selected for wild characteristics they reportedly exhibit such as pioneering spawning tributaries. The Eagle Lake stocking program alternates every other year between age-1 plus and age-0 plus fish attempting to maximize survival rates. In 1997, 371,441 age-0 plus Eagle Lake rainbow were planted into Holter reservoir.

In 1997, an estimated 5,800 kokanee were harvested from Holter Reservoir. Kokanee harvest fell sharply from 1996 levels (32,000; Table 5) due largely to the loss of the record year class of age-2 kokanee. The majority of Holter spawners in 1996 were determined to be age-2 fish (Teuscher and Humphrey 1997) however, kokanee in Holter have demonstrated that undetermined factors are limiting successful spawning. The average size of kokanee in the creel increased to 16.9 inches and nearly doubled from 1996 levels to 2.20 pounds. This increase in size is resultant of the strong 1995 cohort recruited to the 1997 creel as age-3 fish. Yellow perch fishing improved slightly from 1996 levels (0.04 perch per hour; Table 5) to 0.07; still well below the long-term average of 0.33 fish per hour. Approximately 28,800 yellow perch were

harvested in 1997, significantly less than the than the average harvest of approximately 243,730 (Table 5). Average length of yellow perch in the creel decreased from 9.5 to 7.8 inches in 1997.

Results from the angler satisfaction survey showed that 67.2% of anglers were either dissatisfied or very dissatisfied with the number of fish caught while only 13.2% were either satisfied or very satisfied (Table 9). Less than half of anglers who possessed fish (41.5%) responded that they were satisfied or very satisfied with the size of fish caught (Table 9).

Table 5. Summer catch rates, mean size, and harvest of selected species in Holter Reservoir. Harvest estimates include winter ice fishing.

	RAINBOW TROUT			KOKANEE SALMON			YELLOW PERCH		
Year	Catch rate (fish/hr.)	Mean Size (in)	Harvest (x1000)	Catch rate (fish/hr.)	Mean Size (in)	Harvest (x1000)	Catch rate (fish/hr.)	Mean Size (in)	Harvest (x1000)
1986	0.34	13.9	---	0.01	16.9	---	0.16	---	---
1987	0.37	13.8	---	0.01	16.7	---	0.39	8.8	---
1988	0.32	13.7	---	0.01	16.8	---	0.37	---	---
1989	0.27	14.5	57.1	0.01	16.1	2.1	0.85	9.0	330.0
1990	0.26	14.2	59.2	0.11	16.1	24.3	0.53	9.2	297.2
1991	0.27	12.6	62.3	0.10	15.2	22.4	0.40	8.6	237.7
1992	0.22	14.1	53.2	0.09	16.6	20.4	0.52	8.9	492.9
1993	0.14	15.9	33.7	0.06	16.1	12.0	0.22	9.1	313.2
1994	0.03	14.7	10.4	0.06	16.2	13.4	0.34	9.5	336.9
1995	0.16	14.1	20.1	0.03	15.7	4.3	0.08	9.5	108.6
1996	0.21	13.8	47.4	0.16	14.1	32.1	0.04	9.5	50.3
1997	0.11	15.5	38.4	0.02	16.9	5.8	0.07	7.8	26.8
Mean	0.23	14.2	42.4	0.06	16.1	15.2	0.33	9.0	243.7

Harvest estimates for 1986 - 88 were not estimated because creel surveys were not completed during winter months.

Winter Creel: A total of 283 anglers were interviewed during the ice-fishing season on Holter Reservoir. Catch rates were 0.38 for yellow perch and 0.24 for rainbow trout. Yellow perch catch rates have significantly declined in recent years with catch rates for yellow perch averaging 2.7 fish per angler hour (1989 through 1997). Perch fishing peaked in 1992 at 5.6 perch per angler hour (Table 6). Reasons for the decline are unknown, however, overharvest does not appear to be a major factor. MFWP examined the potential for overharvest and determined that a very small percentage of anglers were harvesting more than 25 perch (MFWP memo). Unlike the perch fishery, catch rates for rainbow trout exceeded the 9-year mean of 0.19 fish per hour. Average size of the rainbow trout creeled was 15.3" and 1.40 lbs. The majority of the fish creeled were between 14.5" and 16.4" (age 2+). Only two kokanee were creeled on Holter Reservoir during the 1997 ice fishing season.

Table 6. Anglers catch rates on Holter Reservoir during the ice-fishing season. Catch rates for walleye and brown trout were less than 0.01 for all years.

			Catch Rates (fish per hour)		
Year	# of Interviews	Total Catch	Raiobow	Kokanee	Perch
1989	493	4708	0.23	<0.01	2.95
1990	346	3597	0.24	<0.01	3.05
1991	547	6162	0.27	0.02	3.57
1992	166	2930	0.23	<0.01	5.60
1993	486	4487	0.09	<0.01	2.73
1994	349	4519	0.07	<0.01	3.79
1995	121	624	0.06	0.00	1.69
1996	160	403	0.25	0.00	0.65
1997	283	476	0.24	0.00	0.38
Mean	328	3101	0.19	0.01	2.71

Trend Netting and Hydroacoustic Estimates of Fish Abundance

Floating Gill Nets: Species composition for spring and fall horizontal gillnets are shown in Appendix E - H. Rainbow trout were captured in floating gill nets at the rate of 7.4 per net in the spring and 5.8 in the fall. Numbers of rainbow caught in the spring were above the 12-year average (6.4) while fall catch rates were below this average (7.6 fish per net). Approximately 70% of the rainbows were of hatchery origin (Figure 7); a 57% increase in the wild component from 1996. Fish averaged 15.6" in spring nets with 39% falling between 13.5" and 15". These fish are likely age-2+ Eagle Lake strain planted in 1996 as age-1+.

