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REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS PANHANDLE REGION (Subprojects 1-A, 11-A, III-A, IV A1)

PROJECT I.	SURVEYS AND INVENTORIES
Job a.	Panhandle Region Mountain Lakes Investigations
Job b.	Panhandle Region Lowland Lakes Investigations
Job c.	Panhandle Region Rivers and Streams Investigations
PROJECT II.	TECHNICAL GUIDANCE
PROJECT 111.	HABITAT MANAGEMENT
PROJECT IV.	POPULATION MANAGEMENT

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OBJECTIVES

1. Evaluate stocking rate and stocking frequency of mountain lakes in relation to observed angler use, catch rates, growth rates, and fish abundance determined by gillnetting.
2. Establish limnological and water chemistry baselines to determine potential productivity and to determine future changes.
3. Provide diverse angling opportunities by maintaining a stocking program with different species of salmonids in Panhandle Region mountain lakes.

INTRODUCTION

Mountain lakes provide an important fishing opportunity in Idaho (Reid 1989), necessitating closer evaluation of this fishery resource. Noseeum and Steamboat lakes, in the Little North Fork Clearwater River drainage, were surveyed in 1994 to evaluate stocking rates, angler use, and catch rates.

METHODS

The Idaho Department of Fish and Game (IDFG) mountain lakes survey form was used as a guideline for surveying the lakes. Two 15-m gill nets with two 7.6-m panels of 12 mm and 36 mm mesh were used to sample fish. The nets were set at approximately 1600 and pulled at 1000 the next day. All fish were measured for total length (mm) and weighed to the nearest gram (g).

Several limnological parameters were measured using meters or HACH chemical testing kits (Table 1).

RESULTS AND DISCUSSION

Noseeum and Steamboat lakes are within 2 km of the trailhead and receive heavy fishing pressure as evidenced by the well worn footpath and camping sites. The results of the survey are listed in Tables 2 and 3.

Based on the low catch rates for cutthroat trout *Oncorhynchus clarki* collected by gill nets and angling in Noseeum Lake, the current biennial stocking of 550 fish/ha does not appear to be adequate to meet the demand for fish. An annual stocking schedule of 550 fish/ha should be adequate to meet fishing demand.

We requested an annual stocking rate of 550 Arctic grayling *Thymallus arcticus* /ha in Steamboat Lake. However, the actual stocking rate has ranged from 159 to 1,098 Arctic grayling/ha. The stocking

Table 1. Limnological parameters measured and methodology used to measure these parameters in Noseeum and Steamboat lakes, Idaho, September, 1994.

Limnological parameter	Testing method
Dissolved oxygen (mg\l)	YSI DO\Temperature meter
Temperature (C)	YSI DO\Temperature meter
pH	Fisher Scientific pH meter
Conductivity (umohs)	Cole\Palmer conductivity meter
Hardness (mg\l)	HACH test kit
Alkalinity (mg\l)	HACH test kit
Turbidity (m)	Secchi disk

Table 2. Summary of survey results from Noseeum Lake, Idaho, 1994.

Idaho Fish and Game
Mountain Lake Survey Form

LAKE NAME: Noseeum Lake

DATE: 09 / 29 / 94

IDFG Catalog #: 0 6:2 9:0 1 3 0:0 0 0 0 EPA #:

Major Drainage: LNF Clearwater Minor Drainage: Butte Creek
County: Shoshone Region: Panhandle
USFS Ranger Dist: St. Maries Wilderness Area:
Section: 36 Township: 42 Range: 2 Elevation: 5412 ± 492 feet
GPS (lat/long) N. 47 1.239 W 115 46.562

PHYSICAL:

Lake Type: 2 1. cirque 2. moraine 3. slump 4. caldera 5. beaver

Total Surface Area: 1.8 Hectares

Depth profile: 2

Aspect: 3

1. deep (75% of lake >6m deep)

1. Lake has north facing exposure

2. moderate (50% of lake >6m deep)

2. Lake has south facing exposure

3. shallow (25% of lake >6m deep)

3. Lake has east facing exposure

Maximum Depth 10.0 meters

4. Lake has west facing exposure

Average Depth meters

5. Lake is exposed in all directions

CHEMICAL

Alkalinity 10 mg/l

pH 7.2

Conductance 8.4 umho/cm² @ 25C

Temp (surface) 8.4 C

Secchi Depth 7.5 meters

Temp (bottom) 5.5

Hardness 20

SPAWNING POTENTIAL

Inlet(s) 0 (number) Outlet(s) 1 (number)

Length accessible for spawning Length accessible for spawning

0 meters

0 meters

Inlet spawning suitability: 4 Outlet spawning suitability: 4

1. excellent (abundant)

2. adequate (enough to maintain suitable spawning population)

3. fair (not adequate to maintain population)

4. poor (not suitable for successful spawning)

USE

Campsites 5 (number) Fire pits 6 (number) Litter xL M H

Trail around lake: x complete partial, trampled: YES NO

Access: x good trail poor trail cross country

BIOLOGICAL

Zooplankton Composition and Density

Genera Identified	% of sample	Size	Density (o/l)

INSECT COMPOSITION AND ABUNDANCE

Aquatic Genera	Relative abundance			Terrestrial Genera	Relative abundance		
	L	M	H		L	M	H
	L	M	H		L	M	H
	L	M	H		L	M	H
	L	M	H		L	M	H
	L	M	H		L	M	H

FISH SURVEY

Fishermen 4 (numbers) Hours fished 4.5 (total)
 Fish caught 9 Fish/hour 2 Abundance xL M H

LENGTH FREQUENCY (Collection Method: x angling: x gill net/net hrs 17)

Species	Total Length in mm								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
Cutthroat				12	1				
Total									

FISH CONDITION

Species	Total Length (mm)		Weight (g)		Condition (K)	
	mean	range	mean	range	mean	range
Cutthroat	178	153-230	60	42-125		

STOCKING HISTORY

Year	Species	Number of Fish	Comments
1993	Cutthroat	1,008	
1991	Cutthroat	1,000	
1989	Cutthroat	1,000	
1987	Cutthroat	1,000	
1985	Cutthroat	1,000	

COMMENTS:

Table 3. Summary survey results for Steamboat Lake, Idaho, 1994.

Idaho Fish and Game
Mountain Lake Survey Form

LAKE NAME: STEAMBOAT LAKE DATE: 9/29/94

IDFG Catalog #:06:29:0131:0000 EPA #: _____
Major Drainage LNF Clearwater R. Minor Drainage: Butte Creek
County: Shoshone Region: Panhandle
USFS Ranger Dist: St. Maries Wilderness Area: _____
Section: 35 Township: T15 Range: 5E Elevation: 5,412 feet
GPS (lat/long) N-47.01° 470' W-115.47.432 +/-492

PHYSICAL:

Lake Type: 2 1. cirque 2. moraine 3. slump 4. caldera 5. beaver
Total Surface Area: 4.1 Hectares
Depth profile: 2 Aspect: 1
1. deep (75%) of lake >6m deep 1. Lake has north facing exposure
2. moderate (50%) of lake >6m deep 2. Lake has south facing exposure
3. shallow (25%) of lake >6m deep 3. Lake has east facing exposure
Maximum Depth 8.0 meters 4. Lake has west facing exposure
Average Depth _____ meters 5. Lake is exposed in all directions

CHEMICAL

Alkalinity 5 mg/l pH 7.2
Conductance 6.8 umho/cm² @ 25C Temp (surface) 8.0C
Secchi Depth 8.0 meters Temp (bottom) 7.9C

SPAWNING POTENTIAL

Inlet(s) 3 (number) Outlet(s) 1 (number)
Length accessible for spawning _____ Length accessible for spawning _____
0 meters 0 meters
Inlet spawning suitability: 4 Outlet spawning suitability: 4

- 1. excellent (abundant)
- 2. adequate (enough to maintain suitable spawning population)
- 3. fair (not adequate to maintain population)
- 4. poor (not suitable for successful spawning)

USE

Campsites 4 (number) Fire pits 4 (number) Litter xL M H
Trail around lake: X complete _____ partial, trampled: YES NO
Access: X good trail _____ Poor trail _____ cross country

BIOLOGICAL

Zooplankton Composition and Density

Genera Identified	% of sample	Size	Density (o/l)

INSECT COMPOSITION AND ABUNDANCE

Aquatic Genera	Relative abundance			Terrestrial Genera	Relative abundance		
	L	M	H		L	M	H
	L	M	H		L	M	H
	L	M	H		L	M	H
	L	M	H		L	M	H
	L	M	H		L	M	H

FISH SURVEY

Fishermen 3 (numbers) Hours fished 4.5 (total)
 Fish caught 2.2 Fish/hour 4.9 Abundance L xM H

LENGTH FREQUENCY (Collection Method: ___ angling: ___ gill net\ net hrs ___)

Species	Total Length in mm								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	400+
Grayling				36	5	2	1		
Total				16	5	2	1		

FISH CONDITION

Species	Total Length (mm)		Weight (g)		Condition (K)	
	mean	range	mean	range	mean	range
Grayling	175	160-300	47	34-180		

STOCKING HISTORY

Year	Species	Number of Fish	Comments
1993	Grayling	4,300	
1992	Grayling	650	
1991	Grayling	3,500	
1990	Grayling	4,500	
1989	Grayling	2,000	

COMMENTS:

rate depends on how many grayling are available and how many lakes there are to stock statewide. Annual stocking does appear to be adequate for the fishing pressure. No changes are recommended.

The hardness and total alkalinity measurements for Noseeum and Steamboat lakes were very low (Table 4). Low values indicate low acid buffering capacity, which would make them vulnerable to acid precipitation. All other parameters appeared to be within normal ranges (Table 4).

The majority of lakes (18 of 28) were stocked with westslope cutthroat trout *O. clarki lewisi* in 1994. Seven lakes scheduled for cutthroat trout were missed primarily due the lack of Fish Lake stock fry used for the Little North Fork Clearwater River lakes. All lakes scheduled for rainbow trout *O. mykiss* were stocked, including six drive-to lakes with put-and-take trout. Bloom Lake received brook trout *Salvelinus fontinalis* fingerlings, but splake *S. fontinalis* x *S. namaycush* stocking was discontinued until an evaluation is completed to determine their contribution to the fishery and their effect on brook trout. Brown trout *Salmo trutta*, golden trout *O. aguabonita*, and Arctic grayling were not available for stocking in 1994. Stocking histories for mountain lakes in the Panhandle Region during the past 12 years are summarized in Appendix A.

Creel survey data were not available in 1994 to evaluate program goals.

The stocking schedule for Panhandle Region mountain lakes attempts to balance the number of species of fish and the number of lakes to be stocked each year (Appendices B and C). Deviations from the schedule have most often been caused by lack of fish, access problems, and conflicts with other programs. Lakes in the Little North Fork Clearwater drainage were stocked by plane from McCall Hatchery in 1994.

Species diversity will be maintained by utilizing westslope cutthroat trout and domestic Kamloops rainbow trout for most lakes, golden trout and Arctic grayling (when available) for specialty lakes, and brown trout for attempted control of stunted brook trout.

The lack of suitable sized domestic Kamloops rainbow trout has forced us to utilize different stocks of rainbow trout in order to maintain some species diversity in mountain lakes. Rainbow trout will not be stocked in mountain lakes in the Pend Oreille drainage to avoid diluting the wild Gerrard rainbow gene pool in Lake Pend Oreille, and we will stock only westslope cutthroat in lakes specified for cutthroat trout.

RECOMMENDATIONS

1. Verify lake acreage estimates from aerial photos so that stocking density recommendations are accurate.
2. Evaluate trout growth relative to stocking density and frequency to determine if existing stocking recommendations are resulting in desirable fisheries.
3. Utilize the voluntary angler diary program to evaluate fish population characteristics and angler satisfaction.

Table 4. Limnological characteristics of two mountain lakes, Noseeum and Steamboat lakes, Idaho, September 1994.

Parameter	Noseeum Lake		Steamboat Lake	
	DO	Temperature °C	DO	Temperature °C
Depth				
0	9.3	8.4	9.1	8.0
1	9.1	8.4	8.7	8.0
2	9.2	8.4	9.1	8.0
3	9.1	8.4	8.3	8.0
4	8.9	8.4	8.5	8.0
5	8.5	8.4	8.5	8.0
6	8.5	8.4	8.6	7.9
7	8.9	8.0	4.3	7.9
8	7.6	6.3	4.1	7.9
9	5.7	5.7		
10	1.4	5.5		
11	1.0	5.5		
Secchi		7.5 m		8.0 m
pH		7.3		7.2
Total alkalinity		10.0 mg/l		5.0 mg/l
Hardness		20 mg/l		20 mg/l
Conductivity		8.4 umohs		6.8 umohs
Maximum depth		10 m		8.0 m

4. Work with the U.S. Forest Service and Boundary County Backpackers to create a trail into Smith Lake to provide improved angling opportunity for Arctic grayling.
5. Consider stocking Arctic grayling or golden trout into a more accessible lake to provide increased angling opportunity for specialty stocks. Consult Department personnel and interested anglers to determine suitable waters. Survey lakes, and consider a restoration project to eliminate competition from non-specialty stocks.
6. Evaluate brown trout stocking as a tool for controlling stunted brook trout populations.
7. Evaluate return to the creel for put-and-take rainbow trout in Dismal and Antelope lakes.
8. Increase stocking of Noseeum Lake from biennial to annual at the current stocking rate of 550/ha (250 fry/acre).

LITERATURE CITED

Reid, Will. 1989. A survey of 1987 Idaho anglers opinions and preferences. Idaho Department of Fish and Game. Federal aid in fish restoration program. Job completion report F-35-R-13. Boise.

APPENDICES

Appendix A. Number and species of fish (fry except where noted) stocked into mountain lakes in the Panhandle Region from 1982-1994.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai	Hidden (1-103)	50	1982	15,656	313	Kamloops rainbow	
			1983	12,107	242	Henry's Lake cutthroat	
			1984	12,768	255	Kamloops rainbow	
			1985	12,512	250	Westslope cutthroat	
			1986	6,000	120	Westslope cutthroat	
			1987	12,500	250	Westslope cutthroat	
			1988	12,096	242	Kamloops rainbow	
			1989	3,082	62	Kamloops rainbow	
			1989	12,495	250	Westslope cutthroat	
			1990	12,928	258	Kamloops rainbow	
			1991	12,500	250	Westslope cutthroat	
			1992	8,440	169	Kamloops rainbow	
			1993	12,000	242	Westslope cutthroat	
			1994	12,500	250	Hayspur rainbow	
	Lake Mountain (Cutoff) (1-104)	7	1983	1,723	246	Henry's Lake cutthroat	
			1985	1,748	250	Westslope cutthroat	
			1987	1,750	250	Westslope cutthroat	
			1989	1,750	250	Westslope cutthroat	
			1991	1,750	250	Westslope cutthroat	
	West Fork (1-109)	12	1982	3,648	304	Kamloops rainbow	
			1983	3,016	251	Henry's Lake cutthroat	
			1984	3,010	251	Kamloops rainbow	
			1985	2,990	250	Westslope cutthroat	
			1986	4,495	375	Westslope cutthroat	
			1987	3,000	250	Westslope cutthroat	
			1988	3,007	250	Westslope cutthroat	
			1989	3,087	257	Kamloops rainbow	
			1990	3,000	250	Westslope cutthroat	
			1991	3,000	250	Kamloops rainbow	
			1992	3,000	250	Westslope cutthroat	
1993			3,006	250	Kamloops rainbow		
1994			3,000	250	Westslope cutthroat		

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
<u>Kootenai</u>	Long Mountain (1-112)	3	1987	1,000	333	Grayling	
			1990	1,500	500	Grayling	
			1991	1,500	500	Grayling	
			1992	664	331	Grayling	
			1993	1,500	500	Grayling	
	Parker (1-113)	3	1986	1,225	408	Golden trout	
			1988	1,002	334	Grayling	
			1990	1,410	470	Golden trout	
			1991	1,500	500	Grayling	
			1992	265	122	Grayling	
	Long Canyon (Smith) (1-115)	6	1987	2,000	333	Grayling	
			1988	3,000	500	Grayling	
			1990	3,000	500	Grayling	
			1991	1,000	167	Grayling	
			1993	704	117	Grayling	
	Big Fisher (1-117)	10	1983	2,486	248	Henrys Lake cutthroat	
			1985	2,530	253	Westslope cutthroat	
			1987	2,500	250	Westslope cutthroat	
			1990	2,500	250	Westslope cutthroat	
			1992	2,500	250	Westslope cutthroat	
	Myrtle (1-122)	20	1983	5,189	259	Westslope cutthroat	
1985			5,100	255	Westslope cutthroat		
1987			5,000	250	Westslope cutthroat		
1989			5,000	250	Westslope cutthroat		
1991			4,953	248	Westslope cutthroat		
1993	5,075	254	Westslope cutthroat				

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments	
Kootenai	Trout (1-124)	7	1982	3,296	471	Kamloops rainbow		
			1983	1,720	247	Henrys Lake cutthroat		
			1984	1,733	248	Kamloops rainbow		
			1985	1,748	250	Westslope cutthroat		
			1986	1,721	246	Westslope cutthroat		
			1987	1,751	250	Westslope cutthroat		
			1988	1,743	250	Westslope cutthroat		
			1990	1,750	250	Westslope cutthroat		
			1992	1,750	250	Kamloops rainbow		
			1994	1,750	250	Kamloops rainbow		
	Pyramid (1-125)			1982	3,296	300	Kamloops rainbow	
				1983	2,702	246	Henrys Lake cutthroat	
				1984	2,736	249	Kamloops rainbow	
				1985	2,760	251	Westslope cutthroat	
				1986	2,741	249	Westslope cutthroat	
				1987	2,750	250	Westslope cutthroat	
				1988	2,752	250	Westslope cutthroat	
				1989	2,750	250	Kamloops rainbow	
				1990	2,765	251	Westslope cutthroat	
				1991	2,750	250	Kamloops rainbow	
				1992	2,750	250	Westslope cutthroat	
				1993	2,805	255	Kamloops rainbow	
				1994	1,750	250	Westslope cutthroat	
				Ball Creek (1-126)		6	1983	1,513
	1984	1,000	167				Westslope cutthroat	
	1986	1,498	250				Westslope cutthroat	
	1988	1,500	250				Westslope cutthroat	
	1990	1,500	250				Westslope cutthroat	
	1992	1,500	250				Westslope cutthroat	
	1994	1,000	167				Westslope cutthroat	

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai	Little Ball Creek (1-127)	4	1984	1,500	375	Westslope cutthroat	
			1986	956	239	Westslope cutthroat	
			1988	1,000	250	Westslope cutthroat	
			1990	1,000	250	Westslope cutthroat	
			1992	1,000	250	Westslope cutthroat	
			1994	1,500	375	Westslope cutthroat	
	Snow (1-134)	10	1982	3,008	301	Westslope cutthroat	
			1983	2,872	287	Henrys Lake cutthroat	
			1987	2,500	250	Westslope cutthroat	
			1989	2,400	240	Westslope cutthroat	
			1991	2,500	250	Westslope cutthroat	
			1993	2,500	250	Westslope cutthroat	
	Roman Nose #1 (1-135)	16	1993	390	24	Bull trout	Brook trout control.
	Roman Nose #2 (1-136)	7.9	1993	162	21	Bull trout	Brook trout control.
	Roman Nose #3 (1-137)	12	1983	2,320	193	Domestic Kamloops	(size 2)
			1985	3,000	250	Westslope cutthroat	
			1986	3,000	250	Westslope cutthroat	
			1987	3,000	250	Westslope cutthroat	
			1988	3,000	250	Westslope cutthroat	
			1989	3,000	250	Kamloops rainbow	
			1990	1,000	83	Westslope cutthroat	(size 2)
1991			3,150	262	Kamloops rainbow		
1992			1,305	109	Westslope cutthroat	(size 2)	
1993			3,000	250	Kamloops rainbow		
1994	3,772	314	Westslope cutthroat	772 were size 2.			

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai	Solomon (1-146)	9	1993	500	56	Kamloops rainbow	Winter killed in 1992, shift stocking to put-and-take rainbow.
	Queen (1-148)	5	1983	1,296	259	Henrys Lake cutthroat	
			1986	1,250	250	Westslope cutthroat	
			1988	1,250	250	Westslope cutthroat	
			1990	1,250	250	Westslope cutthroat	
			1992	1,250	250	Westslope cutthroat	
	Debt (1-150)	5	1985	1,250	250	Westslope cutthroat	
			1989	1,250	250	Westslope cutthroat	
			1991	1,250	250	Westslope cutthroat	
			1993	1,250	250	Westslope cutthroat	
	Spruce (1-154)	5	1982	2,432	486	Kamloops rainbow	
			1983	1,297	259	Henrys Lake cutthroat	
			1984	2,520	504	Kamloops rainbow	
			1985	1,250	250	Westslope cutthroat	
			1986	1,250	250	Westslope cutthroat	
			1987	1,250	250	Westslope cutthroat	
			1988	1,250	250	Westslope cutthroat	
			1989	1,265	253	Westslope cutthroat	
			1990	1,250	250	Westslope cutthroat	
			1991	1,247	250	Kamloops rainbow	
			1992	1,250	250	Westslope cutthroat	
			1993	1,250	250	Kamloops rainbow	
			1994	1,360	272	Westslope cutthroat	
	Copper (1-155)	5	1983	1,297	259	Henrys Lake cutthroat	
			1984	1,390	278	Westslope cutthroat	
			1986	1,250	250	Westslope cutthroat	
			1988	1,247	250	Westslope cutthroat	

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments		
<u>Kootenai</u>	Copper (Cont.)		1990	1,250	250	Westslope cutthroat			
			1992	1,250	250	Westslope cutthroat			
			1994	1,360	273	Westslope cutthroat			
	Callahan (Smith) (1-160)	10	1984	2,500	250	Westslope cutthroat			
			1987	2,522	252	Westslope cutthroat			
			1988	2,500	250	Westslope cutthroat			
			1992	2,563	251	Westslope cutthroat			
			1993	2,514	250	Westslope cutthroat			
	Estelle (1-167)	5	1988	1,075	215	Brown trout	Test control of stunted brook trout.		
			1990	500	100	Brown trout (size 3)			
			1992	150	30	Brown trout (size 2)			
	20 <u>Pend Oreille</u>	Hunt (2-101)	12	1982	3,648	304	Kamloops rainbow		
				1985	3,000	250	Westslope cutthroat		
1986				3,000	250	Westslope cutthroat			
1987				3,033	253	Westslope cutthroat			
1988				3,000	250	Westslope cutthroat			
1989				5,000	417	Westslope cutthroat			
1990				3,000	250	Westslope cutthroat			
1991				3,000	250	Westslope cutthroat			
1992				3,023	250	Westslope cutthroat			
1993				3,000	250	Westslope cutthroat			
1994				3,000	250	Westslope cutthroat			
Standard (2-103)				16	1983	4,021	251	Henrys Lake cutthroat	
					1985	4,000	250	Westslope cutthroat	
		1987	3,962		248	Westslope cutthroat			
		1989	4,000		250	Westslope cutthroat			
		1991	4,000		250	Westslope cutthroat			
		1993	4,020		251	Westslope cutthroat			

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
<u>Pend Oreille</u>	Two Mouth #1 (2-106)	?	1981	2,258	--	Westslope cutthroat	Discontinued stocking due to winter kill.
	Two Mouth #2 (2-107)	5	1983	2,054	411	Henrys Lake cutthroat	
			1985	1,265	253	Westslope cutthroat	
			1987	1,269	254	Westslope cutthroat	
			1989	1,265	253	Westslope cutthroat	
			1991	1,250	250	Westslope cutthroat	
			1993	1,327	265	Westslope cutthroat	
	Two Mouth #3 (2-108)	20	1983	4,973	249	Henrys Lake cutthroat	
			1984	5,280	264	Westslope cutthroat	
			1986	5,000	250	Westslope cutthroat	
			1988	5,000	250	Westslope cutthroat	
			1990	5,000	250	Westslope cutthroat	
			1992	5,000	250	Westslope cutthroat	
			1994	5,000	250	Westslope cutthroat	
	Mollies (2-114)	2	1983	648	324	Henrys Lake cutthroat	
			1985	506	253	Westslope cutthroat	
			1987	508	254	Westslope cutthroat	
			1989	500	250	Westslope cutthroat	
			1991	500	250	Westslope cutthroat	
			1993	503	251	Westslope cutthroat	
	Caribou (near West Fk. Mtn) (2-116)	6.8	1984	1,752	258	Henrys Lake cutthroat	
			1986	1,750	257	Westslope cutthroat	
			1987	1,750	257	Westslope cutthroat	
			1988	1,750	257	Westslope cutthroat	
			1990	1,750	257	Westslope cutthroat	
			1992	1,750	257	Westslope cutthroat	
			1994	1,750	257	Westslope cutthroat	

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
<u>Pend Oreille</u>	Fault (Hunt Peak #1) (2-121)	6	1981	2,258	376	Westslope cutthroat	
			1983	2,872	478	Henry's Lake cutthroat	
			1985	1,500	250	Westslope cutthroat	
			1987	1,500	250	Westslope cutthroat	
			1989	1,553	259	Westslope cutthroat	
			1991	2,275	379	Westslope cutthroat	Received McCormick
			1993	1,500	250	Westslope cutthroat	Lake fish as well.
	McCormick (Hunt Peak #2) (2-122)	3.1	1985	780	252	Westslope cutthroat	
			1987	775	250	Westslope cutthroat	
			1989	805	260	Westslope cutthroat	
			1991	816	263	Westslope cutthroat	
			1993	775	250	Westslope cutthroat	
	Little Harrison (2-126)	6.5	1983	1,651	254	Henry's Lake cutthroat	
			1987	1,625	250	Westslope cutthroat	
			1988	1,625	250	Westslope cutthroat	
			1990	1,625	250	Westslope cutthroat	
			1992	1,625	250	Westslope cutthroat	
			1994	1,625	250	Westslope cutthroat	
	Beehive (2-128)	7	1983	1,723	246	Henry's Lake cutthroat	
			1985	1,740	248	Westslope cutthroat	
			1986	1,803	258	Westslope cutthroat	
			1987	1,750	250	Westslope cutthroat	
			1989	2,164	309	Westslope cutthroat	
			1991	1,750	250	Westslope cutthroat	
			1993	1,750	250	Westslope cutthroat	
	Harrison (2-129)	29	1982	6,972	240	Kamloops rainbow	
			1983	7,243	250	Henry's Lake cutthroat	
			1984	7,296	250	Kamloops rainbow	
1985			7,200	248	Westslope cutthroat		

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Pend Oreille	Harrison (Cont.)		1986	6,870	237	Westslope cutthroat	
			1987	7,264	250	Westslope cutthroat	
			1988	7,250	250	Westslope cutthroat	
			1989	7,479	258	Westslope cutthroat	
			1990	7,250	250	Westslope cutthroat	
			1991	7,246	250	Westslope cutthroat	
			1992	7,250	250	Westslope cutthroat	
			1993	7,250	250	Westslope cutthroat	
			1994	7,250	250	Westslope cutthroat	
	Beaver (2-130)	5	1990	500	100	Brown trout (size 3)	Test control of stunted brook trout.
			1992	150	30	Brown trout (size 2)	
	Dennick (2-171)	8	1983	1,939	242	Henrys Lake cutthroat	
			1984	2,060	258	Westslope cutthroat	
			1985	2,010	251	Westslope cutthroat	
			1986	2,500	312	Westslope cutthroat	
			1987	2,000	250	Westslope cutthroat	
			1988	2,000	250	Westslope cutthroat	
			1989	2,064	258	Westslope cutthroat	
			1990	2,000	250	Westslope cutthroat	
			1991	2,000	250	Westslope cutthroat	
			1992	2,000	250	Westslope cutthroat	
			1992	150	19	Brown trout	Stocked by mistake (helicopter plant).
			1993	2,053	257	Westslope cutthroat	
			1994	2,000	250	Westslope cutthroat	
			Sand (2-172)	5	1982	8,360	1,672
	1983	1,221			244	Henrys Lake cutthroat	
	1984	1,254			251	Westslope cutthroat	
	1985	1,260			252	Westslope cutthroat	
	1986	1,250			250	Westslope cutthroat	
	1987	1,250			250	Westslope cutthroat	
	1988	1,247			250	Westslope cutthroat	

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Pend Oreille	Sand (Cont.)		1989	1,250	250	Westslope cutthroat	
			1990	1,250	250	Westslope cutthroat	
			1991	1,250	250	Westslope cutthroat	
			1992	1,250	250	Westslope cutthroat	
			1993	1,026	205	Westslope cutthroat	
			1994	1,250	250	Westslope cutthroat	
	Bloom (2-173)	20	1982	10,620	531	Brook trout	
			1984	5,041	252	Brook trout	
			1985	4,599	230	Brook trout	
			1986	5,360	268	Brook trout	
			1987	5,000	250	Brook trout	
			1988	5,000	250	Brook trout	
			1989	5,000	250	Brook trout	
			1990	10,013	500	Brook trout	
			1990	500	25	Splake	(size 2)
			1991	4,000	200	Brook trout	
			1992	5,000	250	Brook trout	
			1992	2,000	100	Westslope cutthroat	Stocked by mistake (helicopter plant).
			1992	500	25	Splake	(size 2)
			1993	5,000	250	Brook trout	
			1993	500	25	Splake	(size 2)
			1994	5,000	25	Brook trout	(size 2)
			Porcupine (2-182)	13	1982	1,296	100
	1983	2,872			220	Domestic Kamloops	(size 2)
	1984	1,016			78	Catchable rainbow	Shift management
	1985	1,000			77	Catchable rainbow	to put-and-take
	1986	1,075			83	Mt. Lassen rainbow	(size 3) stocking.
	1987	--			--		Road washed out.
	1988	600			46	Mt. Lassen rainbow	
	1989	690			53	Mt. Lassen rainbow	
	1990	750			58	Catchable rainbow	

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
<u>Pend Oreille</u>	Porcupine (Cont.)		1991	--	--	Not stocked	Road washed out.
			1993	387	30	Kamloops rainbow	
			1994	303	23	Hayspur rainbow	
	Moose (2-185)	16.5	1987	1,000	61	Brown trout	Test control on
			1988	4,515	274	Brown trout	stunted brook trout.
			1990	500	30	Brown trout	(size 3)
			1992	500	30	Brown trout	(size 2)
	Antelope (2-190)	16	1982	5,032	314	Westslope cutthroat	
			1989	1,155	72	Mt. Lassen rainbow	(size 3)
			1990	1,000	63	Catchable rainbow	
			1990	200	12	Westslope cutthroat	(Broodstock)
			1991	2,000	125	Westslope cutthroat	(size 2)
			1991	1,100	69	Eagle Lake rainbow	(size 3)
			1991	50	3	Creston brdstck rainbow (Eagle Lake)	
			1992	1,363	85	Hayspur rainbow	(size 3)
			1993	1,387	87	Hayspur rainbow	(size 3)
			1994	1,000	62	Hayspur rainbow	(Size 3)
	Caribou (near Keokee Mtn.) (2-196)	6.8	1983	2,872	422	Henrys Lake cutthroat	
			1984	1,750	257	Westslope cutthroat	
			1985	1,700	250	Westslope cutthroat	
			1986	1,500	220	Westslope cutthroat	
			1987	1,704	250	Westslope cutthroat	
			1988	1,722	253	Westslope cutthroat	
			1989	1,700	250	Westslope cutthroat	
			1990	1,700	250	Westslope cutthroat	
			1991	1,700	250	Westslope cutthroat	
			1992	1,750	257	Westslope cutthroat	
			1993	1,700	250	Westslope cutthroat	
			1994	1,700	250	Westslope cutthroat	

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments	
Spokane	Mirror	5	1981	5,000	1,000	Westslope cutthroat	Winterkill lake.	
	Elsie (3-119)	10	1982	1,440	144	Catchable rainbow	Stock put-and-take (size 3) rainbow.	
			1983	1,500	150	Catchable rainbow		
			1984	2,865	286	Catchable rainbow		
			1985	3,005	300	Catchable rainbow		
			1986	3,024	302	Catchable rainbow		
			1987	2,000	200	Hayspur rainbow		
			1988	4,050	405	Hayspur rainbow		
			1989	2,856	284	Mt. Lassen rainbow		
			1990	3,000	300	Eagle Lake		
			1991	3,516	350	Hayspur rainbow		
			1992	4,020	402	Hayspur rainbow		
			1993	4,045	404	Hayspur rainbow		
			1994	2,264	226	Hayspur rainbow		
			Lower Glidden (3-123)	12	1982	1,880		157
	1983	1,000			83	Catchable rainbow		
	1984	4,945			412	Catchable rainbow		
	1985	3,018			251	Catchable rainbow		
	1986	3,011			251	Catchable rainbow		
	1987	3,277			273	Hayspur rainbow		
	1988	3,001			250	Hayspur rainbow		
	1989	2,836			236	Mr. Lassen rainbow		
	1990	1,775			148	Catchable rainbow		
	1991	1,986			165	Hayspur rainbow	(size 3)	
	1992	3,534			295	Hayspur rainbow		
	1993	4,005			334	Hayspur rainbow		
	1994	2,212			184	Hayspur rainbow		
Upper Glidden (3-124)	10	1980	992	99	Kamloops rainbow	Brook trout control.		
		1993	180	18	Bull trout			

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Spokane	Gold (3-125)	3	1983	1,005	335	Henry's Lk cutthroat	Shallow, need to evaluate survival.
			1987	750	250	Westslope cutthroat	
			1989	750	250	Westslope cutthroat	
			1991	750	250	Mt. Lassen rainbow	
			1993	500	167	Kamloops rainbow	
	Revelt (3-130)	12	1980	992	83	Kamloops rainbow	Brook trout control.
			1993	309	26	Bull trout	
	Crater (3-133)	5	1983	5,000	1,000	Grayling	Reserve for grayling.
			1987	2,100	420	Grayling	
			1988	2,500	500	Grayling	
			1990	2,500	500	Grayling	
			1991	2,500	500	Grayling	
			1993	2,500	500	Grayling	
	Dismal (3-138)	?	1983	1,500	--	Catchable rainbow	Reduce stocking to 250 put-and-take rainbow and evaluate.
			1984	537	--	Catchable rainbow	
			1985	490	--	Catchable rainbow	
			1986	253	--	Catchable rainbow	
			1987	249	--	Hayspur rainbow	
			1988	260	--	Mt. Lassen rainbow	
			1988	260	--	Hayspur rainbow	
			1989	225	--	Mr. Lassen rainbow	
			1990	250	--	Catchable rainbow	
			1991	243	--	Hayspur rainbow	
			1992	250	--	Hayspur rainbow	
			1993	230	--	Hayspur rainbow	
			1994	265	--	Hayspur rainbow	
	Bacon (3-144)	9	1985	2,255	250	Westslope cutthroat	
			1987	2,250	250	Westslope cutthroat	
			1989	2,250	250	Westslope cutthroat	
			1991	2,250	250	Westslope cutthroat	
			1993	2,250	250	Westslope cutthroat	

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
<u>Spokane</u>	Forage (3-146)	13	1987	3,150	242	Golden trout	Reserve for goldens or grayling.
			1988	3,250	250	Grayling	
			1989	2,000	154	Grayling	
			1990	3,250	250	Golden trout	
			1992	600	46	Grayling	
			1993	3,250	250	Grayling	
	Halo (3-147)	12	1985	3,010	251	Westslope cutthroat	
			1987	3,000	250	Westslope cutthroat	
			1989	3,000	250	Westslope cutthroat	
			1991	3,000	250	Westslope cutthroat	
			1993	3,000	250	Westslope cutthroat	
	Crystal (3-160)	10	1983	4,380	438	Henrys Lake cutthroat	
			1985	2,510	251	Westslope cutthroat	
			1987	2,510	251	Westslope cutthroat	
			1988	2,500	250	Westslope cutthroat	
			1989	2,500	250	Westslope cutthroat	
			1991	2,500	250	Westslope cutthroat	
			1993	2,500	250	Westslope cutthroat	
	<u>Little North Fork Clearwater</u>	Devils Club (6-113)	4	1986	1,000	250	Westslope cutthroat
				1988	1,000	250	Westslope cutthroat
				1991	1,093	273	Westslope cutthroat
1992				1,000	250	Westslope cutthroat	
Big Talk (6-114)		?	1986	1,500	--	Westslope cutthroat	
			1988	2,500	--	Westslope cutthroat	
			1990	2,737	--	Westslope cutthroat	
			1992	2,500	--	Westslope cutthroat	
Larkins (6-117)		12	1986	3,000	250	Westslope cutthroat	
			1988	3,000	250	Westslope cutthroat	
	1990		3,278	273	Westslope cutthroat		

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
<u>Little North Fork Clearwater</u>	Mud (6-118)	6	1987	1,500	250	Westslope cutthroat	
			1989	1,500	250	Westslope cutthroat	
			1991	1,500	250	Mt. Lassen rainbow	
			1993	1,500	250	Hayspur rainbow	
	Hero (6-119)	4	1986	1,000	250	Westslope cutthroat	
			1988	1,000	250	Westslope cutthroat	
			1990	1,093	273	Westslope cutthroat	
			1992	1,000	250	Westslope cutthroat	
	Heart (6-122)	40	1986	10,000	250	Westslope cutthroat	
			1990	10,000	250	Mt. Lassen rainbow	
			1992	10,000	250	Mt. Lassen rainbow	
			1994	3,865	97	Kamloops rainbow	
	Northbound (6-123)	12	1986	3,000	250	Westslope cutthroat	
			1988	3,000	250	Westslope cutthroat	
			1990	3,278	273	Westslope cutthroat	
			1992	3,000	250	Westslope cutthroat	
			1994	500	42	Westslope cutthroat	
	Skyland (6-125)	13	1987	3,250	250	Westslope cutthroat	
			1989	3,250	250	Westslope cutthroat	
			1991	3,250	250	Mt. Lassen rainbow	
1993			3,250	250	Hayspur rainbow		
Fawn (6-126)	13	1986	3,250	250	Westslope cutthroat		
		1988	3,250	250	Westslope cutthroat		
		1990	3,565	274	Westslope cutthroat		
		1992	3,250	250	Westslope cutthroat		

Appendix A. Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
<u>Little North Fork Clearwater</u>	Noseeum (6-130)	4	1985	1,008	251	Westslope cutthroat	
			1987	1,000	250	Westslope cutthroat	
			1989	1,000	250	Westslope cutthroat	
			1991	1,000	250	Westslope cutthroat	
			1993	1,000	250	Westslope cutthroat	
	Steamboat (6-131)	9	1986	2,000	222	Grayling	Reserve for grayling.
			1988	4,500	500	Grayling	
			1989	2,000	222	Grayling	
			1990	4,500	500	Grayling	
			1991	3,500	389	Grayling	
			1992	650	72	Grayling	
	Copper (6-201)	3	1985	765	255	Westslope cutthroat	
			1989	750	250	Westslope cutthroat	
			1991	750	250	Westslope cutthroat	
			1992	1,250	417	Westslope cutthroat	
			1993	750	250	Westslope cutthroat	
	Gold (6-202)	8	1986	2,000	250	Westslope cutthroat	
			1988	2,000	250	Westslope cutthroat	
			1990	2,185	273	Westslope cutthroat	
	Tin (6-204)	3	1987	750	250	Westslope cutthroat	
1988			750	250	Westslope cutthroat		
1990			750	250	Blackfoot rainbow		
1992			750	250	Mt. Lassen rainbow		
1994			750	250	Kamloops rainbow		
Silver (6-205)	10	1985	999	100	Mr. Lassen rainbow		
		1989	2,500	250	Westslope cutthroat		
		1991	2,500	250	Westslope cutthroat		
		1993	2,500	250	Hayspur rainbow		

Appendix B. Odd-year stocking schedule for the Panhandle Region mountain lakes.

Lake	Code No.	Surface acres	No. stocked	Species	Substitute species
<u>Kootenai</u>					
Hidden	01-103	50	12,500	C2	K1
Lake Mtn.(Cutoff)	01-104	7	1,750	C2	None
West Fork	01-109	12	3,000	K1	C2
Long Mtn.	01-112	3	1,500	GR	None
Parker	01-113	3	1,000	GN	GR
Long Canyon (Smith)	01-115	6	3,000	GR	None
Myrtle	01-122	20	5,000	C2	None
Pyramid	01-125	11	2,750	K1	C2
Snow	01-134	10	2,500	C2	None
Roman Nose #3	01-137	12	3,000	K1	C2
Spruce	01-154	5	1,250	K1	C2
Debt	01-157	5	1,250	C2	None
Callahan	01-166	10	2,500	C2	None
<u>Pend Oreille</u>					
Hunt	02-101	12	3,000	C2	None
Standard	02-103	16	4,000	C2	None
Two Mouth #2	02-107	5	1,250	C2	None
Mollies	02-114	2	500	C2	None
Fault (Hunt Pk #1)	02-121	6	1,500	C2	None
McCormick (Hunt Pk #2)	02-122	3.1	775	C2	None
Beehive	02-128	7	1,750	C2	None
Harrison	02-129	29	7,250	C2	None
Dennick	02-171	8	2,000	C2	None
Sand	02-172	5	1,250	C2	None
Bloom	02-173	20	5,000	BK*Size 2	None
Caribou (near Keokee Mtn.)	02-196	6.8	1,700	C2	None

Appendix B. Continued.

