

**MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS**

**FISHERIES DIVISION  
JOB PERFORMANCE REPORT**

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATION  
PROJECT NO.: F-46-R-6 STUDY TITLE: SURVEY AND INVENTORY OF COLDWATER LAKES  
JOB NO.: II-a, Segment 1 JOB TITLE: NORTHWEST MONTANA COLDWATER LAKES INVESTIGATIONS  
PERIOD COVERED: JULY 1, 1992 THROUGH JUNE 30, 1993

**ABSTRACT**

Fish populations were surveyed in 23 lakes in the Clark Fork and Kootenai River drainages. Illegally transplanted fish continue to cause problems with existing fisheries and several lakes are recommended for chemical rehabilitation. Hatchery rainbow and cutthroat trout plants were monitored in Lake Koocanusa. Overwinter survival appears to be low and wild fish make up at least half the fishery. Kokanee stocking rates were adjusted in Crystal Lake to increase age at maturity and length at spawning. Ashley Lake water level monitoring was continued.

**BACKGROUND**

The coldwater lake fisheries resource in northwest Montana is comprised of 412 coldwater lakes, ranging from low elevation valley floor lakes to high elevation mountain lakes. The survey and inventory of this fishery resource is an ongoing effort to update the management programs to maintain or improve coldwater lakes fisheries.

**OBJECTIVES AND DEGREE OF ATTAINMENT**

1. To manage lake and reservoir water levels to minimize impacts on fish populations. Objective accomplished utilizing state funding.
2. To maintain water quality at present levels as measured by Water Quality Bureau. Objective accomplished utilizing state funding.
3. To maintain aquatic habitat at a level capable of sustaining existing populations. Objective accomplished using state funding.
4. To increase the opportunity to catch larger trout (14" at 0.5 fish/hour) in specified lakes. Objective accomplished.
5. Provide lake fisheries to sustain an increase of 32,600 angler days by 1992 through natural reproduction and hatchery plants. Provide kokanee fisheries for 12"-14" fish at a catch rate of 1 fish per hour. Objective partially accomplished.
6. To provide a variety of trout sizes and species for angling and prey on stunted salmon. Objective accomplished.
7. To manage regulations and stocking to protect or expand species of special concern. Objective accomplished with state funding.

8. To develop management plans to adapt to the introduction of Mysis and other unwanted species. Objective partially accomplished.
9. Coordinate with other agencies to maintain fisheries and water quality at or above present levels. Objective was accomplished using state funding.
10. To encourage public participation in understanding the problems and strategies of resource management. Objective accomplished.
11. Attempt to acquire and provide facilities on all lakes and reservoirs capable of sustaining more than 300 man days of fishing per year on a priority basis at the rate of one lake per year. Objective was accomplished using state funding.

## PROCEDURES

Lake fish population surveys were conducted using experimental sinking and floating gill nets measuring 6 feet deep by 125 feet in length with a bar mesh size of 3/4, 1, 1/4, and 2 inches. Gamefish were weighed and measured to total length. Nongame fish were enumerated.

## RESULTS

### Lakes Surveys

Fish population data were collected for 23 lakes in the Kootenai and Clark Fork drainages between September, 1992 and July, 1993. The lakes ranged in size from 10 to 1328 surface acres. Initial surveys in the 1960's and again in the mid 1980's established species composition for these lakes. In addition to noting number per net of fish species, number of crayfish per net was established for those lakes that contained crayfish.

Lakes including Cibid, Bootjack, Cad, and Topless were recently rehabilitated and are currently being managed as trout lakes. Of those four lakes, only CAD has remained free of non-game species and is producing relatively healthy rainbow and cutthroat trout (Table 1).

Kilbrennan Lake was a very popular lake to fish for Lincoln County residents. Catch rates approached two fish per hour with more than five fish per angler day. As many as 25 boats might be on the 57 acre lake in a single day in the 1960's and 1970's. Sometime prior to 1976, black bullheads were illegally introduced into the lake. In 1976, gillnetting showed 12.5 bullheads per net. In 1993, there were 73.8 bullheads per net (Table 1). Use of the lake by fishermen has decreased dramatically in the last decade.