The fall net series revealed a record low catch of age-1 and age-2 kokanee (Figure 8). Only 7 kokanee were collected; six of which were age-3 kokanee. Average size and weight of these fish was 18.9" and 2.55 pounds respectively. The age-3 fish are likely holdovers from the very large number of age-1 fish flushed from Hauser in 1995 (Figure 8).

Vertical Gill Nets: Vertical gill net trends mirrored fall horizontal results, with kokanee numbers crashing in 1997 (Figure 8). Summer (July through September) catches of kokanee in 1995 and 1996 were extremely high compared to previous years. However, in 1997 only 11 fish were collected in summer verticals with 8 being age-3. These results are consistent with 1995 and 1996 results where the age-1 cohort that appeared in 1995 continued to dominate the population structure as age-2 kokanee in 1996 and age-3 in 1997.

Beach Seine: Beach seine results are shown in Table 7. Yellow perch numbers continued to be very low while suckers were collected at rates above the six-year mean. Walleye numbers remained constant at the eight-year mean of 0.6 walleye per tow.

Table 7. Beach seine results (number of fish per tow) in Holter Reservoir (1990-1997).

		Number per Tow		
Year	Number of Tows	Yellow Perch	Suckers	Walleye
1990	7	125.1	---	0.0
1991	20	274.2	---	2.5
1992	20	622.2	147.2	0.0
1993	20	38.0	52.5	<0.1
1994	19	169.7	288.6	0.0
1995	16	80.3	120.9	1.0
1996	19	32.4	385.5	0.6
1997	20	32.0	327.4	0.6
Mean	18	171.7	220.4	0.6

Hydroacoustic Estimates of Fish Abundance: Total pelagic fish abundance in Holter reservoir was an estimated 1.52 million. Based on the ratio of fish caught in vertical gill nets (run concurrent with hydroacoustic estimates), approximately 24.5% of the targets were kokanee salmon and 22.6% were rainbow trout. Suckers (white and longnose) comprised 35.9% of fish collected in vertical nets. The resultant population estimates for kokanee salmon and rainbow trout are 373,000 and 344,000 respectively. It is important to note that the above estimates are for the area from Oxbow Bend to the Dam.

Trap Netting: Trap net results are shown in Table 8. Trap nets were fished from 28 April to 8 May 1998. Sixty-four walleye, 1,890 yellow perch, and 124 rainbow trout were sampled in 52 net nights. Sampling focused on collection of yellow perch in the area between split-rock and the dam. Yellow Perch were marked (right pelvic clip) to estimate angler exploitation. Mean length of yellow perch sampled in trap nets was 6.7"; females averaged 8.5" while males averaged 6.4" (Figure 5). Based on length at age analysis conducted on yellow perch from Holter Reservoir, average females are estimated at five with males estimated at three years. Further evaluation using MocPop model parameters estimate the fecundity of the average sized female is approximately 18,000 eggs (MFWP internal memo). Walleye averaged 19.2" for males 26.3" for females. As stated, 1998 tagging efforts targeted yellow perch as opposed to walleye as in years past. Therefore, fewer walleye were collected and no previously tagged fish were collected.

Table 8. Numbers and species of fish captured in trap nets in Holter Reservoir.

			WALLEYE				PERCH		RAINBOW
			Total Catch		Mean Length (in)				
Year	Dates	Nets	♂	♀	♂	♀	Total	# of Clips	Total
1995	4/26-5/12	52	250	59	22.4	26.6	3,281	1,251	84
1996	4/25-5/17	69	181	60	22.9	26.0	1,558	1,100	350
1997	4/29-5/13	45	66	29	22.3	25.5	2,025	1,638	247
1998	4/28-5/8	52	32	11	19.2	26.3	1,890	1,478	124
AVE	——→		132.5	39.8	21.7	26.1	2,189	1,367	201

Walleye tagging: In an effort to estimate angler harvest, walleye caught in trend and trap net operations have been tagged with dangler and more recently monel (jaw tags). The tagging effort began in 1988 with a total of 1,119 walleye being tagged. To date, 126 (11.3%) of the tags have been returned. Surprisingly, 22 of the 41 (54%) tag returns since 1995 were from walleye caught below Holter Dam. Annual tagging and return data are presented in Appendix L.