Lake	Code No.	Surface acres	No. stocked	Species	Substitute species
<u>Spokane</u>					
Gold	03-125	3	750	K1	None
Crater	03-133	5	2,500	GR	None
Bacon	03-144	9	2,250	C2	None
Forage	03-146	13	3,250	GN	GR
Halo	03-147	12	3,000	C2	None
Crystal	03-160	10	2,500	C2	None
<u>Little North Fork Clearwater</u>					
Mud	06-118	6	1,500	K1	None
Skyland	06-125	13	3,250	K1	None
Noseeum	06-130	4	1,000	C2	None
Steamboat	06-131	9	4,500	GR	None
Copper	06-201	3	750	C2	None
Silver	06-205	10	2,500	K1	None

Total number of fish to be stocked:

- C2 - 59,975
- K1 - 18,000
- GR - 11,500
- GN - 5,250 (Grayling can be substituted for goldens)
- BK - 5,000 Size 2

Appendix C. Even-year stocking schedule for the Panhandle Region mountain lakes.

Lake	Code No.	Surface acres	No. stocked	Species	Sustitute species
<u>Kootenai</u>					
Hidden	01-103	50	12,500	K1	C2
West Fork	01-109	12	3,000	C2	K1
Long Mtn.	01-112	3	1,500	C2	None
Parker	01-113	3	1,000	GN	GR
Long Canyon (Smith)	01-115	6	3,000	GR	None
Big Fisher	01-117	10	2,500	C2	None
Trout	01-124	7	1,750	K1	C2
Pyramid	01-125	11	2,750	C2	K1
Ball Creek	01-126	6	1,500	C2	None
Little Ball Cr.	01-127	4	1,000	C2	None
Roman Nose #3	01-137	12	3,000	C2	K1
Queen	01-148	5	1,250	C2	None
Spruce	01-154	5	1,250	C2	K1
Copper	01-155	5	1,250	C2	None
Estelle	01-167	5	1,250	BN	None
<u>Pend Oreille</u>					
Hunt	02-101	12	3,000	C2	None
Two Mouth #3	02-108	20	5,000	C2	None
Caribou (near West Fk. Mtn.)	02-116	7.8	1,750	C2	None
Little Harrison	02-126	6.5	1,625	C2	None
Harrison	02-129	29	7,250	C2	None
Beaver	02-130	5	1,250	BN	None
Dennick	02-171	8	2,000	C2	None
Sand	02-172	5	1,250	C2	None
Bloom	02-173	20	5,000*	BK *Size 2	None
Moose	02-185	16.5	4,200	BN	None

Appendix C. Continued.

Lake	Code No.	Surface acres	No. stocked	Species	Substitute species
Caribou (near Keokee Mtn.)	02-196	6.8	1,700	C2	None
<u>Spokane</u>					
Crater	03-133	5	2,500	GR	None
Forage	03-146	13	3,250	GN	GR
<u>Little North Fork Clearwater</u>					
Devils Club	06-113	4	1,000	C2	None
Big Talk	06-114	?	2,500	C2	None
Larkins	06-117	12	3,000	C2	None
Hero	06-119	4	1,000	C2	None
Heart	06-122	40	10,000	K1	None
Northbound	06-123	12	3,000	C2	None
Fawn	06-126	13	3,250	C2	None
Noseeum	06-130	4	1,000	C2	None
Steamboat	06-131	9	4,500	GR	None
Gold	06-202	8	2,000	C2	None
Tin	06-204	3	750	K1	None

Total number of fish to be stocked:

C2 - 59,075

K1 - 25,000

GR - 11,500

GN - 4,250 (Grayling can be substituted for goldens)

BK - 5,000 size 2

BN - 6,700

1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project I: I-Surveys and Inventories

Subproject I-A: Panhandle Region

Job: b Title: Lowland Lakes Investigations

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

A creel survey was conducted on Hayden Lake from July 1 to November 30, 1994. Anglers fished for an estimated 28,374 hours. Anglers caught an estimated 28,131 fish for a catch rate of 0.99 fish/h. No fin-clipped rainbow trout *Oncorhynchus mykiss* or cutthroat trout *O. clarki* were observed in the creel. This may be a result of marked trout not obtaining legal size, 356 mm (14 inches) and the creel survey beginning after the major trout fishing season was over. In 1995, the creel survey will be conducted from March or April through June 1.

Survey questionnaires were mailed to Hayden Lake property owners and handed out to anglers fishing Hayden Lake. Anglers and lake front property owners supported the quality fishery management program on Hayden Lake.

An angler creel census was conducted on Priest Lake from January 1 to December 31, 1994. An estimated 62,602 hours of effort were expended in 17,198 angler-days. Non-resident anglers accounted for 51 % of the effort. Fishermen harvested an estimated 13,987 lake trout with *Salvelinus namaycush* an average weight of 1.4 kg/fish. Yield of lake trout from Priest Lake in 1994 was estimated at 19,632 kg or 2.05 kg/ha. The average catch rate for lake trout in 1994 was 5 h/fish.

Of the 116 angler questionnaires returned, 108 anglers were specifically fishing for lake trout. Seventy-five percent of the angler questionnaire respondents considered "trophy" size lake trout to be fish in excess of 20 pounds.

The estimated number of kokanee *O. nerka kennerlyi* in Coeur d'Alene Lake in 1994 was the fourth highest since 1980. The high estimate of kokanee abundance was due to the high number of age 1 and age 2 kokanee. Mean length of kokanee spawners was 248 mm and 228 mm for male and female kokanee, respectively.

The number of chinook salmon *O. tshawytscha* redds counted in the Coeur d'Alene and St. Joe rivers in 1994 totaled 118. A total of 17,267 chinook salmon fingerlings were stocked into Coeur d'Alene Lake in 1994.

Two midwater trawl estimates of kokanee population abundance were made in Lake Pend Oreille in 1994. The August estimate totaled 4,350,000 kokanee and the September estimate totaled 9,680,000 kokanee.

On May 27, 1994, 383,550 kokanee age 0 fry were released in Spirit Lake. The Spirit Lake kokanee population was estimated at 189,000 fish during August trawling.

A total of 61,030 one- and two-year-old westslope cutthroat trout *O. clarki lewisi* were released from eight net pens located in Ellisport, Scenic, and Garfield bays on Lake Pend Oreille in April and May of 1994.

The fish populations in Benewah, Chatcolet, and Round (Benewah Count) lakes appear to have good species diversity and reasonable growth. The most abundant fish species collected by gill nets, trap nets, and electrofishing were brown bullheads *Ameirus nebulosus*, followed by yellow perch *Perca flavescens*, northern squawfish *Ptychocheilus oregonensis*, and suckers *Catostomus* sp.. The largemouth bass *Micropterus salmoides* population for all three lakes combined had a Proportional Stock Density (PSD) of 47.6. Most of the relative weight (W_r) values for largemouth bass were between 85 and 105 which indicated a balanced population. Some channel catfish *Ictalurus punctatus* stocked into the St. Joe and St. Maries rivers in 1989 and 1990 have moved down into Chatcolet Lake.

In Round Lake, the alkalinity was 30 mg/1 in 1994, a decline from 60 mg/1 in spring 1966. The pH, dissolved oxygen, and temperature did not differ significantly from data collected in 1966.

Standard lowland lake surveys were conducted on Blue and Chase lakes in Bonner County. Channel catfish have been established and are providing a unique fishing opportunity in Blue Lake. Chase Lake offers some of the largest yellow perch in northern Idaho.

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OBJECTIVES

1. Evaluate return to the creel of stocked rainbow trout *Oncorhynchus mykiss* and cutthroat trout *O. clarki* fingerlings in Hayden Lake.
2. Determine angling effort and harvest on Hayden Lake.
3. Determine angler and property owner's attitudes and opinions about the quality fish management program on Hayden Lake.
4. Estimate the angling effort and harvest of lake trout *Salvelinus namaycush* from Priest Lake.
5. Evaluate the slot limit size regulation for lake trout in Priest Lake.
6. Determine kokanee *O. nerka kennerlyi* stock status in Coeur d'Alene Lake.
7. Evaluate changes in the kokanee population caused by chinook salmon *O. tshawytscha* predation (chinook population abundance).
8. Make predictions about future kokanee fisheries based on year class strength and potential egg deposition.
9. Determine the kokanee stock status in Lake Pend Oreille.
10. Determine the kokanee stock status in Spirit Lake.
11. Evaluate the fish community in Benewah, Chatcolet, and Round (Benewah County) lakes.
12. Evaluate new species introductions of channel catfish *Ictalurus punctatus* and tiger muskie *Esox lucius x E. masquinongy* in Blue Lake (Bonner County).
13. Conduct a standard lowland lake survey on Chase Lake to assess the status of fish populations and their habitat.

METHODS

Angler Creel Census

Hayden Lake

Creel Survey-A roving creel survey was conducted on Hayden Lake (Figure 1) from July 1, 1994 through November 30, 1994. The creel survey will begin again on February 1, 1995 and be completed on June 30, 1995.

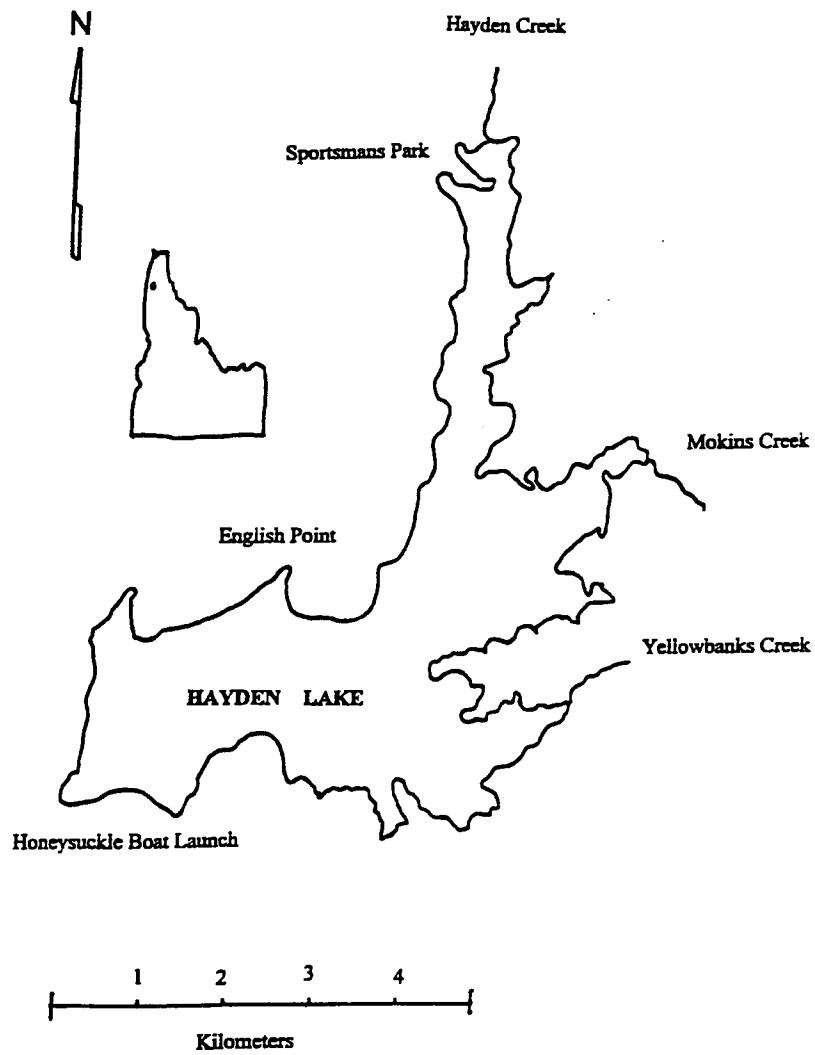


Figure 1. Hayden Lake, Idaho, 1994.

The survey period, July 1 to November 30, 1994, was divided into ten 14-day intervals. Fifty percent of the weekend days and 40% of the weekdays were surveyed. Two instantaneous counts were made per survey day by boat. Each day was divided into two parts; morning and afternoon. All census days and count times were randomly selected. Angler interviews were conducted the same day as the counts. Interviews were conducted on the lake and at the boat ramps.

The creel survey will estimate fishing effort, catch rates, and harvest. Several groups of rainbow trout and westslope cutthroat trout *O. clarki lewisi* (20,000 fish/group) were fin-clipped in 1993 and 1994 (Table 1) to evaluate the stocking program. Fin-clipped trout will help determine what length, what time of the year, or what strain of rainbow trout, either domestic Kamloops or domestic Kamloops\steelhead hybrids, have the best growth and the best returns to the angler. Surveys are not yet complete.

The Creel Census System computer program (McArthur 1993) was used to summarize the creel data.

Angler Questionnaire-Two questionnaires were developed to assess the attitudes of Hayden Lake anglers and lake front property owners on Hayden Lake (Appendices D and E) about the fishery management program on Hayden Lake. Angler questionnaires were handed out during the interview and only to anglers willing to fill out the lengthy paperwork. Property owners' questionnaires were mailed to the address used by the County Assessor to mail tax notices. Each questionnaire had return postage. The responses were summarized for each question.

Priest Lake

Creel Survey-A boat count/angler interview census was used to estimate fishing pressure and harvest and to assess angler opinions on Priest Lake in 1994. Methods were patterned after those used by Bjornn (1957), Rieman and Lukens (1979), and Mauser (1985). The Creel Census Systems computer program (McArthur 1992) was used to delineate survey periods and compute creel census results.

A total of 13 intervals comprised the period of January 1, 1994 to December 31, 1994. Each interval contained two week days and two weekend days on which boat counts were made. Holidays were considered the same as weekend days and sampled accordingly. Two instantaneous boat counts were made on creel census days, the first in the morning and the second in the afternoon at predetermined random times. The instantaneous counts were completed within one hour of the designated start time. Randomly selected survey days and times were provided by the Creel Census Systems program. The lake was divided into four sections, as was done in previous years, to account for differences in fishing pressure by area (Figure 2). Anglers were interviewed while they were fishing as well as at boat launches to acquire completed trip information.

Angler Questionnaire-Questionnaires regarding the management of the Priest Lake fishery (Appendix L) were handed out during angler contacts. The questionnaire was addressed and pre-stamped for return to the Idaho Department of Fish and Game (IDFG). Gary Brookshire, of Priest Lake Guide Service, was also provided with a supply of the same questionnaire to hand out to his clientele. The color of the questionnaire was changed each month.

Table 1. Cutthroat and rainbow trout stocking in Hayden Lake, Idaho spring 1993 through spring 1994. Includes number stocked, number fin-clipped, and fin clip used.

Date stocked	Species	Number stocked	Number finclipped	Fin clipped	Mean length (mm)
May/June 1993	cutthroat trout	99,998	20,000	adipose	163
May 1993	rainbow trout	136,036	20,000	left ventral	70
October 1993	rainbow trout	57,400	20,000	right ventral	178
April 1994	cutthroat trout	99,991	20,000	adipose	160
April 1994	rainbow trout	135,625	20,000	adipose	128

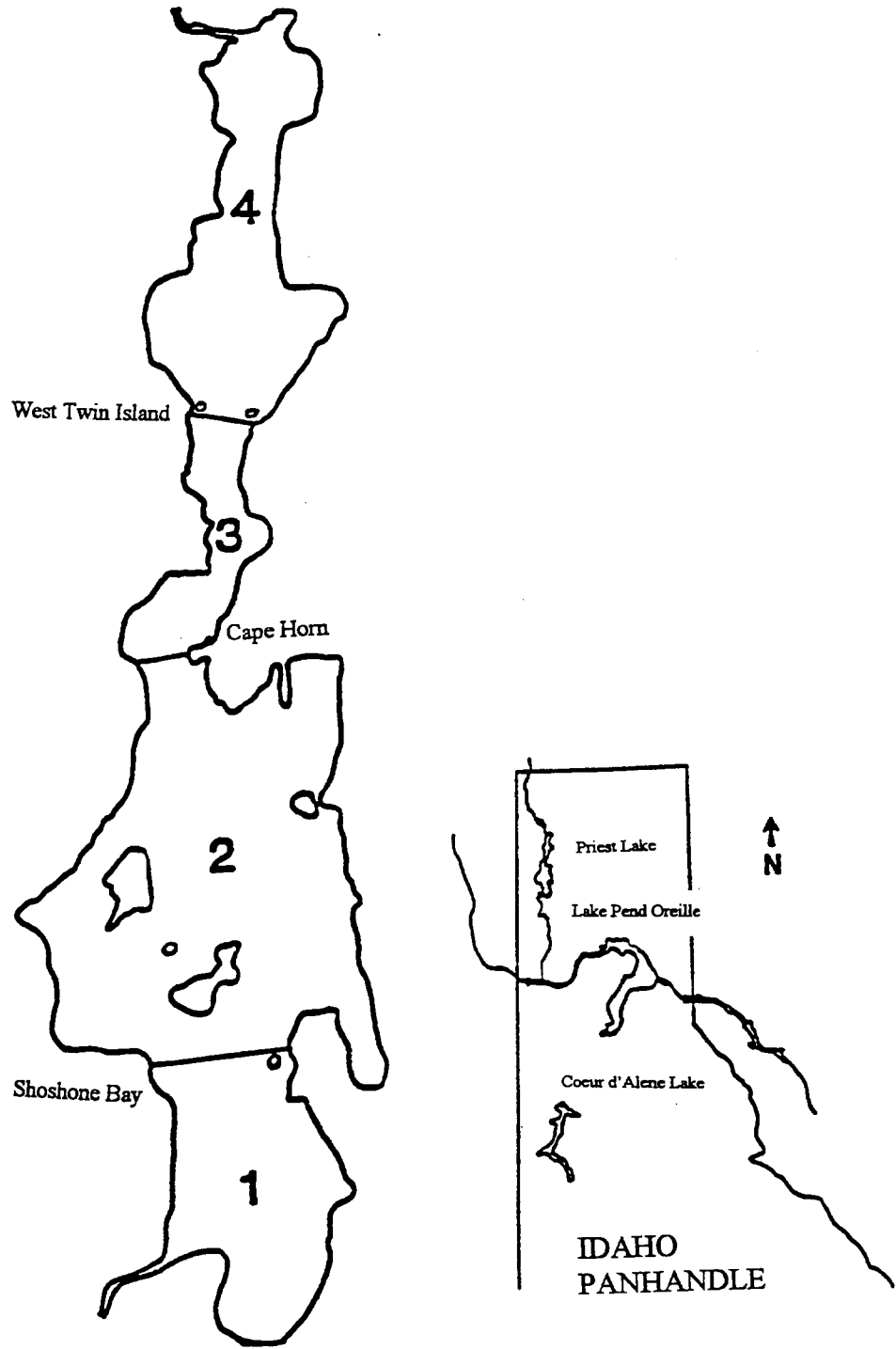


Figure 2. Priest Lake, Idaho, showing 1994 creel census sections.

Fish Population Characteristics

Coeur d'Alene Lake

Kokanee Abundance-Midwater trawling was used to obtain population estimates for kokanee in Coeur d'Alene Lake as described by Bowler et al. (1978), Rieman and Myers (1990), and Maiolie and Davis (1996). Twenty-four transects were surveyed in 1994 (Figure 3).

Length at Spawning-Total lengths (mm) of 110 kokanee spawners were recorded from kokanee collected in gill nets set along the Coeur d'Alene Lake shoreline near Blue Creek Bay on three days in November and December 1994. Mean length for each sex was calculated.

Kokanee Fecundity-The average number of eggs produced per female kokanee was calculated using the mean length and the following formula:

$$Y = - 947 + 5.26x$$

Where: x = mean length of female kokanee spawners (mm)
 Y = mean number of eggs per female

Potential egg deposition was estimated using the following formula:

$$x = [.5(y)]z$$

Where: x = potential egg deposition
 y = estimated population of age 3 kokanee
 z = estimated eggs/female kokanee

Chinook Salmon, Natural Chinook Abundance-Department personnel conducted chinook salmon redd counts (via helicopter) on the Coeur d'Alene River, North Fork Coeur d'Alene River, South Fork Coeur d'Alene River, Little North Fork Coeur d'Alene River, and the St. Joe River on October 10, 1994. Natural chinook salmon abundance was calculated from these redd counts. Biologists estimated 4,500 chinook salmon eggs per redd and assumed a 10% egg-to-smolt survival. Ninety-three redds were needed to produce the desired number of chinook salmon smolts based on these assumptions (41,850 smolts). All redds in excess of 93 were destroyed as described in Horner et al. (1996b).

Lake Pend Oreille

Kokanee Abundance-Lake Pend Oreille kokanee were sampled twice in 1994 with a midwater trawl; once during the new moon phase of August and again during the new moon phase of September.

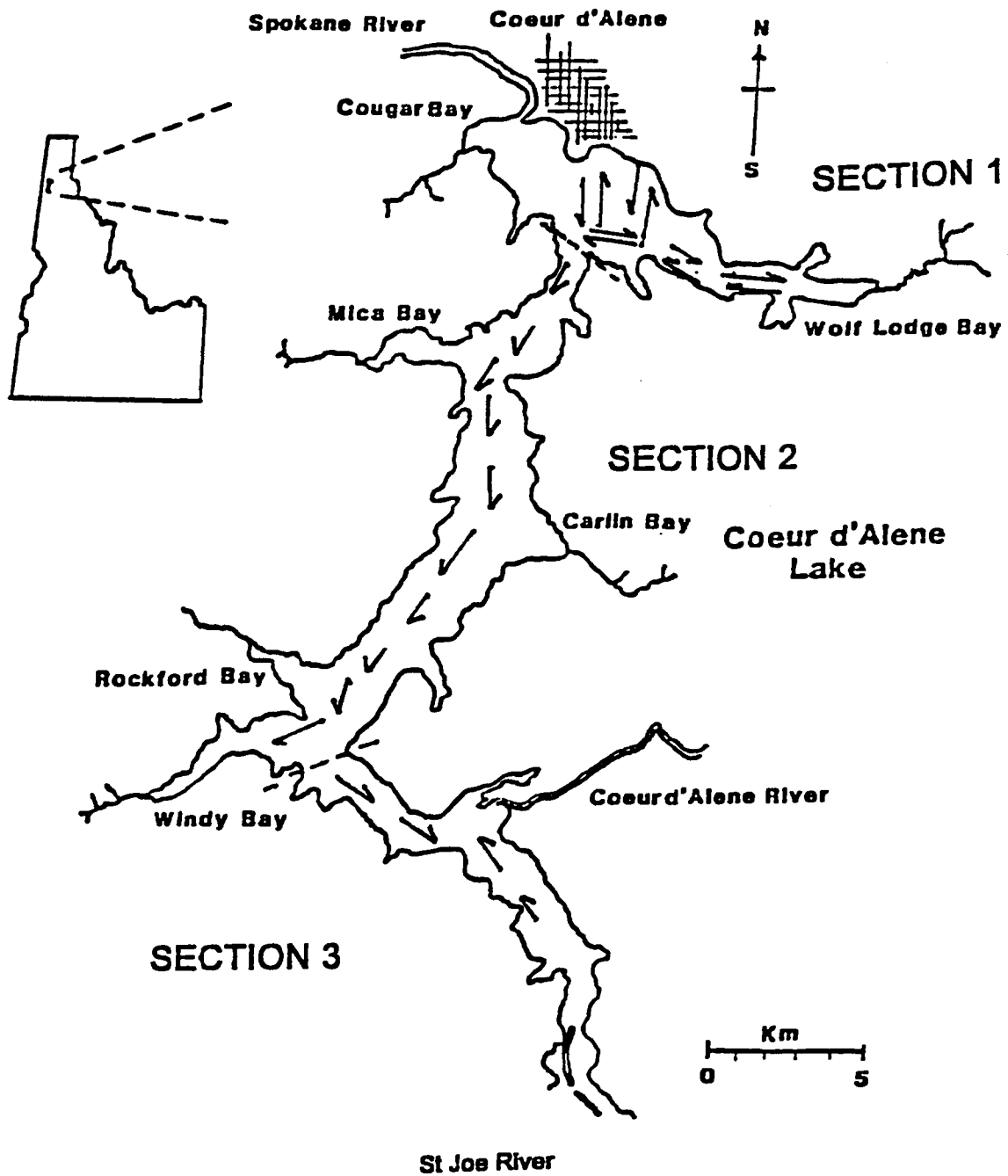


Figure 3. Location of 24 midwater trawling transects to estimate kokanee population abundance in Coeur d'Alene Lake, Idaho 1994.

During the August trawl the methodology, transects, statistical analysis, and kokanee abundance estimates followed techniques described by Bowles et al. (1987). The number of transects in the September trawl were reduced to nine. Hydroacoustic methodology was also employed in both the August and September trawls to estimate the kokanee numbers (Fredricks et al. 1995). Kokanee abundance was calculated by a computer model developed by Rieman and Meyers (1990).

Spirit Lake

Kokanee Abundance-Spirit Lake kokanee were sampled with a midwater trawl during the new moon phase on August 7, 1994. Due to the low water conditions in Spirit Lake in July and August, a smaller trawl (7 m with I/O gas power) boat was used in 1994. The larger midwater trawl (9 m with inboard diesel power) boat, used in previous years on Spirit Lake as well as Lake Pend Oreille and Coeur d'Alene Lake, was not launchable on Spirit Lake in 1994. The net area of the trawl used was 9.29 m² (10 ft x 10 ft). Boat speed was 0.96 meters/second. All other variables, including the trawling transects, were kept the same as trawling with the larger trawl boat in previous years (Horner et al. 1996b). A trawl comparison between the small and larger trawlers was conducted in 1991 (Rieman 1992). Results of the trawl comparison showed that both the large and small boat produced comparable estimates of kokanee density for fish from 50 to 200 mm in length.

Kokanee were divided into age classes by peaks in the length frequency distribution of the catch for Lake Pend Oreille and Spirit Lake and verified by scale and otolith analysis.

Standard Lowland Lake Survey

Five lakes were surveyed in 1994 using the Department of Fish and Game Standard Survey Methodology. Two of the lakes, Blue and Chase, are located in Bonner County in the Pend Oreille River drainage. The other three lakes, Benewah, Chatcolet, and Round, are located at the mouth of the St. Joe River in Benewah County. Benewah, Chatcolet, and Round lakes are connected to the St. Joe River and Coeur d'Alene Lake as a result of the Post Falls Dam (1906) which raised water levels 2.1 m during the summer recreation season (Figure 4).

RESULTS AND DISCUSSION

Angler Creel Census

Hayden Lake

Creel Survey-During the past several years, anglers have complained about the declining trout fishery in Hayden Lake. A multi-year study began in 1993 to assess the fish populations and the fishery

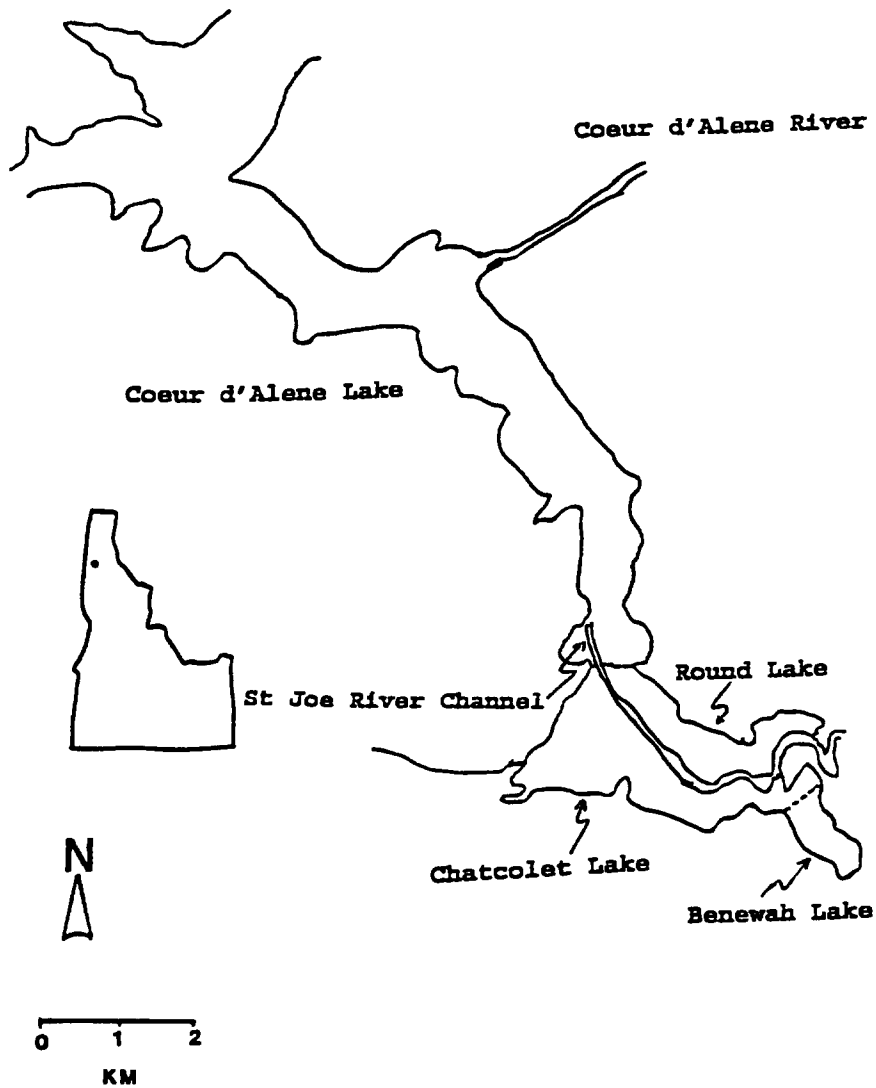


Figure 4. General location of Round (Benewah County), Chatcolet, and Benewah lakes, Idaho.

in Hayden Lake. The main goal was to determine if there actually is a decline in the fishery, and if so, what factors may be contributing.

During the period of July 1 to November 30, 1994, anglers fished for an estimated 28,374 hours (Appendix A). They caught an estimated 28,131 fish (Appendix B) for an estimated catch rate of 0.99 fish/h. Yellow perch *Perca flavescens* was the most abundant species harvested, followed by northern pike *Esox lucius*, black crappie *Pomoxis nigromaculatus*, rainbow trout, and smallmouth bass *Micropterus dolomieu* (Appendix B). Special regulations on bass, black crappie, and trout (Table 2), designed to produce a quality fishery, reduced the harvest of these species.

No fin-clipped trout were observed in the creel. This was probably due to the trout not obtaining the legal harvest length of 356 mm (14 inches), and that the survey began after the traditional spring trout fishery was over. In 1995, the survey will begin in time to survey the spring trout fishery.

Previous creel surveys on Hayden Lake were conducted in 1979 and 1982 (Goodnight and Mauser 1980, Ellis 1983). Fishing effort has increased over 100% since the 1982 survey (Table 3); number of fish caught has also doubled (Table 3). The increase in numbers of fish caught appears to be due to the legal introduction of smallmouth bass and the illegal introduction of northern pike (Table 3).

There has been a significant decline in the number of trout caught and harvested since 1982 (Table 3). It is not clear what has caused this decline. Possible causes include increased predation by other species, changes in stocking strategies (number stocked, size, time of year, stocking location and strain of cutthroat and rainbow trout stocked into Hayden Lake), the disease history and water quality at the hatchery where the trout were raised, or a combination of factors.

Predation on stocked trout by bass, northern squawfish *Ptychocheilus oregonensis*, and northern pike may be affected by stocking location, time of year, and size of fish stocked. The northern stocking site for trout is located at the uppermost end of a relatively shallow weedy arm of the lake that is ideal habitat for largemouth bass *M. salmoides* and northern pike. Rocky shorelines are ideal smallmouth bass habitat. Stocked fingerlings must move down this arm to reach deeper trout water, often following the shoreline, and are vulnerable to predation. Eliminating the northern stocking site would likely reduce predation of stocked trout. However, Hayden Creek, located at the upper end of this arm, is the major spawning stream for wild westslope cutthroat and rainbow trout. Increases in the number of northern pike will likely have a detrimental effect on returning adults as well as juveniles.

Prior to the 1982 creel survey, a total of 328,410 cutthroat trout fry were released into the Hayden Lake tributaries between 1967 to 1973, and 283,797 fry were released between 1977 to 1981. The number stocked per year ranged from 10,120 in 1973 to 134,243 in 1981. Since 1987, a total of 934,675 cutthroat trout fingerlings have been stocked into Hayden Lake (Table 4). More larger cutthroat trout have been stocked into Hayden Lake in the last eight years than from 1967 to 1981 (no cutthroat trout were stocked between 1983 and 1986). It appears that the number of cutthroat trout stocked is not a major factor in the decline of harvested fish.

The decline in cutthroat trout harvest may be attributed to the strain of westslope cutthroat trout stocked into Hayden Lake. The majority of cutthroat trout stocked into Hayden Lake have been the Clark Fork strain which most recently came from Kings Lake, Washington. The stock originated from Priest Lake in the 1940s. These fish have been domesticated for over 50 years. Domestication may have been selected for faster growing fish. Once stocked, these trout may grow fast and mature early. Typically,

Table 2. Fishing regulations for trout, bass, and black crappie in Hayden Lake, Idaho, 1994.

Species	Open season dates	Possession limits	Special rules
Trout Cutthroat Rainbow Splake Kokanee	Year round	2	None under 14"
Bass	Jan. 1 - June 30	0	Closed to harvest
	July 1 - Dec. 31	2	None between 12"-16"
Black crappie	Year round	15	None under 10"

Table 3. Comparison of creel survey results for Hayden Lake, Idaho, in 1979, 1982, and 1994.

Effort	1979 ^a		1982 ^b		1994 ^c	
	<u>10,150</u>		<u>13,060</u>		<u>28,374</u>	
<u>Species</u>	<u>Catch</u>	<u>Harvest</u>	<u>Catch</u>	<u>Harvest</u>	<u>Catch</u>	<u>Harvest</u>
All trout	--	468	4,261	1,389	1,710	540
Rainbow	--	166	--	250	1,277	415
Cutthroat	--	302	--	904	433	125
CttxBb	--	--	--	235	--	--
Large mouth bass	--	--	64	53	2,655	180
Small mouth bass	--	--	--	--	12,601	313
Crappie	--	--	1,876	1,876	2,637	845
Perch	--	--	4,576	4,377	--	3,148
N.Pike	--	--	--	--	--	1,004
Other	--	--	--	--	8,528 ^d	301
TOTAL	--	468	10,770	9,004	28,131	6,570
Catch rate trout (fish/h)	--	0.05	0.33	0.11	0.06	0.02
Catch rate all (fish/h)	--	--	0.83	0.70	0.99	0.23

^a Survey summary dates 6-23-79 to 11-30-79

^b Survey summary dates 6-26-82 to 10-15-82

^c Survey summary dates 7-1-94 to 11-30-94

^d Total includes perch, northern pike, sunfish, brown bullheads and nongame fish.

Table 4. Number and strain of rainbow trout and number of westslope cutthroat trout stocked into Hayden Lake, Idaho, 1982-1994.

Year	Cutthroat trout	Rainbow trout
1982	83,945	0
1983	42,256	228,040 ^a
1984	0	260,400 ^a
1985	0	160,000 ^a
1986	0	343,769 ^b
1987	40,040	366,839 ^c
1988	23,490	108,104 ^a
1989	220,041	490,738 ^d
1990	100,000	188,923 ^e
1991	162,005	298,350 ^f
1992	189,110	256,417 ^a
1993	99,998	193,436 ^g
1994	99,991	270,285 ^f

^aDomestic Kamloops

^bDomestic Kamloops, wild Kamloops

^cDomestic Kamloops, Mt. Lassen

^dDomestic Kamloops, wild Kamloops, Mt. Lassen, Mt Shasta, Hayspur

^eDomestic Kamloops, wild Kamloops, Kamloops/steelhead

^fDomestic Kamloops, Kamloops/steelhead

^gKamloops/steelhead, Kamloops (Black Canyon)

there is a large mortality of first time spawning trout. If these fish are maturing, spawning, and dying before they reach harvestable size, fewer cutthroat trout are available for harvest.

In April 1994, gill nets were set in Hayden Lake to collect trout to determine growth and relative abundance. A total of 32 cutthroat trout were collected; 18 were from the April 1994 stocking and 14 ranged 300 mm to 473 mm in total length. There were eight fin-clipped fish. Six of the clipped cutthroat trout were stocked in April 1994 and averaged 181 mm in length. The two other cutthroat trout, stocked in 1993 at an average length of 163 mm, averaged 335 mm in length and 465 g in weight in 1994 (these two cutthroat trout were immature when caught). These cutthroat trout were two years old. They grew about 172 mm in 11 months or 15.6 mm/month (0.6 in/month). A monthly increase of 0.5 in/month is considered good in northern Idaho waters (Dan Beers, personal communication, Clark Fork Hatchery). Adfluvial cutthroat trout from Coeur d'Alene Lake mature at 4 to 6 years old, domestic westslope cutthroat trout broodstock mature at 3 to 4 years old. The remainder of cutthroat trout collected that were over 325 mm appeared to be mature.

It appears that some of the cutthroat trout may enter the fishery at three years old. It also appears that some cutthroat trout may be maturing before they reach harvestable length, 355 mm, spawning, and possibly dying before they enter the fishery. However, a much larger sample size is needed to obtain a better understanding of the growth and maturation of hatchery westslope cutthroat trout in Hayden Lake.

The number and strain of rainbow trout stocked into Hayden Lake has varied. Catchable size (200-250 mm total length [TL]) rainbow trout were stocked from 1968 to 1976. No rainbow trout were stocked from 1977 to 1982. Fingerling size (75-150 mm TL) rainbow trout have been stocked since 1983. The number and strain of fingerling trout have been dependent on availability (Table 4). Size at stocking has varied from 75 to 150 mm TL. The stocking date has varied from March to November. Most of the stocking took place in the spring or in the fall after water temperatures cooled.

Rearing conditions are also a concern. Most of the rainbow trout stocked into Hayden Lake were raised in southern Idaho hatcheries. The water there is "hard," or high in minerals. The hardness and conductivity values for inflow water at Nampa Fish Hatchery was 547 ppm and 778 micromohs. The hardness and alkalinity values at Niagara Springs Fish Hatchery was 234 ppm and 166 ppm, respectively. Hayden Lake is "soft" water, or low in minerals, with a conductivity of 40 micromohs, and hardness and alkalinity values of 20 ppm and 20 ppm, respectively. We have speculated that differences in water hardness may be contributing to the high mortality of stocked trout, however there is no literature that supports or refutes this hypothesis at this time. The effect of water hardness may be compounding the stress induced by the 12- to 14-hour travel time from southern Idaho hatcheries. Our current solution is to raise the trout at Clark Fork Hatchery, eliminating the water hardness problem and reducing hauling stress.

Three rainbow trout were collected by gill nets in 1994. None of the fish were fin-clipped. The lengths of rainbow trout collected were 336 mm, 640 mm, and 655 mm. A larger sample size is needed to make conclusions about growth, survival, and maturity.

Angler Questionnaire-The third objective is to determine the attitude of anglers toward the management program on Hayden Lake. Hayden Lake is managed for quality trout, bass, and black crappie. Special regulations (Table 2) have been in place for a number of years. Two groups of people

were surveyed; anglers and lake front property owners. The property owner survey is complete. The angler survey will not be complete until the end of June 1995.

During the reporting period July 1 to November 30, a total of 75 angler questionnaires were handed out and 41% (31) were returned. Additional surveys will be handed out during the remainder of the survey which ends June 30, 1995.

The majority of anglers supported the quality management program for Hayden Lake (Appendix D). Ninety-three percent of the 15 anglers who fished for crappie supported the quality regulations for crappie. Eighty-nine percent of the 28 anglers that fished for bass supported the quality management for bass (Appendix D). A total of 63% of the bass anglers supported the slot limit regulation, 50% preferred trophy management, and 50% preferred catch and release of bass. A total of 67% (21) anglers fished for trout. Seventy-six percent of them preferred the 14-in minimum length, 33% preferred trophy management, and 43% would support catch-and-release (Appendix D).

The homeowners survey is complete (Appendix E). A total of 999 surveys were mailed, and 33% (333) were returned. Only 44% (128) of the homeowners fished Hayden Lake during the past 12 months. Fifty-eight percent of these anglers fished for crappie (Appendix E). Seventy-five percent supported the quality management for crappie. A total of 71% of the homeowners fished for bass (Appendix E). Sixty percent supported the quality management for bass, 28% preferred trophy management, and 28% supported catch-and-release for bass (Appendix E). Eighty-seven percent of the homeowners fished for trout on Hayden Lake. Seventy-seven percent supported quality management, 20% preferred trophy management, and 29.5% supported catch-and-release for trout (Appendix E). A more in-depth discussion will occur after completion of the entire survey.

Priest Lake

Creel Survey-During the 1994 creel census, 310 anglers were interviewed. Completed trip information was obtained from 190 of these interviews.

Anglers fished an estimated 62,602 hours in Priest Lake during 1994. The average time spent fishing was 3.64 hours, this amounts to 17,198 angler-days (Table 5). Boat anglers accounted for 98% of the effort in 1994. Non-residents comprised 51% of the fishermen in 1994.

Anglers specifically after lake trout accounted for 85.6% of the effort. Those anglers specifically after cutthroat trout made up less than 1% of the effort. Anglers in search of anything they could catch accounted for the remaining 14%. No bull trout *S. confluentus* were reported caught.

Priest Lake fishermen caught an estimated 21,704 fish in 1994. Approximately 20,000 of these fish were lake trout, and 13,987 of these lake trout were harvested (Table 5). Average success rate for lake trout anglers fishing Priest Lake in 1994 was 5 h/fish. Trolling for lake trout was the most popular method of fishing, accounting for 82% of the effort. Jigging for lake trout was the second most popular method of fishing, accounting for 15% of the effort.

Angler exploitation of lake trout in Priest Lake appears to be rapidly decreasing the average size of fish harvested. Going back to angler harvest data from the early 1950s through 1994 (Figure 5), the

Table 5. Estimated effort and harvest by species, Priest Lake, Idaho, 1956-1994. Numbers in parentheses are the 1994 equivalents for survey period of previous years creel censuses.