Table 1. Summary of gillnet sets for 23 lakes in the Kootenai and Clark Fork Drainages between September 1992 and July 1993.

Lake (water code)	Date	Species	# per Net	Mean Length (mm)	Range (mm)	Mean Weight (g)	Range (g)	Mean Condition Factor (K)	Other Species (Number Per Net)
Middle Thompson (5-9232)	9/13/92	KOK AD	15.2	381	345-494	553	382-1250	1.04	RSS(0.1)
		KOK IM	0.5	248	218-312	153	96-298	1.05	NSQ(9.8)
		RB	0.8	376	244-530	814	136-1466	1.53	MWF(1.0)
		EBT	0.3	285	264-310	181	178-270	0.78	FSU(1.5)

Lake (water code)	Date	Species	# per Net	Mean Length (mm)	Range (mm)	Mean Weight (g)	Range (g)	Mean Condition Factor (K)	Other Species (Number Per Net)
		LMB	0.7	183	174-192	85	76-94	1.39	YP<8" (20.8) YP>8" (6.8)
Lower Thompson (5-9152)	9/15/92	KOK AD	0.2	550					FSU(0.8)
		RB	0.2	390					NSQ(4.7)
		YP<8"	30.3						PS(0.5)
		YP>8"	7.0						
Upper Thompson (5-9760)	9/15/92	NP	1.1	526					NSQ(0.1)
		KOK	0.1	463					PS(6.4)
		YP<8"	7.5						CRF(23.5)
		YP>8"	1.1						
McGregor (5-9216)	9/16/92	LT	1.9	383	212-508	427	73-1000	0.76	MWF(0.1)
		RB	0.5	206	188-585	100	68-2742	1.14	
		EBT	0.3	277	258-297	222	177-268	1.02	
Loon (11-8940)	9/17/92	RB	2.9	307	248-367	264	141-445	0.91	NSQ(11.3)
		SMB	0.9	277	152-419				CRC(3.5)
		LMB	0.3	361	330-391				PS(6.4)
		YP<8"	4.4						CSU(1.6)
		MWF	0.5						FSU(0.6)
Little McGregor (5-9096)	9/17/92	RB	8.0	278	221-415	300	136-949	1.40	YP<8" (18.8)
		EBT	1.0	283	234-364	305	163-586	1.34	YP>8" (12.8)
		HCT	1.8	313	286-350	357	309-518	1.16	
Horseshoe (11-8520)	9/18/92	RB	0.6	369	363-380	409	395-440	0.81	NSQ(9.9) CSU(2.7)
Rainbow (5-9392)	9/21/92	RB	5.0	224	190-271	145	82-209	1.29	YP<8" (24.0)
		CRF	2.6						YP>8" (4.0)
Cibid (11-8130)	9/23/92	RB	1.7	328	300-352	389	281-481	1.10	PS(5.3) CRF(3.0)
Topless (11-9830)	9/23/92	RB	0.5	149		82		2.48	PS(17.5) BBH(5.0) CRF(4.0)
Cad (11-8050)	9/24/92	RB	9.5	214	156-420	133	41-740	1.36	
		HCT	2.5	328	309-392	335	281-450	0.95	
Bootjack (11-7980)	9/24/92	RB	5.7	172	160-183	49	45-64	0.96	PS(1.0)
		HCT	3.0	322	278-380	362	200-663	1.08	CRF(17.3)