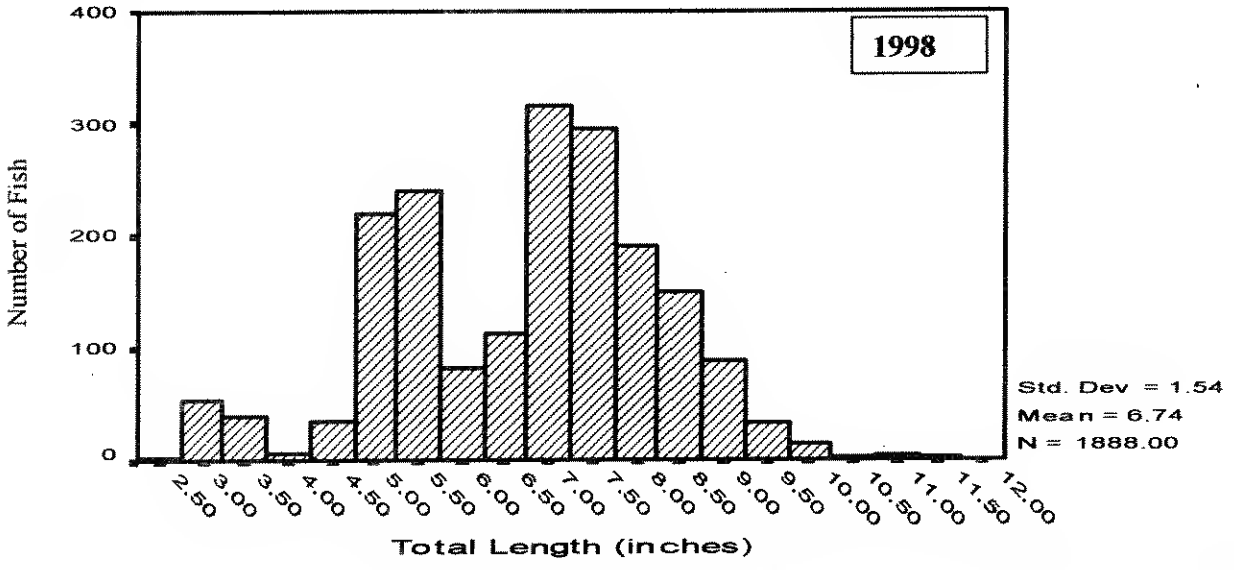

Figure 5. Length frequency of yellow perch collected in 1998 spring trap nets in Holter reservoir.

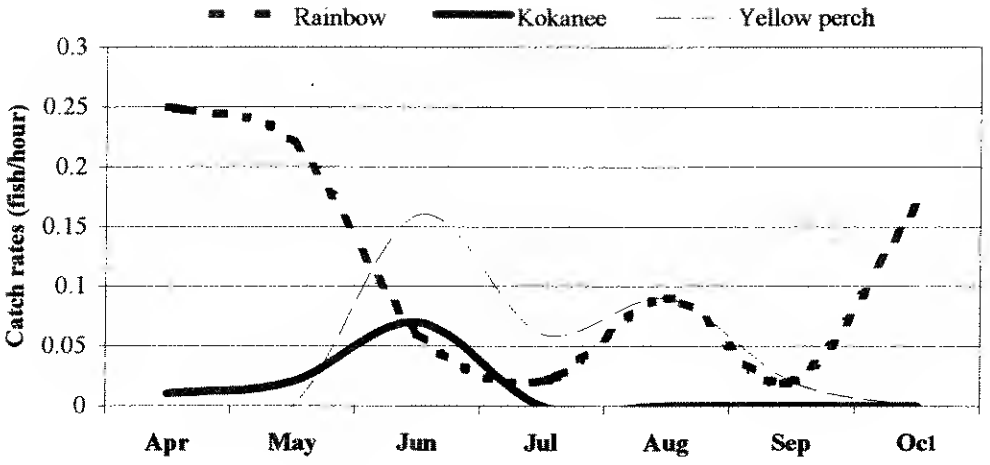

Figure 6. Angler catch rates by season for selected species in Holter reservoir.

Table 9. Angler satisfaction with total catch and size of fish caught in Holter Reservoir for 1996 and 1997. Satisfaction with size of fish dealt only with anglers possessing fish.

	Number of Fish		Size of Fish	
	1996	1997	1996	1997
Very Satisfied	33.4%	1.7%	61.4%	4.9%
Satisfied	2.8%	11.5%	6.0%	36.6%
No Strong Opinion	14.5%	19.6%	4.1%	37.2%
Dissatisfied	2.7%	44.2%	4.4%	19.1%
Very Dissatisfied	46.6%	23.0%	24.2%	2.2%

APPENDICES

Appendix A. Number per net (percent composition) by species for spring floating gillnet catches in Hauser Reservoir.