Census period	Year	Angler hours	Kokanee	Cutthroat	Bull trout	Lake trout	Total harvest	Overall success (fish/h)
April 30-October 15	1956	96,630 (48,984)	102,360	3,580	1,590	270 (10,758)	107,800	1.12
April 30-November 30	1966	64,604 (49,386)	68,884	2,387	1,173	199 (10,758)	72,643	1.12
May 18-September 6	1968	48,286 (36,652)	32,314	1,611	1,096	0 (5,711)	35,021	0.73
June 2-September 6	1969	46,819 (27,000)	37,880	1,256	650	0 (9,347)	39,786	0.85
May 16-October 2	1970	82,063 (46,216)	79,840	2,776	1,526	138 (9,347)	84,280	1.03
April 15-December 15	1978	99,157 (56,599)	4,593	2,585	2,320	5,724 (12,884)	15,222	0.15
April 16-December 15	1983	47,039 (56,599)	66	105	92	4,620 (12,884)	4,883	0.10
April 12-November 7	1986	71,516 (56,343)	0	134	0	6,295 (12,659)	6,429	0.09
May 9-July 17	1987	27,903 (25,001)	0	11	-	2,969 (2,422)	2,980	0.11
January 23-March 1	1993	12,918 (0)	0	0	0	2,605 (0)	2,605	0.20
January 1-December 31	1994	62,602	0	0	0	13,987	13,987	0.22

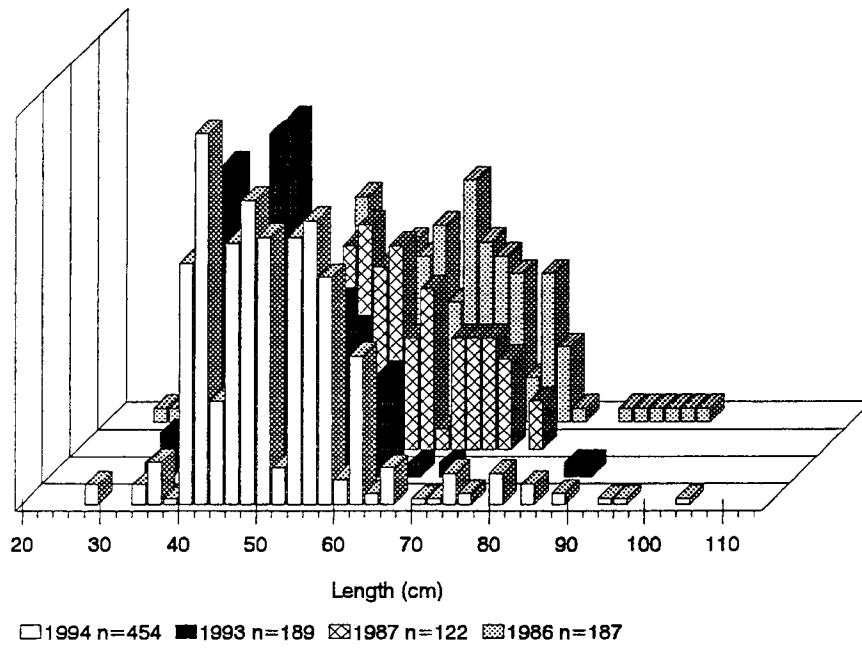
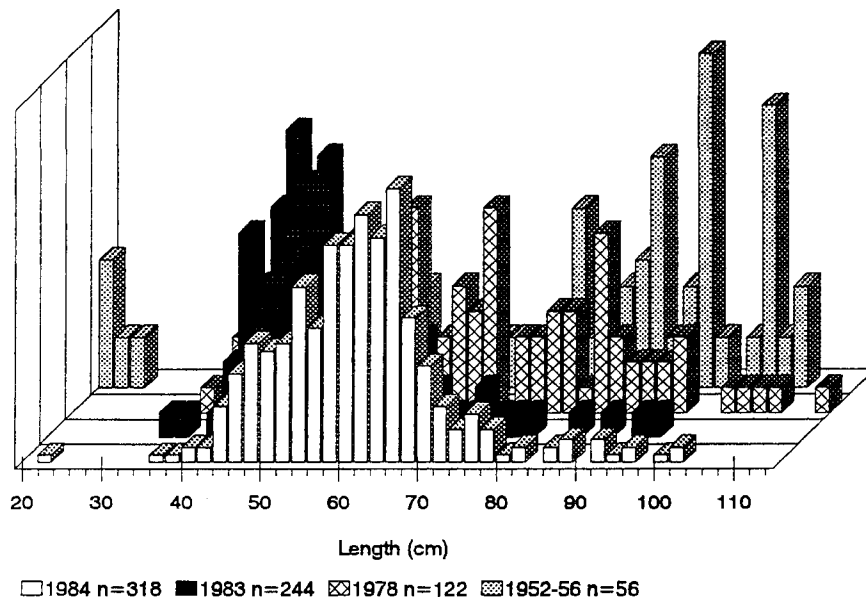


Figure 5. Length frequency of lake trout in the angler catch from Priest Lake, Idaho, 1952-1994.

mean size of lake trout in the catch has seen a steady decline. The continued liberal harvest of lake trout will likely result in further declines in the average size of fish harvested and a fishery comprised of 381 mm to 432 mm (15 to 17 inch) lake trout in less than ten years.

The current slot limit regulation, none between 660 mm to 813 mm (26 inches and 32 inches) and only one fish over 813 mm (32 inches), was designed in 1991 to allow for a liberal harvest of the smaller lake trout while providing a slot sanctuary for the fish to grow through to attain a larger "trophy" size. The lower end of the slot, 660 mm, (26 inches) was set too high to provide the desired result. Basically no fish were making it into the slot. Figure 6 shows the length frequency of lake trout in the angler catch for 1994. Based on an average growth rate of 31 mm (1.22 inches) per year (derived from lake trout tag return data), less than 3% of the fish caught in the slot limit were smaller than 660 mm (26 inches) in 1992 when the regulation was initiated. Not only is the average size of lake trout in Priest Lake declining, but larger fish are less numerous in the catch than in previous years (Figure 5). Where 25 years ago angler effort on Priest Lake was actually greater than what it was in 1994 (Table 5), that effort was spread over several species - kokanee, cutthroat trout, and lake trout. Today all the effort is directed at lake trout. With the anticipated level of effort increasing and the advances in lake trout fishing techniques, the harvest of lake trout from Priest Lake will continue to increase as well. New regulations for the harvest of lake trout are required to maintain some larger fish for future generations of anglers to harvest.

Angler Questionnaire-A total of 116 angler questionnaires were returned; 46 of these were from Priest Lake Guide Service cliental. The majority of the questionnaire respondents (108 anglers) were specifically fishing for lake trout. Only 12% of the lake trout fishermen (14 respondents) were after trophy size fish specifically. Eight of the 14 "trophy seekers" were cliental of the Priest Lake Guide Service. When asked what they considered to be a "trophy" size lake trout, 44% of the anglers said over 25 pounds, 31% said between 20 and 25 pounds, 14% said between 15 and 20 pounds, 4% said between 10 and 15 pounds, and 7% said between 5 and 10 pounds. Additional Priest Lake census and questionnaire data are summarized in Appendices K and L.

Fish Population Characteristics

Coeur d'Alene Lake

Kokanee Population-The goals of the kokanee and chinook salmon management program on Coeur d'Alene Lake are to provide a high yield kokanee fishery and a limited trophy chinook salmon fishery. This will be achieved by establishing and maintaining a predator-prey balance between the kokanee and chinook salmon. Research indicates a balanced system will be achieved by attaining and maintaining a density of 50 age 3 and older kokanee/ha (Rieman and Myers 1990, Rieman and Maiolie in progress, and discussed in Horner et al. (1996b).

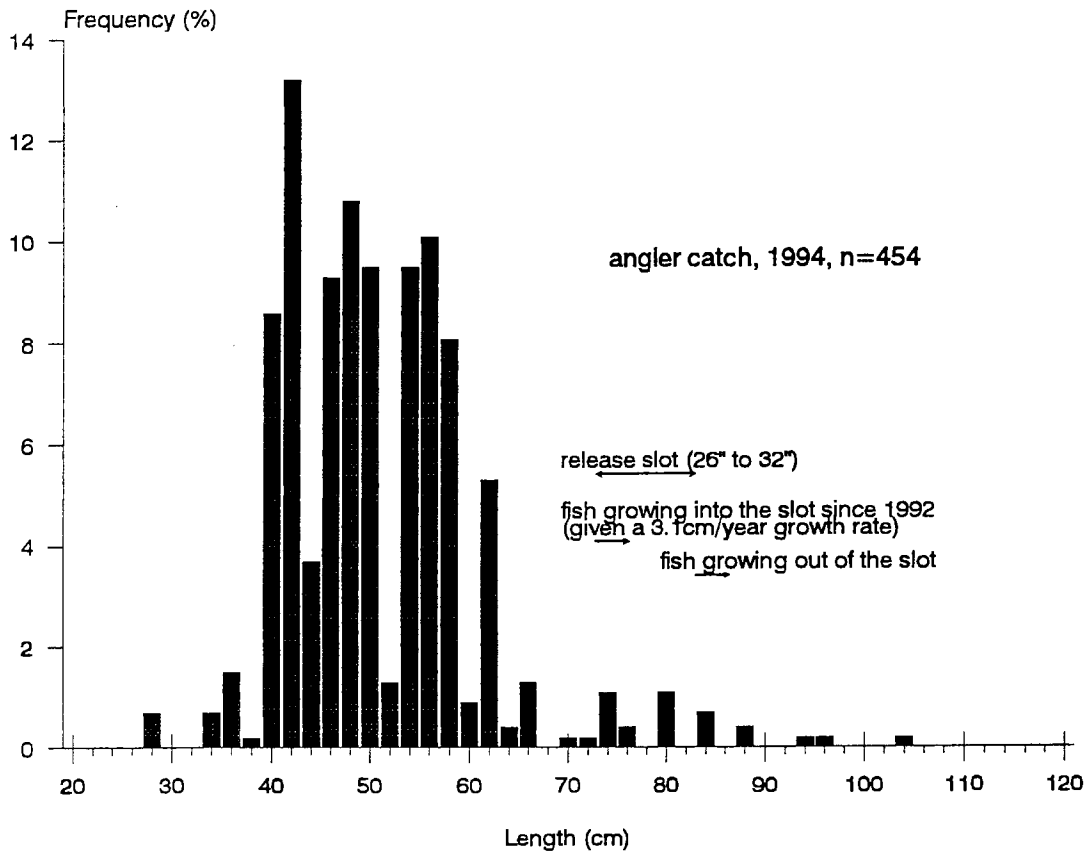


Figure 6. Length frequency of lake trout in the angler catch from Priest Lake, Idaho, 1994, showing the percent of fish growing into and out of the 26- to 32-inch slot limit since 1992, the year the slot regulation took effect.

There are two main objectives for the program. The first is to assess kokanee population status, using abundance estimates, evaluate changes in abundance due to chinook salmon predation, and predict future kokanee fisheries based on year class strength and potential egg deposition. The second objective is to assess chinook salmon population status by determining relative abundance of hatchery and natural chinook salmon stocks and predicting the effect on kokanee abundance.

The key to the kokanee and chinook salmon management program on Coeur d'Alene Lake is the number of kokanee. As long as kokanee abundance is adequate to maintain recruitment while supplying fish for the angler and forage for chinook salmon and other predators in the lake, the management program is working. However, the goal is to also produce the best fishery possible.

Kokanee population abundance in Coeur d'Alene Lake is determined by mid-water trawling. In 1994, the estimated total number of kokanee in Coeur d'Alene Lake was similar to 1993 (Table 6). This was the fourth highest estimate since 1980 (Table 7). The high estimate was due to two strong year classes of kokanee 1991 and 1992. The high abundance of age 2 kokanee (1991 year class) is attributed to higher than average egg deposition in 1991 of 167 million (average 143 million) and a warmer than average spring in 1992 which may have increased fry survival (Table 8). The high number of age one kokanee (1992 year class) was probably due to the highest egg deposition recorded (198 million eggs) (Table 8).

The abundance of age 3 and older kokanee was estimated to be 0.5 million (Table 6). The age 3 and older kokanee in 1994 produced a potential egg deposition of 64 million eggs (mean length of male kokanee was 248 mm, mean length of female kokanee was 228 mm and the estimated number of eggs per female was 254). Mean length of age 3 and older kokanee declined in 1994 (Figure 7), most likely as a result of high densities of kokanee in the lake.

The density of age 3 and older kokanee was 52 fish/ha in 1994 (Table 9). This was the goal set for age 3 and older kokanee. The 14-year (1979-1993) mean density for age 3 and older kokanee/ha is 106. The more recent 5-year (1989-1993) average is 104 fish/ha. The desired density of 50 age 3 and older kokanee/ha has only been attained one other time, 1993, since the beginning of the chinook program in 1982. The low density in 1993 was influenced by the loss of kokanee production resulting from I-90 reconstruction.

Chinook Salmon-It appears that in the past, the number of chinook salmon in the lake have been inadequate to reduce kokanee density to the desired goal. In 1993, we decided to increase the number of age 0 chinook salmon entering the lake annually to 72,000 by stocking 30,000 hatchery raised chinook salmon fingerlings and production of 42,000 natural chinook salmon (93 redds, at 4,500 eggs/redd, 10% survival from egg to fingerling). Due to a lower than expected egg take, only 17,267 age 0 hatchery chinook salmon were stocked on June 6, 1994 into Wolf Lodge Bay (Table 10).

In 1994, the egg take was over 200,000 eggs, which should allow stocking the desired 30,000 fingerlings in 1995. A total of 153 chinook salmon were trapped in the Wolf Lodge Creek trap from September 1 to October 28, 1994. Hatchery personnel spawned 37 females and 45 males. Hatchery chinook salmon comprised 72% of the fish trapped and natural fish comprised 28% (Table 11). The egg take during the next two to three years may be low due to the low number of chinook salmon stocked in 1992 and no chinook salmon stocked in 1993 (Table 10).

Table 6. Estimates of the abundance of kokanee by year-class (1975-1993) made by midwater trawl in Coeur d'Alene Lake, Idaho, 1979-1994. Estimates are in millions of kokanee.

Year Class ^a	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979
1993	1.80															
1992	5.40	5.57														
1991	4.90	5.23	3.02													
1990	0.50	1.42	0.81	4.86												
1989		.48	0.51	0.54	3.00											
1988			0.98	1.82	0.59	3.04										
1987				1.28	2.48	0.75	3.42									
1986					1.32	3.95	3.06	6.88								
1985						0.94	2.81	2.38	2.17							
1984							0.61	2.92	2.59	4.13						
1983								0.89	1.83	0.86	0.70					
1982									0.72	1.86	1.17	1.51				
1981										2.53	1.89	1.91	4.53			
1980											0.80	1.25	2.36	2.43		
1979												0.81	1.38	1.75	1.86	
1978													0.93	1.71	1.68	1.50
1977														1.06	1.95	2.29
1976															1.06	1.79
1975																0.45
Total	12.6	12.70	5.32	8.50	7.39	8.68	10.90	13.07	7.31	9.37	4.56	6.48	9.20	6.94	6.50	6.04
Total Age 1 & older	10.8	7.13	2.30	3.64	4.39	5.64	7.48	6.19	5.14	5.24	3.86	4.97	4.67	4.51	4.69	4.54
No. fish /ha	1,306	1,316	551	881	766	900	1,123	1,353	757	970	472	671	953	719	678	625

57

^aYear eggs were deposited.

Table 7. Kokanee population estimates (in millions) and 90% confidence intervals for each age class in each section of Coeur d'Alene Lake, Idaho, July 6-10, 1994.

Section	Age 0	Age 1	Age 2	Age 3	TOTAL
1	1.76 ±137%	1.13 ±30%	0.50 ±37%	0.08 ±54%	3.42
2	0.06 ±61%	1.83 ±69%	2.8 ±19%	0.2 ±57%	4.89
3	0.0	2.47 ±51%	1.56 ±77%	0.21 ±73%	4.24
TOTAL	1.82	5.43	4.89	0.49	12.6 ^a

^a Dfference from Table 1 is rounding error.

Table 8. Estimates of female kokanee spawning escapement, potential egg deposition, fall abundance of kokanee fry, and their subsequent survival rates in Coeur d'Alene Lake, Idaho, 1979-1994.

Year	Estimated female spawning escapement	Estimated potential number of eggs (x10 ⁶)	Fall fry estimate the following year (x10 ⁶)	Percent survival from egg deposition to fall fry
1979	256,716	86	1.86	2.20
1980	501,492	168	2.43	1.45
1981	550,000	184	4.54	2.46
1982	358,200	120	1.51	1.25
1983	441,376	99	0.70	0.71
1984	316,829	106	4.13	3.90
1985	530,631	167	2.17	1.29
1986	368,633	103	6.89	6.68
1987	377,746	126	3.42	2.71
1988	362,000	119	3.04	2.55
1989	516,845	155	3.00	1.94
1990	657,777	204	4.86	1.96
1991	631,500	167	3.03	1.81
1992	488,438	198	5.57	2.81
1993	240,000	92	5.95	6.46
1994	250,000	64	--	--

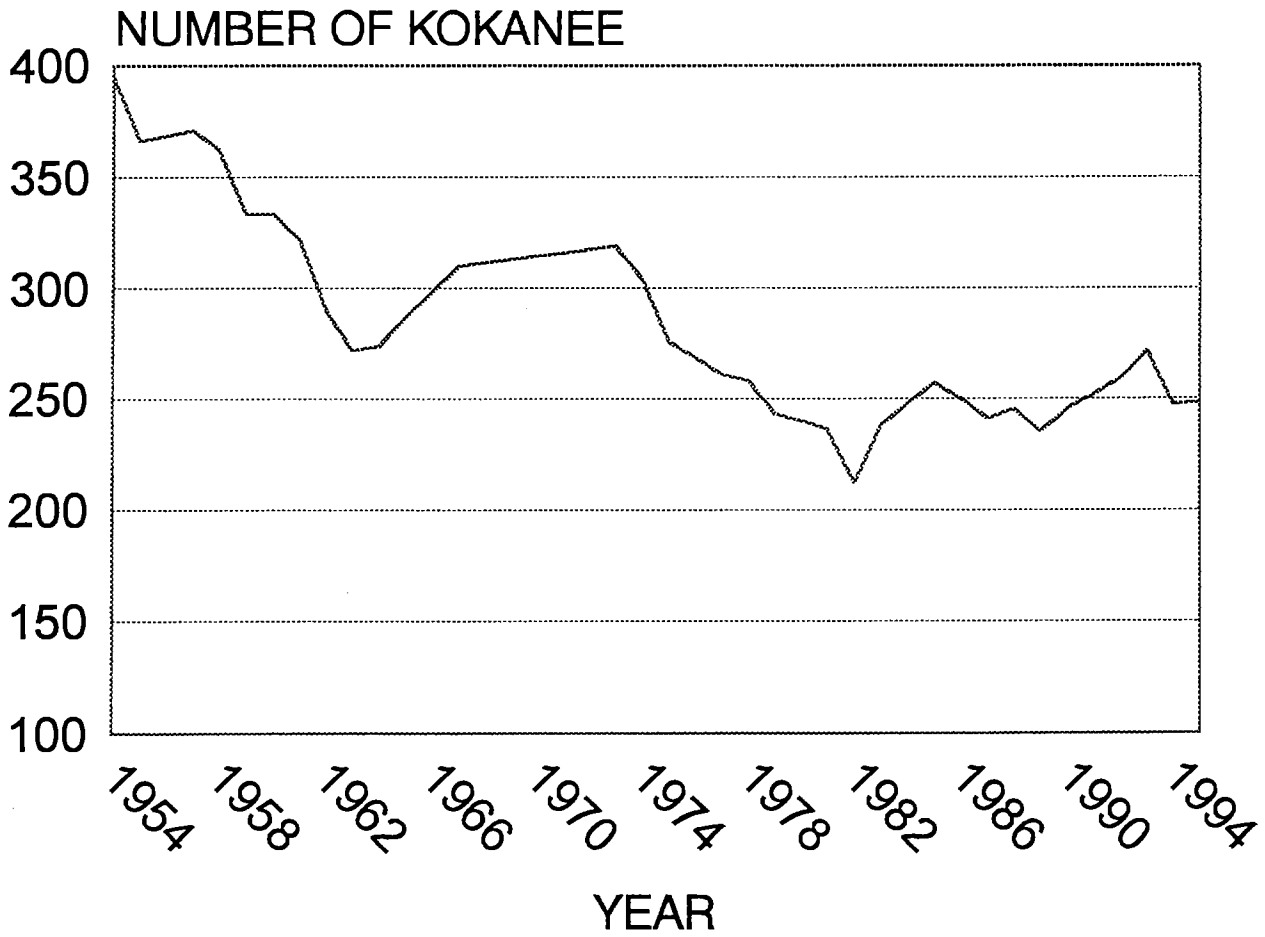


Figure 7. Mean length (mm) of kokanee spawners in Coeur d'Alene Lake, Idaho, 1954-1994.

Table 9. Kokanee density (fish/ha) estimates for each age class in each section of Coeur d'Alene Lake, Idaho, July 6-10, 1994.

Section	Age 0	Age 1	Age 2	Age 3	TOTAL
1	825	532	248	37	1,642
2	10	318	488	37	853
3	0	1,413	894	120	2,427
WHOLE LAKE	188	564	509	52	1,313 ^a

^a Difference from Table 1 due to rounding error.

Table 10. Number, weight and lengths of fall chinook salmon released into Coeur d'Alene Lake, Idaho, 1982-1994.

Release date	Release site	Number released	release Weight (kg)	Length (mm)		Rearing hatchery	Stock of fish	Mark
				mean	range			
07-19-82	MR*	28,700	767	137	125-150	HAGERMAN	BONNEVILLE	NONE
10-05-82	I-90	5,700	273	150	130-170	HAGERMAN	BONNEVILLE	NONE
<u>Total 82</u>		34,400	1,040					
08-09-83	I-90	30,100	289	109	80-130	MACKAY	BONNEVILLE	NONE
10-26-83	I-90	30,000	637	124	80-150	MACKAY	BONNEVILLE	NONE
<u>Total 83</u>		60,100	926					
10-29-84	I-90	10,500	373	150	80-190	MACKAY & MULLAN	LAKE MICHIGAN	NONE
10-16-85	I-90	11,100	409	136	--	MACKAY & MULLAN	LAKE MICHIGAN	L - VENTRAL
10-17-85	I-90	7,400	273	143	--	LAKE MICHIGAN	ADIPOSE	
<u>Total 85</u>		18,500	682					
07-02-86	I-90	29,500	375	114	81-145	MACKAY	LAKE MICHIGAN	R - VENTRAL
07-01-87	I-90	59,400	900	119	62-155	MACKAY	LAKE MICHIGAN	ADIPOSE
07-16-88	I-90	44,600	977	133	95-180	MACKAY	LAKE COEUR d'ALENE	L - VENTRAL
07-06-89	I-90	35,000	636	126	100-165	MACKAY	LAKE COEUR d'ALENE	R - VENTRAL
07-10-90	MR	35,700	626	123	80-145	MACKAY	LAKE COEUR d'ALENE	ADIPOSE
07-10-90	MR	^b 650	11	123	80-145	MACKAY	LAKE COEUR d'ALENE	AD/R - VENT
<u>Total 90</u>		36,350	637					
07-09-91	MR	41,600	750	129	75-151	MACKAY	LAKE COEUR d'ALENE	L - VENTRAL
07-09-91	MR	^b 1,050	16	129	75-151	MACKAY	LAKE COEUR d'ALENE	AD/L - VENT
<u>Total 91</u>		42,650	766					
07-07-92	MR	10,000	500	132	115-150	MACKAY	LAKE COEUR d'ALENE	R - VENTRAL
1993		0 No hatchery chinook were stocked.						
06-06-94	I-90	17,267	910	134	110-180	NAMPA	LAKE COEUR d'ALENE	ADIPOSE

*MR = Mineral Ridge boat ramp.

^bSterile triploid fish from heat-shocked eggs.

Table 11. The number and percent of hatchery and wild chinook salmon trapped in Wolf Lodge Creek, Coeur d'Alene Lake, Idaho, 1984-1994.

Year trapped	Natural fish trapped						Hatchery fish trapped						Year hatchery fish stocked	Age when trapped	Fin clip
	M		F		Total		M		F		Total				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
1984	No natural fish return.						22	63	13	37	35	100	1982	2	--
1985	No natural fish return.						--	--	--	--	--	--	1982	3	--
1986	Unknown natural run, hatchery fish not marked.						19	41	27	59	46	100	1983	3	--
1987	3-year-old fish from 1984 release were not marked.						27	79	7	21	34	100	1984 1985	3 2	-- AD & LV
1988	3-year-old fish from 1985 release were not marked.						15	29	37	71	52	--	1985	3	AD
							3	100	0	0	3	--	1985	3	LV
							5	83	1	17	6	--	1986	2	RV
Total	25	56	20	44	45	42	23	38	62	61	58				
1989							3	33	6	67	9	--	1986	3	RV
							46	64	26	36	72	--	1987	2	AD
Total	22	42	31	58	53	40	49	60	32	40	81	60			
1990							16	28	43	72	59	--	1987	3	AD
							23	80	5	20	28	--	1988	2	LV
Total	40	46	43	54	83	49	39	44	48	56	87	51			
1991							1	14	6	86	7	--	1987	4	AD
							41	41	60	59	101	--	1988	3	LV
							64	61	41	39	105	--	1989	2	RV
Total	50	60	34	40	84	28	106	50	107	50	213	72			
1992							2	40	3	60	5	--	1988	4	LV
							33	39	51	61	84	--	1989	3	RV
							22	88	3	12	25	--	1990	2	AD
Total	36	52	33	48	69	37	57	50	57	50	114				

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TABLE11

Table 11. Continued.

Year trapped	Natural fish trapped						Hatchery fish trapped						Year hatchery fish stocked	Age when trapped	Fin clip
	M		F		Total		M		F		Total				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
1993							1	50	1	50	2	--	1989	4	RV
							18	46	21	54	39	--	1990	3	AD
							3	75	1	25	4	--	1991	2	LV
	Total	6	46	7	54	13	22	22	48	23	52	45	78		
1994							8	5	14	9	22	--	1990	4	AD
							24	16	49	32	73	--	1991	3	LV
							10	7	4	3	14	--	1992	2	RV
	Total	29	19	15	10	44	29	42	28	67	44	109	72		

Most of the natural chinook salmon reproduction occurred in the Coeur d'Alene River system. A total of 110 redds were counted in the Coeur d'Alene River system and 8 in the St. Joe River in 1994 (Table 12). A total of 25 redds were eliminated, 13 from the South Fork Coeur d'Alene River, 4 from the Coeur d'Alene River, and 8 from the St. Joe River to meet our goal of 93 redds. In 1995, the recruitment goal of 72,000 age 0 chinook salmon should be met.

Prior to 1993, the hatchery and natural composition of the chinook salmon spawning run in Wolf Lodge Creek was representative of the composition in the fishery. This correlation is no longer valid. Natural reproduction of chinook salmon in Wolf Lodge Creek has been reduced by the relocation of the trap in 1988 (Maiolie and Davis 1996). In 1993 and 1994, the hatchery composition in Wolf Lodge Creek was 78% and 72%, respectively. In the 1993 and 1994 fishery, hatchery chinook salmon comprised only 32% and less than 23% of the catch, respectively. We believe the catch figures are more representative of the overall composition of hatchery and natural chinook salmon in Coeur d'Alene Lake.

Three chinook salmon derbies were held in 1994; June 18-19, August 6-14, and December 10-11. Natural chinook salmon comprised 95%, 77%, and 95% of the catch for the June, August, and December derbies, respectively. Catch rates were 28, 39, and 4.4 h/fish for the June, August, and December derbies, respectively. A creel survey was conducted during the December derby. Anglers fished an estimated 1,785 h, caught an estimated 409 chinook salmon, and harvested an estimated 155 fish during the two-day derby.

Nine members of the Lake Coeur d'Alene Anglers Association (chinook salmon club) returned angler diaries for 1994. They fished for a combined total of 2,765 h and caught 346 chinook salmon for a catch rate of 8 h/fish. Natural chinook salmon comprised 94% of the catch, similar to the three chinook salmon derbies.

The low number of hatchery chinook salmon in the catch is likely the result of 10,000 chinook salmon being stocked in 1992 and no chinook salmon stocked in 1993. The low number of hatchery chinook salmon in the creel will continue in 1995.

Lake Pend Oreille

Kokanee Population-The total population estimate for all age classes of kokanee in Lake Pend Oreille during the August trawling was 4,350,000 kokanee (Table 13). A September trawl was conducted to verify the low August estimate. The total population estimate derived from the September trawl was 9,680,000 kokanee (Table 13). However, the estimate for age 1+ kokanee remained the lowest ever recorded in the 18 years since trawling estimates have been made. It is possible that the distribution of age 1+ and 2+ kokanee during the August trawl was such that the population was under sampled (Fredricks et al. 1995), but the overall abundance of the Lake Pend Oreille kokanee population remains critically low.

Table 12. Counts of fall chinook salmon redds in the Coeur d'Alene and St. Joe rivers, Lake and Fighting creeks, Coeur d'Alene Lake, Idaho, 1989-1994.

Location	Survey Date					
	9/29/89	11/1/90	10/31/91	10/20/92	10/18/93	10/10/94
Coeur d'Alene River						
Cataldo Mission to S.F. Cd'A River	--	41	11	29	80	82
S.F. Cd'A River to L.N.F. Cd'A River	--	10	0	5	11	14
L.N.F. Cd'A River to Steamboat Creek	--	--	2	3	6	1
Steamboat Creek to steel bridge	--	--	--	1	0	0
Subtotal	52	55	13	38	97	97
South Fork Coeur d'Alene River	--	--	--	--	--	13
Little North Fork Coeur d'Alene River	--	--	--	--	--	0
St. Joe River						
St. Joe City to Calder	--	4	0	18	20	6
Calder to Huckleberry CG	--	3	1	1	4	0
Huckleberry CG to Marble Cr.	--	3	0	2	0	1
Marble Creek to Avery	--	0	0	0	0	1
Subtotal	0	10	1	21	24	8
Lake Creek	--	5	--	3	--	--
Fighting Creek	--	0	--	1	--	--
GRAND TOTAL	52	70	14	63	121	118

Table 13. Estimated abundance (million) of kokanee made by midwater trawl in Lake Pend Oreille, Idaho, for 1977-1994. To follow a particular year class of kokanee, read up one row and right one column (Fredricks et al., 1995).

Sample year	Age class						4/5+ Density (N/ha)	Total
	0+	1+	2+	3+	4+	5+		
1994 (Sept)	6.76	0.38	0.70	0.99	0.76	0.07	36.9	9.98
1994 (Aug)	3.06	0.46	0.35	0.29	0.17	0.02	9.6	4.35
1993	3.17	1.48	1.30	2.00	1.02		45.1	8.97
1992	4.55	1.33	0.78	1.11	0.64		28.3	8.41
1991	1.98	0.83	1.77	0.77	0.27		11.9	5.62
1990	3.35	1.59	1.45	0.33	0.20		8.8	6.93
1989	4.48	1.17	1.20	0.45	0.37		18.1	7.71
1988	7.31	1.66	0.51	0.38	0.35		15.5	10.21
1987	3.55	0.78	0.84	0.43	0.42		18.6	6.02
1986	1.66	1.15	0.68	0.54	0.24		10.6	4.26
1985	1.79	1.03	1.24	0.37*			*	4.47
1984	2.63	1.51	1.21	0.28*			*	5.62
1983	2.14	2.28	0.50	0.29*			*	5.21
1982	3.84	2.77	0.64	0.87*			*	8.12
1981	2.31	1.36	0.79	0.74*			*	5.20
1980	1.69	1.00	0.96	1.03*			*	4.68
1979	2.01	1.31	1.70	0.67*			*	5.69
1978	1.82	0.71	2.00	1.29*			*	5.82
1977	2.01	1.17	2.95	0.65*			*	6.78

*Age 3+ and 4+ kokanee were not separated through aging prior to 1986.

Spirit Lake

Kokanee Population-The total population of kokanee in Spirit Lake as estimated by the August trawling was 189,444 kokanee. This estimate is considerably less than any previous trawl estimate in Spirit Lake (Table 14). The 1994 population estimate is considered to be an underestimate for Spirit Lake kokanee. Several factors may have influenced the trawl results. First, the south Idaho trawler used in 1994 has a different catch efficiency than the north Idaho trawler. Second, it is possible that the same unusual distribution of kokanee during the August trawl in Lake Pend Oreille occurred in Spirit Lake as well, leading to an underestimate of kokanee numbers in both lakes. Lending credence to this theory is the fact that 383,550 kokanee fry were released in Spirit Lake in July 1994. With such an infusion of young-of-the-year kokanee numbers into Spirit Lake, the trawl catch of at least this year class of fish should have come out greater than it did. These kokanee fry were the progeny of Colorado late spawning kokanee that were hatched and reared at Cabinet Gorge Hatchery.

On April 8, 1994, a public meeting was held in Spirit Lake, Idaho, to address the concerns of local anglers that the kokanee in Spirit Lake were stunted, requiring an increase in the bag limit. Age and growth data from the other north Idaho kokanee lakes showed that the same age kokanee in Spirit Lake were larger than kokanee in Lake Pend Oreille or Coeur d'Alene Lake (Figure 8). The explanation for smaller size kokanee being caught in Spirit Lake is related to two factors. First, kokanee in Spirit Lake mature at age 2 and 3, and second, fishing pressure on a weak year class reduced the density of age 3 kokanee to a point where the majority of fish caught by anglers were smaller two-year-old fish. Angling effort on Spirit Lake from April through September 1992 totaled 31,337 h and accounted for a harvest of 102,595 kokanee (Horner et al. 1996a).

Net Pen Cutthroat Trout

A total of 61,030 one- and two-year-old westslope cutthroat trout were released from eight net pens located in Ellisport, Scenic, and Garfield bays on Lake Pend Oreille, Idaho, in April and May of 1994. Every cutthroat trout received an adipose fin clip prior to being placed in the net pens in the fall of 1993. Since the inception of the program in the fall of 1989 (Horner et al. 1995), a total of 231,031 westslope cutthroat trout have been reared in net pens and released in Lake Pend Oreille (Table 15). In previous years the total annual release of net pen cutthroat consisted of one-year-old fish. In 1994, a portion of the net pen release, 15,030 fish were two-year-old fish. The average length of the two-year-old fish was 223 mm; the one-year-old fish averaged 167 mm. To evaluate the return to the creel of the one-year-old fish and two-year-old fish, 145 one-year-old fish and 148 two-year-old fish were Floy-tagged. Yellow, non-reward, Floy tags series (T003201 to T03500) were inserted into the dorsal musculature of the fish prior to release.

On April 29, 1994, Chip Corsi, IDFG, collected 21 cutthroat trout from the mouth of the fish ladder at the Strong Creek flume (Strong Creek is a tributary to Lake Pend Oreille near Ellisport Bay). All 21 of these fish were adipose fin-clipped and appeared to be sexually mature, with some of the females extruding eggs. These fish were all two-year-old net pen cutthroat trout, presumably from the Ellisport Bay release five days earlier. No Floy tags from the one- or two-year-old net pen fish were returned by anglers in 1994.

Table 14. Estimates of kokanee year classes (1977-1993) made by midwater trawling in Spirit Lake, Idaho, 1981-1994. Estimates are in thousands of kokanee. Estimates from 1990 to present are from computer program generated data as compared to a hand calculation method for previous years. A comparison of values is given for the years 1990-1993, the parenthesis numbers are hand calculations comparable to estimates made for 1981-1989.

Year class	1994 ^a	1993	1992 ^b	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981
1993	11.8 ^c													
1992	76.5	52.5												
1991	81.7	244.1												
1990	19.7	114.4		458.4										
1989		11.5		215.6	110.0									
1988		(88.1)		90.0	285.8	120.2	71.1 ^d							
1987		(411.8)		26.0	84.1	130.5	225.8	46.3 ^e						
1986		(205.3)		(661.4)	62.0	223.2	92.4	178.7	16.6 ^f					
1985		(19.3)		(316.7)	(149.3)	85.8	156.3	347.5	287.3	164.4 ^g				
1984				(131.0)	(399.2)			97.6	107.9	206.8	3.5 ^h			
1983				(40.1)	(112.8)				56.5	113.2	17.4	143.3		
1982					(90.3)					74.3	160.8	272.6	526.0	
1981											103.1	146.8	209.0	281.3
1980												54.2	57.7	73.4
1979													48.0	82.1
1978														92.6
1977														
ages	177.6	370.0		331.6	431.9									
I-IV		(636.3)		(487.7)	(602.3)	439.5	474.5	623.8	451.7	394.3	281.3	473.6	314.7	248.1
Totals	189.4	422.5		790.0	541.9									
		(724.5)		(1,149.2)	(751.5)	559.7	545.6	670.1	467.7	558.7	284.8	616.8	840.7	529.4

^a Small trawler used due to low lake level.

^b No trawling conducted in 1992 due to low lake level.

^c kokanee fry released in 1994.

^d 75,000 kokanee fry released in 1988.

^e 60,800 kokanee fry released in 1987.

^f 57,142 kokanee fry released in 1986.

^g 109,931 kokanee fry released in 1985.

^h 100,000 kokanee fry released in 1984.

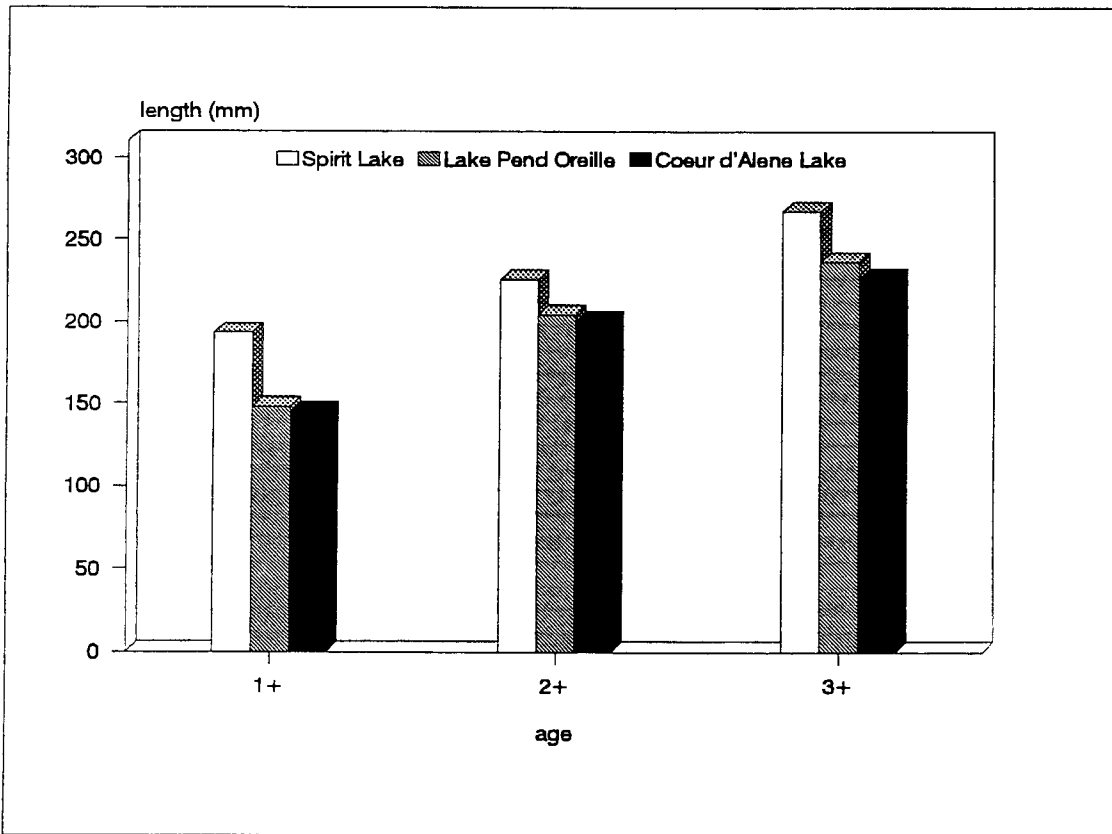


Figure 8. Mean Length of kokanee at age 1+, 2+, and 3+ for Spirit Lake (1987-1991), Lake Pend Oreille (1987-1991), and Coeur d'Alene Lake (1989-1991), Idaho.

Table 15. The numbers, age, and size of net pen-reared westslope cutthroat trout released into Lake Pend Oreille, Idaho, 1990-1994.

Year	No. of fish released	Age	Mean length at release (mm)	No. of net pens	Release date
1990	38,841	1	160	4	May
1991	34,870	1	171	6	May 31
1992	50,130	1	173	6	May 15
1993	46,160	1	173	6	May 15-16
1994	46,000	1	167	5	April 19-
	15,030	2	223	3	May 11

Standard Lowland Lake Survey

Round, Chatcolet, and Benewah Lakes

Limnology-There has been no separation of Benewah, Chatcolet, and Round lakes since 1906 when Post Falls Dam was built. Lake boundaries are now identified by bridges or islands. Probably as a result of this lack of separation, the limnology of these three lakes was similar (Table 16).

A study of Round Lake conducted in 1966 included limnology, water quality, and fish population assessment. The dissolved oxygen and temperature profile reported by Marcuson (1966) for Round Lake were similar to the profiles in 1994 (Table 17). Dissolved oxygen has not changed significantly since 1966. However, total alkalinity has declined since 1966 from 60 mg/l to 30 mg/l in 1994. This indicates Round Lake and the other lakes have lost some of the acid buffering capability (acid neutralizing capacity) since 1966.

Fish Community-The same fish species were found in all three lakes with a few exceptions (Table 18). Length ranges for each species (Appendices F,G,H) were similar for all three lakes, so each species was treated as a single population (Figures 9,10,11).