Lake (water code)	Date	Species	# per Net	Mean Length (mm)	Range (mm)	Mean Weight (g)	Range (g)	Mean Condition Factor (K)	Other Species (Number Per Net)
Crystal (11-8180)	10/14/92	RB	0.3	319	252-387	325	174-500	1.00	PS(0.7)
		KOK	27.1	238	222-260	121	94-162	0.90	CRF(4.3)
		YP<8"	18.0						
		YP>8"	4.7						
Bull (11-8040)	10/28/92	RB	0.3	378	308-448	401	246-556	0.74	CRC(16.1)
		DV	0.4	425	346-491	683	246-1100	0.89	NSQ(7.3)
		KOK AD	19.3	354	325-380	410	350-466	0.92	CSU(1.8)
		KOK IM	1.0	234	193-291	124	56-232	0.97	MWF(0.9)
		WCT	0.2	329		382		1.07	YP<8"(12.5) YP>8"(3.6)
Spar (11-9640)	10/29/92	LT	6.5	391	206-856	773	62-6810	1.29	RSS(0.2)
		KOK AD	1.0	295	250-386	245	126-520	0.95	
		KOK IM	7.3	199	181-226	67	56-90	0.85	
		EBT	1.8	314	264-364	368	182-620	1.18	
Kilbrennan (11-8640)	04/29/93	EBT	23.8	242	157-343	177	39-358	1.25	
		RB	10.0	284	168-374	251	42-432	1.10	
		HCT	1.3	267	240-295	214	140-268	1.12	BBH(73.8)
Skinner (11-9560)	4/29/93		NO	FISH	CAUGHT	SOME	JUMPING	IN	NET VICINITY
Rattlebone (11-9430)	5/11/93	LMB	0.5	334		668		1.79	
Blue (7-5920)	5/11/93	RB	0.5	313		314		1.02	LING(0.5)
		EBT	6.5	230	178-266	127	39-208	1.04	PS(2.5)
Sunday (7-8979)	5/15/93	LMB	0.5	323		706		2.09	
		YP<8"	13.3						
		YP>8"	4.0						PS(1.3)
Upper Sunday (7-8980)	5/15/93	HCT	6.0	217	185-250	129	82-208	1.26	CSU(1.0)
Lower Stillwater (7-7600)	6/1/93	NP	4.25	452	292-607	760	140-1589	0.82	NSQ(0.4)
		MWF	0.3	343	273-413	552	222-882	1.37	YP<8"(10.3)
		LT	0.2	536		965		0.63	YP>8"(1.0) PS(0.1)
Upper Stillwater (7-9440)	6/2/93	NP	6.1	509	308-684	966	178-2385	0.73	
		DV	0.1	445		681		0.77	NSQ(0.6)
		LT	0.1	725		3405		0.89	CSU(0.5)

Lake (Water code)	Date	Species	# per Net	Mean Length (mm)	Range (mm)	Mean Weight (g)	Range (g)	Mean Condition Factor (K)	Other Species (Number Per Net)
		YP<8"	13.4						FSU(0.5)
		YP>8"	1.4						
Upper Whitefish (7-9460)	6/4/93	DV	3.3	329	265-361	416	192-556	1.17	
		WCT	0.7	278	255-301	234	184-284	1.09	
		HCT	1.0	253	227-292	222	138-362	1.37	

BBH = Black Bullhead; CRC = Peamouth; CRF = Crayfish; CSU = Largescale Sucker; DV = Bull Trout; EBT = Brook Trout; FSU = Longnose Sucker; HCT = Hatchery Westslope Cutthroat; KOK AD = Kokanee Adult; KOK IM = Kokanee Immature; LMB = Largemouth Bass; LING = Burbot; LT = Lake Trout; MWF = Mountain Whitefish; NP = Northern Pike; NSQ = Northern Squawfish; PS = Pumpkinseed; RSS = Redside Shiner; SMB = Smallmouth Bass; YP>8" = Yellow Perch greater than eight inches; YP<8" = Yellow Perch less than eight inches.

#### Lake Koocanusa Monitoring

Spring floating gillnet sets were initiated in Lake Koocanusa in 1993 to determine success of rainbow and cutthroat stocking (Table 2). Returns of hatchery cutthroat trout planted at Age II+ were fair although no hatchery cutthroat trout were caught that would have held over in the reservoir for one year (3+ cutthroat trout). The combined net catch of wild rainbow and wild cutthroat trout was comparable to returns of hatchery westslope cutthroat trout that are stocked at approximately 175,000 per year (hatchery trout were identified by fin erosion). Hatchery rainbow trout (Duncan strain Gerrard or Kamloops trout) showed fair returns to the nets including several fish that appear to have survived at least one year in the reservoir and had begun feeding on kokanee and peamouth chubs.