SPECIES	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
RB	14.4(29.0)	3.7(9.7)	2.9(17.7)	2.2(13.2)	0.9(5.4)	1.9(7.8)	3.1(12.7)	2.3(17.2)	1.6(7.0)	4.6(39.0)	1.7(9.5)	3.1(19.2)
LL	0.1(0.2)	0.5(1.3)	0.1(0.6)	0.3(2.0)	0.3(1.6)	0.2(0.7)	0.7(3.0)	0.2(1.6)	0.5(2.0)	0.1(1.0)	0.3(1.9)	0.1(0.7)
KOK	1.4(2.9)	13.8(36.0)	11.7(71.3)	12.4(74.2)	14.9(88.6)	21.1(85.6)	11.6(47.6)	9.2(68.0)	12.5(56.1)	6.8(58.1)	12.9(73.4)	6.8(41.8)
MWF	0.1(0.2)	0.0	0.2(1.2)	0.0	0.0	0.1(0.4)	0.0	0.0	0.0	0.0	0.0	0.0
WE	0.0	0.0	0.0	0.0	0.0	0.0	0.3(1.1)	0.0	0.1(0.4)	0.0	0.0	0.1(0.7)
YP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1(0.8)	0.1(0.4)	0.0	0.0	0.0
LNSU	26.3(52.9)	13.7(35.8)	1.0(6.1)	0.9(5.3)	0.3(1.6)	0.5(1.8)	2.6(10.9)	0.3(2.5)	4.6(20.9)	0.1(1.0)	0.8(5.7)	3.0(18.5)
WSU	6.9(13.8)	6.3(16.4)	0.5(3.1)	0.9(5.3)	0.5(2.7)	0.4(1.5)	5.9(24.3)	1.2(9.0)	2.8(12.7)	0.1(1.0)	1.4(9.5)	3.1(19.2)
CARP	0.2(0.5)	0.0	0.0	0.0	0.0	0.0	0.1(0.4)	0.0	0.0	0.0	0.0	0.0
U.CHUB	0.2(0.5)	0.3(0.8)	0.0	0.0	0.0	0.6(2.2)	0.0	0.1(0.8)	0.1(0.4)	0.0	0.0	0.0
TOT #	448	383	164	151	185	271	267	122	244	105	158	146
# NETS	9	10	10	9	11	11	11	9	11	9	9	9

Appendix B. Number per net (percent composition) by species for fall floating gillnet catches in Hauser Reservoir.

SPECIES	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
RB	8.0(31.3)	6.6(44.2)	16.7(42.0)	6.5(20.9)	6.0(16.5)	3.1(8.1)	4.7(15.0)	3.2(17.7)	3.0(17.0)	2.2(13.1)	3.6(17.5)	2.3(44.6)
LL	0.6(2.5)	0.2(1.2)	0.6(1.4)	0.3(0.9)	0.2(0.5)	0.3(0.7)	0.1(0.3)	0.1(0.5)	0.2(1.0)	0.4(2.2)	0.3(1.3)	0.4(7.1)
KOK	14.6(57.3)	3.7(25.1)	19.1(47.9)	22.6(73.2)	28.9(79.3)	26.7(70.0)	25.6(81.5)	13.7(76.3)	9.2(52.1)	13.5(81.4)	15.5(74.6)	2.1(41.1)
MWF	1.1(4.3)	0.0	0.4(0.9)	0.1(0.3)	0.3(0.7)	0.2(0.5)	0.2(0.6)	0.0	0.1(0.5)	0.1(0.5)	0.0	0.0
WE	0.0	0.0	0.0	0.0	0.0	0.2(0.5)	0.0	0.0	0.0	0.0	0.4(1.8)	0.1(1.8)
YP	0.2(0.7)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LNSU	0.4(1.4)	1.9(12.9)	1.0(2.5)	0.3(0.9)	0.1(0.2)	0.0	0.1(0.3)	0.0	2.5(13.9)	0.0	0.2(0.9)	0.1(1.8)
WSU	0.3(1.1)	2.4(16.0)	0.2(0.5)	0.1(0.3)	0.1(0.2)	0.0	0.3(0.9)	0.2(1.0)	2.1(11.9)	0.4(2.2)	0.4(1.8)	0.2(3.6)
CARP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1(0.4)	0.0
U.CHUB	0.4(1.4)	0.1(0.6)	1.9(4.8)	1.1(3.5)	0.9(2.5)	7.7(20.2)	0.5(1.4)	0.8(4.5)	0.6(3.6)	0.1(0.5)	0.4(1.8)	0.0
TOTAL #	281	163	438	339	401	420	346	198	194	183	228	56
# NETS	11	11	11	11	11	11	11	11	11	11	11	11

Appendix C. Number per net (percent composition) by species for spring sinking gillnet catches in Hauser Reservoir.