The largemouth bass population appears to be healthy. Fish ranged in length from 120 mm to 590 mm (Figure 9). The Proportional Stock Density (PSD) was 47.6 and within the range, 40-70, for balanced populations with a substantial fishery (Anderson 1980).

The relative weight (W_r) values ranged from 79 to 170 (Figure 10) with 100 being optimum (Anderson 1980). Most of the largemouth bass less than 400 mm had W_r values of less than 100, while most of the bass greater than 400 mm had W_r values greater than 100. The W_r values for the larger bass were influenced by the maturation of the gonads (sampling was conducted prior to spawning). W_r values between 85 to 100 indicates a well balanced bass population (Kohler and Hubert 1993).

The length/weight equation for bass in each lake, and pooled data, were similar to bass populations in other northern Idaho lakes (Table 19). The length/weight equation reported by Howse (1986) for bass in Round Lake was similar to the one reported in 1994 (Table 19).

Back-calculated length at annulus formation for largemouth bass in Benewah, Chatcolet, and Round lakes were similar to bass populations in other northern Idaho lakes (Table 20). Growth of warmwater fish species in northern Idaho tends to be slower than in southern Idaho because the water temperatures are colder and the growing season is shorter. In most northern Idaho lakes a 305 mm largemouth bass was 6 to 8 years old (Table 20). Dillon (1991) reported mean age of 300 mm largemouth bass was 4.9 years in the Panhandle Region. Mean age of 300 mm largemouth bass in the Southwest and Southeast regions was 3.9 and 4.0 years, respectively.

Table 16. Limnological characteristics of Benewah, Chatcolet, and Round (Benewah County) lakes, Idaho, June 1994.

Depth	<u>Benewah Lake</u>		<u>Round Lake</u>		<u>Chatcolet Lake</u>	
	DO	Temperature °C	DO	Temperature °C	DO	Temperature °C
0	10.2	15.0	10.0	16.1	9.8	15.5
1	11.2	14.1	10.1	14.0	9.7	13.7
2	11.0	11.0	10.2	13.3	10.0	12.4
3	11.8	10.3	9.8	10.4	9.9	11.3
4	8.2	9.6	9.4	10.0	10.2	11.2
4.3	0.5	9.4				
5					9.6	10.9
6					9.4	10.0
7					9.7	9.5
8					8.7	9.3
9					7.8	8.9
10					6.4	8.5
11					5.2	8.3
Secchi		1.70		1.90		3.25
pH		8.46		8.90		8.10
Total alkalinity		35.mg/l		30 mg/l		30 mg/l

Table 17. Comparison of dissolved oxygen, temperatures, seechi depth, pH, and total alkalinity in Round Lake, (Benewah County) Idaho, 1966 and 1994.

Depth (m)	1994		1966	
	Dissolved oxygen (mg/l)	Temperature °C	Dissolved oxygen ^a (mg/l)	Temperature ^b °C
Surface	10.0	16.1	9.8	14
1	10.1	14.0	9.8	14
2	10.2	13.3	9.9	14
3	9.8	10.4	9.9	14
4	9.4	10.0	10.5	14
5			9.6	14
Bottom	9.4	10.0	9.2	14
		1.90		1.5
pH		8.9		8.6 ^a
Total Alkalinity (mg/l)		30		60 ^c

^a Dissolved oxygen and pH taken 7-10-66

^b Temperature taken 6-19-66

^c Total alkalinity average for the spring 1966

Table 18. Fish species present in Round (Benewah County), Benewah, and Chatcolet lakes, Idaho, June 1994.

Species	Round Lake	Benewah Lake	Chatcolet Lake
Largemouth bass	Y	Y	Y
Yellow perch	Y	Y	Y
Black crappie	Y	Y	Y
Pumpkinseed	Y	Y	Y
Northern pike	Y	Y	Y
Cutthroat trout	Y	Y	Y
Rainbow trout	N	Y	N
Bull trout	N	Y	N
Chinook salmon	Y	N	Y
Kokanee	Y	Y	Y
Brown bullheads	Y	Y	Y
Channel catfish	N	N	Y
Squawfish	Y	Y	Y
Tench	Y	Y	Y
Suckers	Y	Y	Y

Y = Present

N = Not present

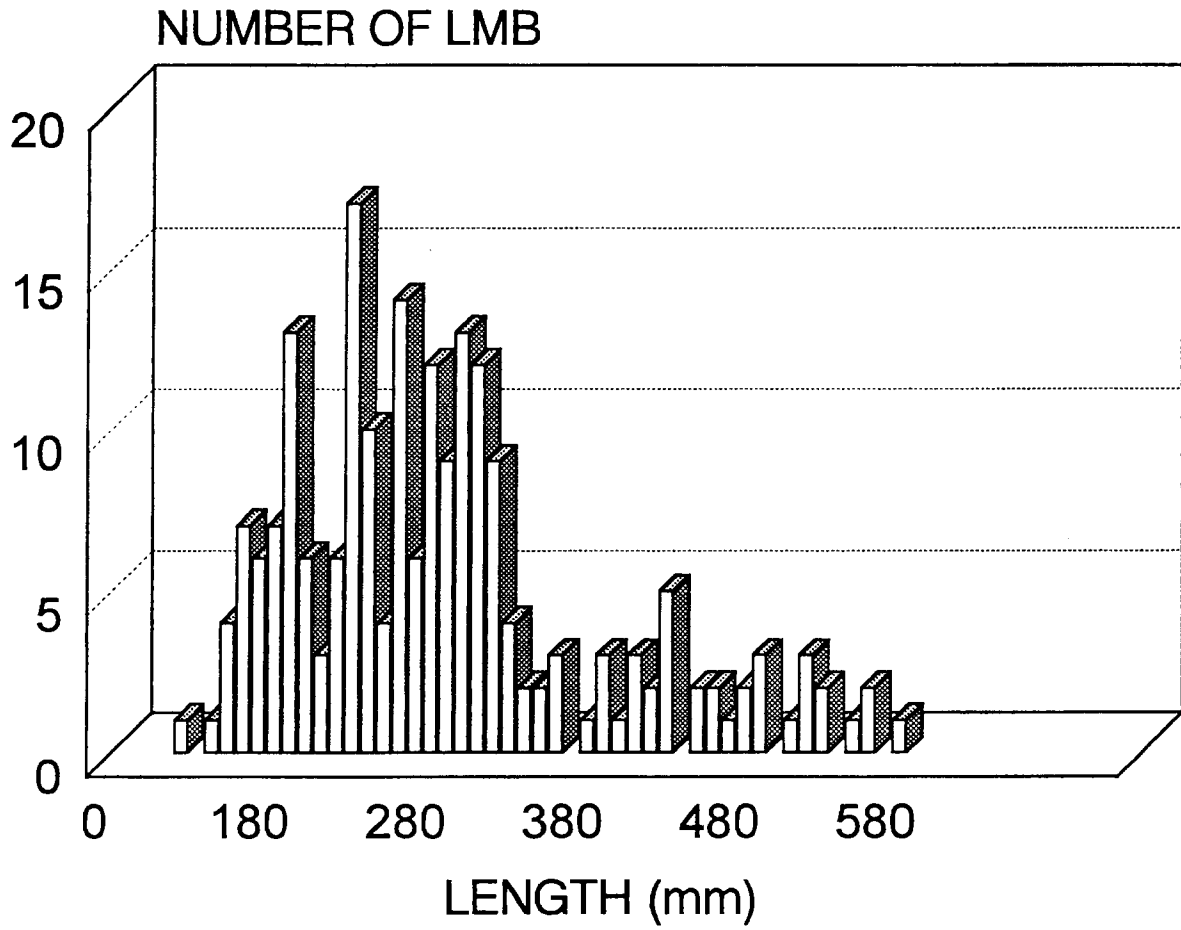


Figure 9. Length frequency of largemouth bass collected by electrofishing in Round (Benewah), Chatcolet, and Benewah lakes, Idaho, June 1994.

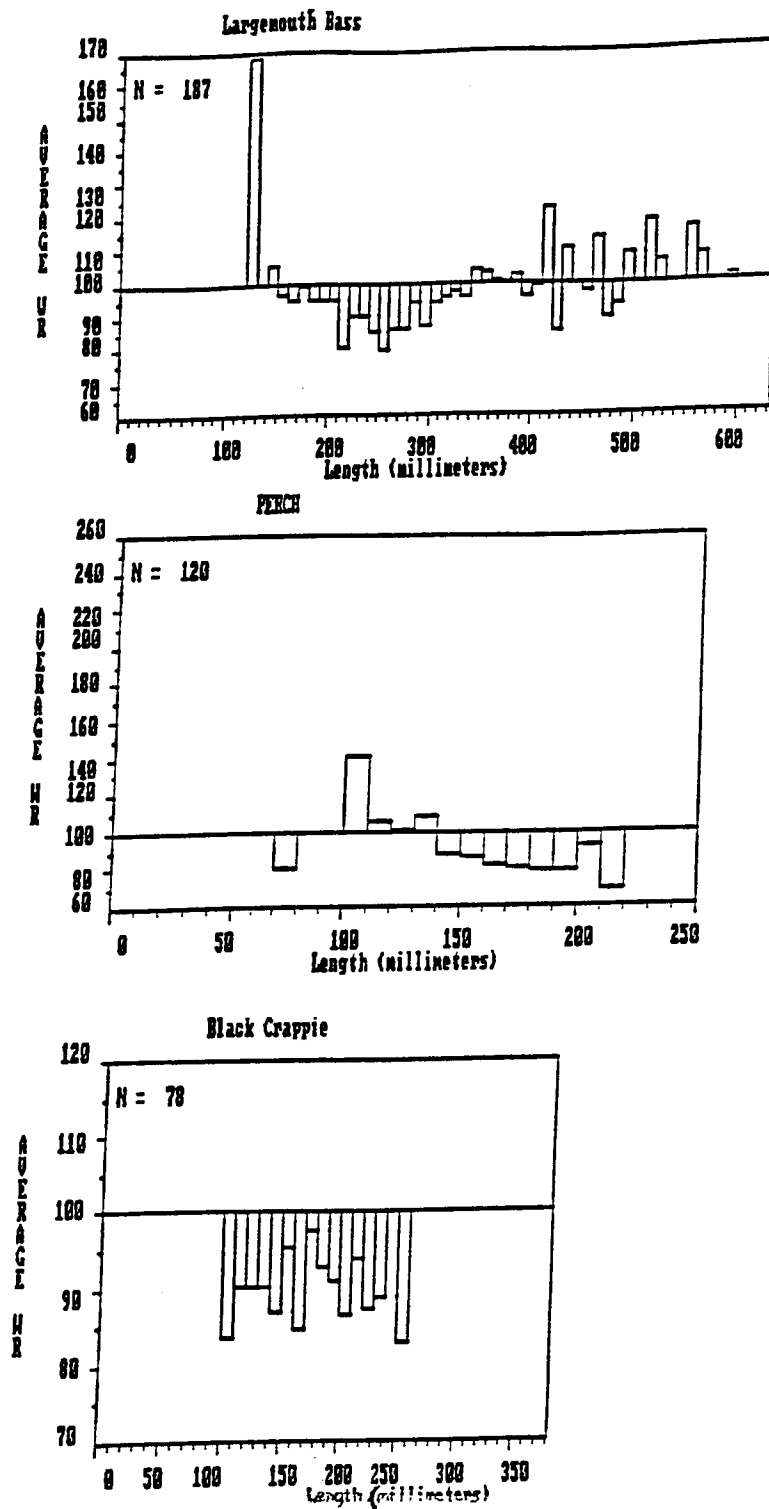


Figure 10. Relative weights (WR) of largemouth bass, black crappie, and yellow perch collected by electrofishing, gillnetting, and trapnetting in Round (Benewah County), Chatcolet, and Benewah lakes, Idaho, June 1994.

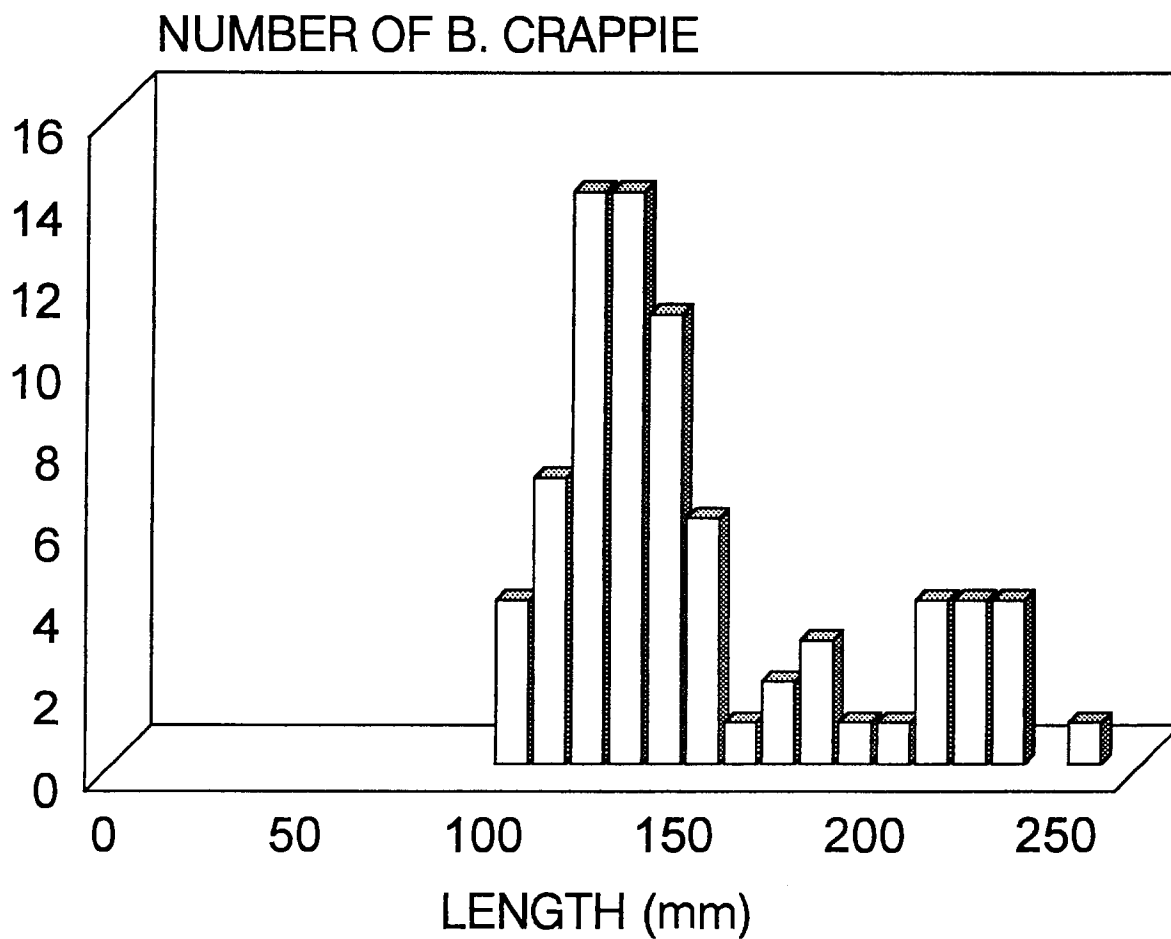


Figure 11. Length frequency of black crappie collected by electrofishing in Round (Benewah County), Chatcolet, and Benewah lakes, Idaho, June 1994.

Table 19. Length-weight equations for largemouth bass collected by gill nets and electrofishing from Benewah, Chatcolet, and Round (Benewah County) lakes, Idaho, June 1994, compared to the standard equation and various other Idaho lakes.

Standard	$\text{Log } W_s = -5.316 + 3.191 \text{ Log } L$
All three lakes ^a	$\text{Log } W = -5.538 + 3.266 \text{ Log } L$
Benewah	$\text{Log } W = -5.362 + 2.196 \text{ Log } L$
Chatcolet	$\text{Log } W = -5.69 + 3.340 \text{ Log } L$
Round	$\text{Log } W = -5.336 + 3.189 \text{ Log } L$
Round ^b	$\text{Log } W = -5.504 + 3.288 \text{ Log } L$
Thompson	$\text{Log } W = -4.697 + 2.920 \text{ Log } L$
Fernan	$\text{Log } W = -4.973 + 3.037 \text{ Log } L$
Anderson	$\text{Log } W = -4.845 + 2.990 \text{ Log } L$
Blue (Coeur d'Alene system)	$\text{Log } W = -4.585 + 2.890 \text{ Log } L$

^a Combined Benewah, Chatcolet, and Round lakes.

^b Howse 1966

Table 20. Mean back-calculated lengths at each annulus of largemouth bass captured by gill nets and electrofishing in Benewah, Chatcolet, and Round (Benewah County) lakes, Idaho, June 1994, compared to various other Idaho lakes.

Lake	Age																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Benewah	64	110	154	190	226	253	290	320	338	389	423	444	471	514	538	517	539
Chatcolet	65	116	164	211	254	287	322	366	393	434	462	486	501	533			
Round	103	176	244	302	361	398	437	460	470	463							
Hayden	49	69	96	123	154	185	221	257	299	343	446	520					
Lower Twin	63	101	125	155	196	231	276	329	366	380	411	447	465	490			
Fernan	74	130	175	204	237	270	297	376	437	459	486	502	520				
Cocolalla	71	94	118	152	189	223	257	282	296	399							

The black crappie population in Benewah, Chatcolet, and Round lakes appears to have faster growth rates than other northern Idaho populations based on back-calculated lengths at annulus formations (Table 21). Black crappie collected by gill nets, trap nets, and electrofishing ranged from 100 to 250 mm TL (Figure 11). However, all W_r values were below 100 (Figure 10), indicating a problem with food supply.

Yellow perch collected by gill nets, trap nets, and electrofishing ranged from 20 to 210 mm TL (Figure 12). Yellow perch also appear to have problems with food supply as indicated by W_r values (Figure 10).

Northern pike were found in all three lakes. The lengths ranged from 300 to 1,070 mm. A total of 11 northern pike were caught, which indicates a low abundance when compared to northern pike in Cougar Bay, Coeur d'Alene Lake (Horner et al. 1996b).

Chatcolet Lake was the only lake where we found channel catfish. The catfish were originally stocked in the St. Joe and St. Maries rivers near St. Maries, Idaho, in 1989-1991 and in the St. Maries River in 1993. Catfish evidently moved downstream into Chatcolet Lake. Catfish collected ranged from 410 to 549 mm in total length. Their ages were six or seven years, which corresponded to the 1989 and 1990 stockings (assuming the catfish were one or two years old when stocked).

Howse (1966) reported that brown bullheads *Ameiurus nebulosus* and yellow perch were the most abundant species, followed by squawfish and tench *Tinca tinca*. In 1994, brown bullhead and yellow perch were the most abundant species, followed by squawfish and suckers *Catostomus sp.* (Figure 13). With the exception of newly introduced species (chinook salmon, channel catfish, and northern pike) the fish community has changed very little since 1966.

Generally the fish populations in these lakes are stable and support a good fishery. We recommend no change in current management strategies

Blue Lake-Blue Lake is located in Bonner County, Idaho, approximately 11.3 km north of the town of Priest River. At 36 ha in surface area, this shallow bog lake has a mean depth of less than 3.5 m. Aquatic vegetation consumes most of Blue Lake by the end of the summer months. Blue Creek is the only inlet and outlet stream of Blue Lake. This stream flows approximately 2.4 km west to the Priest River. This sometimes ephemeral stream provides no upstream fish passage from Priest River to Blue Lake due to a reported waterfall of some 4.5 m in height.

The shore line surrounding Blue Lake is in private ownership except for a county road right-of-way at the north end of the lake. This access provides an unimproved boat launch site for smaller boats. Bonner County purchased this access site, circa 1954, from a local land owner, specifically for sportsmen's access to Blue Lake.

Blue Lake was rotenoned in September of 1954 to remove unwanted populations of suckers, peamouth *Mylocheilus caurinus*, squawfish, and yellow perch. Other fish present prior to renovation were black crappie, largemouth bass, and brook trout *S. fontinalis*. Rainbow trout, brook trout, and kokanee were restocked in the spring of 1955. For the next 20 years or so, Blue Lake was a popular winter ice fishery for rainbow and brook trout. By the mid-1980s, Blue Lake had changed from a coldwater salmonid fishery to a mixed stock warmwater/coolwater fishery, consisting of yellow perch,

Table 21. Mean back-calculated length at each annulus for black crappie captured by gill nets and electrofishing from Benewah, Chatcolet, and Round (Benewah County) lakes, Idaho, June 1994, compared to various other Idaho lakes.

Lake	Age											
	1	2	3	4	5	6	7	8	9	10	11	12
Benewah	68	112	150	190	196							
Chatcolet	70	111	146	186	204							
Round	66	108	144	176	215							
Lower Twin	56	82	113	139	168	193	220	260				
Hayden	33	54	75	96	118	142	109	196	220	246	286	330
Cocolalla	63	101	148	184	202	229	246					

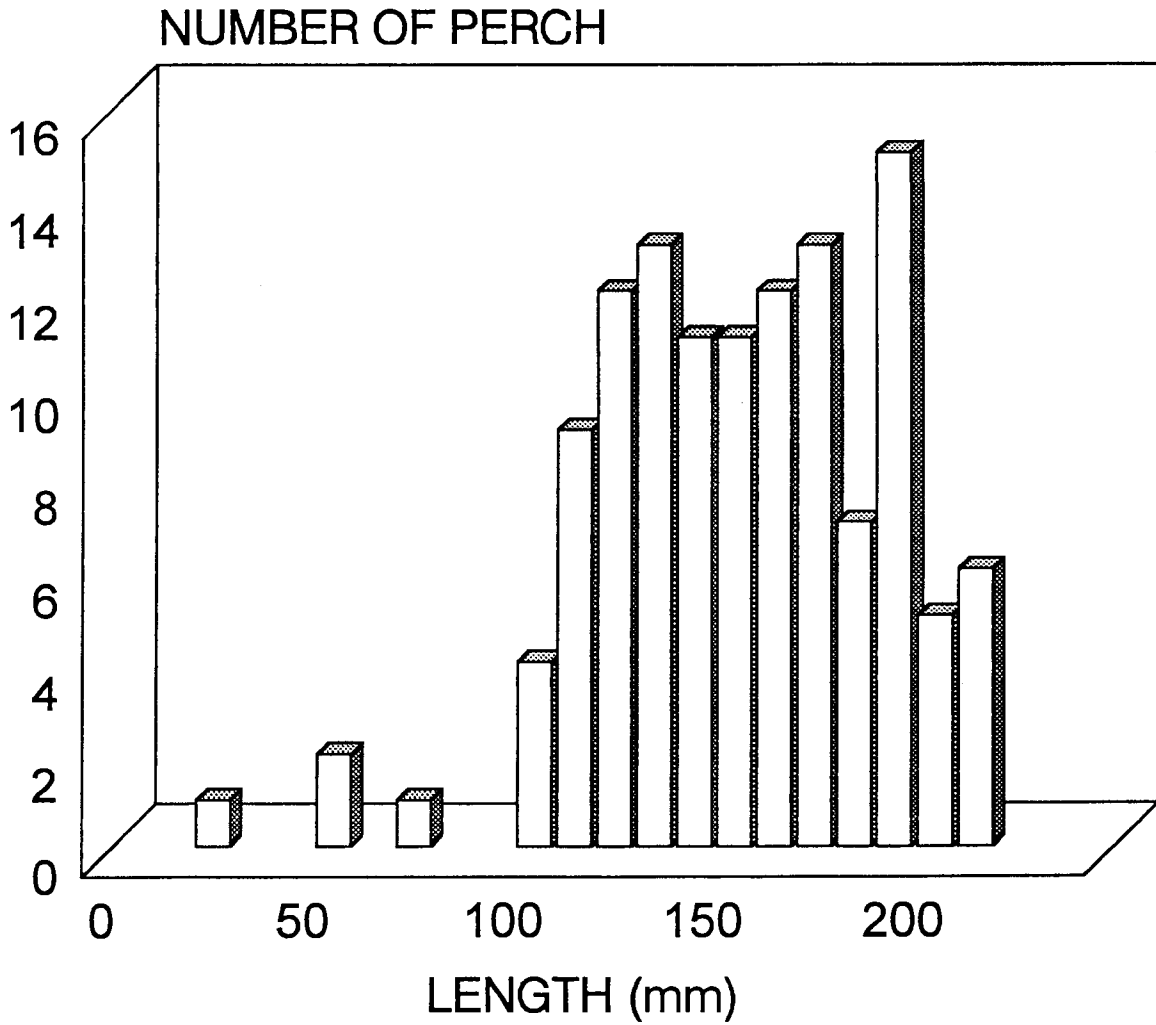
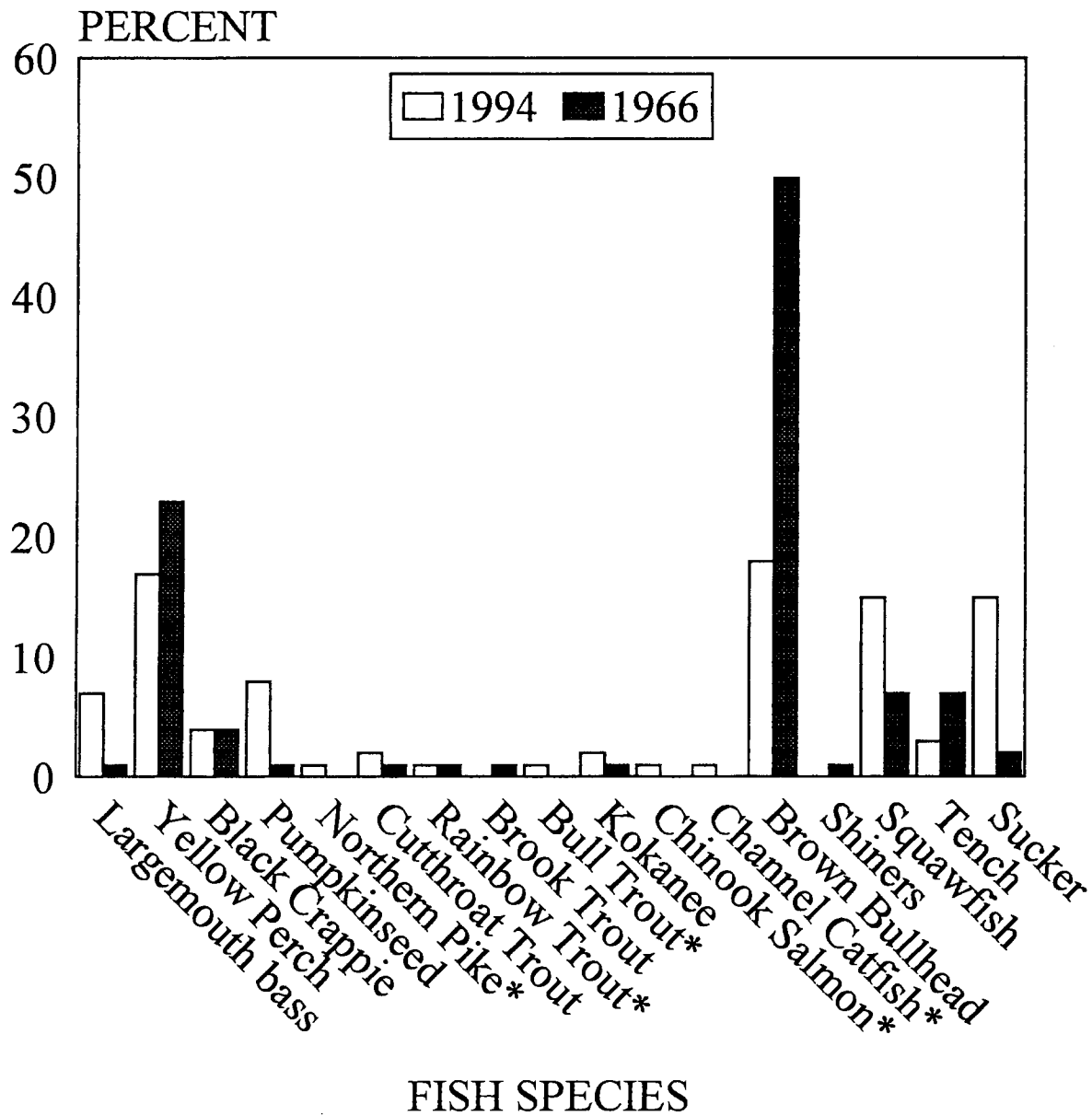


Figure 12. Length frequency of yellow perch collected by electrofishing, gillnetting, and trapnetting in Round (Benewah County), Chatcolet, and Benewah lakes, Idaho, June 1994.



* Percent less than 1

Figure 13. Comparison of fish species found in Round Lake (Benewah County), Idaho, 1966 and 1994.

largemouth bass, black crappie, and an occasional northern pike. The illegal introduction of northern pike and eutrophication of the lake probably contributed to the end of the trout fishery in Blue Lake. The first recorded catch of northern pike in Blue Lake occurred in 1982.

Blue Lake was recommended for renovation in 1989, but the rotenone project was canceled after local fishermen objected (Maiolie et al. 1991). A 1988 survey of Blue Lake had shown the fish community consisted mainly of yellow perch and brown bullhead (Table 22). The local fishermen's reason for not wanting the rotenone project was that they caught largemouth bass in Blue Lake that weighed up to 4 pounds. An electrofishing survey of Blue Lake in October 1989 (Table 22) did find a significant number of largemouth bass, but nothing as large as the anglers reported. Instead of rotenoning Blue Lake, tiger muskie were introduced along with the continued stocking of channel catfish (Table 23) to provide a unique fishery in north Idaho.

The June 1994 fishery survey of Blue Lake yielded catches of largemouth bass, black crappie, channel catfish, northern pike, yellow perch, pumpkinseed *Lepomis gibbosus*, brown bullhead, and brook trout (Table 22, Appendix I). No tiger muskie captured during the survey, but in a subsequent visit to the lake, a dead 770 mm tiger muskie was found floating in the aquatic weed beds near the public access site. Age analysis of channel catfish, largemouth bass, black crappie, and northern pike is presented in Table 24.

Chase Lake-Chase Lake is located approximately 1.7 km southeast of Coolin, Idaho near the southern end of Priest Lake. This shallow bog lake is approximately 65 ha in surface area with a mean depth of 2.5 m. The outlet, an ephemeral stream during drought years, flows approximately 2 km to enter Priest Lake at Coolin Bay.

Chase Lake has never been the recipient of any salmonid stocking by IDFG. Fishery surveys and officer creel census reports from the early 1970s indicate the only fish present in Chase Lake were largemouth bass and pumpkinseed. A 1984 survey of Chase Lake yielded catches of yellow perch and brown bullhead in addition to the largemouth bass and pumpkinseed (Table 25). In June 1994, Chase Lake was surveyed again. This survey revealed basically the same fish community structure as was there ten years previous (Table 25). Chase Lake does offer some of the largest yellow perch in northern Idaho with fish averaging 275 mm and some of the largest up to 320 mm in length. One reported problem with fish caught from Chase Lake in the mid-summer is the presence of internal parasites and nematodes in the flesh and black spot disease.

RECOMMENDATIONS

1. Complete the creel survey on Hayden Lake which began in July 1994 and will end in June 1995.
2. Evaluate the effect of northern pike on the fish community, especially the trout population, in five years.
3. Reduce harvest of lake trout in Priest Lake to produce a greater percentage of large fish in the catch.

Table 22. Fish survey results from Blue Lake, Bonner County, Idaho, July 1988 (gill nets); October 1989 (electrofishing); and June 1994 (gill nets, trap nets, and electrofishing).

Year	Species	Number collected	Mean length (mm)	Length range (mm)
1994	largemouth bass	81	175	110-570
	black crappie	53	173	110-250
	channel catfish	13	411	320-580
	northern pike	2	1,000	970-1030
	pumpkinseed	85	140	110-170
	yellow perch	189	166	120-230
	brook trout	2	265	260-270
	brown bullhead	10	253	210-290
1989	largemouth bass	40	211	60-290
	black crappie	20	170	50-250
	channel catfish	1	330	-
	northern pike	1	902	-
	pumpkinseed	14	101	20-160
	yellow perch	110	179	160-220
	brook trout	-		
	brown bullhead	17	252	210-290
1988	largemouth bass	3	168	141-199
	black crappie	7	168	145-195
	channel catfish	2	292	245-338
	northern pike	-		
	pumpkinseed	4	125	123-128
	yellow perch	68	185	155-215
	brook trout	-		
	brown bullhead	21	242	220-255

Table 23. New species introduced to Blue Lake, Bonner County, Idaho.

Species	1987	1988	1989	1990	1991	1992	1993
Channel							
catfish	2,044	0	0	2,000	2,000	0	3,000
Tiger muskie	--	--	350	352	115	0	50
Gammrus							
shrimp	--	--	5 gal. (~100,000)	--	--	--	--

Table 24. Length at age for largemouth bass (LMB), black crappie (BC), northern pike (NP), and channel catfish (CC) sampled from Blue Lake, Bonner County Idaho, June, 1994.

Species	<u>Length at Age (mm)</u>								
	age 1	age 2	age 3	age 4	age 5	age 6	age 7	age 8	age 9
LMB	54	85	124	160	198	226	255	289	305
BC	100	134	156	180	203	236			
NP	346	414	482	586	663	742	861	946	
CC					325	418	475	580	

Table 25. Fish survey results from Chase Lake, Idaho, June 1994 (gill and trap nets); August 1984 (gill nets); and June 1971 (hoop nets and hook and line).

Year	Species	Number collected	Mean length (mm)	Length range (mm)
1994	largemouth bass	22	217	190-330
	yellow perch	48	275	170-320
	pumpkinseed	6	167	150-210
	brown bullhead	22	322	280-370
1984	largemouth bass	10	247	205-325
	yellow perch	85	223	175-295
	pumpkinseed	7	178	105-215
	brown bullhead	3	302	175-295
1971	largemouth bass	23	247	211-270
	pumpkinseed	101	182	166-205

4. Monitor kokanee population abundance and size of age 3 and older fish in Coeur d'Alene Lake with trawling to determine the effect of chinook salmon predation.
5. Trap and spawn chinook salmon in Wolf Lodge Creek to provide eggs for the stocking program in Coeur d'Alene Lake.
6. Stock no more than 30,000 chinook salmon smolts annually in Wolf Lodge Bay, Coeur d'Alene Lake.
7. Count chinook salmon redds in St. Joe and Coeur d'Alene river drainages and eliminate redds in excess of 93.
8. Survey Coeur d'Alene Lake chinook salmon anglers to collect data on catch rates, length frequencies, hatchery and natural composition (including derbies).
9. Continue to monitor the kokanee stock status in Lake Pend Oreille.
10. Continue to monitor the kokanee stock status in Spirit Lake.
11. Discontinue the rearing of two-year-old cutthroat trout in the Lake Pend Oreille net pens.
12. Work with local landowners and sportsmen to reduce the aquatic weed growth in Blue Lake, by means of mechanical harvest to enhance fishing and boating access.

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APPENDICES

Appendix A. Summary of fishing effort by interval on Hayden Lake, Idaho,
July to November, 1994.

Date: 12/05/94
Page: 1

Time: 12:22:35 pm

Idaho Department of Fish and Game
Creel Survey System
Pressure Report by Interval and Daytype
Summary

Body of Water: HAYDEN LAKE Year: 1994 EPA Number: 000000000000

SECTION NUMBER	INTERVAL	DAYTYPE	BOAT ANGLERS HOURS	BANK ANGLERS HOURS	TUBE ANGLERS HOURS	ICE ANGLERS HOURS	TOTAL ANGLERS HOURS
1	1	Weekday	3328	919	0	0	4247
		Weekend	2242	1176	0	0	3418
		Interval 1 totals: +/- at 95% C.I.:	5570 1693	2095 1174	0 0	0 0	7665 2060
1	2	Weekday	2041	355	0	0	2396
		Weekend	1892	302	0	0	2194
		Interval 2 totals: +/- at 95% C.I.:	3933 1519	657 244	0 0	0 0	4590 1539
1	3	Weekday	2511	1044	0	0	3555
		Weekend	558	67	0	0	625
		Interval 3 totals: +/- at 95% C.I.:	3069 830	1111 494	0 0	0 0	4180 966
1	4	Weekday	1798	548	0	0	2346
		Weekend	1328	260	0	0	1588
		Interval 4 totals: +/- at 95% C.I.:	3126 791	808 248	0 0	0 0	3934 829
1	5	Weekday	976	287	0	0	1263
		Weekend	1456	94	0	0	1550
		Interval 5 totals: +/- at 95% C.I.:	2432 544	381 235	0 0	0 0	2813 593
1	6	Weekday	1269	225	0	0	1494
		Weekend	688	105	0	0	793
		Interval 6 totals: +/- at 95% C.I.:	1957 667	330 249	0 0	0 0	2287 712
1	7	Weekday	512	20	0	0	532

12/05/94

Time: 12:22:40 pm

2

Idaho Department of Fish and Game
 Creel Survey System
 Pressure Report by Interval and Daytype
 Summary

of Water: HAYDEN LAKE Year: 1994 EPA Number: 000000000000

SECTION	INTERVAL	DAYTYPE	BOAT ANGLERS	BANK ANGLERS	TUBE ANGLERS	ICE ANGLERS	TOTAL ANGLERS
			HOURS	HOURS	HOURS	HOURS	HOURS
1	7	Weekend	609	56	0	0	665
	Interval 7 totals:		1121	76	0	0	1197
	+/- at 95% C.I.:		416	89	0	0	425
	8	Weekday	380	33	0	0	413
		Weekend	614	39	0	0	653
	Interval 8 totals:		994	72	0	0	1066
	+/- at 95% C.I.:		487	102	0	0	498
	9	Weekday	59	0	0	0	59
		Weekend	410	0	0	0	410
	Interval 9 totals:		469	0	0	0	469
	+/- at 95% C.I.:		497	0	0	0	497
	10	Weekday	58	0	0	0	58
		Weekend	104	12	0	0	115
	Interval 10 totals:		162	12	0	0	173
	+/- at 95% C.I.:		149	23	0	0	150
Section 1 totals:			22833	5542	0	0	28374
+/- at 95% C.I.:			2812	1370	0	0	3129
Season totals:			22833	5542	0	0	28374
+/- at 95% C.I.:			2812	1370	0	0	3129

of Report.

Appendix B. Summary of fish caught and harvested from Hayden Lake, Idaho,
July to November, 1994.

12/05/94

Time: 12:35:55 pm

1

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Water: HAYDEN LAKE

Year of Census: 1994

EPA Number: 000000000000

BY DT CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	RBT	RBTLV	RBTRV	RBTAD	CT	CTAD	LMB	SMB
1 1	585	3691	4196	25	0	0	0	0	0	51	76
2	403	2642	3045	123	0	0	0	0	0	31	0
Tot:	988	6333	7241	148	0	0	0	0	0	82	76
5%CI:	558	1688	3171	162	0	0	0	0	0	111	123
2 1	860	3108	3968	38	0	0	0	0	0	0	0
2	147	2247	2394	53	0	0	0	0	0	13	26
Tot:	1007	5355	6362	91	0	0	0	0	0	13	26
5%CI:	743	1813	3498	84	0	0	0	0	0	6	46
3 1	1184	2602	3790	18	0	0	0	71	0	18	36
2	175	375	550	25	0	0	0	0	0	0	0
Tot:	1359	2977	4340	43	0	0	0	71	0	18	36
5%CI:	1171	697	1803	54	0	0	0	73	0	4	72
4 1	293	2177	2470	0	0	0	0	14	0	14	45
2	135	1089	1226	30	0	0	0	17	0	6	52
Tot:	428	3266	3696	30	0	0	0	31	0	20	97
5%CI:	242	696	1542	33	0	0	0	7	0	4	104
5 1	136	760	897	0	0	0	0	0	0	0	0
2	271	298	569	51	0	0	0	0	0	26	78
Tot:	407	1058	1466	51	0	0	0	0	0	26	78
5%CI:	330	206	711	99	0	0	0	0	0	32	115
6 1	1878	1050	2927	0	0	0	0	0	0	21	0
2	59	282	341	35	0	0	0	12	0	0	0
Tot:	1937	1332	3268	35	0	0	0	12	0	21	0
5%CI:	1944	458	2375	38	0	0	0	17	0	43	0
7 1	75	420	495	0	0	0	0	0	0	0	0
2	86	215	301	11	0	0	0	11	0	0	0

12/05/94

Time: 12:36:03 pm

2

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Harvest by Section and Interval

of Water: HAYDEN LAKE

Year of Census: 1994

EPA Number: 00000000000000

DY	FISH	FISH	FISH	RBT	RBTLV	RBTRV	RBTAD	CT	CTAD	LMB	SMB
IT CD	KEPT	RELEASED	CAUGHT								
Tot:	161	635	796	11	0	0	0	11	0	0	0
5%CI:	175	221	568	24	0	0	0	24	0	0	0
8 1	17	254	272	0	0	0	0	0	0	0	0
2	66	347	413	0	0	0	0	0	0	0	0
Tot:	83	601	685	0	0	0	0	0	0	0	0
5%CI:	80	276	664	0	0	0	0	0	0	0	0
9 1	0	0	0	0	0	0	0	0	0	0	0
2	170	40	210	0	0	0	0	0	0	0	0
Tot:	170	40	210	0	0	0	0	0	0	0	0
5%CI:	226	48	264	0	0	0	0	0	0	0	0
10 1	0	32	32	0	0	0	0	0	0	0	0
2	12	23	35	6	0	0	0	0	0	0	0
Tot:	12	55	67	6	0	0	0	0	0	0	0
5%CI:	17	44	70	10	0	0	0	0	0	0	0
11 1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
Tot:	0	0	0	0	0	0	0	0	0	0	0
5%CI:	0	0	0	0	0	0	0	0	0	0	0
Tot:	6472	21652	28131	415	0	0	0	125	0	180	313
5%CI:	2504	2737	5908	223	0	0	0	79	0	124	215
Tot:	6472	21652	28131	415	0	0	0	125	0	180	313
5%CI:	2504	2737	5908	223	0	0	0	79	0	124	215

Report.