Table 2. Summary of 13 gill nets in Lake Koocanusa 5/20-21/93.

Species	Number per Net	Mean Length (mm)	Range (mm)	Mean Weight (g)	Range (g)	Mean Condition Factor (k)
Wild Cutthroat Trout	0.5	316	265-361	306	190-452	0.96
Wild Hybrid Trout	1.6	312	184-442	310	86-800	1.02
Hatchery Cutthroat Trout	1.9	292	276-345	245	185-374	0.98
Duncan Rainbow Trout (Kamloops)	1.0	357	294-485	529	218-1190	1.16
Bull Trout	2.2	383	193-605	955	50-2179	1.70
Kokanee Salmon	3.1	266	185-316	149	50-234	0.79
Northern Pike	one fish	891		5448		0.77
Peamouth	171.0					
Northern Squawfish	7.9					
Largescale Sucker	1.3					
Longnose Sucker	0.5					

### Lake Monitoring for Kokanee Populations

In 1992, gillnetting efforts were continued for four kokanee lakes to monitor stocking success. Information for Middle Thompson Lake, Bull Lake, and Spar Lake are shown in Table 1. Crystal Lake is one of 11 lakes in Region 1 that is maintained for kokanee by stocking. Crystal Lake has typically been planted with 50,000 kokanee annually. However, due to fluctuations in available hatchery kokanee, Crystal has been planted with 0 to 100,000 kokanee (Table 3) beginning in 1988. It is probable that high stocking rates between 1990 and 1992 have led to a one year decrease in age of maturity (III+ to II+) and a concurrent decrease in mean length of spawning kokanee. The stocking rate for Crystal Lake was reduced to 50,000 kokanee in 1993 and monitoring will continue to assess the changes.

Table 3. Summary of Kokanee gillnetting and hatchery stocking rates for Crystal Lake, Montana, 1975-1993.

Year	Mean Lengths (Ranges) of Spawning Adults		Hatchery Plants and Hatchery Origin	
	Male	Female	Kokanee Salmon	Rainbow Trout
1975	18.1 (17.2-19.8)	17.6 (15.8-18.4)	----	4,995(A)
1976	17.1	17.6	90,000(S)	5,033(A)
1977	17.3 (12.4-20.1)	18.0 (14.9-21.6)	100,000(S)	7,168(A)
1978	16.5 (15.2-19.5)	15.6 (11.0-20.5)	50,000(S)	7,000(A)
1979	17.5 (13.9-18.5)	17.2 (16.6-18.1)	50,000(S)	7,038(A)
1980	19.2	----	50,000(S)	7,029(A)
1981	----	----	----	7,517(A)
1982	----	----	50,000(S)	7,708(A)
1983	----	----	50,000(MS)	7,027(A)
1984	----	----	49,982(MS)	7,072(A)
1985	15.1 (12.0-16.5)	16.2 (12.3-18.5)	----	10,017(A)
1986	14.4 (13.6-16.6)	14.0 (13.4-15.2)	50,000(S)	10,014(A)
1987	----	----	50,000(S)	8,739(A)
1988	18.2 (17.7-20.5)	17.9 (16.9-19.0)	----	8,007(A)
1989	----	----	50,000(MS)	8,000(A)
1990	9.6 (8.8-11.2)	9.3 (8.8-9.7)	100,000(MS)	9,000(A)
1991	9.0 (8.2-9.8)	9.1 (8.3-9.7)	100,000(MS)	8,000(A)
1992	9.5 (8.7-10.4)	9.2 (8.7-10.3)	100,000(S)	8,000(A)
1993	NA	NA	50,000(S)	8,000(A)

A = Arlee Hatchery; MS = Murray Springs Hatchery; S = Somers Hatchery.

### Ashley Lake Level Monitoring

Because of the very dry weather in the last half of 1992, continuing into the winter of 1993, the Ashley Lake impounded water level was 78 percent of the full pool storage level of 19,224 acre feet (af) at the end of June 1993. From January through June we released 2,308 af and the lake level rose from 10,130 af

to 15,107 af. Spring snow melt and rains were 91 percent of average runoff (7,280 af) by June's end.