SPECIES	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
RB		0.2(0.2)	0.0	0.0	0.0	0.0	0.0	0.0	0.2(0.4)	0.0	0.0	0.3(0.4)
LL		1.4(1.5)	0.8(1.2)	0.8(0.9)	0.7(0.7)	1.2(1.2)	0.2(0.2)	1.7(2.6)	1.3(3.0)	1.2(1.4)	1.0(1.4)	1.0(1.2)
KOK		1.0(1.1)	2.8(4.2)	1.7(1.7)	2.5(2.7)	3.3(3.1)	0.5(0.7)	7.5(11.5)	3.2(7.2)	1.5(1.9)	0.2(0.2)	0.5(0.6)
MWF		3.6(3.8)	3.7(5.4)	2.3(2.4)	1.8(2.0)	3.2(3.0)	1.2(1.7)	1.3(2.0)	0.7(1.5)	2.2(2.7)	0.7(0.9)	0.5(0.6)
WE		0.0	0.0	0.2(0.2)	0.0	0.0	0.5(0.7)	0.0	0.3(0.8)	0.0	0.0	0.3(0.4)
YP		4.4(4.7)	7.2(10.6)	5.5(5.8)	12.3(13.5)	14.5(13.7)	15.2(21.5)	11.2(17.1)	5.8(13.3)	2.5(3.1)	3.7(5.1)	4.7(5.5)
LNSU		21.8(23.0)	12.2(17.9)	21.3(22.3)	17.8(19.5)	22.2(20.9)	13.8(19.6)	15.3(23.5)	14.2(32.2)	15.0(18.6)	10.3(14.3)	33.8(40.0)
WSU		62.0(65.5)	40.7(60.0)	63.2(66.0)	53.3(58.4)	59.0(55.7)	37.7(53.3)	26.7(40.8)	18.0(40.9)	57.0(70.7)	54.7(75.6)	42.5(50.3)
CARP		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8(1.0)	0.5(0.7)	0.0
U.CHUB		0.2(0.2)	0.3(0.5)	0.3(0.3)	2.8(3.1)	2.0(1.9)	0.0	0.5(0.8)	0.0	0.2(0.2)	0.0	0.0
BURBOT		0.0	0.2(0.2)	0.2(0.2)	0.0	0.3(0.2)	1.5(2.1)	1.2(1.8)	0.3(0.8)	0.33(0.4)	1.3(1.8)	0.8(1.0)
SM.BUFF		0.0	0.0	0.2(0.2)	0.0	0.2(0.3)	0.2(0.2)	0.0	0.0	0.0	0.0	0.0
TOTAL #	0	473	407	574	548	635	424	392	264	484	434	434
# NETS	0	5	6	6	6	6	6	6	6	6	6	6

Appendix D. Number per net (percent composition) by species for fall sinking gillnet catches in Hauser Reservoir.

SPECIES	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
RB	1.0(0.7)	2.0(1.4)	0.5(0.5)	1.8(1.8)	0.3(0.3)	0.7(0.7)	0.7(0.7)	0.1(0.2)	0.6(0.4)	0.3(0.3)	0.3(0.4)	0.4(0.8)
LL	1.4(1.0)	0.5(0.4)	0.5(0.5)	0.0	0.7(0.7)	0.4(0.4)	1.1(1.0)	0.7(1.0)	1.1(0.9)	0.4(0.5)	1.1(1.4)	0.1(0.5)
KOK	0.6(0.4)	5.8(4.2)	9.8(9.1)	18.3(18.3)	10.7(11.1)	20.7(20.6)	8.1(7.7)	5.0(6.8)	5.1(4.0)	15.6(18.9)	1.4(1.8)	0.4(0.8)
MWF	5.0(3.6)	3.2(2.3)	2.8(2.6)	0.5(0.5)	2.0(2.1)	1.7(1.7)	1.3(1.2)	1.1(1.6)	1.1(0.9)	0.3(0.3)	0.6(0.7)	0.1(0.5)
WE	0.0	0.0	0.0	0.0	0.0	0.6(0.6)	0.1(0.1)	0.1(0.2)	0.3(0.2)	0.0	0.6(0.7)	1.0(1.8)
YP	6.8(4.9)	13.0(9.3)	4.7(4.3)	3.5(3.5)	3.7(3.8)	11.3(11.2)	8.9(8.1)	7.9(10.7)	9.4(7.4)	6.6(8.0)	10.0(12.5)	4.1(7.3)
LNSU	40.4(28.9)	22.5(16.1)	26.0(24.1)	14.7(14.7)	15.5(16.1)	16.7(16.6)	20.0(18.3)	13.7(18.7)	15.3(12.0)	14.9(18.1)	17.1(21.4)	10.0(17.7)
WSU	84.8(60.5)	92.3(66.0)	63.0(58.3)	59.3(59.4)	61.0(63.4)	45.3(45.0)	64.9(59.3)	42.0(57.3)	57.6(45.1)	41.6(50.5)	47.7(59.4)	34.7(61.4)
CARP	0.0	0.0	0.0	0.2(0.2)	0.0	0.0	1.1(1.0)	0.0	38.1(29.1)	0.1(0.2)	0.0	0.0
U.CHUB	0.0	0.2(0.1)	0.2(0.1)	1.3(1.3)	2.2(2.3)	1.7(1.7)	2.0(1.8)	1.4(1.4)	0.9(0.7)	0.3(0.3)	0.3(0.4)	0.0
BURBOT	0.0	0.0	0.0	0.3(0.3)	0.2(0.2)	0.4(0.4)	0.7(0.7)	0.9(1.2)	0.3(0.2)	2.3(2.8)	1.1(1.4)	5.3(9.3)
SM.BUFF	0.0	0.3(0.2)	0.5(0.5)	0.0	0.0	1.1(1.1)	0.0	0.7(1.0)	0.0	0.0	0.0	0.0
TOTAL #	700	839	648	600	577	705	765	513	902	576	562	396
# NETS	5	6	6	6	6	7	7	7	7	7	7	7

Appendix E. Number per net (percent composition) by species for spring floating gillnet catchcs in Holter Reservoir.