: 12/05/94
: 1

Time: 12:36:57 pm

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

of Water: HAYDEN LAKE		Year of Census: 1994								EPA Number:
BY INT CD	BCR	BCK	SPLAKE	PERCH	PIKE	SUNFISH	ANY	OTHER	BK	
1 1	709	76	0	204	0	25	0	51	0	
2	62	31	0	219	0	0	0	0	0	
1 Tot:	771	107	0	423	0	25	0	51	0	
95%CI:	1084	141	0	363	0	8	0	87	0	
2 1	618	355	0	431	19	19	0	0	0	
2	13	0	0	26	26	0	0	0	0	
2 Tot:	631	355	0	457	45	19	0	0	0	
95%CI:	1157	439	0	476	67	49	0	0	0	
3 1	235	252	0	558	107	0	0	107	0	
2	0	0	0	50	50	0	0	50	0	
3 Tot:	235	252	0	608	157	0	0	157	0	
95%CI:	291	317	0	940	166	0	0	197	0	
4 1	73	59	0	45	117	0	0	0	0	
2	11	11	0	0	17	0	0	0	0	
4 Tot:	84	70	0	45	134	0	0	0	0	
95%CI:	126	83	0	67	132	0	0	0	0	
5 1	0	0	0	68	28	0	0	40	0	
2	0	0	0	51	12	0	0	0	0	
5 Tot:	0	0	0	119	40	0	0	40	0	
95%CI:	0	0	0	148	48	0	0	80	0	
6 1	0	61	0	1473	323	0	0	0	0	
2	71	0	0	12	0	0	0	0	0	
6 Tot:	71	61	0	1485	323	0	0	0	0	
95%CI:	155	72	0	1747	362	0	0	0	0	
7 1	0	0	0	0	0	0	0	0	0	
2	0	0	0	11	54	0	0	0	0	

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Harvest by Section and Interval

of Water: HAYDEN LAKE

Year of Census: 1994

EPA Number:

BY INT CD	BCR	BCK	SPLAKE	PERCH	PIKE	SUNFISH	ANY	OTHER	BK
Tot:	0	0	0	11	54	0	0	0	0
5% CI:	0	0	0	20	77	0	0	0	0
8 1	0	0	0	0	9	0	0	9	0
2	0	0	0	0	66	0	0	0	0
Tot:	0	0	0	0	75	0	0	9	0
5% CI:	0	0	0	0	78	0	0	19	0
9 1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	170	0	0	0	0
Tot:	0	0	0	0	170	0	0	0	0
5% CI:	0	0	0	0	226	0	0	0	0
10 1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	6	0	0	0	0
Tot:	0	0	0	0	6	0	0	0	0
5% CI:	0	0	0	0	15	0	0	0	0
11 1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
Tot:	0	0	0	0	0	0	0	0	0
5% CI:	0	0	0	0	0	0	0	0	0
Tot:	1792	845	0	3148	1004	44	0	257	0
5% CI:	1624	570	0	2078	496	49	0	230	0
Tot:	1792	845	0	3148	1004	44	0	257	0
5% CI:	1624	570	0	2078	496	49	0	230	0

of Report.

Appendix C. Summary of catch rate data per species by interval from Hayden Lake, Idaho, July to November, 1994.

12/05/94

Time: 12:33:39 pm

1

Idaho Department of Fish and Game
Creel Survey System
Summary for Catch Rate by Day Type and Interval - for Total hours

of Water: HAYDEN LAKE

1994

EPA Number: 000000000000

DAYTYPE	CR KEPT	CR RELSD	CR CGHT	CR- RBT KEPT	CR- RBT REL	CR- RBTLV KEPT	CR- RBTLV REL	CR- RBTBV KEPT	CR- RBTBV REL	CR- RBTAD KEPT	CR- RBTAD REL	CR- CT KEPT	CR- CT REL	CR- CTAD KEPT	CR- CTAD REL	CR- LMB KEPT	CR- LMB REL	CR- SMB KEPT	CR- SMB REL
1 Weekday	0.12	0.87	0.99	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.02	0.02	0.53
Weekend	0.12	0.77	0.89	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.00	0.43
2 Weekday	0.35	1.30	1.66	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.00	0.38
Weekend	0.07	1.02	1.09	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	0.01	0.72
3 Weekday	0.33	0.73	1.07	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.14	0.01	0.30
Weekend	0.28	0.60	0.88	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60
4 Weekday	0.13	0.93	1.85	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.22	0.02	0.45
Weekend	0.09	0.69	0.77	0.02	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.06	0.03	0.46
5 Weekday	0.11	0.60	0.71	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.07	0.00	0.28
Weekend	0.18	0.19	0.37	0.03	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.05	0.08
6 Weekday	1.26	0.70	1.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.15
Weekend	0.07	0.36	0.43	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.16
7 Weekday	0.14	0.79	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00
Weekend	0.13	0.32	0.45	0.02	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.03
8 Weekday	0.04	0.62	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.21	0.00	0.00
Weekend	0.10	0.53	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.09	0.00	0.03
9 Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weekend	0.42	0.10	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00
10 Weekday	0.00	0.55	0.55	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weekend	0.10	0.20	0.31	0.05	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11 Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 wkdy CR:	0.23	0.64	0.87	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.11	0.00	0.19
1 wknd CR:	0.14	0.44	0.58	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.01	0.23
1 Sson CR:	0.20	0.58	0.79	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.09	0.01	0.20
Season CR:	0.23	0.64	0.87	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.11	0.00	0.19
Season CR:	0.14	0.44	0.05	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.01	0.23
Season CR:	0.20	0.58	0.79	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.09	0.01	0.20

f Report.

12/05/94

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Idaho Department of Fish and Game
Creel Survey System
Summary for Catch Rate by Day Type and Interval - for Species 9 - 24

of Water: HAYDEN LAKE

Year of Census: 1994

EPA Number:

IT DAYTYPE	CR-KPT BCR	CR-KPT BCK	CR-KPT SPLAKE	CR-KPT PERCH	CR-KPT PIKE	CR-KPT SUNFIS	CR-KPT ANY	CR-KPT OTHER	CR-KPT BK
1 Weekday	0.17	0.02	0.00	0.05	0.00	0.01	0.00	0.01	0.00
Weekend	0.02	0.01	0.00	0.05	0.00	0.00	0.00	0.00	0.00
2 Weekday	0.25	0.15	0.00	0.18	0.01	0.01	0.00	0.00	0.00
Weekend	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
3 Weekday	0.07	0.07	0.00	0.16	0.03	0.00	0.00	0.03	0.00
Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4 Weekday	0.03	0.03	0.00	0.02	0.05	0.00	0.00	0.00	0.00
Weekend	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
5 Weekday	0.00	0.00	0.00	0.05	0.02	0.00	0.00	0.03	0.00
Weekend	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00
6 Weekday	0.00	0.04	0.00	0.99	0.22	0.00	0.00	0.00	0.00
Weekend	0.09	0.20	0.00	0.02	0.00	0.00	0.00	0.00	0.00
7 Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weekend	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
8 Weekday	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00
Weekend	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00
9 Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weekend	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00
10 Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weekend	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
11 Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 wkdy CR:	0.05	0.03	0.00	0.13	0.03	0.00	0.00	0.01	0.00
1 wknd CR:	0.01	0.00	0.00	0.02	0.07	0.00	0.00	0.01	0.00
1 Sson CR:	0.04	0.02	0.00	0.10	0.04	0.00	0.00	0.01	0.00
Season CR:	0.05	0.03	0.00	0.13	0.03	0.00	0.00	0.01	0.00
Season CR:	0.01	0.00	0.00	0.02	0.07	0.00	0.00	0.01	0.00
Season CR:	0.04	0.02	0.00	0.10	0.04	0.00	0.00	0.01	0.00

f Report.

Appendix D. Summary of angler survey results for Hayden Lake, Idaho, 1994 (31 returns)

HAYDEN LAKE ANGLING SURVEY 1994/1995

1. Was Hayden Lake your primary destination? Yes 94% No 6% .
If NO, what was your primary destination? _____ .
2. Was fishing the primary reason you came to Hayden Lake? Yes 87% No 13%.
If NO, what was your primary reason _____ .
3. How did you fish Hayden Lake on your last trip? (Check all that apply).
From a boat 97% .
From shore 13% .
From a float tube 0 .
Other DOCK 10% (please specify)
4. What kind of terminal tackle did you use on your last trip? (Please check all that apply).
Bait 32% Lures 34% Flies 10% Other 0 (please specify)
5. How many days in total did you spend fishing in Idaho last year?
Mean-Median
44-30 Days per year
6. How many days did you spend fishing at Hayden Lake last year?
29-15 Days at Hayden Lake in a year
7. How many hours did you spend fishing at Hayden Lake on your last trip?
6.3-6 Hours at Hayden Lake on last trip
8. Did you enjoy your last trip to Hayden Lake?
Yes 87% No 10% Did not answer 3%

Fish Management Questions

Hayden Lake has been managed as a quality fishery since 1988. We would appreciate your input on the management direction for crappie, bass, and trout.

Crappie *Current regulation: 15 fish per day and none under 10 inches.*

Hayden lake was once known for its large crappie. Aging of these fish indicated that they were growing slowly due to the short growing season in northern Idaho. A 10 inch crappie was 6 years old and it takes 10 to 12 years to reach 14 inches. In previous years, small fish were the result of fish being harvested before they grew large (not stunting from over population). A special regulation was implemented in 1990 to reduce harvest of crappie with the intent of managing for better than average sized fish. We have two management options for crappie in Hayden Lake, general and quality. Under quality management (current regulations) the number of crappie harvested decreases but the average size increases to over 10 in. Under general management there would be no restrictions on harvest. However, under this option the average size of crappie would be less than 10 in and there would be fewer crappie over 10 in long to harvest.

Please answer the following questions pertaining to the crappie fishery and crappie management on Hayden Lake:

9. Do you fish for crappie? Yes 48% (n=15) No N=31
10. On the average, how many legal size crappie (10 inches or longer) do you catch per day?
- | | |
|---------|-----------|
| 0 | <u>0</u> |
| 1 - 5 | <u>33</u> |
| 6 - 10 | <u>40</u> |
| 11 - 15 | <u>13</u> |
| 15+ | <u>13</u> |
11. On the average, I catch more crappie 10 inches or longer now than five years ago.
 Yes 40% No 20% Same 13% DNA 27%
12. On the average I catch more crappie now than five years ago.
 Yes 33% No 20% Same 20% DNA 27%
13. Would you prefer that Hayden Lake continue to be managed for quality crappie knowing that only a portion of the crappies caught could be harvested but average

size of the crappie harvested would be over 10 inches?

Yes 93% No 7% No opinion

14. Would you prefer that Hayden Lake be managed for general crappie knowing that you could harvest any crappies you caught but the average size would less than 10 inches?

Yes 80% No 13% No opinion 7%

Largemouth bass/Smallmouth bass *Two bass per day, none between 12 to 16 inches bass harvest from July 1 to December 31.*

The growing season for bass in northern Idaho is generally only 3 to 4 months a year. Bass can reach trophy size if they live long enough. A 12 inch bass is typically 6 to 9 years old. The quality bass regulations currently in effect are intended to provide high catch rates for better than average sized bass, while still allowing some limited harvest. The July 1 opener for harvest of bass protects large bass during the spring spawning season. The slot limit allows harvest of small and large bass, while providing high catch rates for the 12 to 16 inch bass. We have three management options for bass on Hayden Lake, general, quality (current management), and trophy.

General- The goal is uncomplicated fishing with a general bag limit of 5 bass per day and none under 12 inches. Under this option the number of bass over 12 inches would be reduced due to high harvest.

Quality- The goal is to be able to catch more larger fish by giving up some harvest opportunity. This option would provide more bass to catch in the 12 to 16 inch range and allow limited harvest .

Trophy- The goal is to catch more large trophy bass. Under this option harvest would be severely restricted (20 inch minimum) or eliminated (catch-and-release). However, the number of bass harvested would be limited to two.

Please answer the following questions pertaining to the bass fishery and management on Hayden Lake:

15. Do you fish for bass?

Yes 89.3% (n=28) No 10.7% N=31

16. Do you support the current bass regulations on Hayden Lake?
 Yes 89.3% No 10.7% No opinion
 If NO, Why not? _____
17. Would you prefer that bass in Hayden Lake be managed for "general rules" knowing that the number of bass over 12 inches would be reduced because of increased harvest and that most bass caught would be less than 12 inches?
 Yes 7.1% No 89.3% No opinion 3.6%
18. Would you prefer that bass in Hayden Lake continue to be managed for "quality" (current management) knowing that harvest would be limited but more bass would be caught in the 12 to 16 inch range?
 Yes 64.3% No 35.7% No opinion 0
19. Would you prefer that bass in Hayden Lake be managed for "trophy" knowing that harvest would be restricted to fish over 20 inches?
 Yes 50% No 42.9% No opinion 7.1%
20. Would you prefer catch-and-release fishing only for bass on Hayden Lake?
 Yes 50% No 42.9% No opinion 7.1%
21. Are you confident in your ability to tell the difference between a largemouth bass and a smallmouth bass?
 Yes 85.7% No 14.3%
22. Do you think largemouth and smallmouth bass should be managed with separate regulations?
 Yes 17.9% No 75% No opinion 7%
 If YES, why? _____
23. On the average, how many largemouth bass do you catch per day (please check one)?
- | | | | |
|--------|--------------|-----------------------------------|----------|
| 0 | <u>14%</u> | I do not fish for largemouth bass | <u>0</u> |
| 1 - 5 | <u>53.6%</u> | | |
| 6 - 10 | <u>25%</u> | | |

10+ 7.1%

24. On the average, how many smallmouth bass do you catch per day (please check one)?

0 3.6%
1 - 5 60.7%
6 - 10 21.4%
10+ 7.1%

I do not fish for smallmouth bass 7.1%

25. What percent of the time you spend fishing for bass do you fish for

largemouth? 46.6%
smallmouth? 39.8%
= 100%

Trout *2 fish per day and none under 14 inches*

Hayden Lake is currently being managed for quality trout fishing. All tributary streams have been closed to fishing to allow maximum production of wild cutthroat and rainbow trout. An additional 150,000 cutthroat and 300,000 rainbow trout fingerlings are stocked annually to supplement wild production. The 14 inch minimum length limit and two trout bag limit is designed to allow trout to grow to a larger size while still allowing some harvest. Splake, a brook trout - lake trout hybrid, were recently introduced as an experiment to see how well they utilize mysis shrimp and to see if they will reach trophy size.

Hayden Lake can be managed for general, quality or trophy trout.

General- The goal is uncomplicated fishing with a general bag limit of 6 trout per day. Under this option the number of larger size trout would be reduced. Wild trout production would be reduced because immature fish would be harvested.

Quality- The goal is to be able to catch more larger fish by giving up some harvest opportunity. This option would provide more trout to catch over 14 inches.

Trophy- The goal is to catch more large trophy trout. Under this option harvest would be restricted to a 20 inch minimum or eliminated (catch-and-release). However , the number of trout caught and released would increase.

26. Do you fish for trout in Hayden Lake?

Yes 67.7% (n=21) No N=31

27. Would you prefer that trout in Hayden Lake be managed for "general" knowing that the number of trout over 14 inches would be reduced due to increased harvest?

Yes 0 No 90.5% No opinion 9.5%

28. Would you prefer that trout in Hayden Lake be managed for "quality" (current management) knowing that harvest would be limited but more trout would be caught in the 14 inch and over range?

Yes 76.2% No 14.3 No opinion 9.5%

29. Would you prefer that trout in Hayden Lake be managed for "trophy" knowing that harvest would be restricted to fish over 20 inches?

Yes 33.3% No 57.1% No opinion 9.5%

30. Would you support catch-and-release fishing for trout on Hayden Lake?

Yes 42.9% No 57% No opinion

31. On the average, how many trout do you catch per day?

0 19.1%, 1 47.6%, 2 14.3%, 3 14.3%, 4 0, 5 0, 5+ 0, NA 4.8%

YOUR HELP IS APPRECIATED!

JAD:kh

Appendix E. Summary of Hayden Lake, Idaho property owners survey results 1994-1995 (333 surveys returned).

HAYDEN LAKE ANGLING SURVEY 1994/1995

1. Have you fished Hayden Lake within the last 12 months?
(Check one) Yes 44% (n=148) No 56% (n=185).

If NO, please return questionnaire (or give to someone in your household that fishes).

If YES, please continue.

2. How many people in your household fish Hayden Lake? ave. 2.088 (number).

3. How did you fish Hayden Lake on your last trip? (Check all that apply).

From a boat 79% From shore 35% From a float tube 3%
Other DOCK 16% (please specify)

4. What kind of terminal tackle did you use on your last trip? (Please check all that apply).

Bait 51% Lures 83% Flies 21% Other _____ (please specify)

5. What was the primary species of fish you were trying to catch on your last fishing trip to Hayden Lake? (Please check one)

Largemouth bass 44% Yellow perch 12% Cutthroat trout 26% Rainbow trout 42%
Smallmouth bass 24% Crappie 13% Splake 1% Northern pike 1%
Pumpkinseed 0 Other 0 Anything 11%

6. How many fish of each species did you catch and how many did you release the last time you fished Hayden Lake?

Species	Caught	Kept	Released
Largemouth bass	<u>1.3</u>	<u>.13</u>	<u>1.2</u>
Smallmouth bass	<u>1.5</u>	<u>.06</u>	<u>1.5</u>
Black crappie	<u>2.2</u>	<u>.48</u>	<u>1.8</u>
Sunfish	<u>2.3</u>	<u>.01</u>	<u>2.4</u>
Yellow perch	<u>2.2</u>	<u>.45</u>	<u>1.8</u>
Northern pike	<u>.45</u>	<u>.27</u>	<u>.16</u>

ANGSURH

Rainbow trout	<u>.55</u>	<u>.18</u>	<u>.35</u>
Splake	<u>.27</u>	<u>.07</u>	<u>.02</u>
Other (_____)	<u>.14</u>	<u>.05</u>	<u>.09</u>

7. How many days in total did you spend fishing in Idaho last year?
(mean-median) 20-10 Days per year
8. How many days did you spend fishing at Hayden Lake last year?
16-7.5 Days at Hayden Lake in a year
9. How many hours did you spend fishing at Hayden Lake on your last trip?
3.9-3 Hours at Hayden Lake on last trip

Fish Management Questions

Hayden Lake has been managed as a quality fishery since 1988. We would appreciate your input on the management direction for crappie, bass, and trout.

Crappie *current regulation: 15 fish per day and none under 10 inches.*

Hayden lake was once known for its large crappie. Aging of these fish indicated that they were growing slowly due to the short growing season in northern Idaho. A 10 inch crappie was 6 years old and it takes 10 to 12 years to reach 14 inches. In previous years the small fish were the result of fish being harvested before they grew large (not stunting from over population). A special regulation was implemented in 1990 to reduce harvest of crappie with the intent of managing for better than average sized fish. We have two management options for crappie in Hayden Lake, general and quality. Under quality management (current regulations) the number of crappie harvested decreases but the average size increases to over 10 in. Under general management there would be no restrictions on harvest. However, under this option the average size of crappie would be less than 10 in. and there would be fewer crappie over 10 in long to harvest.

Please answer the following questions pertaining to the crappie fishery and crappie management on Hayden Lake:

12. Do you fish for crappie? Yes 58%(n=83) No N=148
13. On the average, how many legal size crappie (10 inches or longer) do you catch per day?

0 3.5% 1 - 5 20.9% 6 - 10 59.3% 11 - 15 11.6% 15+ 0 DNA 4.7%

14. On the average, I catch more crappie 10 inches or longer now than five years ago.

Yes 21% No 45% Same 17% DNA 16%

15. On the average I catch more crappie now than five years ago.

Yes 9% No 59% Same 15% DNA 16%

16. Would you prefer that Hayden Lake continue to be managed for quality crappie knowing that only a portion of the crappies caught could be harvested but average size of the crappie harvested would be over 10 inches?

Yes 75.6% No 10.5% No opinion 10.5% DNA 3.5%

If not, why not? _____

17. Would you prefer that Hayden Lake be managed for general crappie knowing that you could harvest any crappies you caught but the average size would less than 10 inches?

Yes 12% No 70% No opinion 13% DNA 5.8%

Largemouth bass/Smallmouth bass *Two bass per day, none between 12 to 16 inches bass harvest from July 1 to December 31.*

The growing season for bass in northern Idaho is generally only 3 to 4 months a year. Bass can reach trophy size if they live long enough. A 12 inch bass is typically 6 to 9 years old. The quality bass regulations currently in effect are intended to provide high catch rates for better than average sized bass, while still allowing some limited harvest. The July 1 opener for harvest of bass protects large bass during the spring spawning season. The slot limit allows harvest of small and large bass, while providing high catch rates for the 12 to 16 inch bass. We have three management options for bass on Hayden Lake, general, quality (current management), and trophy.

General- The goal is uncomplicated fishing with a general bag limit of 5 bass per day and none under 12 inches. Under this option the number of bass over 12 inches would be reduced due to high harvest.

Quality- The goal is to be able to catch more larger fish by giving up some harvest opportunity. This option would provide more bass to catch in the 12 to 16 inch range and allow limited harvest .

Trophy- The goal is to catch more large trophy bass. Under this option harvest would be severely restricted (20 inch minimum) or eliminated (catch-and-release). However, the number harvested would be limited to two.

Please answer the following questions pertaining to the bass fishery and management on Hayden Lake:

18. Do you fish for bass?

Yes 71%(n=106) No 29% N=148

19. Do you support the current bass regulations on Hayden Lake?

Yes 72.6% No 10.4% No opinion 6.6% DNA 10.4%

If NO, Why not? _____

20. Would you prefer that bass in Hayden Lake be managed for "general rules" knowing that the number of bass over 12 inches would be reduced because of increased harvest and that most bass caught would be less than 12 inches?

Yes 10.4% No 71.7% No opinion 11.3% DNA 6.6%

21. Would you prefer that bass in Hayden Lake be managed for "quality" (current management) knowing that harvest would be limited but more bass would be caught in the 12 to 16 inch range?

Yes 60.4% No 26.4% No opinion 6.6% DNA 6.6%

22. Would you prefer that bass in Hayden Lake be managed for "trophy" knowing that harvest would be restricted to fish over 20 inches?

Yes 28.3% No 58.5% No opinion 8.5% DNA 4.7%

23. Would you prefer catch-and-release fishing only for bass on Hayden Lake?

Yes 28.3% No 54.7% No opinion 11.3% DNA 5.7%

24. Are you confident in your ability to tell the difference between a largemouth bass and a smallmouth bass?

Yes 82.1% No 16% DNA 1.9%

25. Do you think largemouth and smallmouth bass should be managed with separate regulations?

Yes 15.1% No 62.3% No opinion 21.7%
If YES, why? _____

26. On the average, how many largemouth bass do you catch per day (please check one)?

0	<u>28.3%</u>	I do not fish for largemouth bass <u>11.3%</u>
1 - 5	<u>57.6%</u>	
6 - 10	<u>0.9%</u>	
10+	<u>0.9%</u>	

27. On the average, how many smallmouth bass do you catch per day (please check one)?

0	<u>22.7%</u>	I do not fish for smallmouth bass <u>4.7%</u>
1 - 5	<u>61.3%</u>	
6 - 10	<u>9.4%</u>	
10+	<u>0.9%</u>	

28. What percent of the time you spend fishing for bass do you fish for

largemouth?(mean)	<u>38.3 %</u>
smallmouth?(mean)	<u>35.6 %</u>
	100%

Trout *2 fish per day and none under 14 inches*

Hayden Lake is currently being managed for quality trout fishing. All tributary streams have been closed to fishing to allow maximum production of wild cutthroat and rainbow trout. An additional 150,000 cutthroat and 300,000 rainbow trout fingerlings are stocked annually to supplement wild production. The 14 inch minimum length limit and two trout bag limit is designed to allow trout to grow to a larger size while still allowing some harvest. Splake, a brook trout - lake trout hybrid, were recently introduced as an experiment to see how well they utilize mysis shrimp and to see if they will reach trophy size.

Hayden Lake can be managed for general, quality or trophy trout.

General- The goal is uncomplicated fishing with a general bag limit of 6 trout per day. Under this option the number of larger size trout would be reduced. Wild trout production would be reduced because immature

fish would be harvested.

Quality- The goal is to be able to catch more larger fish by giving up some harvest opportunity. This option would provide more trout to catch over 14 inches.

Trophy- The goal is to catch more large trophy trout. Under this option harvest would be restricted to a 20 inch minimum or eliminated (catch-and-release). However, the number of trout caught and released would increase.

29. Do you fish for trout in Hayden Lake?

Yes 87%(n=129) No 13% N=148

30. Would you prefer that trout in Hayden Lake be managed for "general" knowing that the number of trout over 14 inches would be reduced due to increased harvest?

Yes 11.6% No 81.4% No opinion 3.9% DNA 3.1%

31. Would you prefer that trout in Hayden Lake be managed for "quality" (current management) knowing that harvest would be limited but more trout would be caught in the 14 inch and over range?

Yes 77.5% No 17.1% No opinion 3.9% DNA 1.6%

32. Would you prefer that trout in Hayden Lake be managed for "trophy" knowing that harvest would be restricted to fish over 20 inches?

Yes 20.2% No 73.6% No opinion 4.7% DNA 1.6%

33. Would you support catch-and-release fishing for trout on Hayden Lake?

Yes 29.5% No 58.1% No opinion 10.1% DNA 2.3%

34. On the average, how many trout do you catch per day?

0 34%, 1 44%, 2 9%, 3 5%, 4 1%, 5 0, 5+ 0 DNA 5.4%

YOUR HELP IS APPRECIATED!

Appendix F. Benewah Lake survey report.

Benewah Lake - Narrative

Benewah Lake is located at the southern end of Coeur d'Alene Lake, Idaho. It was an isolated lake until the completion of the Post Falls Dam which raised the water level of Coeur d'Alene Lake 7 to 8 feet. This inundated the original lake area and now Round, Chatcolet, Benewah lakes and the St. Joe River are now combined into one body of water. Benewah Lake is approximately 400 acres and a relatively shallow lake. In the summer months, extensive aquatic weed growth does restrict access to some parts of the lake.

The lake is ideal for warmwater fish species; largemouth bass, northern pike, yellow perch, and black crappie. It has a good largemouth bass population with bass ranging in length from 4 inches to 22 inches. There is a large number of bass in the 11 to 14 inch class. The railroad trestle at the mouth of the lake is ideal crappie habitat.

There is a boat launch and campground - part of Heyburn State Park - on the southeast side of the lake.

Appendix F-1. Mean back-calculated length (mm) at each annulus of largemouth bass captured by gill nets and electrofishing from Benewah Lake, Idaho, June 1994.

Year class	Age	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Mean length
1993	1	0																		
1992	2	1	80	110																120
1991	3	17	62	113	175															189
1990	4	25	65	111	153	188														204
1989	5	25	66	113	159	202	236													253
1988	6	19	59	102	145	185	219	246												260
1987	7	9	65	108	146	181	225	260	287											302
1986	8	6	68	115	156	200	245	286	321	347										363
1985	9	4	63	102	126	150	179	206	241	262	284									304
1984	10	1	45	70	108	140	167	191	212	234	262	291								315
1983	11	0																		0
1982	12	1	64	94	132	164	186	207	233	259	291	336	366	383						395
1981	13	5	72	113	145	190	221	260	297	333	363	386	408	430	451					466
1980	14	2	69	106	156	186	228	281	313	350	384	418	442	463	486	506				525
1979	15	1	88	164	208	271	340	391	427	455	497	513	527	539	550	561	574			590
1978	16	0																		0
1977	17	1	48	84	124	152	178	207	242	272	324	374	414	441	467	486	502	517	539	550

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Appendix G. Round Lake survey report.

Round Lake - Narrative

Round Lake is located at the southern end of Coeur d'Alene Lake, Idaho. It was 134 acres until 1906 when completion of Post Falls Dam raised Coeur d'Alene Lake approximately 7 to 8 feet and inundated the original lake area. Round Lake is now about a 600-acre bay contiguous with Coeur d'Alene Lake. The bay is approximately 2.6 miles long, 2,158 feet wide, and has a mean depth of 4.6 feet.

The game fish community contains largemouth bass, northern pike, black crappie, yellow perch, brown bullheads, and an occasional westslope cutthroat trout or rainbow trout. Typically, the best time to fish Round Lake is in the spring before aquatic vegetation severely restricts access.

There is one boat launch located on the east side of the lake, but the most popular launch is located on the west side of Chatcolet Lake. Extreme care is needed when crossing the old St. Joe River channel because of submerged logs and islands. Heyburn State Park, located on the west side of Chatcolet Lake, has several campgrounds.

Appendix G-1. Mean back-calculated lengths (mm) at each annulus of largemouth bass captured by gill nets and electrofishing from Round Lake (Benewah County), Idaho, June 1994.

Year class	Age	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Mean length
1993	1	0	0																	
1992	2	0																		
1991	3	1	46	164	215															265
1990	4	3	63	149	212	272														317
1989	5	0																		
1988	6	4	175	214	271	327	367	395												410
1987	7	1	66	173	242	305	349	402	432											450
1986	8	1	62	159	287	342	372	436	484	515										520
1985	9	2	91	157	248	287	362	396	434	450	481									495
1984	10	1	100	176	215	279	339	370	399	425	449	463								480

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Appendix H. Chatcolet Lake survey report.

Chatcolet Lake - Narrative

Chatcolet Lake is located at the southern end of Coeur d'Alene Lake, Idaho. It was an isolated lake until 1906 when the completion of Post Falls Dam raised Coeur d'Alene Lake water level approximately 7 to 8 feet and inundated the original lake area. It is now contiguous with Coeur d'Alene Lake with a surface area of approximately 600 acres.

The game fish community is similar to Round and Benewah lakes and contains largemouth bass, northern pike, black crappie, yellow perch, channel catfish, brown bullheads, kokanee, westslope cutthroat trout, and an occasional bull trout and chinook salmon.

Chatcolet Lake is a popular bass fishery. There are bass 20 inches long and weighing up to 6 pounds in the lake. It is also becoming known for the channel catfish which weigh 4 to 5 pounds. The channel catfish had moved downstream from the original stocking sites near St. Maries, Idaho.

There are two boat launches and several campgrounds in Heyburn State Park located adjacent to Chatcolet Lake.

Appendix H-1. Mean back-calculated length (mm) at each annulus of largemouth bass captured by gill nets and electrofishing from Chatcolet Lake, Idaho, June 1994.

Year class	Age	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Mean length
1993	1	0	0																	
1992	2	4	81	123																153
1991	3	3	64	126	175															187
1990	4	1	56	134	226	306														330
1989	5	9	69	130	182	233	273													298
1988	6	14	62	112	161	205	248	280												296
1987	7	8	62	106	153	198	237	275	298											314
1986	8	3	57	111	164	208	257	297	329	359										375
1985	9	4	57	99	138	181	225	254	284	319	345									363
1984	10	3	67	109	151	197	251	297	334	361	395	411								425
1983	11	1	64	106	151	184	243	279	321	356	376	405	418							430
1982	12	2	59	118	170	248	314	362	396	426	448	470	482	494						505
1981	13	2	64	114	164	214	251	307	363	395	416	436	453	473	491					505
1980	14	2	74	140	186	227	272	320	358	397	420	445	471	493	511	533				545

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Appendix I. Blue Lake survey report.

Blue Lake - Narrative

Blue Lake is located in Bonner County, Idaho, approximately 7 miles north of the town of Priest River. The shore line surrounding Blue Lake is in private ownership with the exception of a county road right-of-way on the north side of the lake. This access provides an unimproved boat launch site for smaller boats. At 90 acres in surface area, Blue Lake has a mean depth of less than 10 feet. Blue Creek, the only inlet and outlet stream to Blue Lake, flows approximately 1.5 miles due west to the Priest River. This outlet stream provides no upstream fish passage from the river to the lake.

Blue Lake was surveyed by the Idaho Department of Fish and Game in 1994 to assess new species introductions of channel catfish and tiger muskie.

New species introduced to Blue Lake, Bonner County, Idaho.

Species	1987	1988	1989	1990	1991	1992	1993
Channel catfish	2,044	0	0	2,000	2,000	0	3,000
Tiger muskie	--	--	350	352	115	0	50
Gammrus	--	--	5 gal. (~100,000)	--	--	--	--

Channel catfish in Blue Lake are doing well. During the June 1994 survey, 13 channel catfish were captured, measured, and released back into Blue Lake. The average fish was 16 inches long and weighed about 1.5 pounds. The largest catfish caught during the survey was 22.8 inches long and weighed 5 pounds. The only tiger muskie seen in Blue Lake was a dead 30-inch fish found floating in the weed bed near the boat launch. Other game fish found in Blue Lake consisted of largemouth bass, black crappie, northern pike, pumpkinseed sunfish, yellow perch, and brook trout. The only non-game fish species sampled in Blue Lake in 1994 was brown bullhead.

Appendix J. Chase Lake survey report.

Chase Lake - Narrative

Chase Lake is a shallow bog lake located one mile southeast of Coolin, Idaho. At about 160 acres in size and a mean depth of less than 10 feet, Chase Lake supports populations of yellow perch, pumpkinseed sunfish, largemouth bass, and brown bullheads. Historically, Chase Lake was known for growing some of the largest pumpkinseed in north Idaho, but over the past 15 years or so that has changed. While there are still some pumpkinseed in Chase Lake their average size is not much different than pumpkinseed found in other lakes in the region. The average size of yellow perch in Chase Lake is just under 11 inches, with some perch exceeding 12 1/5 inches in length. During June of 1994, the Idaho Department of Fish and Game conducted a gill net survey of Chase Lake. In addition to the near trophy size yellow perch and average size pumpkinseed, largemouth bass up to 13 inches and brown bullhead over 14 inches were found. One reported problem with fish caught from Chase Lake in the mid-summer and early fall is the presence of internal parasites and nematodes in the flesh. These conditions are, in part, brought on by the shallow nature of Chase Lake and the warm summer water temperatures.

Appendix K. Angler creel census data for Priest Lake, Idaho, 1994, showing survey parameters, instantaneous count data, angler interview summary, and effort, catch rate, and harvest estimates for each section by interval and day type.

Idaho Department of Fish and Game
Creel Survey System
Creel Survey Definition

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Project Identification Number: 19-94-001

Project Name: PRIEST LAKE CREEL	Project Leader: LANCE NELSON
Body of Water: PRIEST LAKE	EPA Stream No.: 0
Survey Start Date: 01/01/94	Survey End Date: 12/31/94
Type Survey: ROVING	Number of Sections: 4
Number Days per Interval: 30	Number of Survey Intervals: 13
Number of Time Periods Per Day: 1	Number of Day Types: 2
Boat Counts Used: Y	Nonuniform Sampling Used:
	for Sections: N
	for Day Periods: N

Purpose of Survey: ANGLER EFFORT & CATCH STATISTICS ON LAKE TROUT

Species 1: LT	Species 2: BT
Species 3: CT	Species 4: OTHER

Section Areas (hectares)

Section 1: 1807.0	Section 2: 4790.0	Section 3: 756.0
Section 4: 2101.0	Section 5: 0.0	Section 6: 0.0
Body of Water Total Area: 9454.0		

End of Report

Idaho Department of Fish and Game
 Creel Survey System
 Instantaneous Counts
 Raw Data

Body of Water: PRIEST LAKE

EPA Number: 0

SECTION	DATE	INTERVAL	DAY TYPE	TIME	BOAT ANGLERS	BANK ANGLERS	TUBE ANGLERS	ICE ANGLERS
1	01/04/94	1	1	0.00	0	0	0	0
2	01/04/94	1	1	0.00	0	0	0	0
3	01/04/94	1	1	0.00	0	0	0	0
4	01/04/94	1	1	0.00	0	0	0	0
1	01/15/94	1	2	11.00	0	0	0	0
2	01/15/94	1	2	11.00	2	0	0	0
3	01/15/94	1	2	11.00	0	0	0	0
4	01/15/94	1	2	11.00	0	0	0	0
4	01/15/94	1	2	14.00	0	0	0	0
3	01/15/94	1	2	14.00	1	0	0	0
2	01/15/94	1	2	14.00	1	0	0	0
1	01/15/94	1	2	14.00	0	0	0	0
1	01/27/94	1	1	0.00	0	0	0	0
2	01/27/94	1	1	0.00	0	0	0	0
3	01/27/94	1	1	0.00	0	0	0	0
4	01/27/94	1	1	0.00	0	0	0	0
1	02/05/94	2	2	0.00	0	0	0	0
2	02/05/94	2	2	0.00	0	0	0	0
3	02/05/94	2	2	0.00	0	0	0	0
4	02/05/94	2	2	0.00	0	0	0	0
1	02/25/94	2	1	0.00	0	0	0	0
2	02/25/94	2	1	0.00	0	0	0	0
3	02/25/94	2	1	0.00	0	0	0	0
4	02/25/94	2	1	0.00	0	0	0	0
1	03/06/94	3	2	11.00	0	0	0	0
2	03/06/94	3	2	11.00	10	0	0	0
3	03/06/94	3	2	11.00	4	0	0	0
4	03/06/94	3	2	11.00	0	0	0	0
1	03/06/94	3	2	16.00	0	0	0	0
2	03/06/94	3	2	16.00	6	0	0	0
3	03/06/94	3	2	16.00	0	0	0	0
4	03/06/94	3	2	16.00	0	0	0	0
1	03/08/94	3	1	10.30	0	0	0	0
2	03/08/94	3	1	10.30	1	0	0	0
3	03/08/94	3	1	10.30	2	0	0	0
4	03/08/94	3	1	10.30	0	0	0	0
1	03/08/94	3	1	14.00	0	0	0	0
2	03/08/94	3	1	14.00	1	0	0	0
3	03/08/94	3	1	14.00	1	0	0	0
4	03/08/94	3	1	14.00	0	0	0	0
1	03/12/94	3	2	11.20	1	0	0	0
2	03/12/94	3	2	11.35	11	0	0	0
3	03/12/94	3	2	11.41	4	0	0	0
4	03/12/94	3	2	11.43	2	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Instantaneous Counts
Raw Data

Body of Water: PRIEST LAKE

EPA Number: 0

SECTION	DATE	INTERVAL	DAY TYPE	TIME	BOAT ANGLERS	BANK ANGLERS	TUBE ANGLERS	ICE ANGLERS
4	03/12/94	3	2	14.12	1	0	0	0
3	03/12/94	3	2	14.14	5	0	0	0
2	03/12/94	3	2	14.26	6	0	0	0
1	03/12/94	3	2	14.28	3	0	0	0
1	03/13/94	3	2	0.00	2	0	0	0
2	03/13/94	3	2	0.00	7	0	0	0
3	03/13/94	3	2	0.00	6	0	0	0
4	03/13/94	3	2	0.00	3	0	0	0
2	03/14/94	3	1	0.00	1	0	0	0
2	03/15/94	3	1	0.00	2	0	0	0
2	03/16/94	3	1	0.00	1	0	0	0
2	03/17/94	3	1	0.00	1	0	0	0
2	03/18/94	3	1	0.00	0	0	0	0
2	03/19/94	3	2	0.00	2	0	0	0
3	03/19/94	3	2	0.00	1	0	0	0
4	03/19/94	3	2	0.00	1	0	0	0
1	03/20/94	3	2	0.00	1	0	0	0
2	03/20/94	3	2	0.00	5	0	0	0
3	03/20/94	3	2	0.00	3	0	0	0
4	03/20/94	3	2	0.00	2	0	0	0
1	03/24/94	3	1	0.00	1	0	0	0
2	03/24/94	3	1	0.00	2	0	0	0
3	03/24/94	3	1	0.00	1	0	0	0
4	03/24/94	3	1	0.00	1	0	0	0
1	03/25/94	3	1	0.00	0	0	0	0
2	03/25/94	3	1	0.00	2	0	0	0
3	03/25/94	3	1	0.00	2	0	0	0
4	03/25/94	3	1	0.00	0	0	0	0
1	03/26/94	3	2	0.00	2	0	0	0
2	03/26/94	3	2	0.00	3	0	0	0
3	03/26/94	3	2	0.00	3	0	0	0
4	03/26/94	3	2	0.00	1	0	0	0
1	03/27/94	3	2	10.17	5	0	0	0
2	03/27/94	3	2	10.30	16	0	0	0
3	03/27/94	3	2	10.36	2	0	0	0
4	03/27/94	3	2	10.44	3	0	0	0
1	03/27/94	3	2	14.30	2	0	0	0
2	03/27/94	3	2	14.40	17	0	0	0
3	03/27/94	3	2	14.52	0	0	0	0
4	03/27/94	3	2	15.00	1	0	0	0
1	04/23/94	4	2	10.15	5	0	0	0
2	04/23/94	4	2	10.25	8	0	0	0
3	04/23/94	4	2	10.35	5	0	0	0
4	04/23/94	4	2	10.45	3	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Instantaneous Counts
Raw Data