The initial maximum level from runoff was 14,921 af, but because of late June rains, continuing into July, the lake rose to its current higher level. With the continuing rains it will probably reach its peak in July. New rainfall records will be necessary in July and/or August to restore the lake to its typical level for mid-year, around 17,000 af.

#### RECOMMENDATIONS

Recommendations for work items in fiscal year 1994 are listed below:

1. Monitoring of rainbow trout (Onchrhynchus mykiss) and cutthroat trout populations should be continued in Lake Koocanusa to compared to fish numbers in the 1978-1981 era which was immediately before kokanee became established. Monitoring should include marking of all cutthroat trout with tetracycline to identify between wild and hatchery reared trout
2. Continue surveying small lakes within the region as the need or opportunity arises.
3. In cooperation with the U.S. Forest Service and/or Noranda Minerals Inc. chemically rehabilitate either Blue Lake or Hidden Lake near Stryker, Montana and Kilbrennan Lake near Troy, Montana to remove undesirable nongame fish and re-establish a sport fishery.
4. Continue to monitor success of planting kamloops (Duncan strain) rainbow trout in a wide variety of lake habitats ranging from lakes of several thousand acres surface area down to less than 100 surface acres.
5. Continue regulating water levels in Ashley Lake to provide good flows for the outlet stream without deleterious effects upon the lake fishery.
6. Continue monitoring of kokanee populations in region lakes every one to four years on a scheduled basis to detect population changes. Much of this data can be obtained during kokanee spawning efforts.
7. Assist as needed the Flathead Lake Salmon Hatchery kokanee spawning efforts.
8. Finish genetic analysis of selected kokanee stocks used for planting in regional lakes including genetics of Lake Koocanusa/Kootenai River/Kootenay Lake stocks of kokanee. To date analysis has been made of kokanee from four lakes but has yet to be done on fish being reared in hatcheries (Creston National Hatchery and Flathead Lake Salmon Hatchery) originating from the states of Colorado and Wyoming. Kokanee of Colorado origin have been planted in Lake Mary Ronan since 1988.
9. Monitoring of the Lake Mary Ronan fishery will be emphasized as it supports a major sport fishery and kokanee egg collection. This lake was illegally planted with yellow perch (Perca flavescens) in spring 1992. Data to be collected includes kokanee year class strengths, angler catch data, kokanee egg collecting, numbers of rainbow and cutthroat trout spawning in tributaries and abundance of yellow perch.

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Date: August 19, 1993

Waters referred to:

Lake Mary Ronan	7-7700	Topless	11-9830
Middle Thompson	5-9232	Cad	11-8050
Lower Thompson	5-9152	Bootjack	11-7980
Upper Thompson	5-9760	Crystal	11-8180
McGregor	5-9216	Bull	11-8040
Loon	11-8940	Spar	11-9640
Little McGregor	5-9096	Kilbrennan	11-8640
Horseshoe	11-8520	Skinner	11-9560
Rainbow	5-9392	Rattlebone	11-9430
Cibid	11-8130	Blue	7-5420
Sunday	7-8979	Upper Sunday	7-8980
Lower Stillwater	7-7600	Upper Stillwater	7-9440
Upper Whitefish	7-9460	Lake Koocanusa	11-8690

Key words: rainbow trout, trout, cutthroat trout

Fish species referred to:

black bullhead - Ictalurus melas  
brook trout - Salvelinus fontinalis  
kokanee - Oncorhynchus nerka  
largemouth bass - Micropterus salmoides  
largescale sucker - Catostomus macrocheilus  
longnose sucker - Catostomus  
northern pike - Esox lucius  
peamouth - Mylocheilus caurinus  
pumpkinseed - Lepomis gibbosus  
rainbow trout - Oncorhynchus mykiss  
northern squawfish - Ptychocheilus oregonensis  
westslope cutthroat trout - Oncorhynchus clarki lewisi  
yellow perch - Perca flavescens  
lake trout - Salvelinus namaycush  
burbot - Lota lota  
bull trout - Salvelinus confluentus