SPECIES	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
RB	6.8(25.5)	11.1(47.1)	13.8(64.3)	3.5(25.0)	6.0(61.5)	9.9(34.5)	5.2(39.2)	4.7(26.1)	3.9(34.0)	2.6(63.9)	2.4(36.7)	7.4(53.6)
LL	0.0	0.4(1.6)	0.3(1.2)	0.0	0.1(1.3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
KOK	0.2(0.6)	0.6(2.6)	0.4(1.7)	0.4(2.7)	2.8(28.2)	13.4(46.9)	1.6(11.7)	1.1(6.2)	3.4(30.1)	0.6(13.9)	3.4(51.7)	1.1(8.0)
MWF	0.7(2.5)	0.4(1.6)	0.3(1.2)	0.1(0.9)	0.0	0.3(1.2)	0.4(3.3)	0.0	0.1(1.0)	0.0	0.0	0.0
WE	1.3(5.0)	1.8(7.4)	0.9(4.1)	0.3(1.8)	0.5(5.1)	4.0(13.9)	0.1(0.8)	0.7(3.7)	0.7(5.8)	0.1(2.8)	0.1(1.7)	0.2(1.6)
YP	0.0	4.8(20.1)	4.0(18.7)	1.3(8.9)	0.0	0.0	5.1(38.3)	5.3(29.8)	1.7(14.6)	0.0	0.0	0.0
LNSU	10.8(40.4)	2.4(10.1)	0.9(4.1)	5.4(38.4)	0.1(1.3)	0.1(0.4)	0.0	1.4(8.1)	0.9(7.8)	0.1(2.8)	0.3(5.0)	1.7(12.0)
WSU	6.7(24.8)	1.9(7.9)	0.8(3.5)	3.1(22.3)	0.3(2.6)	0.8(2.7)	0.8(5.8)	4.7(26.1)	0.6(4.9)	0.7(16.7)	0.3(5.0)	3.4(24.8)
CARP	0.3(1.2)	0.4(1.6)	0.3(1.2)	0.0	0.0	0.1(0.4)	0.1(0.8)	0.0	0.2(1.9)	0.0	0.0	0.0
U.CHUB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL #	161	189	171	112	78	258	120	161	103	36	60	125
# NETS	6	8	8	8	8	9	9	9	9	9	9	9

Appendix F. Number per net (percent composition) by species for fall floating gillnet catches in Holter Reservoir.

SPECIES	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
RB	13.6(77.2)	18.0(76.6)	5.5(41.5)	6.7(52.1)	4.8(34.7)	7.3(53.7)	5.9(35.3)	3.2(42.0)	6.9(42.5)	4.6(20.0)	9.3(39.1)	5.8(64.2)
LL	0.1(0.8)	0.5(2.2)	0.3(1.9)	0.1(0.9)	0.0	0.3(1.9)	0.2(1.3)	0.0	0.1(0.7)	0.0	0.1(0.5)	0.3(3.7)
KOK	0.9(4.9)	1.1(4.8)	2.9(21.7)	4.2(33.0)	7.8(56.5)	5.4(39.8)	4.8(28.6)	3.8(49.3)	7.6(46.6)	17.4(76.5)	13.0(54.4)	0.8(8.6)
MWF	0.6(3.3)	0.0	0.4(2.8)	0.1(0.9)	0.2(1.6)	0.4(2.8)	0.0	0.0	0.2(1.4)	0.0	0.0	0.2(2.5)
WE	1.7(9.7)	0.1(0.5)	0.0	0.3(2.6)	0.0	0.0	0.1(0.7)	0.2(2.9)	0.0	0.4(2.0)	1.3(5.6)	1.6(17.3)
YP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LNSU	0.6(3.3)	1.6(6.9)	1.6(12.3)	0.9(7.0)	0.9(6.5)	0.1(0.9)	3.3(20.0)	0.1(1.4)	0.4(2.7)	0.2(1.0)	0.0	0.0
WSU	0.1(0.8)	2.1(9.0)	2.6(19.8)	0.3(2.6)	0.1(0.8)	0.1(0.9)	2.3(14.0)	0.3(4.3)	1.0(6.2)	0.1(0.5)	0.1(0.5)	0.2(2.5)
CARP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
U.CHUB	0.0	0.0	0.0	0.1(0.9)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1(1.2)
TOTAL #	123	188	106	115	124	108	150	69	146	205	215	81
# NETS	7	8	8	9	9	8	9	9	9	9	9	9

Appendix G. Number per net (percent composition) by species for spring sinking gillnet catches in Holter Reservoir.