Body of Water: PRIEST LAKE

EPA Number: 0

SECTION	DATE	INTERVAL	DAY TYPE	TIME	BOAT ANGLERS	BANK ANGLERS	TUBE ANGLERS	ICE ANGLERS
4	04/23/94	4	2	14.50	5	0	0	0
3	04/23/94	4	2	15.25	2	0	0	0
2	04/23/94	4	2	15.30	10	0	0	0
1	04/23/94	4	2	15.40	1	0	0	0
1	04/29/94	4	1	9.28	0	0	0	0
2	04/29/94	4	1	9.40	3	0	0	0
3	04/29/94	4	1	9.52	1	0	0	0
4	04/29/94	4	1	10.10	1	0	0	0
1	04/29/94	4	1	12.30	0	0	0	0
2	04/29/94	4	1	12.41	2	0	0	0
3	04/29/94	4	1	12.55	1	0	0	0
4	04/29/94	4	1	13.03	1	0	0	0
1	05/07/94	5	2	8.48	5	0	0	0
2	05/07/94	5	2	8.52	19	0	0	0
3	05/07/94	5	2	9.11	4	0	0	0
4	05/07/94	5	2	9.17	6	0	0	0
1	05/19/94	5	1	12.55	0	0	0	0
2	05/19/94	5	1	13.00	0	0	0	0
3	05/19/94	5	1	13.22	0	0	0	0
4	05/19/94	5	1	13.40	0	0	0	0
1	05/19/94	5	1	20.05	0	0	0	0
2	05/19/94	5	1	20.15	0	0	0	0
3	05/19/94	5	1	20.25	0	0	0	0
4	05/19/94	5	1	20.30	0	0	0	0
1	05/23/94	5	1	8.40	0	0	0	0
2	05/23/94	5	1	8.45	2	0	0	0
3	05/23/94	5	1	9.00	3	0	0	0
4	05/23/94	5	1	9.05	3	0	0	0
1	05/23/94	5	1	15.04	0	0	0	0
2	05/23/94	5	1	15.10	1	0	0	0
3	05/23/94	5	1	15.15	1	0	0	0
4	05/23/94	5	1	15.25	2	0	0	0
4	05/28/94	5	2	8.55	10	0	0	0
3	05/28/94	5	2	9.03	7	0	0	0
2	05/28/94	5	2	9.10	21	0	0	0
1	05/28/94	5	2	9.40	4	0	0	0
4	05/28/94	5	2	12.30	1	0	0	0
3	05/28/94	5	2	12.50	1	0	0	0
2	05/28/94	5	2	13.00	0	0	0	0
1	05/28/94	5	2	13.10	0	0	0	0
4	06/11/94	6	2	14.00	13	0	0	0
3	06/11/94	6	2	14.12	5	0	0	0
2	06/11/94	6	2	14.26	13	0	0	0
1	06/11/94	6	2	14.41	8	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Instantaneous Counts
Raw Data

Body of Water: PRIEST LAKE

EPA Number: 0

SECTION	DATE	INTERVAL	DAY TYPE	TIME	BOAT ANGLERS	BANK ANGLERS	TUBE ANGLERS	ICE ANGLERS
1	06/11/94	6	2	9.00	11	0	0	0
2	06/11/94	6	2	9.10	26	0	0	0
3	06/11/94	6	2	9.29	6	3	0	0
4	06/11/94	6	2	9.44	18	3	0	0
1	06/13/94	6	1	6.20	0	0	0	0
2	06/13/94	6	1	6.25	0	0	0	0
3	06/13/94	6	1	6.35	0	0	0	0
4	06/13/94	6	1	6.40	0	0	0	0
4	06/13/94	6	1	14.30	0	0	0	0
3	06/13/94	6	1	14.30	0	0	0	0
2	06/13/94	6	1	14.30	0	0	0	0
1	06/13/94	6	1	14.30	0	0	0	0
1	07/01/94	7	1	11.00	0	0	0	0
2	07/01/94	7	1	11.00	1	0	0	0
3	07/01/94	7	1	11.00	0	0	0	0
4	07/01/94	7	1	11.00	0	0	0	0
4	07/01/94	7	1	17.00	0	0	0	0
3	07/01/94	7	1	17.00	0	0	0	0
2	07/01/94	7	1	17.00	0	0	0	0
1	07/01/94	7	1	17.00	0	0	0	0
1	07/07/94	7	1	8.00	3	0	0	0
2	07/07/94	7	1	8.14	6	0	0	0
3	07/07/94	7	1	8.29	3	0	0	0
4	07/07/94	7	1	8.35	2	0	0	0
4	07/10/94	7	2	12.35	3	0	0	0
3	07/10/94	7	2	12.50	2	0	0	0
2	07/10/94	7	2	13.05	7	0	0	0
1	07/10/94	7	2	13.20	1	0	0	0
4	07/10/94	7	2	19.50	3	0	0	0
3	07/10/94	7	2	20.00	2	1	0	0
2	07/10/94	7	2	20.08	1	0	0	0
1	07/10/94	7	2	20.30	1	0	0	0
1	07/17/94	7	2	9.00	8	0	0	0
2	07/17/94	7	2	9.24	7	0	0	0
3	07/17/94	7	2	9.47	5	0	0	0
4	07/17/94	7	2	10.03	4	0	0	0
1	07/26/94	7	1	12.45	1	0	0	0
2	07/26/94	7	1	13.00	3	0	0	0
3	07/26/94	7	1	13.10	0	0	0	0
4	07/26/94	7	1	13.30	1	0	0	0
4	07/26/94	7	1	18.00	0	0	0	0
3	07/26/94	7	1	18.20	1	0	0	0
2	07/26/94	7	1	18.30	1	0	0	0
1	07/26/94	7	1	18.50	1	0	0	0

Idaho Department of Fish and Game
 Creel Survey System
 Instantaneous Counts
 Raw Data

Body of Water: PRIEST LAKE

EPA Number: 0

SECTION	DATE	INTERVAL	DAY TYPE	TIME	BOAT ANGLERS	BANK ANGLERS	TUBE ANGLERS	ICE ANGLERS
1	07/28/94	7	1	9.40	4	0	0	0
2	07/28/94	7	1	10.30	5	0	0	0
3	07/28/94	7	1	10.40	4	0	0	0
4	07/28/94	7	1	10.50	1	0	0	0
3	07/28/94	7	1	15.40	1	0	0	0
4	07/28/94	7	1	15.45	1	0	0	0
2	07/28/94	7	1	16.20	4	0	0	0
1	07/28/94	7	1	16.25	0	0	0	0
4	07/30/94	8	2	11.55	5	0	0	0
3	07/30/94	8	2	12.05	1	0	0	0
2	07/30/94	8	2	12.25	7	0	0	0
1	07/30/94	8	2	12.30	1	0	0	0
1	07/30/94	8	2	14.10	1	0	0	0
2	07/30/94	8	2	14.20	2	0	0	0
3	07/30/94	8	2	14.50	0	0	0	0
4	07/30/94	8	2	15.00	1	0	0	0
1	08/03/94	8	1	7.25	2	0	0	0
2	08/03/94	8	1	7.45	8	0	0	0
3	08/03/94	8	1	8.00	2	0	0	0
4	08/03/94	8	1	8.05	11	0	0	0
1	08/03/94	8	1	12.20	0	0	0	0
2	08/03/94	8	1	12.30	4	0	0	0
3	08/03/94	8	1	12.40	2	0	0	0
4	08/03/94	8	1	12.45	4	0	0	0
1	08/18/94	8	1	11.00	2	0	0	0
2	08/18/94	8	1	11.25	4	2	0	0
3	08/18/94	8	1	11.35	1	0	0	0
4	08/18/94	8	1	11.50	2	0	0	0
4	08/18/94	8	1	18.05	1	0	0	0
3	08/18/94	8	1	18.10	2	0	0	0
2	08/18/94	8	1	18.25	3	0	0	0
1	08/18/94	8	1	18.35	0	0	0	0
1	08/28/94	8	2	12.00	1	0	0	0
2	08/28/94	8	2	12.20	12	0	0	0
3	08/28/94	8	2	12.30	1	0	0	0
4	08/28/94	8	2	12.40	1	0	0	0
4	08/28/94	8	2	19.20	0	0	0	0
3	08/28/94	8	2	19.40	3	0	0	0
2	08/28/94	8	2	19.50	1	0	0	0
1	08/28/94	8	2	20.00	0	0	0	0
1	09/17/94	9	2	11.15	0	0	0	0
2	09/17/94	9	2	11.40	20	0	0	0
3	09/17/94	9	2	12.10	4	0	0	0
4	09/17/94	9	2	12.15	4	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Instantaneous Counts
Raw Data

Body of Water: PRIEST LAKE

EPA Number: 0

SECTION	DATE	INTERVAL	DAY TYPE	TIME	BOAT ANGLERS	BANK ANGLERS	TUBE ANGLERS	ICE ANGLERS
4	09/17/94	9	2	14.20	3	0	0	0
3	09/17/94	9	2	14.30	2	0	0	0
2	09/17/94	9	2	15.00	8	0	0	0
1	09/17/94	9	2	15.20	1	0	0	0
1	09/18/94	9	2	8.00	0	0	0	0
2	09/18/94	9	2	8.00	8	0	0	0
3	09/18/94	9	2	8.00	6	0	0	0
4	09/18/94	9	2	8.00	0	0	0	0
1	09/18/94	9	2	11.30	4	0	0	0
2	09/18/94	9	2	11.45	17	0	0	0
3	09/18/94	9	2	11.55	2	0	0	0
4	09/18/94	9	2	12.05	5	0	0	0
4	09/18/94	9	2	14.35	8	0	0	0
3	09/18/94	9	2	14.50	2	0	0	0
2	09/18/94	9	2	14.55	8	0	0	0
1	09/18/94	9	2	15.20	4	0	0	0
1	09/27/94	9	1	9.00	1	0	0	0
2	09/27/94	9	1	9.05	6	0	0	0
3	09/27/94	9	1	9.30	1	0	0	0
4	09/27/94	9	1	9.45	5	0	0	0
1	09/27/94	9	1	13.45	0	0	0	0
2	09/27/94	9	1	14.00	4	0	0	0
3	09/27/94	9	1	14.15	1	0	0	0
4	09/27/94	9	1	14.35	3	0	0	0
1	10/06/94	10	1	10.30	0	0	0	0
2	10/06/94	10	1	10.40	4	0	0	0
3	10/06/94	10	1	10.50	0	0	0	0
4	10/06/94	10	1	11.00	0	0	0	0
4	10/06/94	10	1	14.00	0	0	0	0
3	10/06/94	10	1	14.00	0	0	0	0
2	10/06/94	10	1	14.00	4	0	0	0
1	10/06/94	10	1	14.00	0	0	0	0
1	11/05/94	11	2	10.00	0	0	0	0
2	11/05/94	11	2	10.00	2	0	0	0
3	11/05/94	11	2	10.00	0	0	0	0
4	11/05/94	11	2	10.00	0	0	0	0
1	11/06/94	11	2	10.00	0	0	0	0
2	11/06/94	11	2	10.00	1	0	0	0
3	11/06/94	11	2	10.00	0	0	0	0
4	11/06/94	11	2	10.00	0	0	0	0
1	11/13/94	11	2	10.00	0	0	0	0
2	11/13/94	11	2	10.00	1	0	1	0
3	11/13/94	11	2	10.00	0	0	0	0
4	11/13/94	11	2	10.00	0	0	0	0

Idaho Department of Fish and Game
 Creel Survey System
 Instantaneous Counts
 Raw Data

Body of Water: PRIEST LAKE

EPA Number: 0

SECTION	DATE	INTERVAL	DAY TYPE	TIME	BOAT ANGLERS	BANK ANGLERS	TUBE ANGLERS	ICE ANGLERS
1	11/19/94	11	2	10.00	0	0	0	0
2	11/19/94	11	2	10.00	1	0	0	0
3	11/19/94	11	2	10.00	0	0	0	0
4	11/19/94	11	2	10.00	0	0	0	0
1	11/20/94	11	2	10.00	0	0	0	0
2	11/20/94	11	2	10.00	0	0	0	0
3	11/20/94	11	2	10.00	0	0	0	0
4	11/20/94	11	2	10.00	0	0	0	0
2	11/26/94	11	2	10.00	1	4	0	0
1	11/26/94	11	2	10.00	0	0	0	0
3	11/26/94	11	2	10.00	0	0	0	0
4	11/26/94	11	2	10.00	0	0	0	0
1	11/27/94	12	2	10.00	0	0	0	0
2	11/27/94	12	2	10.00	0	2	0	0
3	11/27/94	12	2	10.00	0	0	0	0
4	11/27/94	12	2	10.00	0	0	0	0
2	12/01/94	12	1	0.00	1	0	0	0
4	12/07/94	12	1	11.00	0	0	0	0
3	12/07/94	12	1	11.00	0	0	0	0
2	12/07/94	12	1	11.00	0	0	0	0
1	12/07/94	12	1	11.00	0	0	0	0
4	12/07/94	12	1	15.00	0	0	0	0
3	12/07/94	12	1	15.00	0	0	0	0
2	12/07/94	12	1	15.00	0	0	0	0
1	12/07/94	12	1	15.00	0	0	0	0
2	12/17/94	12	2	0.00	2	0	0	0
2	12/19/94	12	1	0.00	1	0	0	0
2	12/20/94	12	1	0.00	1	0	0	0
2	12/23/94	12	1	0.00	2	0	0	0
2	12/24/94	12	2	0.00	1	0	0	0
2	12/26/94	12	1	0.00	1	0	0	0

End of Report.

Angler Summary Report
Idaho Department of Fish and Game

Body of Water: PRIEST LAKE

EPA Number: 0

Angler Composition

Total Number of Anglers: 642
Percent of resident: 49.38%
Percent of non-resident: 50.93%

Total Number of Interviews: 310
Ave Number Anglers/Interview: 2.07
Percentage of Interviews with --

1 angler : 24.52%
2 anglers: 53.55%
3 anglers: 13.87%
4 anglers: 7.10%
5 anglers: 0.32%
>5 anglers: 0.65%

Percentage of Anglers:

Catching:	Releasing:	Harvesting:
0: 49.53%	0: 83.80%	0: 52.96%
1: 14.95%	1: 7.94%	1: 16.98%
2: 11.53%	2: 2.49%	2: 9.50%
3: 7.32%	3: 2.80%	3: 7.79%
4: 3.89%	4: 0.78%	4: 2.96%
5: 3.89%	5: 0.31%	5: 3.27%
more than 6: 8.88%	more than 6: 1.87%	6: 6.54%

Type of Fishing (from Instantaneous Counts)

Boat: 97.84%
Bank: 2.03%
Tube: 0.14%
Ice: 0.00%

Method of Fishing

Bait: 15.42%
Lure: 81.99%
Fly: 2.59%

Catch Composition

LT: 85.75% BT: 0.00%
CT: 0.26% OTHER: 13.99%

Number of Completed trips : 190
Average Time Spent Fishing: 3.64

Idaho Department of Fish and Game
 Creel Survey System
 Pressure Report by Interval and Daytype
 Summary

Body of Water: PRIEST LAKE

Year: 1994 EPA Number: 0

SECTION NUMBER	INTERVAL	DAYTYPE	BOAT ANGLERS HOURS	BANK ANGLERS HOURS	TUBE ANGLERS HOURS	ICE ANGLERS HOURS	TOTAL ANGLERS HOURS
1	3	Weekday	68	0	0	0	68
		Weekend	404	0	0	0	404
Interval 3 totals:			472	0	0	0	472
+/- at 95% C.I.:			305	0	0	0	305
1	4	Weekend	368	0	0	0	368
		Interval 4 totals:	368	0	0	0	368
+/- at 95% C.I.:			490	0	0	0	490
1	5	Weekend	919	0	0	0	919
		Interval 5 totals:	919	0	0	0	919
+/- at 95% C.I.:			1068	0	0	0	1068
1	6	Weekend	2424	0	0	0	2424
		Interval 6 totals:	2424	0	0	0	2424
+/- at 95% C.I.:			989	0	0	0	989
1	7	Weekday	633	0	0	0	633
		Weekend	1215	0	0	0	1215
Interval 7 totals:			1848	0	0	0	1848
+/- at 95% C.I.:			2013	0	0	0	2013
1	8	Weekday	439	0	0	0	439
		Weekend	86	0	0	0	86
Interval 8 totals:			525	0	0	0	525
+/- at 95% C.I.:			555	0	0	0	555
1	9	Weekday	139	0	0	0	139
		Weekend	249	0	0	0	249

Idaho Department of Fish and Game
 Creel Survey System
 Pressure Report by Interval and Daytype
 Summary

Body of Water: PRIEST LAKE Year: 1994 EPA Number: 0

SECTION NUMBER	INTERVAL	DAYTYPE	BOAT ANGLERS HOURS	BANK ANGLERS HOURS	TUBE ANGLERS HOURS	ICE ANGLERS HOURS	TOTAL ANGLERS HOURS
Interval 9 totals:			388	0	0	0	388
+/- at 95% C.I.:			382	0	0	0	382
=====							
Section 1 totals:			6944	0	0	0	6944
+/- at 95% C.I.:			2638	0	0	0	2638
=====							
2	1	Weekend	401	0	0	0	401
Interval 1 totals:			401	0	0	0	401
+/- at 95% C.I.:			378	0	0	0	378

2	3	Weekday	666	0	0	0	666
		Weekend	1770	0	0	0	1770
Interval 3 totals:			2436	0	0	0	2436
+/- at 95% C.I.:			757	0	0	0	757

2	4	Weekday	1716	0	0	0	1716
		Weekend	2206	0	0	0	2206
Interval 4 totals:			3922	0	0	0	3922
+/- at 95% C.I.:			913	0	0	0	913

2	5	Weekday	399	0	0	0	399
		Weekend	3994	0	0	0	3994
Interval 5 totals:			4393	0	0	0	4393
+/- at 95% C.I.:			4179	0	0	0	4179

2	6	Weekend	3483	0	0	0	3483
Interval 6 totals:			3483	0	0	0	3483
+/- at 95% C.I.:			2623	0	0	0	2623

2	7	Weekday	1473	0	0	0	1473

Idaho Department of Fish and Game
Creel Survey System
Pressure Report by Interval and Daytype
Summary

Body of Water: PRIEST LAKE

Year: 1994 EPA Number: 0

SECTION NUMBER	INTERVAL	DAYTYPE	BOAT ANGLERS HOURS	BANK ANGLERS HOURS	TUBE ANGLERS HOURS	ICE ANGLERS HOURS	TOTAL ANGLERS HOURS
2	7	Weekend	1513	0	0	0	1513
Interval 7 totals:			2986	0	0	0	2986
+/- at 95% C.I.:			1581	0	0	0	1581
2	8	Weekday	2404	164	0	0	2568
		Weekend	1468	0	0	0	1468
Interval 8 totals:			3872	164	0	0	4036
+/- at 95% C.I.:			2156	329	0	0	2181
2	9	Weekday	2772	0	0	0	2772
		Weekend	2342	0	0	0	2342
Interval 9 totals:			5114	0	0	0	5114
+/- at 95% C.I.:			2184	0	0	0	2184
2	10	Weekday	1523	0	0	0	1523
Interval 10 totals:			1523	0	0	0	1523
+/- at 95% C.I.:			609	0	0	0	609
2	11	Weekend	180	56	14	0	250
Interval 11 totals:			180	56	14	0	250
+/- at 95% C.I.:			96	112	28	0	150
2	12	Weekday	319	0	0	0	319
		Weekend	76	51	0	0	127
Interval 12 totals:			395	51	0	0	446
+/- at 95% C.I.:			213	101	0	0	236

Idaho Department of Fish and Game
Creel Survey System
Pressure Report by Interval and Daytype
Summary

Body of Water: PRIEST LAKE Year: 1994 EPA Number: 0

SECTION NUMBER	INTERVAL	DAYTYPE	BOAT ANGLERS HOURS	BANK ANGLERS HOURS	TUBE ANGLERS HOURS	ICE ANGLERS HOURS	TOTAL ANGLERS HOURS
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Section 2 totals:			28705	271	14	0	28990
+/- at 95% C.I.:			6184	362	28	0	6194

3	1	Weekend	45	0	0	0	45
Interval 1 totals:			45	0	0	0	45
+/- at 95% C.I.:			89	0	0	0	89

3	3	Weekday	1431	0	0	0	1431
		Weekend	626	0	0	0	626
Interval 3 totals:			2057	0	0	0	2057
+/- at 95% C.I.:			752	0	0	0	752

3	4	Weekday	286	0	0	0	286
		Weekend	429	0	0	0	429
Interval 4 totals:			715	0	0	0	715
+/- at 95% C.I.:			368	0	0	0	368

3	5	Weekday	666	0	0	0	666
		Weekend	1416	0	0	0	1416
Interval 5 totals:			2082	0	0	0	2082
+/- at 95% C.I.:			1569	0	0	0	1569

3	6	Weekend	702	191	0	0	893
		Interval 6 totals:	702	191	0	0	893
+/- at 95% C.I.:			128	383	0	0	404

3	7	Weekday	937	0	0	0	937
		Weekend	1041	52	0	0	1093

Idaho Department of Fish and Game
Creel Survey System
Pressure Report by Interval and Daytype
Summary

Body of Water: PRIEST LAKE

Year: 1994 EPA Number: 0

SECTION NUMBER	INTERVAL	DAYTYPE	BOAT ANGLERS HOURS	BANK ANGLERS HOURS	TUBE ANGLERS HOURS	ICE ANGLERS HOURS	TOTAL ANGLERS HOURS
Interval 7 totals:			1978	52	0	0	2030
+/- at 95% C.I.:			1165	104	0	0	1169
3	8	Weekday	1151	0	0	0	1151
		Weekend	143	0	0	0	143
Interval 8 totals:			1294	0	0	0	1294
+/- at 95% C.I.:			359	0	0	0	359
3	9	Weekday	554	0	0	0	554
		Weekend	484	0	0	0	484
Interval 9 totals:			1038	0	0	0	1038
+/- at 95% C.I.:			305	0	0	0	305
Section 3 totals:			9911	243	0	0	10154
+/- at 95% C.I.:			2183	397	0	0	2219
4	3	Weekday	68	0	0	0	68
		Weekend	354	0	0	0	354
Interval 3 totals:			422	0	0	0	422
+/- at 95% C.I.:			237	0	0	0	237
4	4	Weekday	858	0	0	0	858
		Weekend	1226	0	0	0	1226
Interval 4 totals:			2084	0	0	0	2084
+/- at 95% C.I.:			881	0	0	0	881
4	5	Weekday	416	0	0	0	416
		Weekend	3087	0	0	0	3087

Idaho Department of Fish and Game
 Creel Survey System
 Pressure Report by Interval and Daytype
 Summary

Body of Water: PRIEST LAKE Year: 1994 EPA Number: 0

SECTION NUMBER	INTERVAL	DAYTYPE	BOAT ANGLERS HOURS	BANK ANGLERS HOURS	TUBE ANGLERS HOURS	ICE ANGLERS HOURS	TOTAL ANGLERS HOURS
Interval 5 totals:			3503	0	0	0	3503
+/- at 95% C.I.:			2880	0	0	0	2880
4	6	Weekend	1978	191	0	0	2169
Interval 6 totals:			1978	191	0	0	2169
+/- at 95% C.I.:			638	383	0	0	744
4	7	Weekday	469	0	0	0	469
		Weekend	1302	0	0	0	1302
Interval 7 totals:			1771	0	0	0	1771
+/- at 95% C.I.:			598	0	0	0	598
4	8	Weekday	3074	0	0	0	3074
		Weekend	467	0	0	0	467
Interval 8 totals:			3541	0	0	0	3541
+/- at 95% C.I.:			3321	0	0	0	3321
4	9	Weekday	2218	0	0	0	2218
		Weekend	806	0	0	0	806
Interval 9 totals:			3024	0	0	0	3024
+/- at 95% C.I.:			1530	0	0	0	1530
Section 4 totals:			16323	191	0	0	16514
+/- at 95% C.I.:			4823	383	0	0	4838
Season totals:			61883	705	14	0	62602
+/- at 95% C.I.:			8557	659	28	0	8582

End of Report.

Idaho Department of Fish and Game
Creel Survey System
Summary for Catch Rate by Day Type and Interval - for Total hours

Body of Water: PRIEST LAKE

1994

SEC	INT	DAYTYPE	CR KEPT	CR RELSO	CR CGHT	CR- KEPT	LT REL	CR- KEPT	BT REL	CR- KEPT	CT REL	CR- KEPT	OTHER REL
1	1	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.06	0.05	0.11	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00
	4	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.50	0.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	Weekday	0.25	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.32	1.20	1.52	0.32	1.20	0.00	0.00	0.00	0.00	0.00	0.00
	6	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	Weekday	0.75	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.18	0.09	0.28	0.18	0.09	0.00	0.00	0.00	0.00	0.00	0.00
	8	Weekday	0.39	0.00	0.39	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.20	0.00	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	10	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sec 1 wkdy CR:			0.11*	0.00	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sec 1 wknd CR:			0.10	0.10	0.20	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Sec 1 Sson CR:			0.10	0.03	0.13	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00

* - Zero average

2 1 Weekday 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Idaho Department of Fish and Game
Creel Survey System
Summary for Catch Rate by Day Type and Interval - for Total hours

Body of Water: PRIEST LAKE

1994

SEC	INT	DAYTYPE	CR KEPT	CR RELS	CR CGHT	CR- KEPT	LT REL	CR- KEPT	BT REL	CR- KEPT	CT REL	CR- KEPT	OTHER REL
2	1	Weekend	0.25	0.05	0.30	0.25	0.05	0.00	0.00	0.00	0.00	0.00	0.00
	2	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	Weekday	0.33	0.11	0.44	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.09	0.06	0.15	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00
	4	Weekday	0.15	0.45	0.60	0.15	0.45	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	Weekday	0.18	0.10	0.28	0.18	0.10	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.30	0.03	0.32	0.30	0.00	0.00	0.03	0.00	0.00	0.00	0.00
	6	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.08	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	Weekday	0.30	0.15	0.45	0.24	0.15	0.00	0.00	0.03	0.00	0.00	0.00
		Weekend	0.17	0.00	0.17	0.16	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	8	Weekday	0.19	0.15	0.34	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.10	0.10	0.20	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00
	9	Weekday	0.19	0.17	0.36	0.19	0.17	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.33	0.02	0.35	0.31	0.01	0.00	0.00	0.00	0.01	0.00	0.00
	10	Weekday	0.53	0.18	0.70	0.53	0.18	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.57	0.11	0.68	0.57	0.11	0.00	0.00	0.00	0.00	0.00	0.00
	12	Weekday	1.00	0.17	1.17	1.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.78	0.22	1.00	0.78	0.22	0.00	0.00	0.00	0.00	0.00	0.00
	13	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Sec 2 wkdy CR:	0.22	0.11	0.33	0.22	0.11	0.00	0.00	0.00	0.00	0.00	0.00
		Sec 2 wknd CR:	0.21	0.05	0.25	0.20	0.04	0.00	0.00	0.00	0.00	0.00	0.00
		Sec 2 Sson CR:	0.22	0.09	0.31	0.21	0.09	0.00	0.00	0.00	0.00	0.00	0.00

3	1	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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Idaho Department of Fish and Game
 Creel Survey System
 Summary for Catch Rate by Day Type and Interval - for Total hours

Body of Water: PRIEST LAKE

1994

SEC	INT	DAYTYPE	CR KEPT	CR RELSD	CR CGHT	CR- KEPT	LT REL	CR- KEPT	BT REL	CR- KEPT	CT REL	CR- KEPT	OTHER REL
3	1	Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	Weekday	0.22	0.07	0.30	0.22	0.07	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.13	0.14	0.27	0.13	0.14	0.00	0.00	0.00	0.00	0.00	0.00
	4	Weekday	0.00	1.33	1.33	0.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	Weekday	0.12	0.06	0.18	0.12	0.06	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.05	0.03	0.08	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00
	6	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	Weekday	0.30	0.00	0.30	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.19	0.00	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9	Weekday	0.23	0.00	0.23	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	1.08	0.00	1.08	0.18	0.00	0.00	0.00	0.00	0.00	0.90	0.00
	10	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sec 3	vkdy	CR:	0.07	0.11	0.18	0.07	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Sec 3	vknd	CR:	0.11	0.01	0.12	0.04	0.01	0.00	0.00	0.00	0.00	0.07	0.00
Sec 3	Sson	CR:	0.08	0.08	0.16	0.06	0.08	0.00	0.00	0.00	0.00	0.02	0.00

4 1 Weekday 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Idaho Department of Fish and Game
Creel Survey System
Summary for Catch Rate by Day Type and Interval - for Total hours

Body of Water: PRIEST LAKE

1994

SEC	INT	DAYTYPE	CR KEPT	CR RELS	CR CGHT	CR- KEPT	LT REL	CR- KEPT	BT REL	CR- KEPT	CT REL	CR- KEPT	OTHER REL
4	1	Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.07	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4	Weekday	1.50	0.00	1.50	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.22	0.00	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.17	0.17	0.33	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17
	7	Weekday	0.32	0.11	0.44	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.03	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	8	Weekday	0.25	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.39	0.03	0.42	0.39	0.03	0.00	0.00	0.00	0.00	0.00	0.00
	9	Weekday	0.88	0.32	1.20	0.88	0.32	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	1.53	0.34	1.88	0.19	0.00	0.00	0.00	0.00	0.03	1.34	0.31
	10	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	11	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	12	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13	Weekday	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Weekend	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sec 4 wkdy CR:			0.23	0.03	0.26	0.23	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Sec 4 wknd CR:			0.18	0.04	0.23	0.08	0.00	0.00	0.00	0.00	0.00	0.10	0.04
Sec 4 Sson CR:			0.21	0.04	0.25	0.19	0.02	0.00	0.00	0.00	0.00	0.03	0.01
Wkdy Season CR:			0.16	0.06	0.22	0.15	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Wknd Season CR:			0.15	0.05	0.02	0.11	0.04	0.00	0.00	0.00	0.00	0.04	0.01
Ave Season CR:			0.15	0.06	0.21	0.14	0.06	0.00	0.00	0.00	0.00	0.01	0.00

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	FISH CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
1	1	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 1 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
1	2	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 2 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
1	3	1	0	0	0	0	0	0	0
		2	25	19	44	25	0	0	0
Int 3 Tot:			25	19	44	25	0	0	0
+/- 95%CI:			36	12	57	36	0	0	0
1	4	1	0	0	0	0	0	0	0
		2	184	0	184	184	0	0	0
Int 4 Tot:			184	0	184	184	0	0	0
+/- 95%CI:			245	0	245	245	0	0	0
1	5	1	0	0	0	0	0	0	0
		2	294	1103	1397	294	0	0	0
Int 5 Tot:			294	1103	1397	294	0	0	0
+/- 95%CI:			360	1281	2069	360	0	0	0
1	6	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 6 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
1	7	1	475	0	475	475	0	0	0
		2	224	112	335	224	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	FISH CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
Int 7 Tot:			699	112	810	699	0	0	0
+/- 95%CI:			811	173	907	811	0	0	0
1	8	1	172	0	172	172	0	0	0
		2	0	0	0	0	0	0	0
Int 8 Tot:			172	0	172	172	0	0	0
+/- 95%CI:			417	0	417	417	0	0	0
1	9	1	0	0	0	0	0	0	0
		2	49	0	49	49	0	0	0
Int 9 Tot:			49	0	49	49	0	0	0
+/- 95%CI:			73	0	73	73	0	0	0
1	10	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int10 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
1	11	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int11 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
1	12	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int12 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
1	13	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	FISH CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
Int13 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
Sec 1 Tot:			1423	1234	2656	1423	0	0	0
+/-95% CI:			1014	1293	2312	1014	0	0	0
2	1	1	0	0	0	0	0	0	0
		2	100	20	120	100	0	0	0
Int 1 Tot:			100	20	120	100	0	0	0
+/- 95%CI:			94	19	130	94	0	0	0
2	2	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 2 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
2	3	1	222	74	296	222	0	0	0
		2	159	101	260	159	0	0	0
Int 3 Tot:			381	175	556	381	0	0	0
+/- 95%CI:			257	49	275	257	0	0	0
2	4	1	259	777	1036	259	0	0	0
		2	0	0	0	0	0	0	0
Int 4 Tot:			259	777	1036	259	0	0	0
+/- 95%CI:			374	349	808	374	0	0	0
2	5	1	71	41	113	71	0	0	0
		2	1186	108	1294	1186	0	0	0
Int 5 Tot:			1257	149	1407	1257	0	0	0
+/- 95%CI:			1847	124	1931	1847	0	0	0
2	6	1	0	0	0	0	0	0	0
		2	279	0	279	279	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	FISH CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
Int 6 Tot:			279	0	279	279	0	0	0
+/- 95%CI:			627	0	627	627	0	0	0
2	7	1	440	219	660	352	0	44	0
		2	262	0	262	245	0	0	15
Int 7 Tot:			702	219	922	597	0	44	15
+/- 95%CI:			486	143	763	436	0	93	33
2	8	1	496	372	868	496	0	0	0
		2	144	144	288	144	0	0	0
Int 8 Tot:			640	516	1156	640	0	0	0
+/- 95%CI:			552	255	857	552	0	0	0
2	9	1	535	468	1001	535	0	0	0
		2	780	47	827	733	0	0	0
Int 9 Tot:			1315	515	1828	1268	0	0	0
+/- 95%CI:			858	319	1837	844	0	0	0
2	10	1	801	267	1069	801	0	0	0
		2	0	0	0	0	0	0	0
Int10 Tot:			801	267	1069	801	0	0	0
+/- 95%CI:			346	107	891	346	0	0	0
2	11	1	0	0	0	0	0	0	0
		2	142	28	170	142	0	0	0
Int11 Tot:			142	28	170	142	0	0	0
+/- 95%CI:			125	17	159	125	0	0	0
2	12	1	319	53	372	319	0	0	0
		2	99	28	127	99	0	0	0
Int12 Tot:			418	81	499	418	0	0	0
+/- 95%CI:			234	44	293	234	0	0	0
2	13	1	0	0	0	0	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	FISH CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
2	13	2	0	0	0	0	0	0	0
Int13 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
Sec 2 Tot:			6294	2747	9042	6142	0	44	15
+/-95% CI:			2342	584	3235	2327	0	93	33
3	1	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 1 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
3	2	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 2 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
3	3	1	318	106	424	318	0	0	0
		2	80	90	170	80	0	0	0
Int 3 Tot:			398	196	594	398	0	0	0
+/- 95%CI:			305	67	283	305	0	0	0
3	4	1	0	381	381	0	0	0	0
		2	0	0	0	0	0	0	0
Int 4 Tot:			0	381	381	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
3	5	1	79	39	117	79	0	0	0
		2	72	37	109	72	0	0	0
Int 5 Tot:			151	76	226	151	0	0	0
+/- 95%CI:			215	64	267	215	0	0	0
3	6	1	0	0	0	0	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
3	6	2	0	0	0	0	0	0	0
Int 6 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
3	7	1	281	0	281	281	0	0	0
		2	207	0	207	207	0	0	0
Int 7 Tot:			488	0	488	488	0	0	0
+/- 95%CI:			375	0	375	375	0	0	0
3	8	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 8 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
3	9	1	128	0	128	128	0	0	0
		2	523	0	523	87	0	0	436
Int 9 Tot:			651	0	651	215	0	0	436
+/- 95%CI:			683	0	683	238	0	0	728
3	10	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int10 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
3	11	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int11 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
3	12	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	FISH CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
Int12 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
3	13	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int13 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
Sec 3 Tot:			1688	653	2340	1252	0	0	436
+/-95% CI:			864	93	871	580	0	0	728
4	1	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 1 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
4	2	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int 2 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
4	3	1	0	0	0	0	0	0	0
		2	23	0	23	23	0	0	0
Int 3 Tot:			23	0	23	23	0	0	0
+/- 95%CI:			33	0	33	33	0	0	0
4	4	1	1287	0	1287	1287	0	0	0
		2	272	0	272	272	0	0	0
Int 4 Tot:			1559	0	1559	1559	0	0	0
+/- 95%CI:			324	0	324	324	0	0	0
4	5	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	FISH CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
Int 5 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
4	6	1	0	0	0	0	0	0	0
		2	362	362	722	362	0	0	0
Int 6 Tot:			362	362	722	362	0	0	0
+/- 95%CI:			497	124	541	497	0	0	0
4	7	1	152	53	205	152	0	0	0
		2	33	0	33	33	0	0	0
Int 7 Tot:			185	53	238	185	0	0	0
+/- 95%CI:			173	46	224	173	0	0	0
4	8	1	753	0	753	753	0	0	0
		2	184	14	198	184	0	0	0
Int 8 Tot:			937	14	951	937	0	0	0
+/- 95%CI:			1000	18	1000	1000	0	0	0
4	9	1	1952	710	2662	1952	0	0	0
		2	1234	277	1511	152	0	0	1083
Int 9 Tot:			3186	987	4173	2104	0	0	1083
+/- 95%CI:			2816	494	3990	1535	0	0	2357
4	10	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int10 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
4	11	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int11 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
4	12	1	0	0	0	0	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Harvest by Section and Interval

Body of Water: PRIEST LAKE

Year of Census: 1994

SEC NUM	DY INT	FISH CD	FISH KEPT	FISH RELEASED	FISH CAUGHT	LT	BT	CT	OTHER
4	12	2	0	0	0	0	0	0	0
Int12 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
4	13	1	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0
Int13 Tot:			0	0	0	0	0	0	0
+/- 95%CI:			0	0	0	0	0	0	0
Sec 4 Tot:			6252	1416	7666	5170	0	0	1083
+/-95% CI:			3052	512	4168	1934	0	0	2357
Seasn Tot:			15657	6050	21704	13987	0	44	1534
+/-95% CI:			4071	1511	5826	3243	0	93	2467

End of Report.

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN
1	1	Weekday	0	0	0	0	0
		Weekend	0	0	0	0	0
Interval 1 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0
1	2	Weekday	0	0	0	0	0
		Weekend	0	0	0	0	0
Interval 2 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0
1	3	Weekday	0	0	0	0	0
		Weekend	43	43	0	0	0
Interval 3 Totals:			43	43	0	0	0
+/- at 95% C.I.:			61	61	0	0	0
1	4	Weekday	0	0	0	0	0
		Weekend	385	385	0	0	0
Interval 4 Totals:			385	385	0	0	0
+/- at 95% C.I.:			518	518	0	0	0
1	5	Weekday	0	0	0	0	0
		Weekend	647	647	0	0	0
Interval 5 Totals:			647	647	0	0	0
+/- at 95% C.I.:			797	797	0	0	0
1	6	Weekday	0	0	0	0	0

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN

1	6	Weekend	0	0	0	0	0
				0	0	0	0

Interval 6 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

1	7	Weekday	818	818	0	0	0
				57	0	0	0
		Weekend	367	367	0	0	0
				55	0	0	0

Interval 7 Totals:			1185	1185	0	0	0
+/- at 95% C.I.:			1388	1388	0	0	0

1	8	Weekday	187	187	0	0	0
				48	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 8 Totals:			187	187	0	0	0
+/- at 95% C.I.:			453	453	0	0	0

1	9	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 9 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

1	10	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 10 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

1	11	Weekday	0	0	0	0	0
				0	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN
1	11	Weekend	0	0	0	0	0
				0	0	0	0
Interval 11 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0
1	12	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0
Interval 12 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0
1	13	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0
Interval 13 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0
Section 1 Totals:			2447	2447	0	0	0
+/- at 95% C.I.:			1743	1743	0	0	0
2	1	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	241	241	0	0	0
				62	0	0	0
Interval 1 Totals:			241	241	0	0	0
+/- at 95% C.I.:			252	252	0	0	0
2	2	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN

Interval 2 Totals:	0	0	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0	0	0

2	3	Weekday	262	262	0	0	0
				47	0	0	0
		Weekend	212	212	0	0	0
				50	0	0	0

Interval 3 Totals:	473	473	0	0	0	0	0
+/- at 95% C.I.:	330	330	0	0	0	0	0

2	4	Weekday	613	613	0	0	0
				61	0	0	0
		Weekend	0	0	0	0	0
				51	0	0	0

Interval 4 Totals:	613	613	0	0	0	0	0
+/- at 95% C.I.:	906	906	0	0	0	0	0

2	5	Weekday	144	144	0	0	0
				57	0	0	0
		Weekend	1164	1164	0	0	0
				46	46	0	0

Interval 5 Totals:	1308	1308	0	0	0	0	0
+/- at 95% C.I.:	1833	1833	0	0	0	0	0

2	6	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 6 Totals:	0	0	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0	0	0

2	7	Weekday	7949	300	0	7649	0
				44	0	25	0
		Weekend	298	279	0	0	19
				49	0	0	51

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN

Interval 7 Totals:			8247	579	0	7649	19
+/- at 95% C.I.:			16169	429	0	16163	41

2	8	Weekday	558	558	0	0	0
				48	0	0	0
		Weekend	107	107	0	0	0
				44	0	0	0

Interval 8 Totals:			665	665	0	0	0
+/- at 95% C.I.:			632	632	0	0	0

2	9	Weekday	610	610	0	0	0
				49	0	0	0
		Weekend	967	967	0	0	0
				50	0	0	0

Interval 9 Totals:			1578	1578	0	0	0
+/- at 95% C.I.:			1034	1034	0	0	0

2	10	Weekday	938	938	0	0	0
				50	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 10 Totals:			938	938	0	0	0
+/- at 95% C.I.:			425	425	0	0	0

2	11	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	252	252	0	0	0
				56	0	0	0

Interval 11 Totals:			252	252	0	0	0
+/- at 95% C.I.:			226	226	0	0	0

2	12	Weekday	339	339	0	0	0
				47	0	0	0
		Weekend	144	144	0	0	0
				53	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM	TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
		(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN

Interval 12 Totals:	483	483	0	0	0
+/- at 95% C.I.:	287	287	0	0	0

2 13 Weekday	0	0	0	0	0
Weekend	0	0	0	0	0

Interval 13 Totals:	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0

Section 2 Totals:	14797	7129	0	7649	19
+/- at 95% C.I.:	16358	2514	0	16163	41

3 1 Weekday	0	0	0	0	0
Weekend	0	0	0	0	0

Interval 1 Totals:	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0

3 2 Weekday	0	0	0	0	0
Weekend	0	0	0	0	0

Interval 2 Totals:	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0

3 3 Weekday	1059	1059	0	0	0
Weekend	218	218	68	0	0
			61	0	0

Interval 3 Totals:	1277	1277	0	0	0
+/- at 95% C.I.:	1206	1206	0	0	0

3 4 Weekday	0	0	0	0	0
		41	0	0	0

Idaho Department of Fish and Game
 Creel Survey System
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Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN

3	4	Weekend	0	0	0	0	0
				51	0	0	0

Interval 4 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

3	5	Weekday	335	335	0	0	0
				73	0	0	0
		Weekend	79	79	0	0	0
				48	0	0	0

Interval 5 Totals:			414	414	0	0	0
+/- at 95% C.I.:			781	781	0	0	0

3	6	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 6 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

3	7	Weekday	325	325	0	0	0
				48	0	0	0
		Weekend	294	294	0	0	0
				53	0	0	0

Interval 7 Totals:			619	619	0	0	0
+/- at 95% C.I.:			475	475	0	0	0

3	8	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 8 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

3	9	Weekday	243	243	0	0	0
				57	0	0	0

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER	
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	
			(cm)	AVE LEN	(cm)	AVE LEN	(cm)	AVE LEN

3	9	Weekend	117	117	0	0	0
				48	0	0	0

Interval 9 Totals:			360	360	0	0	0
+/- at 95% C.I.:			397	397	0	0	0

3	10	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 10 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

3	11	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 11 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

3	12	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 12 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

3	13	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 13 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN

Section 3 Totals:			2669	2669	0	0	0
+/- at 95% C.I.:			1564	1564	0	0	0

4	1	Weekday	0	0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 1 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

4	2	Weekday	0	0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Interval 2 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

4	3	Weekday	0	0	0	0	0
		Weekend	37	37	0	0	0
				57	0	0	0

Interval 3 Totals:			37	37	0	0	0
+/- at 95% C.I.:			53	53	0	0	0

4	4	Weekday	1851	1851	0	0	0
		Weekend	322	322	0	0	0
				53	0	0	0
				52	0	0	0

Interval 4 Totals:			2172	2172	0	0	0
+/- at 95% C.I.:			389	389	0	0	0

4	5	Weekday	0	0	0	0	0
		Weekend	0	0	0	0	0
				9	0	0	0
				48	0	0	0

Idaho Department of Fish and Game
 Creel Survey System
 Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN

Interval 5 Totals:			0	0	0	0	0
+/- at 95% C.I.:			0	0	0	0	0

4	6	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	300	300	0	0	0
				44	0	0	0

Interval 6 Totals:			300	300	0	0	0
+/- at 95% C.I.:			412	412	0	0	0

4	7	Weekday	245	245	0	0	0
				55	0	0	0
		Weekend	75	75	0	0	0
				63	0	0	0

Interval 7 Totals:			321	321	0	0	0
+/- at 95% C.I.:			302	302	0	0	0

4	8	Weekday	1335	1335	0	0	0
				57	0	0	0
		Weekend	315	315	0	0	0
				57	0	0	0

Interval 8 Totals:			1649	1649	0	0	0
+/- at 95% C.I.:			1816	1816	0	0	0

4	9	Weekday	2732	2732	0	0	0
				53	0	0	0
		Weekend	174	174	0	0	0
				49	0	0	0

Interval 9 Totals:			2906	2906	0	0	0
+/- at 95% C.I.:			2212	2212	0	0	0

4	10	Weekday	0	0	0	0	0
				0	0	0	0
		Weekend	0	0	0	0	0
				0	0	0	0

Idaho Department of Fish and Game
Creel Survey System
Summary for Yield by Section and Interval

Body of Water: PRIEST LAKE

1994

EPA Number: 0

SEC	INT	DAY	TOTAL	LT	BT	CT	OTHER
NUM		TYPE	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)	YIELD (kg)
			(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN	(cm) AVE LEN

Interval 10 Totals:	0	0	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0	0	0

4	11	Weekday	0	0	0	0	0
		Weekend	0	0	0	0	0

Interval 11 Totals:	0	0	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0	0	0

4	12	Weekday	0	0	0	0	0
		Weekend	0	0	0	0	0

Interval 12 Totals:	0	0	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0	0	0

4	13	Weekday	0	0	0	0	0
		Weekend	0	0	0	0	0

Interval 13 Totals:	0	0	0	0	0	0	0
+/- at 95% C.I.:	0	0	0	0	0	0	0

Section 4 Totals:	7386	7386	0	0	0	0	0
+/- at 95% C.I.:	2934	2934	0	0	0	0	0

Season Totals:	27300	19632	0	7649	19		
+/- at 95% C.I.:	16783	4518	0	16163	41		

Allometric Growth Equation:

LT WT = 0.016160 * LEN** 2.866
 BT WT = ***** * LEN** 0.000
 CT WT = ***** * LEN** 0.000
 OTHER WT = ***** * LEN** 0.000

where * means multiplication, ** means exponent
 weight in grams, length in centimeters



IDAHO DEPARTMENT OF FISH AND GAME
PRIEST LAKE ANGLER QUESTIONNAIRE

Lake trout (mackinaw) are now the most abundant game fish species in Priest Lake. A decision was made in 1992 to manage the lake trout population with a slot limit to provide better lake trout fishing now and in the future. The current regulation of 3 fish, none between 26" and 32" and only one over 32", was intended to do three things:

- 1) allow liberal harvest of the small, good eating lake trout;
- 2) allow a few fish to be protected by the no harvest slot size (26" to 32"), with a limited number of fish entering the slot size they would have plenty of food to eat to grow to a trophy size;
- 3) limit the harvest of larger lake trout so that some live long enough to reach a trophy size.

From information gathered in 1993, there is concern that too few fish are entering the protected slot to provide sufficient numbers of fish to grow to a trophy size. In 1994 a more intensive angler survey is in progress to assess the lake trout fishery in Priest Lake. This questionnaire is part of that survey. Your answers to the following questions will help us develop future management direction for Priest Lake to provide the type of fishery you want.

Mark Your Answer

1. What do you fish for in Priest Lake?

- 93% a. lake trout
8% b. cutthroat trout (catch and release)
3% c. other (yellow perch)

2. How many days per year do you fish Priest Lake?

- 46% a. 0-5
12% b. 6-10
5% c. 11-15
9% d. 16-20
24% e. more than 20

3. What size lake trout do you prefer to fish for?

- 33% a. "keeper" size lake trout (less than 26")
12% b. "trophy" size lake trout
53% c. both

4. What do you consider a trophy size for lake trout?

- 7% a. 5-10 lbs.
4% b. 10-15 lbs.
14% c. 15-20 lbs.
30% d. 20-25 lbs
43% e. over 25 lbs +

5. How many fish do you typically catch each trip?

- 56% a. 0-2
24% b. 3-4
12% c. 5-6
1% d. 7-8
8% e. more than 8

6. How many fish do you typically keep each trip?

- 10% a. 0
17% b. 1
38% c. 2
34% d. 3 (daily limit)

Please include any additional comments below:

1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project I: Surveys and Inventories

Subproject I-A: Panhandle Region

Job: c

Title: Rivers and Streams Investigations

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

Westslope cutthroat trout *Oncorhynchus clarki lewisi* densities estimated from snorkeling transects in the catch-and-release sections of the North Fork Coeur d'Alene, Little North Fork Coeur d'Alene, and St. Joe rivers were 98, 26, and 133 trout/ha, respectively. Densities in the catch-and-keep sections of the same rivers were 35, 3, and 29 trout/ha, respectively.

The number of trout estimated by electrofishing in the catch-and-release and the catch-and-keep sections of the North Fork Coeur d'Alene River was 42 trout/ha and 26 trout/ha, respectively.

The number of trout estimated by electrofishing in transects in the catch-and-release and the catch-and-keep sections of the Little North Fork Coeur d'Alene River was 137 trout/ha and 64 trout/ha, respectively. Trout were concentrated in two sections of rip-rap in both transects. The remainder of the transects were almost devoid of trout.

The total number of bull trout *Salvelinus confluentus* redds counted in the Pend Oreille Lake, Priest Lake, and St. Joe River drainages in 1994 were 516, 28, and 61, respectively.

No bull trout redds were observed in the upper Little North Fork Clearwater River and Marble Creek drainages in 1994.

Bull trout adults and juveniles were observed in the Priest Lake drainage during summer surveys in Lion, Two Mouth, and Indian creeks. No bull trout were found in Granite Creek or the South Fork Granite Creek in 1994.

The number of kokanee *O. nerka kennerlyi* spawners counted in Boundary, Long Canyon, Parker, and Smith creeks in the Kootenai River drainage in 1994 was 6, 0, 6, and 50+, respectively.

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OBJECTIVES

1. Estimate the density of trout in selected snorkeling transects in the Little North Fork Coeur d'Alene and North Fork Coeur d'Alene rivers and the St. Joe River annually. Compare trends with previously collected data.
2. Estimate population abundance of trout in the Little North Fork Coeur d'Alene, North Fork Coeur d'Alene, and St. Joe rivers by electrofishing, biannually.
3. Assess the status of bull trout *Salvelinus confluentus* populations in Pend Oreille and Priest lakes, St. Joe and upper Little North Fork Clearwater rivers and Marble Creek drainages based on abundance of bull trout redds in selected tributaries.
4. Document the presence of bull trout in Lion, Two Mouth, Indian, Granite, and South Fork Granite creeks, tributaries to Priest Lake.
4. Monitor the abundance of spawning kokanee *O. nerka kennerlyi* in selected tributaries of the Kootenai River.

METHODS

Cutthroat Trout Densities

Snorkeling

Biologists snorkeled previously established transects in the North Fork Coeur d'Alene River (NFC DAR) and Little North Fork Coeur d'Alene River (LNFC DAR) (Lewynsky 1986) (Figure 1) and the St. Joe River (SJR) (Rankel 1971) (Figure 2). There were 28, 13, and 38 transects surveyed in NFC DAR, LNFC DAR, and SJR, respectively. The number of trout was recorded for each transect by species and by length group of greater than 300 mm or less than 300 mm. Mountain whitefish *Prosopium williamsoni* were counted as adults and juveniles. Northern squawfish *Ptychocheilus oregonensis* and suckers *Catostomus sp.* were enumerated.

The length (m) and width (m) of each transect were measured to determine the area (m²) surveyed. Trout density was reported as fish/m², fish/100 m², and trout/ha.

Electrofishing

Two transects were sampled; one in the catch-and-release regulation section and one in the catch-and-keep section of the LNFC DAR and NFC DAR (Figure 1). Electrofishing was accomplished by

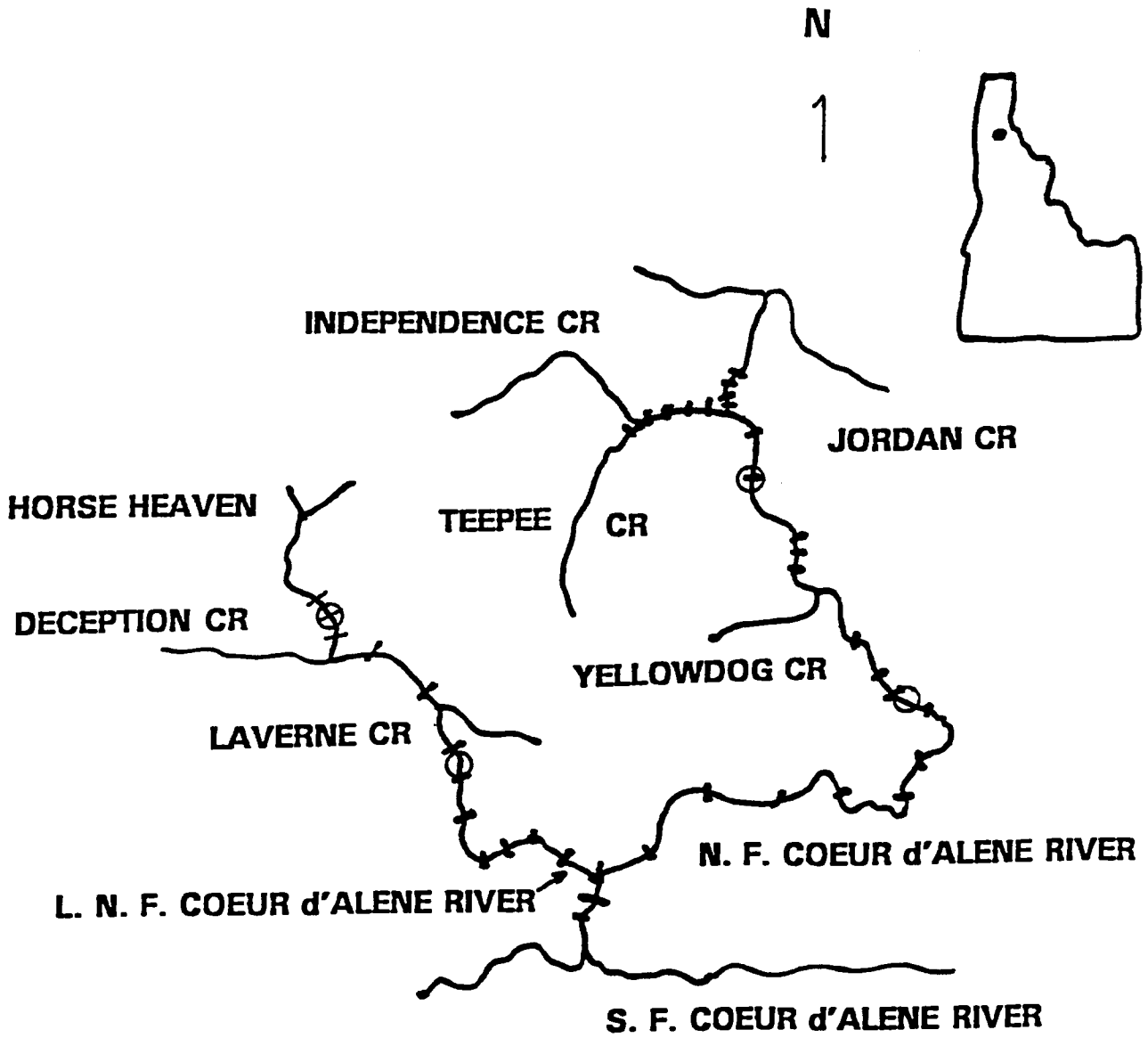


Figure 1. General locations of snorkeling transects in the North Fork and Little North Fork Coeur d'Alene rivers, Idaho, 1994 (circles indicate location of electrofishing transects).

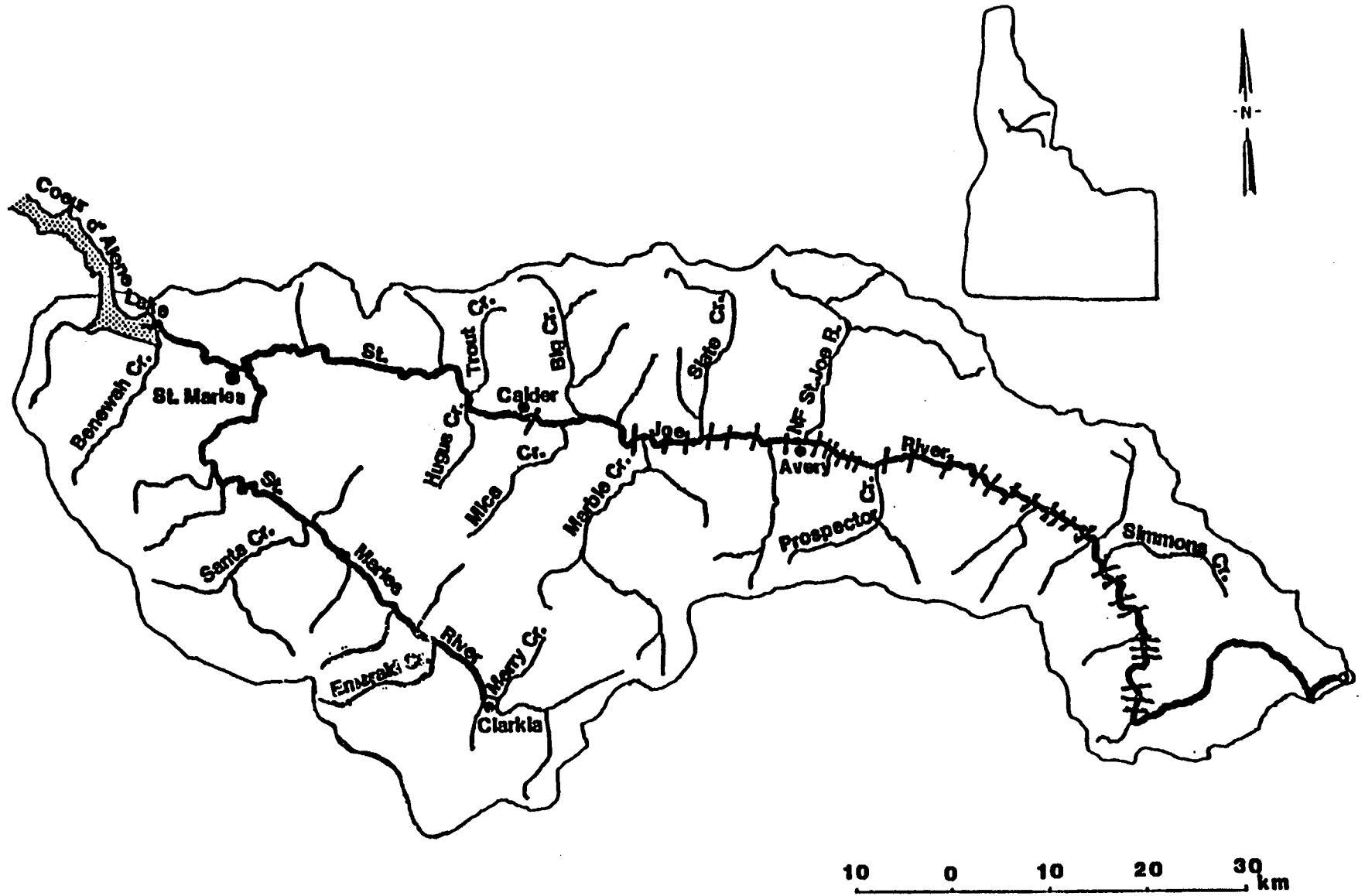


Figure 2. General locations of snorkeling transects on the St. Joe River, Idaho, 1994.

wading downstream. This method required a minimum of five people, two netters, two for the electrodes, and one person to control the electrofishing equipment. Electrofishing equipment was transported in a canoe and included a VVP15 Cofelt variable voltage pulsator and 5,000-watt gasoline powered generator. A Peterson mark/recapture estimate was made (Ricker 1975). On the first run, all fish collected were measured (total length [TL] mm) and marked with a hole punch in the caudal fin. The recapture run was conducted one week later. All fish collected were examined for a mark and lengths of fish were recorded (Appendix A).

In the NFCDAR, the area of the transect in the catch-and-release section was 3.4 ha. It began at President's Creek Campground and ended at the first bridge, approximately 2 km downstream. The area of the transect in the catch-and-keep section was 5.4 ha. It began at the first bridge downstream from Kit Price Campground and ended at Jupiter Creek, approximately 1.6 km downstream (Figure 1).

In the LNFC DAR, the area of the transect in the catch-and-release section was 1.5 ha. It began approximately 2.4 km upstream from Deception Creek and ended approximately 1.6 km downstream. The area of the transect in the catch-and-keep section was 1.6 ha. It began approximately 1.0 km below Laverne Creek and ended approximately 1.6 km downstream (Figure 1).

Bull Trout Redd Counts

Bull trout redd counts have been conducted in the Pend Oreille Lake drainage since 1983 and in the Priest Lake and St. Joe River drainages since 1992 (Horner et al. 1996a) to monitor population trend information. In 1994, a portion of the Little North Fork Clearwater River and Marble Creek drainages were also surveyed for bull trout spawning activity. Cooperative funding for the Little North Fork Clearwater River and Marble Creek surveys was provided by the U.S. Bureau of Land Management and the U.S. Forest Service. Survey techniques and identification of bull trout redds followed methodology as described by Pratt (1984).

Standard Stream Surveys

Five tributary streams (Lion, Two Mouth, Indian, South Fork Granite, and Granite creeks) to Priest Lake were surveyed in 1994 for presence/absence of bull trout. In addition to the search for bull trout, a standard survey, as per the Idaho Department of Fish and Game 'Standard Stream Survey' guidelines (Appendix B), was conducted on all five systems. Snorkeling, electrofishing, and minnow traps were utilized in the search for bull trout. Conductivity of the streams in the Priest Lake drainage is low and electrofishing with a Cofelt BP1C backpack electrofisher was ineffective. Stream reaches surveyed in 1994 (Appendices C,D,E,F) were comparable to surveys conducted by Mauser (1985) and Strach and Bjornn (1990).

RESULTS AND DISCUSSION

Cutthroat Trout Densities

North Fork Coeur d'Alene River

Snorkeling-The estimated density of westslope cutthroat trout *Oncorhynchus clarki lewisi* was 98 fish/ha and 35 fish/ha in the catch-and-release and the catch-and-keep sections, respectively (Table 1, Figure 3). The summary of fish observed and fish densities per transect are displayed in Appendices G and H. The density of trout larger than 300 mm was higher in the catch-and-release section than in the catch-and-keep section where a one cutthroat trout, 14-inch minimum size regulation was in effect (Figure 3).

Electrofishing-The estimated number of trout (westslope cutthroat and rainbow trout *O. mykiss*) in the catch-and-release and the catch-and-keep transects was 183 ± 21 or 43 fish/ha and 143 ± 19 or 26 fish/ha, respectively (Table 2). The estimated number of westslope cutthroat trout in the catch-and-release and the catch-and-keep transects was 183 ± 21 and 66 ± 7 , respectively (Table 2). The differences between the estimates were statistically significant at the 0.05 level.

Little North Fork Coeur d'Alene River

Snorkeling-We estimated the density of westslope cutthroat trout to be 26 fish/ha and 3 fish/ha in the catch-and-release and the catch-and-keep sections, respectively (Table 1, Figure 3). No cutthroat trout larger than 300 mm were observed. Appendix I displays the number of fish observed and the density per transect.

Electrofishing-The estimated number of trout in the catch-and-release and catch-and-keep transects were 206 ± 27 or 137 trout/ha and 147 ± 21 or 64 trout/ha, respectively (Table 2). The westslope cutthroat trout populations in the catch-and-release and catch-and-keep transects were estimated to be 184 ± 25 and 95 ± 20 , respectively (Table 2). The difference between the estimates was statistically significant at the 0.05 level. However, the fish were concentrated in the rip-rap along the road in both transects. The rip-rap sections were approximately 200 mm long. There was very little trout cover in the remainder of the transects.

Most of the trout collected while electrofishing were less than 250 mm TL (Figure 4). The difference between snorkeling and electrofishing density estimates may be attributed to habitat and sampling methods. Most of the smaller trout collected electrofishing were located among the rip-rap. It is very difficult for divers to see in the shadows and behind the rocks to count fish. Electrofishing pulls the trout out of the rocks where they can be collected and counted. In some cases, snorkeling may underestimate trout densities especially when rip-rap type habitat is present.

Table 1. Summary of westslope cutthroat trout densities counted in snorkeling transects in the North Fork Coeur d'Alene, Little North Fork Coeur d'Alene and the St. Joe rivers, Idaho, July and August 1994.

North Fork Coeur d'Alene River

Fishing rule present	Fish size	Cutthroat counted	Transect length (km)	Number counted/km	Area (ha)	No. counted/ha
Catch-and-keep (1 ct, 14" min. size)	≤ 300 mm	186	1.95	95	5.9	32
	> 300 mm	18	1.95	9	5.9	3
Total				104		35
Catch-and-release	≤ 300 mm	172	1.4	123	2.3	75
	> 300 mm	54	1.4	39	2.3	23
Total				162		98

Little North Fork Coeur d'Alene River

Fishing rule present	Fish size	Cutthroat counted	Transect length (km)	Number counted/km	Area (ha)	No. counted/ha
Catch-and-keep (1 ct, 14" min. size)	≤ 300 mm	5	0.81	6	1.6	3
	> 300 mm	0	0.81	0	1.6	0
Total				6		3
Catch-and-release	≤ 300 mm	12	.33	36	0.47	26
	> 300 mm	0	.33	0	0.47	0
Total				36		26

Table 1. Continued

St. Joe River

Fishing rule present	Fish size	Cutthroat counted	Transect length (km)	Number counted/km	Area (ha)	No. counted/ha
Catch-and-keep (1 ct, 14" min. size)	≤ 300 mm	120	1.6	75	4.8	25
	> 300 mm	20	1.6	13	4.8	4
Total				88		29
Catch-and-release	≤ 300 mm	379	1.8	211	4.0	95
	> 300 mm	152	1.8	84	4.0	38
Total				295		133

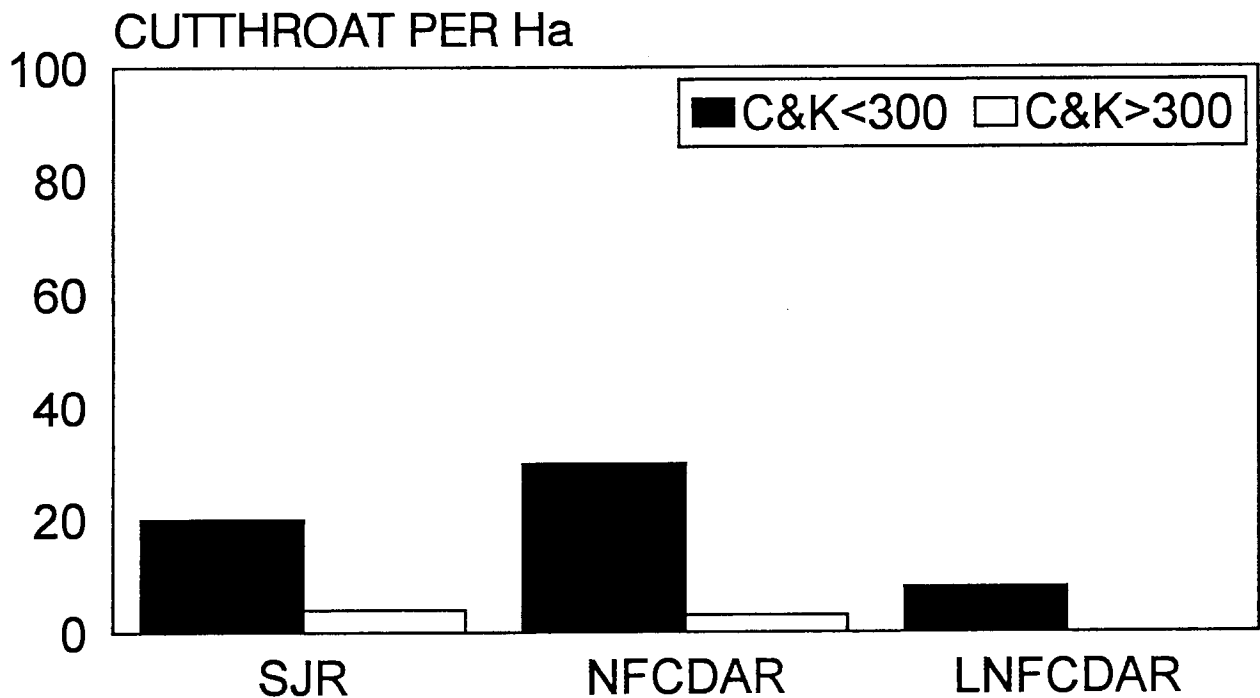
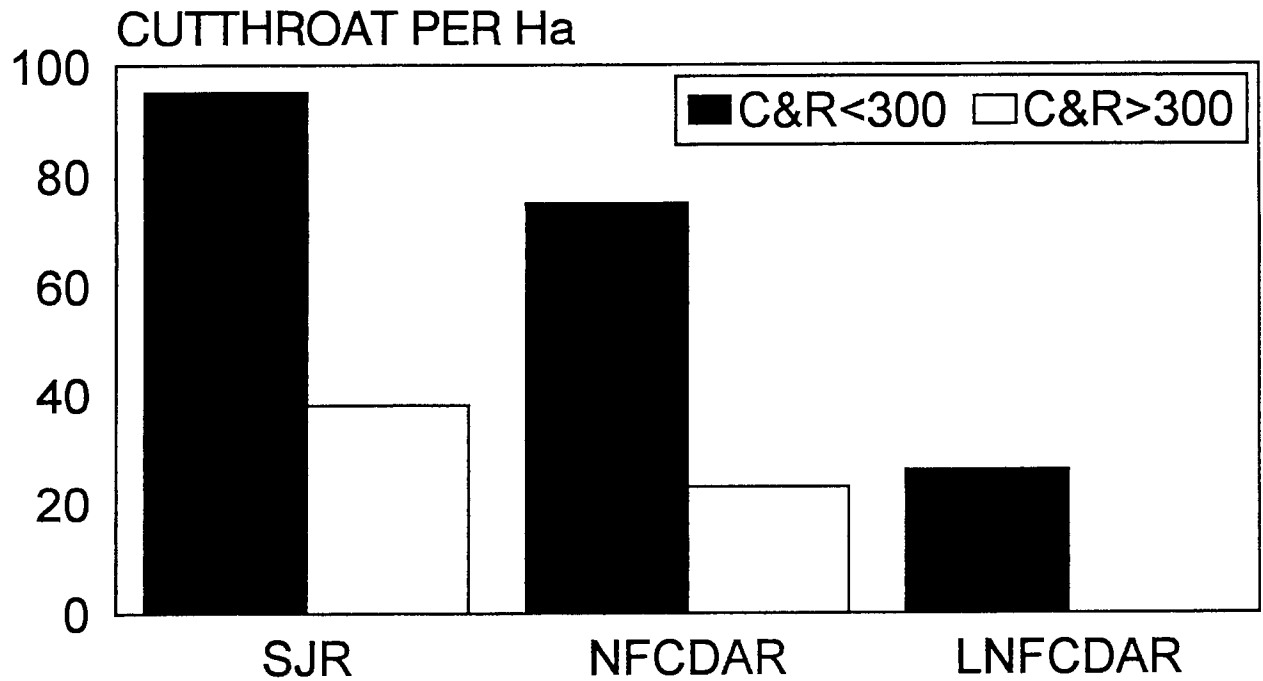


Figure 3. Number of westslope cutthroat trout per hectare observed by snorkeling selected transects in the St. Joe River (SJR), North Fork Coeur d'Alene River (NFCDAR), and the Little North Fork Coeur d'Alene River (LNFC DAR), 1994. The regulation in the catch-and-keep section allowed harvest of one cutthroat trout, 14 inches minimum length.

Table 2. Population estimates for trout, collected by electrofishing, in the North Fork Coeur d'Alene and Little North Fork Coeur d'Alene rivers, Idaho, 1994.

River		Catch-and-release		Catch-and-keep	
		No. of fish	Fish/ha	No. of fish	Fish/ha
North Fork Cd'A	Trout	183 + 21	43	147 + 26	26
	Cutthroat	183 + 21	43	66 + 7	12
L. N. Fork Cd'A	Trout	206 + 27	137	147 + 21	64
	Cutthroat	184 + 25	123	95 + 20	41

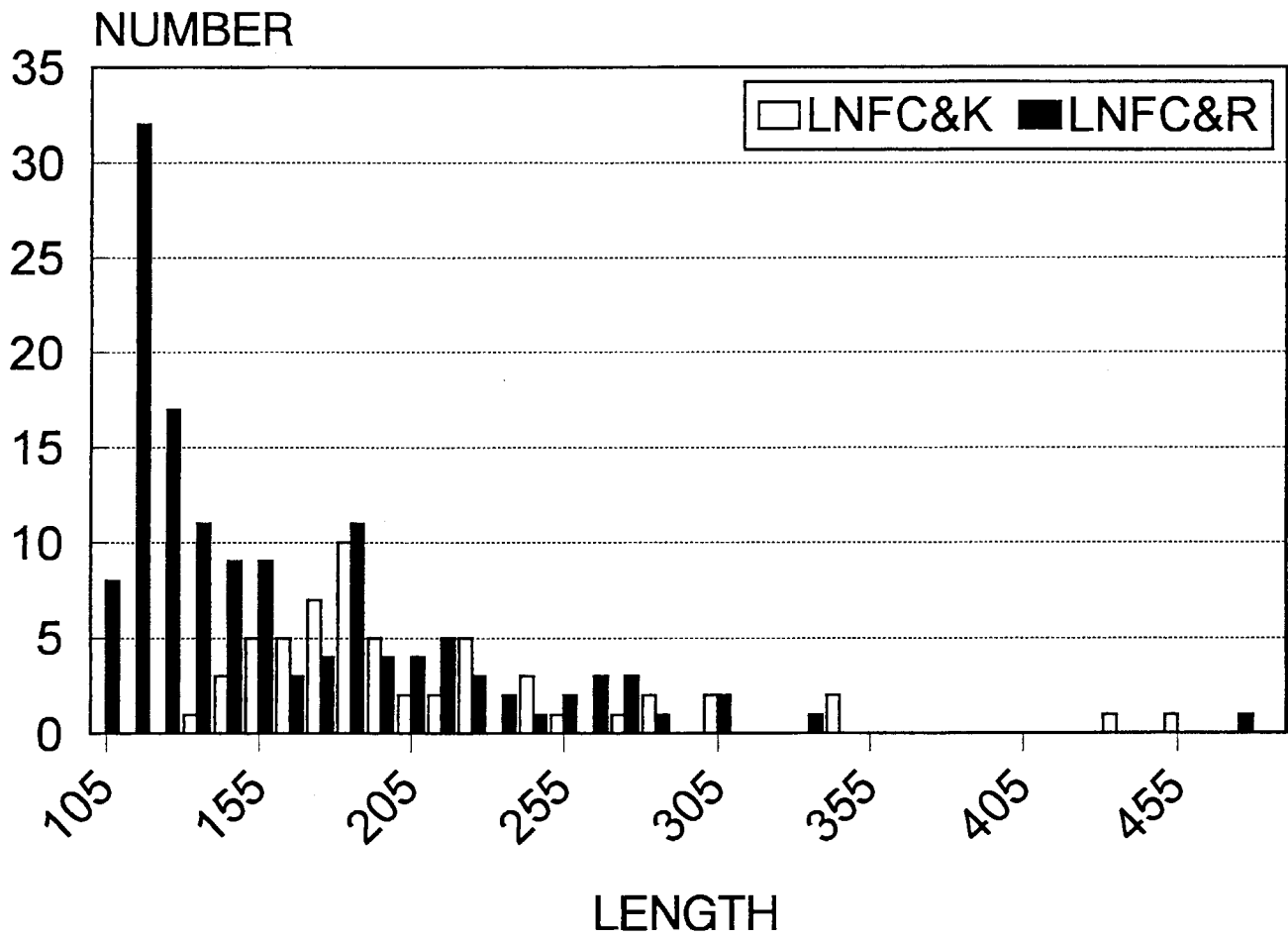


Figure 4. Length frequency of westslope cutthroat trout collected by electrofishing in the catch-and-keep and the catch-and-release sections of the Little North Fork Coeur d'Alene River, Idaho, 1994.

St. Joe River

The density of westslope cutthroat trout estimated by snorkeling counts was 133 fish/ha and 29 fish/ha in the catch-and-release and the catch-and-keep sections of the SJR, respectively (Table 1, Figure 3). The density of cutthroat trout greater than 300 mm was 38 fish/ha and 4 fish/ha in the catch-and-release and the catch-and-keep sections of the SJR, respectively. This difference may be a partially attributed to harvest of trout over 356 mm TL. A summary of fish observed and estimated fish densities for each transect are displayed in Appendices J and K.

The number of westslope cutthroat trout observed in snorkeling transects was less in 1994 than in 1993 for all three rivers (Tables 3, 4, and 5). This decline may have been influenced by the lower water levels and high water temperatures due to severe drought conditions in 1994. The water temperature reached afternoon highs in the mid-20s °C (mid-70s °F). This may have forced cutthroat trout to seek cooler water in tributaries which were not surveyed.

In addition to higher water temperatures, the lack of instream trout cover, i.e., deep pools and large woody debris, in the LNFC DAR and NFC DAR probably contributed to the lack of cutthroat trout in the rivers. More cutthroat trout were observed in the SJR in 1994 despite the high water temperatures (mid-20s °C) than in the LNFC DAR and NFC DAR. Fishing regulations, drainage geology, and fish biology are similar between the St. Joe and Coeur d'Alene River drainages. Numerous deep pools with abundant woody debris in the mainstem rivers provide ideal trout cover as well as critical overwintering habitat. Lower densities of cutthroat trout in the Coeur d'Alene River drainage are a direct result of habitat degradation.

Bull Trout Redd Counts

Lake Pend Oreille Drainage

A total of 516 bull trout redds were counted in the six index streams (East Fork Lightning, Johnson, Trestle, Grouse, North Gold, and Gold creeks) in 1994. This number is very close to the 1993 count of 529 redds (Table 6). The total number of bull trout redds counted in all 17 streams surveyed in 1994 was 625. Based on the expansion factor of 3.2 fish/redd, an estimated 1,651 bull trout entered the six index streams to spawn in 1994. The total estimated spawning escapement for bull trout in the seventeen tributaries to Pend Oreille Lake surveyed in 1994 was 2,000.

Trestle Creek was, once again, the one tributary that accounted for the majority of redds in the Pend Oreille Lake drainage in 1994. Gold Creek came in at a distant second with 164 redds, which is an increase of 37% from 1993 and an all time high for redds counted in Gold Creek since 1983. Where we saw this dramatic increase in Gold Creek redd numbers and Trestle Creek numbers stay close to the same as 1993 numbers, other systems in the drainage experienced a decrease in bull trout spawning activity. Char and Rattle creeks, in the Lightning Creek drainage, and Johnson Creek showed some of the more dramatic decreases. Char Creek dropped from a record high in 1993 of 37 redds to 13 redds in 1994. No redds were observed in Rattle Creek in 1994, where in the past we have seen a high of 51 redds in 1983, to a low of 8 redds in 1993. Habitat changes in the Lightning Creek drainage are some

Table 3. Mean number of westslope cutthroat trout counted in snorkeling transects (fish/m²) in the North Fork Coeur d'Alene River, Idaho, 1973, 1980-81, 1987-88, 1991, 1993, and 1994.

River section	Year							
	1973 ^a	1980 ^a	1981 ^a	1987 ^b	1988 ^c	1991 ^d	1993 ^e	1994
Confluence of South Fork Cd'A River to Yellowdog Creek	2.4	0.5	0.9	--	1.4	7.5 ± 5.0	22 ± 10.4 (0.003)	15 ± 6.3 (0.003) 33±34
Yellowdog to Tepee Creek	11.2	6.8	5.7	25.4	27.3	28.4 ± 19.4	9 ± 9.2 (0.004)	33±34 (0.02)
Tepee Creek to Jordan Creek	6.0 ^f	5.6 ^f	5.7 ^f	16.4	3.2	1.5 ± 3	2.7 ± 7.6 (0.003)	11.8±17 (0.01)
Tepee Creek mouth to Independence Creek	17	12	11	42	31	30	3.2 ± 4.5 (0.002)	2.0±205 (0.001)
Confluence of South Fork Cd'A River to Jordan Creek (including Tepee Creek)	4.6	3.2	3.4	--	10 ± 19	8.6 ± 4.3	14 ± 6.1 (0.003)	15.5±8 (0.005)

^aAverage value for July, August and September sampling.

^bAugust sampling.

^cJuly 20-24 sampling.

^dAugust sampling.

^eJuly 18 - August 4 sampling.

^fFish per transect calculated for Tepee Creek to Cow Creek.

Table 4. Mean number of westslope cutthroat trout counted in snorkeling transects (fish/m²) in the St. Joe River, Idaho, 1969-77, 1979-80, 1982, 1990, 1993, and 1994.

Stream section	Year									
	1974	1975	1976	1977	1979	1980	1982	1990	1993	1994
Prospector to Spruce Tree Campground	27.0	28.9	48.8	32.6	29.8	28.3	55.4	52.8 ± 13.1 (0.03)	40.3 ± 11.8 (0.02)	29.4 ± 10.7 (0.02)
Spruce to Ruby Creek	59.0	74	22.8	55.8	38.0	17.6	40.0	49 ± 26 (0.03)	14 ± 10 (0.01)	9.8 ± 11.1 (0.009)
Prospector to Ruby Creek	--	--	--	--	--	--	--	51.7 ± 10.6 (0.04)	32.9 ± 10.1 (0.02)	23.8 ± 9.0 (0.02)
Calder to Avery	--	--	--	--	--	--	--	1.6 ± 1.6 (0.000.2)	4.4 ± 6.1 (0.001)	12.4 ± 11.8 (0.002)
Avery to Prospector	4.0	3.4	--	2.0	3.3	4.7	1.1	12 ± 7.6 (0.0002)	21.3 ± 13.6 (0.005)	7.7 ± 4.1 (0.004)
Calder to Prospector Creek	--	--	--	--	--	--	--	5.9 ± 4.2 (0.002)	11.4 ± 7.4 (0.0002)	10.1 ± 5.5 (0.001)
Calder to Ruby Creek	--	--	--	--	--	--	--	35 ± 10.3	24.3 ± 7.4	18.3 ± 5.9 (0.007)

Table 5. Mean number of westslope cutthroat trout counted in snorkeling transects (fish/m²) in the Little North Fork Coeur d'Alene River, Idaho, for 1973, 1980-81, 1988, 1991, 1993, and 1994.