SPECIES	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
RB		1.6(0.9)	1.5(1.4)	1.0(1.1)	1.2(1.0)	1.0(0.7)	0.3(0.2)	0.5(0.4)	0.5(0.5)	2.0(2.3)	0.5(0.7)	0.7(0.8)
LL		1.4(0.8)	0.2(0.2)	0.2(0.2)	0.8(0.7)	0.2(0.1)	0.2(0.1)	0.0	0.0	0.5(0.6)	0.3(0.5)	0.0
KOK		0.0	0.3(0.3)	0.0	0.0	0.8(0.6)	0.2(0.1)	0.2(0.1)	0.2(0.2)	0.8(1.0)	2.2(3.1)	0.0
MWF		3.0(1.7)	4.0(3.6)	4.7(5.1)	4.8(4.0)	8.7(5.8)	2.8(1.8)	1.8(1.5)	1.8(2.0)	0.8(1.0)	1.5(2.2)	1.0(1.1)
WE		2.6(1.6)	2.2(2.0)	2.5(2.8)	2.4(2.0)	2.2(1.4)	2.5(1.6)	2.3(1.9)	4.8(5.3)	1.0(1.2)	2.7(3.9)	3.0(3.4)
YP		95.8(57.2)	37.3(34.0)	26.8(29.5)	46.8(39.2)	75.2(50.4)	66.7(43.4)	52.3(42.3)	25.7(28.1)	26.5(30.9)	6.8(9.9)	5.0(5.7)
LNSU		27.6(16.5)	19.3(17.6)	10.2(11.2)	13.6(11.4)	17.7(11.9)	8.3(5.4)	12.8(10.4)	11.7(12.8)	5.17(6.0)	12.2(17.6)	11.5(13.0)
WSU		35.4(21.2)	44.7(40.7)	45.2(49.7)	49.4(41.4)	43.3(29.1)	72.0(46.9)	53.5(43.2)	46.7(51.0)	48.5(56.6)	42.5(61.6)	67.0(76.0)
CARP		0.2(0.1)	0.0	0.3(0.4)	0.0	0.0	0.5(0.3)	0.2(0.1)	0.2(0.2)	0.2(0.2)	0.3(0.5)	0.0
U.CHUB		0.0	0.2(0.2)	0.0	0.4(0.3)	0.0	0.0	0.2(0.1)	0.0	0.2(0.2)	0.0	0.0
TOTAL #	0	838	658	545	597	894	921	743	549	514	414	529
# NETS	0	5	6	6	5	6	6	6	6	6	6	6

Appendix H. Number per net (percent composition) by species for fall sinking gillnet catches in Holter Reservoir.

SPECIES	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
RB	4.0(4.3)	2.5(2.5)	2.7(2.6)	1.5(1.8)	2.5(3.1)	4.2(4.4)	0.7(0.8)	1.0(1.5)	1.8(2.7)	3.3(3.9)	1.3(1.8)	1.7(2.8)
LL	0.2(0.2)	0.3(0.3)	0.0	0.0	0.0	0.0	0.2(0.2)	0.2(0.2)	0.0	0.0	0.2(0.2)	0.0
KOK	0.3(0.4)	0.2(0.2)	0.5(0.5)	0.5(0.6)	1.5(1.9)	1.5(1.6)	1.2(1.4)	1.0(1.5)	0.8(1.2)	1.8(2.1)	4.8(6.4)	0.2(0.3)
MWF	1.7(1.8)	2.0(2.0)	0.5(0.5)	1.5(1.8)	3.5(4.3)	1.2(1.3)	1.8(2.2)	1.0(1.5)	0.2(0.2)	0.5(0.6)	0.5(0.7)	0.8(1.4)
WE	2.3(2.5)	3.2(3.1)	1.3(1.3)	4.3(5.2)	2.3(2.9)	2.8(3.0)	3.5(4.2)	4.0(6.0)	1.7(2.4)	0.5(0.6)	4.5(6.0)	4.2(7.0)
YP	22.0(24.0)	28.8(28.8)	22.2(21.8)	8.8(10.6)	13.0(16.0)	10.7(11.3)	18.0(21.5)	6.3(9.4)	6.8(10.0)	7.7(9.0)	2.2(2.9)	1.2(2.0)
LNSU	22.0(24.0)	21.5(21.5)	22.3(21.9)	17.0(20.4)	12.5(15.4)	19.2(20.3)	13.0(15.5)	11.3(17.0)	16.0(23.4)	11.0(12.9)	15.0(20.0)	10.2(17.2)
WSU	39.3(42.8)	41.7(41.6)	52.2(51.2)	49.7(59.6)	45.5(56.2)	54.8(58.1)	45.0(53.8)	41.7(62.3)	41.0(60.0)	59.8(70.0)	46.2(61.4)	41.0(69.3)
CARP	0.0	0.0	0.2(0.2)	0.0	0.2(0.2)	0.0	0.3(0.4)	0.3(0.5)	0.0	0.7(0.8)	0.5(0.7)	0.0
U.CHUB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BURBOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2(0.2)	0.0	0.0
TOTAL #	551	601	611	500	486	566	502	401	410	513	451	355
# NETS	6	6	6	6	6	6	6	6	6	6	6	6

Appendix 1. Creel survey results, harvest and gillnet trends for **kokanee salmon** in Hauser Reservoir.

Year	Summer Catch Rate (fish/hr.)	Winter Catch Rates (fish/hr.)	Ave. size (inches) Summer Creel	Harvest (X1000)	Spring Floaters (fish/net)	Fall Floaters (fish/net)	Summer Verticals (fish/night)
1986	0.10		16.6		1	15	28
1987	0.13		15.6		14	4	47
1988	0.24		16.3		12	19	131
1989	0.42	0.23	14.6	101.4	12	23	105
1990	0.22	0.18	15.7	60.9	15	29	86
1991	0.46	0.18	14.7	141.3	21	27	46
1992	0.22	0.30	15.8	78.4	12	26	23
1993	0.22	0.47	16.0	89.3	9	14	12
1994	0.15	0.03	14.8	37.1	13	9	41
1995	0.11	0.06	17.0	29.1	7	14	48
1996	0.10	0.00	14.1	17.4	13	16	40
1997	0.03	0.01	16.8	7.4	7	2	4
Mean	**0.20**	**0.16**	**15.7**	62.5	**11**	**17**	**51**

Appendix J. Stocking records, creel survey results, harvest and gillnet trends for **rainbow trout** in Hauser Reservoir.

Year	Stocking (X1000)	Summer Catch Rates (fish/hr.)	Winter Catch Rates (fish/hr.)	Ave. size (inches) Summer Creel	Harvest (X1000)	Spring Floaters (fish/net)	Fall Floaters (fish/net)	% wild from Floaters
1986	213	0.25	N/A	13.5	N/A	14	8	
1987	213	0.24	N/A	14.2	N/A	4	7	
1988	212	0.24	N/A	15.8	N/A	3	17	4
1989	200	0.12	0.18	13.7	25.5	2	7	7
1990	125	0.10	0.11	14.9	27.8	1	6	4
1991	138	0.02	0.08	15.3	7.8	2	3	11
1992	126	0.05	0.02	15.1	13.0	3	5	11
1993	100	0.05	0.04	16.3	16.5	2	3	16
1994	105	0.02	0.01	16.6	4.2	2	3	
1995	107	0.05	0.04	17.5	11.5	5	2	
1996	94	0.05	0.04	17.5	14.8	2	4	
1997	99	0.08	0.08	16.9	13.9	3	2	15
Mean	**144**	**0.11**	**0.07**	**15.6**	**15.0**	**4**	**6**	**10**

%wild in 1986-87 were not estimated because hatchery fish were not marked before 1986.
%wild in 1994-96 were not estimated because hatchery fish were not marked in 1994.

Appendix K. Stocking records, catch rates, harvest and gillnet trends for **rainbow trout** in Holter Reservoir

Year	Stocking (X1000)	Summer Catch Rates (fish/hr.)	Winter Catch Rates (fish/hr.)	Ave. size (inches) Summer Creel	Harvest (X1000)	Spring Floaters (fish/net)	Fall Floaters (fish/net)	% wild from Floaters
1986	357.3	0.34	N/A	13.9	N/A	7	14	
1987	323.0	0.37	N/A	13.8	N/A	11	18	
1988	322.9	0.32	N/A	13.7	N/A	14	6	44
1989	350.0	0.27	0.23	14.5	57.2	4	7	37
1990	347.3	0.26	0.24	14.2	59.2	6	5	27
1991	420.1	0.27	0.27	12.6	62.3	10	7	37
1992	382.8	0.22	0.23	14.1	53.2	5	6	33
1993	325.0	0.14	0.09	15.9	33.7	5	3	42
1994	290.5	0.03	0.07	14.7	10.4	4	7	66
1995	317.5	0.16	0.06	14.1	20.1	3	5	52
1996	100.0	0.21	0.25	13.8	47.4	2	9	20
1997	371.4	0.11	0.24	15.5	38.4	7	6	29
Mean	**325.7**	**0.23**	**0.19**	**14.2**	**42.4**	7	**8**	**39**

%wild in 1986-87 were not estimated because hatchery fish were not marked before 1986.

Appendix L. Holter walleye tagging summary. Dangler tags used between 1988 and 1995; 1996 most walleye were tagged with both jaw and dangler tags; 1997 all walleye tagged with jaw tags.

		NUMBER OF TAG RETURNS BY ANGLERS											
Year	# Tagged	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total	(%)
1988	100	6	2	1	6	4	5	1	1	0		**26**	**26.0**
1989	30		2	2	0	0	0	0	1	0		**5**	**16.7**
1990	121			3	10	16	7	3	2	1		**42**	**34.7**
1991	63				1	4	4	1	0	0		**10**	**15.9**
1992	42					2	1	1	0	0		**4**	**9.5**
1993	18						0	5	0	0		**5**	**27.8**
1994	19							0	0	1		**1**	**5.3**
1995	284								5	10	4	**19**	**6.7**
1996	212									7	5	**12**	**5.7**
1997	230										2	**2**	**0.9**
	Totals	**6**	**4**	**6**	**17**	**26**	**17**	**11**	**9**	**19**	**11**		

150 of the 230 walleye tagged in 1997 were from fish relocated from Canyon Ferry

Appendix M. Water discharge (cfs) from Hauser and Holter dams for the years 1986 through 1997.

	Hauser Reservoir			Holter Reservoir		
Year	Turbine	Spillway	Total	Turbine	Spillway	Total
1986	2846	978	3824	3742	140	3882
1987	2387	253	2640	2686	0	2686
1988	2410	16	2426	2456	0	2456
1989	2525	126	2651	2709	4	2713
1990	2479	140	2619	2732	0	2732
1991	2686	445	3131	3122	109	3231
1992	2341	56	2397	2433	2	2435
1993	2869	1309	4178	4086	468	4554
1994	2548	170	2718	2938	0	2938
1995	2938	1678	4616	3788	1003	4791
1996	4821	1981	6802	5498	1148	6646
1997	4120	4038	8158	6106	1976	8082

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Waters referred to:

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Holter Reservoir 17-9136