River section	Year						
	1973	1980	1981	1988 ^b	1991 ^c	1993 ^d	1994
Mouth to Horse Heaven	5.6 ^a	5.9 ^a	7.5 ^a	2.7	3.9	3.8 ± 4.6 (0.002)	2.1 ± 1.7 (0.001)
Mouth to Laverne Creek	--	--	0.8 ^e	1.0	3.3 ± 5.1	3.3 ± 5.1 (0.002)	0.6 ± 0.8 (0.0003)
Lavern to Deception Creek	--	--	3.8 ^{e,f}	7.4 ^f	1.5 ± 5.3	0.5 ± 9.0 (0.0003)	4.0 ± 5.0 (0.003)
Deception to Horse Heaven	--	--	--	--	5.3 ± 10.5	--	4.7 ± 6.3 (0.006)

^aAverage value for July, August and September sampling.

^bJuly 20 sampling.

^cAugust 21-25 sampling.

^dJuly 29 sampling.

^eAverage value for 1980-1981.

^fDensities from transects from Laverne Creek to Iron Creek.

Table 6. Number of bull trout redds counted per stream in the Pend Oreille Lake, Idaho, drainage, 1983-1994.

Area Stream	Total redds counted											
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLARK FORK RIVER	-	-	-	-	-	-	-	-	-	2	8	11
Lightning Creek	28	9	46	14	4	-	-	-	-	11	2	5
Spring Creek	0	-	0	-	-	-	-	-	-	-	-	-
East Fork	110	24	132	8	59	79	100	29	^a	32	27	28
Savage Creek	36	12	29	-	0	-	-	-	-	1	6	6
Char Creek	18	9	11	0	2	-	-	-	-	9	37	13
Porcupine Creek	37	52	32	1	9	-	-	-	-	4	6	1
Wellington Creek	21	18	15	7	2	-	-	-	-	9	4	9
Rattle Creek	51	32	21	10	35	-	-	-	-	10	8	0
Johnson Creek	13	33	23	36	10	4	17	33	25	16	23	3
Twin Creek	7	25	5	28	0	-	-	-	-	3	4	0
NORTH SHORE												
Trestle Creek	298	272	298	147	230	236	217	274	220	134	304	276
Pack River	34	37	49	25	14	-	-	-	-	65	21	22
Rapid Lightning Creek	-	0	-	0	-	-	-	-	-	-	-	-
Grouse Creek	2	108	55	13	56	24	50	48	33 ^b	17	23	18
Hellroaring Creek	0	-	0	-	-	-	-	-	-	-	-	-
Jeru Creek	0	-	0	-	-	-	-	-	-	-	-	-
EAST SHORE												
Granite Creek	3	81	37	37	30	-	-	-	-	0	7	11
Sullivan Springs	9	8	14	-	6	-	-	-	-	0	24	31
North Gold Creek	16	37	52	8	36	24	37	35	41	41	32	27
Gold Creek	131	124	111	78	62	111	122	84	104	93	120	164
Total 6 index streams	570	598	671	290	453	478	543	503	423^c	333	529	516
Total all streams	814	881	930	412	555	-	-	-	-	447	656	625

1983 and 1984 data reported by Pratt (1985).

1985 and 1986 data reported by Hoelscher and Bjornn (1989).

^a Not surveyed in 1991 due to early snow fall.

^b Upper section not surveyed, count is from Chute Creek downstream.

^c Represents only a partial count due to early snow fall.

of the most dynamic in all of northern Idaho with bedload movement changing the entire habitat structure of a stream course with each new high water event. Johnson Creek is another system that has been impacted by habitat degradation. The lower section of Johnson Creek is losing potential spawning gravel to siltation. Redd counts in Johnson Creek in 1994 dropped to an all time low of three redds.

Priest Lake Drainage

In the Upper Priest Lake drainage, a total of 28 bull trout redds were observed in 1994 as compared to the 18 redds observed in 1993 (Table 7). In addition to the 12 Upper Priest Lake tributaries surveyed in 1994, 3 lower Priest Lake tributaries were also surveyed. Indian, Lion and Two Mouth creeks (Appendices L,M,N) were added to the survey in 1994. Indian Creek, where two redds were observed, was the only lower Priest Lake tributary where bull trout redds were found. With the expansion factor of 3.2 fish/redd, an estimated 90 bull trout comprised the spawning escapement in the surveyed streams of Upper Priest Lake, and 6 bull trout entered Indian Creek in 1994 to spawn.

Results of the surveys in the Priest Lake drainage indicated the depressed status of bull trout in this system. Overharvest concerns were first addressed in 1973 when the tributary streams to Upper Priest Lake and Priest Lake were closed to fishing for bull trout. Both lakes were closed to harvest of bull trout in 1984. Competition with and predation from lake trout *S. namaycush* may forever inhibit bull trout populations in lower Priest Lake. While lake trout do reside in Upper Priest Lake, the population does not appear to be so great as to offer the same constraint. For whatever reason, lake trout have not established at the same level of abundance in Upper Priest Lake, and bull trout persist in greater abundance than in the lower lake. The contrast in habitat conditions between the Upper Priest Lake drainage and the lower Priest Lake east side tributary streams may also explain some of the difference in bull trout densities. Suitable spawning habitat is limited in the east side tributary streams. Protection of these tributary streams, to both the upper and lower lake, is of major importance to preserve and enhance the bull trout population in this system.

St. Joe River Drainage

In the upper St. Joe River drainage, a total of 61 bull trout redds were observed in 1994 (Table 8). Expanding the number of redds observed by 3.2 fish/redd, an estimated 195 bull trout spawned in the surveyed reaches of the upper St. Joe River in 1994.

The results from the past three years of surveys (Table 8) of the upper St. Joe River drainage indicated that bull trout population levels remain depressed. The problems in the St. Joe River drainage, as with the Pend Oreille Lake drainage, are primarily due to habitat degradation. Angler harvest of bull trout has been closed in this drainage since 1988. Protection and enhancement of bull trout habitat in the St. Joe River drainage, as with other bull trout systems in northern Idaho, is considered a major priority.

Table 7. Description of bull trout redd survey locations including transect description, distance surveyed, and number of redds observed in the Priest Lake, Idaho drainage 1994. Surveys were conducted between September 19 and September 23, 1994. Number of bull trout redds observed in the 1992 and 1993 surveys are also presented.

Stream	Survey		Number of redds observed		
	Transect description	Distance (km)	1994	1993	1992
Upper Priest River	Mouth of Rock Cr. downstream to F.S. trail 317 crossing	0.3	1	2	-
	Mouth of Lime Cr. downstream to the mouth of Snow Cr.	3.2	4	3	-
Rock Creek	Togo Gulch to the mouth	0.8	0	0	-
	Mouth upstream to F.S. trail 308 crossing	0.5	0	0	-
Lime Creek	Mouth upstream approximately 0.8 km	0.8	0	0	-
Cedar Creek	Mouth upstream approximately 1.6 km	1.6	2	0	-
Ruby Creek	Mouth upstream to a barrier waterfall upstream from F.S. road 655	2.0	0	0	-
Hughes Fork	North end of Hughes Meadows upstream to F.S. trail 312 crossing	2.0	2	3	7
	Foot bridge on F.S. trail 311 downstream to F.S. road 622 bridge	2.4	7	0	2
Bench Creek	F.S. road 622 downstream to the mouth	8.0	-	1	-
Jackson Creek	Mouth upstream approximately 0.8 km	0.8	2	2	0
Gold Creek	Mouth upstream to F.S. trail 311 crossing	1.6	0	0	4
	Mouth upstream approximately 2 km	2.0	6	2	5
Boulder Creek	Mouth upstream approximately 1.6 km to a barrier waterfall	1.6	0	0	0
Trapper Creek	Mouth upstream to approximately 0.8 km upstream from East Fork	3.2	4	4	-
Caribou Creek	Mouth upstream to old road crossing	1.6	0	1	-
Indian Creek	Bridge 2.8 km upstream from the East Shore Road upstream to 2.4 km to the wooden bridge.	2.4	2	-	-
Lion Creek	0.2 km downstream from the East Shore Road upstream to 0.6 km to the bedrock chutes	0.6	0	-	-
	0.4 km upstream and 0.4 km downstream from the second Lion Cr. bridge.	0.8	0	-	-
	Campsite 5.3 km from the East Shore Road upstream 0.4 km	0.4	0	-	-
	Gravel pit 6.6 km from East Shore Road downstream 0.4 km.	0.4	0	-	-
Two Mouth Creek	0.4 km upstream and 0.4 km downstream from the East Shore Road bridge.	0.8	0	-	-
	0.4 km upstream and 0.4 km downstream from the second (passable) bridge up from the East Shore Road.	0.8	0	-	-
	0.4 km upstream from the third (passable) bridge up from the East Shore Road.	0.8	0	-	-

Transect survey descriptions are not necessarily the same for the 1992 counts.

Table 8. Number of bull trout redds counted in tributaries to the upper St. Joe River drainage, Idaho, 1992, 1993 and 1994.

Stream	Number of redds ^a observed		
	1992 ^b	1993 ^c	1994 ^d
St. Joe River from Bean Cr. to Heller Cr.	0	0	-
St. Joe River from Heller Cr. to St. Joe Lake	10	14	3
Bacon Cr.	0	0	-
Bean Cr.	14	0	-
Beaver Cr. & Bad Bear Cr.	2	2	0
California Cr.	2	4	-
Gold Cr.	-	2	-
Heller Cr.	0	0	-
Indian Cr.	-	0	0
Medicine Cr.	11	33	48
Red Ives Cr.	-	0	-
Ruby Cr.	0	1	-
Sherlock Cr.	0	3	-
Simmons Cr.	-	7	5
Washout	-	3	0
Wampus Cr.	-	0	0
North Fork Simmons Cr.	-	1	0
Timber Cr.	-	0	1
Wisdom Cr.	1	1	4
Yankee Bar Cr.	1	0	-
Totals	57	71	61

^a Only definite bull trout redd sightings are reported in this table. Bright/clean gravel areas reported as possible bull trout redds are not included.

^b 1992 survey date was September 25.

^c 1993 survey date was October 3.

^d 1994 survey date was September 24.

Coeur d'Alene Lake

No specific efforts were made in Coeur d'Alene Lake to find bull trout. However, one 660 mm male bull trout was captured in a gill net set off Higgins Point, Coeur d'Alene Lake, in December of 1994 while sampling spawning kokanee.

Little North Fork Clearwater River and Marble Creek Drainages

Bull trout redd counts were conducted for the first time in the upper Little North Fork of the Clearwater and upper Marble Creek drainages in 1994 (Table 9, Appendix O). No bull trout redds were observed in either drainage. Eight adult bull trout were observed in the Little North Fork Clearwater River drainage. No bull trout were seen in the upper Marble Creek drainage.

Standard Stream Surveys

Lion Creek

Lion Creek was surveyed on July 19, 25, and 26, 1994. Discharge, measured at the mouth of Lion Creek on July 19, 1994, was approximately 50 cfs.

Bull trout were observed in Lion Creek during snorkeling surveys (Appendix C). Two juvenile bull trout, one fry (~30 mm) and one fingerling (~150 mm), were observed in the lower reaches of Lion Creek just upstream from the Eastside Road. Four additional juvenile bull trout (130 to 160 mm) were observed in the upper section of Lion Creek within 0.5 km of the end of the survey reach. In addition to the bull trout, westslope cutthroat trout and brook trout *S. fontinalis* were observed. The mean density of fish in Lion Creek in 1994 (13.0 fish/100 m²) has changed little since 1988 (14.8 fish/100 m²) when it was last surveyed (Table 10).

Lion Creek consists of two basic channel types - erosional and depositional. From Priest Lake upstream to just below the Eastside Road, the stream channel is characterized by a low gradient of 1% to 2%. The stream meanders through a mature conifer timber stand with a heavy canopy. There are numerous deep pools resulting from large log jams. Substrate is composed of 50% sand, 40% gravel, 8% cobble, and 2% boulder. While good fish rearing and holding habitat can be found in this section, suitable spawning areas are limited.

The next 500 m of stream, up to the State Park boundary, is a transitional area. With a mean gradient of 3% this section is characterized by a series of cascades over boulders and large cobble with a few undercut banks and alder riparian cover.

From the State Park boundary upstream approximately 5 km, the stream gradient ranges between 3% to 6%. Chute-pool complexes characterize this section with the substrate dominated by bedrock and

Table 9 . Description of bull trout redd survey in the upper Little North Fork Clearwater River and upper Marble Creek drainages, Idaho with reach description, distance surveyed, survey date, number of redds and number of live bull trout observed.

Stream	Reach description	Reach distance (km)	Survey date	No. of redds	No. of live fish
Little N. Fork Clearwater River	Fish Lake downstream to FS road 1925 bridge crossing	5.5	9/16/94	0	0
	FS road 1925 bridge crossing downstream to Rocket Creek	4.5	9/18/94	0	6
Lost Lake Creek	Lost Lake downstream to Little N. Fork Clearwater River	4.5	9/17/94	0	0
Little Lost Lake Creek	Little Lost Lake downstream to Little N. Fork Clearwater River	4.0	9/17/94	0	1
Lund Creek	Headwaters downstream to Little N. Fork Clearwater River	5.0	9/19/94	0	1
Rocket Creek	Headwaters downstream to Little N. Fork Clearwater River	2.5	9/19/94	0	0
Freezeout Creek	Marble Creek upstream to headwaters	6.0	9/21/94	0	0
Marble Creek	FS trail 261 crossing upstream to headwaters	6.5	9/21/94	0	0
Delaney Creek	Marble Creek upstream to headwaters	3.5	9/22/94	0	0
	Unnamed Delaney Creek tributary upstream to Crater Lk.	2.5	9/22/94	0	0

Table 10. Mean densities of trout (fish/100 m²) found in tributary streams to Priest Lake, Idaho, during snorkeling surveys, 1983-1994.

Stream/year	Species				all fishes
	cutthroat	brook trout	bull trout	unidentified	
Lion					
1983	0.8	0.0	0.0	-	0.8
1987	6.4	0.0	0.1	-	6.5
1988	14.4	0.0	0.03	-	14.8
1994	12.6	0.0	0.03	0.1	13.0
Two Mouth					
1983	0.4	0.0	0.0	-	0.4
1987	16.9	0.02	0.0	-	17.0
1988	12.3	0.4	0.2	-	13.0
1989	14.0	0.0	0.0	-	15.0
1994	15.3	0.4	0.0	2.8	18.5
Indian					
1983	22.6	1.4	0.9	-	24.8
1987	11.4	4.7	4.9	-	21.0
1988	16.1	2.1	0.0	-	18.2
1989	10.0	0.0	0.3	-	10.2
1994	7.0	1.8	0.6	3.7	13.1
Granite					
1987	0.8	0.0	0.6	-	1.3
1988	1.1	0.7	0.2	-	2.0
1989	0.2	0.0	0.1	0.3	0.3
1994	0.0	0.0	0.0	0.1	0.1
S.F. Granite					
1983	1.4	6.9	0.1	-	8.4
1984	7.2	1.3	0.6	-	9.1
1985	4.0	0.0	0.0	-	4.0
1986	0.0	0.0	0.0	-	0.0
1987	0.6	1.7	2.7	-	0.5
1988	1.8	0.3	0.2	-	2.3
1994	0.0	0.4	0.0	0.0	0.4

boulders. Spawning gravels are limited to the tail out areas of some of the larger pools. The barrier identified at the end of the surveyed reach consisted of a bedrock shelf with a 1-m drop to a shallow pool. Upstream 150 m from the small falls was a large log jam which had backed up bedload material behind it creating a 2-m to 3-m drop. Immediately upstream of the log jam was a 30-m long bedrock chute that in itself offered a considerable barrier to fish passage.

Two Mouth Creek

Two Mouth Creek was surveyed July 20 and 27, 1994. Discharge measured at the Eastside Road crossing was estimated at 30 cfs.

No bull trout were observed in Two Mouth Creek during the snorkeling surveys (Appendix D), but subsequent backpack electrofishing did yield two 120 mm bull trout. These fish were sampled approximately 50 m downstream of the second bridge on Two Mouth Creek on August 8, 1994. Fish species observed during the snorkeling surveys included westslope cutthroat and brook trout. The mean density of these species (18.5 fish/100 m² in 1994) has changed little in the past five years (Table 10).

Two Mouth Creek is very much like Lion Creek in its physical character. The lower 0.5 km of Two Mouth, from the Eastside Road to Priest Lake, is a low gradient depositional stream channel. The mid-section or transitional area of Two Mouth Creek starts at the Eastside Road and continues upstream about 0.8 km to an old impassable wooden bridge. This section is characterized by a boulder-cobble substrate and average gradient of 3%. The upper section, above the wooden bridge, is an erosional channel type with gradients approaching 7% in some reaches. The stream channel is typically large boulder and bedrock chutes and drops to large plunge pools. As with Lion Creek, Two Mouth Creek offers substantial holding and rearing habitat for fish but limited spawning habitat.

Indian Creek

Indian Creek was surveyed on July 28, 1994. Discharge as measured at the Eastside road was approximately 34 cfs.

During the snorkeling survey of Indian Creek, four juvenile bull trout in the 130 mm to 200 mm size range were observed. Two adult bull trout, estimated at 530 mm and 660 mm in length, were also seen. One of the adult bull trout and one juvenile were seen in the lower section and the remaining bull trout were seen in the upper section (Appendix E). In addition to the bull trout, westslope cutthroat and brook trout were observed. Mean densities of fish observed in Indian Creek in 1994 (13.1 fish/100 m²) were slightly greater than recorded in 1989 (10.2 fish/100 m²) (Table 10).

The physical character of Indian Creek differs little from that of Lion or Two Mouth creeks. The lower section, from Priest Lake upstream to the Eastside Road is typified by a low gradient, meandering, depositional stream channel. Log jams and other large woody debris provide considerable holding and rearing areas but due to the deposition of fine sediments no spawning gravels are present in this section of stream. The upper reach of Indian Creek (Appendix E) is characterized by an average stream gradient of about 3%, which is moderate compared to the upper sections of Lion and Two Mouth creeks. The

rifle-pool-run character of this section of Indian Creek provides abundant rearing and holding habitat for fish, but the only available spawning gravel occurs at the tailouts of deep pool, perhaps too deep to provide quality spawning habitat due to reduced water velocities.

Granite Creek

Granite Creek was snorkeled on August 19, 1994 in search of bull trout, but none were found. The surveyed section of Granite Creek (Appendix F) from Blacktail Creek upstream approximately 2 km mirrored earlier surveys conducted on the system in the 1980s (Mauser 1985, Strach and Bjornn 1990). The only fish observed were one 300 mm mountain whitefish and an unidentified salmonid approximately 230 mm in length. Additional sampling efforts with minnow traps did not yield any fish. Fish species present in previous surveys of Granite Creek included westslope cutthroat trout and brook trout as well as bull trout (Table 10).

Stream discharge was estimated at 160 cfs at the time of the survey. The physical character of the surveyed reach of Granite Creek consisted of a low to moderate gradient of 2.5% with a cobble-boulder-gravel substrate and considerable siltation, so much so as to be considered unsuitable for spawning. Habitat consisted mainly of a riffle-run complex. The majority of the pools found in this section were associated with log jams or single large logs in the stream channel. The presence of aquatic vegetation and poor water clarity impaired visibility and sighting of fish while snorkeling.

South Fork Granite Creek

The South Fork Granite Creek was snorkeled on August 18, 1994 in search of bull trout, but none were found. The survey started at the second bridge crossing of the U.S. Forest Service road 311 and continued upstream to the third bridge crossing of U.S. Forest Service road 311, a total of approximately 1.8 km (Appendix F). Stream discharge at the time of survey was estimated at 56 cfs. The only fish observed during the snorkeling survey were brook trout (Table 10). Additional sampling with minnow traps yielded two cutthroat trout, 48 mm and 98 mm in length.

The physical makeup of the South Fork Granite Creek was one with a low gradient of between 1.5% and 3%. Undercut banks with alder-conifer riparian cover and large woody debris in the stream channel offered good fish holding and rearing habitat. The substrate of cobble and gravel was heavily impacted with sediment and covered with mats of aquatic macrophytes throughout the survey reach. Suspended sediment in the water and the aquatic vegetation limited visibility during the snorkeling surveys.

Kootenai River Kokanee Spawning Ground Counts

Early spawning kokanee from Kootenay Lake, British Columbia, Canada, utilize tributaries of the Kootenai River in Idaho for spawning. The Kootenay Lake South Arm stocks have been declining for many years (Horner et al. 1996a). Estimates of the number of spawning kokanee in four Kootenai

River tributaries have been made during a one-day count in mid-August to early September since 1983. The 1994 spawning escapement counts are reported in Table 11, along with previous years estimates.

RECOMMENDATIONS

1. Conduct annual snorkeling surveys in the LNFC DAR, NFC DAR, and SJR.
2. Conduct biennial electrofishing population estimates in the LNFC DAR, NFC DAR, and the SJR.
3. Survey all bull trout spawning streams in the Pend Oreille Lake drainage in 1995 that were surveyed in 1994.
4. Continue with the bull trout redd counts in the Priest Lake drainage.
5. Continue to assist the Forest Service with bull trout redd surveys in the St. Joe River drainage.
6. Cooperate with the U.S. Bureau of Land Management and Forest Service on bull trout redd counts in the upper North Fork Clearwater River drainage.
7. Continue with increased enforcement efforts in the tributary streams during the period of late summer and early fall when adult bull trout are vulnerable to illegal harvest.
8. Post bull trout identification and regulation signs indicating harvest closures and bag limits where appropriate.
9. Actively oppose any and all land use activities that could further degrade critical bull trout habitat and support activities that protect or recover critical habitat.
10. Identify streams where brook trout may be detrimental to bull trout. Begin to selectively remove brook trout from streams on a prioritized basis.

Table 11. Number of spawning kokanee salmon counted in tributaries to the Kootenai River, Idaho, 1983-1994.

Stream	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Boundary	10	55	200	10	0	0	30	4	1	10	10	6
Long Canyon	300	17	650	400	0	0	0	0	0	0	0	0
Parker	100	70	75	10	6	0	0	0	0	0	4	6
Smith	150	130	1500+	400	350	200+	75	40	10	75+	15	50+

1983 counts made on August 15.

1984 and 1991 counts made on August 31.

1985 counts made on September 6.

1986 counts made on September 4.

1987-1990 and 1993 counts made on September 1.

1992 counts made on August 30.

1994 counts made on September 1.

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APPENDICES

Appendix A. Length frequency of westslope cutthroat trout collected by electrofishing, in the North Fork and Little North Fork Coeur d'Alene Rivers, Idaho, 1994. Fish are separated into number of fish marked, caught, and recaptured in the Peterson mark and recapture population estimate.

Length (mm)	<u>North Fk Coeur d'Alene R</u>						<u>L.North Fk Coeur d'Alene R</u>					
	<u>Catch & Keep</u>			<u>Catch & Rel.</u>			<u>Catch & Keep</u>			<u>Catch & Rel.</u>		
	M	C	R	M	C	R	M	C	R	M	C	R
90-99	0	0	0	3	2	1	0	0	0	5	0	0
100-109	0	0	0	7	5	2	0	0	0	6	1	0
110-119	0	0	0	5	5	2	0	0	0	17	21	6
120-129	1	2	0	4	8	3	0	0	0	13	9	6
130-139	3	2	2	3	3	1	1	0	0	7	8	4
140-149	4	7	4	10	10	6	1	2	0	6	7	4
150-159	7	5	5	3	7	3	4	1	1	6	5	3
160-169	6	5	4	4	2	0	2	4	1	1	4	2
170-179	5	11	6	2	2	1	4	4	1	3	4	3
180-189	5	4	4	3	1	0	4	5	1	7	7	3
190-199	6	4	3	3	2	1	0	6	1	2	8	5
200-209	2	5	3	0	2	1	1	3	2	3	2	2
210-219	2	3	2	3	1	1	2	0	0	5	3	2
220-229	0	0	0	1	1	0	0	2	2	2	5	3
230-239	0	1	1	0	1	1	0	0	0	2	2	2
240-249	1	1	1	1	3	0	0	1	0	1	0	0
250-259	0	2	1	0	4	0	0	1	0	2	1	1
260-269	1	0	0	2	0	0	0	1	1	2	2	1
270-279	1	2	1	2	1	1	1	0	0	1	3	1
280-289	1	0	0	0	0	0	0	2	0	1	0	0
290-299	0	0	0	2	0	0	0	0	0	0	0	0
300-309	0	0	0	0	0	0	2	0	0	2	0	0
310-319	0	0	0	1	1	0	0	0	0	0	1	1
320-329	0	0	0	0	0	0	0	0	0	0	0	0
330-339	0	0	0	1	1	0	0	0	0	0	0	0
340-349	0	0	0	1	1	0	1	1	0	0	0	0
350-359	0	0	0	1	0	0	0	0	0	0	0	0
360-369	0	0	0	0	2	0	0	0	0	0	0	0
370-379	0	0	0	1	0	0	0	0	0	0	0	0
380-380	0	0	0	0	0	0	0	0	0	0	0	0
390-399	0	0	0	0	0	0	0	0	0	0	0	0
400-409	0	0	0	2	0	0	0	0	0	0	0	0
410-419	0	0	0	3	1	1	0	0	0	0	0	0
420-429	0	0	0	2	2	1	0	0	0	0	0	0
430-439	0	0	0	1	1	0	0	1	0	0	0	0
440-449	0	0	0	0	0	0	0	0	0	0	0	0
450-459	0	0	0	0	1	0	1	1	0	0	0	0
460-469	0	0	0	1	1	1	0	0	0	0	0	0
470-479	0	0	0	0	0	0	0	0	0	1	1	1
Total	45	54	37	72	71	28	27	35	10	95	95	49

STANDARD STREAM SURVEYS

I. Surveys will be conducted using the following common gear:

A. Electrofishing.

Pulsed DC backpack unit, gas or battery powered with meter to record seconds fished. Relative values of c/e can be recorded if time is kept.

Pulsed DC boat with boom-mounted electrodes for large streams, or use of a canoe or drift boat set up. A throwable electrode has been effective for some workers.

B. Snorkeling.

You will train biologists and temporaries. Use whatever wet/dry suites, masks, etc., that are available. Each region should have a fish mock-up for training and determining visibility corridors for large streams.

C. Conductivity meter/kit.

D. A 30 meter/100 foot (0.1 foot increments) plastic measuring tape.

E. Range finder(s) for large streams.

F. Flow meter or film canister to estimate velocity.

G. Wading rod or meter stick to measure water depth.

H. Viewing box.

A plexiglass viewing box for observing substrate. Size is not critical, ability to see the substrate is. Back packers may want to use a snorkel mask. Petrosky divided his viewing box into ten equal cells with marking pen for better estimate of substrate percentages. Substrate viewing area can be as large as 30" diameter.

I. Thermometer.

Pocket, max-min, thermographs - depends on intensity of data collection, just make sure you take a temperature.

J. Measuring board/trough.

K. Scales for weighing fish.

L. Scale envelopes.

M. Camera and film.

N. Pocket level.

Appendix B (Cont'd). Standard Stream Survey Methodology

STANDARD STREAM SURVEYS (cont.)

II. Conduct surveys with the following procedures:

A. General

Fill-in forms to include the following variables:

- | | |
|---------------------|---|
| 1. Stream | 10. Channel Type |
| 2. Drainage | 11. Section Length |
| 3. EPA Reach number | 12. Percent Gradient |
| 4. Project Strata | 13. Mean Width |
| 5. Project Section | 14. Mean Depth |
| 6. Region | 15. Percent pool; riffle; run; pocket water |
| 7. Collector | 16. Percent sand; gravel; rubble; boulder |
| 8. Date | |
| 9. Map Reference | |

B. Fish Community/Distribution (Objective: To sample fish community - sample representative mix of habitat types.)

1. Effort (Electrofishing).

Section(s) to be electrofished will include at least one pool/riffle/run complex. Block nets will be used for population estimates. You determine if it will be a sample (no population or density estimates, one pass removal) or a 2, 3, 4 pass removal estimate, or mark recapture estimate.

2. Densities by species and age (size) class (number/100 m²).

This is required for electrofishing or snorkeling. Length of section and several widths will be measured.

3. Identification.

If you have the fish in hand, identify it. No more; sculpin sp, sucker sp, bullhead sp. Let us learn again to identify these. Remember, many (6) non-game fish are species of special concern. If necessary, take samples back to the lab to identify (except species of special concern).

4. Biological Information.

The number of each game fish collected per cm, or observed per 1-inch size group, and occurrence of non-game fish. Weight and scales (or other ageing structure) are to be taken and recorded for up to five individuals/cm/game fish species. All information should be recorded on scale envelopes. Sex and maturity will be recorded for all mortalities.

STANDARD STREAM SURVEYS (cont.)

5. Periodicity.

Everyone has more streams than can be visited in a career. This standard survey is for any stream we visit, so next year or 20 years from now, meaningful comparisons can be made.

C. Physical Habitat.

For each survey, photographs (establish photo points) should be taken and maps drawn of the section. Adequate narrative detail and map detail should be provided to allow repetition. Techniques described or alluded to, in the attachments from Petrosky/Holubetz, are to be followed. In addition, mean velocity will be estimated at the 1/4, 1/2, and 3/4 widths if using a flow meter. Idiot proof flow meters are now available. A relative velocity value can be determined by floating a film canister half-filled with water near where width measurements were taken for a run or riffle. Measure the time and distance for minimum of three repetitions. With width, depth, and velocity measurements, a ballpark discharge can be calculated.

III. Stream Survey Report.

A. Data Summaries: The following data summaries shall be included in tabular form (just as you are now doing for lowland lake surveys).

1. The number and percent of fish per cm per section, mean weight, and W_r per cm, age(s) and maturity per cm for each species.
2. Back-calculated lengths at annuli by age for individual species.
3. Species composition of the total catch expressed by number and weight with length ranges for each species and sub-totals for game and non-game species.

B. Narrative: a one to two-page narrative shall be completed for each survey, with content to include the following:

1. Description of Catch - Summarize the highlights of the catch characteristics, including angler desirability of the size and species composition, significant age composition or growth characteristics, etc.
2. Comparisons with previous years.

Appendix B (Cont'd). Standard Stream Survey Methodology

STANDARD STREAM SURVEYS (cont.)

3. Management Implications - Describe significant management implications such as good or poor growth, good or poor hatchery trout survival, fish community status in relation to potential, etc.
4. Management Recommendations - Present any management recommendations warranted, including a need for more in-depth assessment, and regulation recommendations.

Following are some forms (borrowed and/or revised) to help in the data acquisition. Make comments for improvements on these forms, so proposed changes can be discussed at the managers meeting.

SECTION DESCRIPTION SHEET

Stream _____ Date _____
Stratum _____ Section _____
Section Location _____

Place Transect Photograph Here

Vehicle Access _____

Photo Point _____

Comments _____

Appendix B (Cont'd). Standard Stream Survey Methodology

FISH SURVEY

Stream _____ Date ___/___/___ Leader/Recorder _____

Agency: Idaho Department of Fish and Game

Program: (circle your region) R1, R2, R3-N, R3-M, R4, R5, R6, R7

Stratum _____ Section _____

Channel Type: B, C, Other Section Type: monitoring, chinook sup.,
steelhead sup., evaluation

Quad Map _____ UTM X/Y _____

EPA Reach # _____

Length _____ Transect Widths _____

H₂O Temp. _____ Time _____ Mean Width _____

Conductivity _____ μ S SEC Area _____

Corridor visibility _____ m

Methods: () Snorkel (circle corridor or entire stream width)
() Electrofish
() Other _____

Habitat Type: (circle one) Pool, Riffle, Run, Pocket Water

PHYSICAL HABITAT DATA SHEET

Stream _____ Date _____ Collectors _____

EPA Reach _____ Length _____ Comments _____

Strata _____ Vertical Drop _____

Section _____ Gradient ‰ _____

Channel Types: B - confined, flushing
C - meandered, depositional

Habitat Type: (circle one) pool, riffle, run, pocket water

Appendix B (Cont'd). Standard Stream Survey Methodology

Transect Length from Bottom	Width	Location on transect (1 to r)	Depth	Velocity (run only)	Substrate Class by Area				
					Sand	Gravel	Rubble	Boulder	Bedrock
		1/4							
		1/2							
		3/4							
		1/4							
		1/2							
		3/4							
		1/4							
		1/2							
		3/4							
		1/4							
		1/2							
		3/4							

Appendix B (Cont'd). Standard Stream Survey Methodology

SNORKELING DATA
Anadromous Streams

Length Class (in)	RAINBOW - STEELHEAD				RESIDENT SPECIES					
	Total	Wild & Natural	Adipose Clipped	Hatchery Catchable	CTT	BRK	BLT	MWF		
<2										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
>12 specify length										
Age 0 Chinook					Adults					
Age 1 Chinook					Redds					

Other Species Observed _____

Appendix B (Cont'd). Standard Stream Survey Methodology

SNORKELING DATA
Resident Streams

Length Class (in)	RAINBOW - REDBAND				OTHER					
	Total	Wild & Natural	Adipose Clipped	Hatchery Catchable	CTT	BRK	BLT	MWF		
<2										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
>12 specify length										
Redds										

Other Species Observed _____

Appendix B (Cont'd). Standard Stream Survey Methodology

STREAM SURVEY ELECTROFISHING DATA SHEET
(_____ of _____)

STREAM NAME: _____ REGION: _____
DATE: _____ SAMPLE CREW LEADER: _____

Length range	Section _____				(mm)	Species _____			
	Species		Species						
(mm)					(mm)				
					320-329				
					330-339				
					340-349				
50-59					350-359				
60-69					360-369				
70-79					370-379				
80-89					380-389				
90-99					390-399				
100-109					400-409				
110-119					410-419				
120-129					420-429				
130-139					430-439				
140-149					440-449				
150-159					450-459				
160-169					460-469				
170-179					470-479				
180-189					480-489				
190-199					490-499				
200-209					500-509				
210-219					510-519				
220-229					520-529				
230-239					530-539				
240-249					540-549				
250-259					550-559				
260-269									
270-279									
280-289									
290-299									
300-309					Number				
310-319					Tot. Wt.				

SURVEY GUIDELINES

General Variables

General variables will be part of both fish density and physical habitat common data bases. The following variable and definitions are proposed:

1. Stream:
Stream name according to convention of Pacific Northwest Rivers Study (i.e., Salmon).
2. Drainage:
Coded according to drainages proposed in Attachment C1 (planned obsolescence with use of EPA reach numbers).
3. EPA Reach Number:
Coded according to convention of the Pacific Northwest Rivers Study.
4. Project Strata:
Identifier code for stream reach to be defined and coded by individual worker (optional).
5. Project Section:
Identifier code for stream section to be defined and coded by individual worker.
6. Program:
Coded according to Attachment C2 (ie, your region).
7. Collector:
Last name of person collecting data.
8. Date:
Date(s) of data collection.

Fish Density

9. Section Area:
Area sampled (m²)
10. Density by Species and Age Class:
Number/100m² for species and age classes defined in Attachment C3.
11. Method Code:
Coded according to Attachment C3.
12. Comments Field:
(Attachment C3).

Appendix B (Cont'd). Standard Stream Survey Methodology

SURVEY GUIDELINES (cont.)

Physical Habitat

13. Channel Type:
Coded by major channel types (A, B, C, D, F channels) according to USFS system (Attachment C5).
14. Section Length:
Length of sample section, measured at channel midpoint (m).
15. Percent Gradient:
Vertical drop/section length. Vertical drop measured by Abney or level.
16. Mean Width:
Mean of at least four width measurements (m), according to methods in Attachment C6.
17. Mean Depth:
Mean from at least four transects (cm), according to methods in Attachment C6.
18. Percent-Pool:Run:Riffle:Pocket Water:
Habitat composition of the entire sample section, classified according to criteria in Attachment C7.
19. Percent-Sand:Gravel:Rubble:Boulder:
Mean of ocular estimates of percent of substrate composition from at least four transects, according to criteria in Attachment C6.
20. Velocity:
Measured by flow meter at 1/4 points in stream cross section taken at riffle or run. Measurements to be taken at 0.6 depth measured from surface to substrate if using a flow meter. If measured by film canister, near the thalweg with three passes and averaged for a time/known distance (i.e. 8 seconds, 10 feet). Measurements to be done at riffle or run for most uniform flow.

RELATIONSHIP OF SPECIALIZED DATA BASES TO COMMON DATA BASES

Undoubtedly, fish population and habitat data collected for specific purposes will be more detailed than the common data base. However, it is important that the specialized data can be compressed into the common data base format.

For example, habitat classes defined by Bisson, et al. (1981)^a were divisions of the basic habitat classes, pools, riffles, and runs. Workers preferring this or other classifications should ensure that their data can be recombined to fit the format of the common data base:

Common Data Base Class	Bisson Habitat Class
Pool:	Secondary channel pool Backwater pool Trench pool Plunge pool Lateral scour pool Dammed pool
Riffle:	Low-gradient riffle Rapid Cascade
Run:	Glide
Pocket Water:	

^aBisson, P.A., J.L. Nielsen, R.A. Palmason, and L.E. Grove, 1981.

A system of naming habitat types in small streams, with examples of habitat utilization by salmonids during low streamflow, Pages 62-73, in Symposium on Acquisition and Utilization of Aquatic Habitat Inventory Information (Portland, Oregon, October 28-30, 1981).

Appendix B (Cont'd). Standard Stream Survey Methodology

MANDATORY REPORT FORM

Idaho Department of Fish and Game
Scientific Collecting Permit

A standard inventory data set will be required for any fish community or presence/absence sampling survey within the state. Additional data is welcomed; however, this minimum amount of information must be collected for each transect or study site, and the form(s) returned as part of the required report. One form per transect (both sides).

Stream Name: _____

Transect No.: _____

EPA Reach Number: _____
(Or description of stream reach bounded by tributaries.)

Collection Date: ___/___/___

Collector's Name: _____

Density Estimator (✓): Depletion ___ Mark/Recapture ___
Direct Observation (Snorkeling) ___

Water Temp. (C°): _____

Transect Length (M): _____
(Must include at least one pool/riffle/run complex.)

Transect Width: _____
(Take at least four measurements for an average.)

NOTICE OF COLLECTION:

IDFG Person Contacted: _____

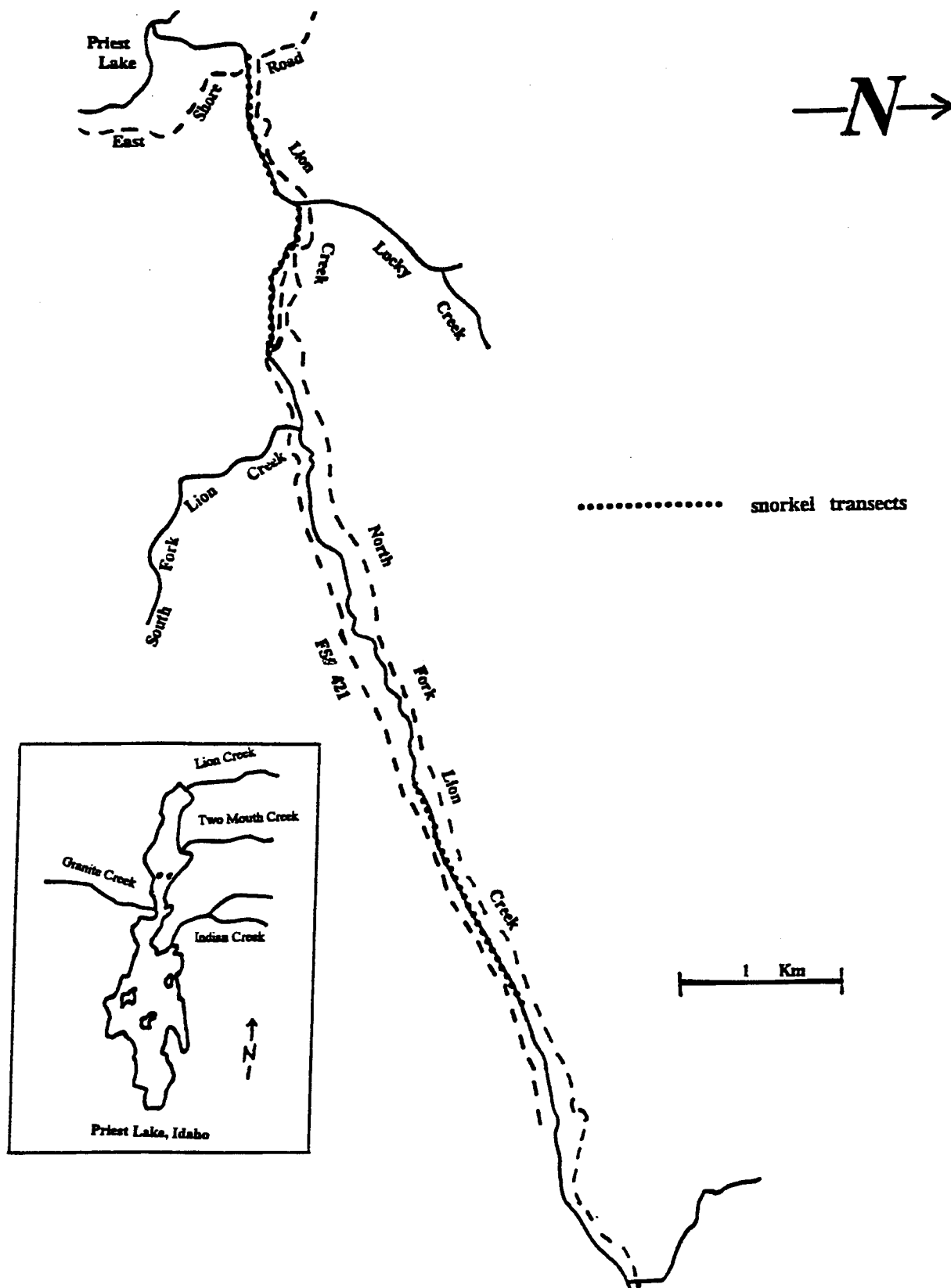
Date & Time of Contact: _____

Disposition of Fish: _____

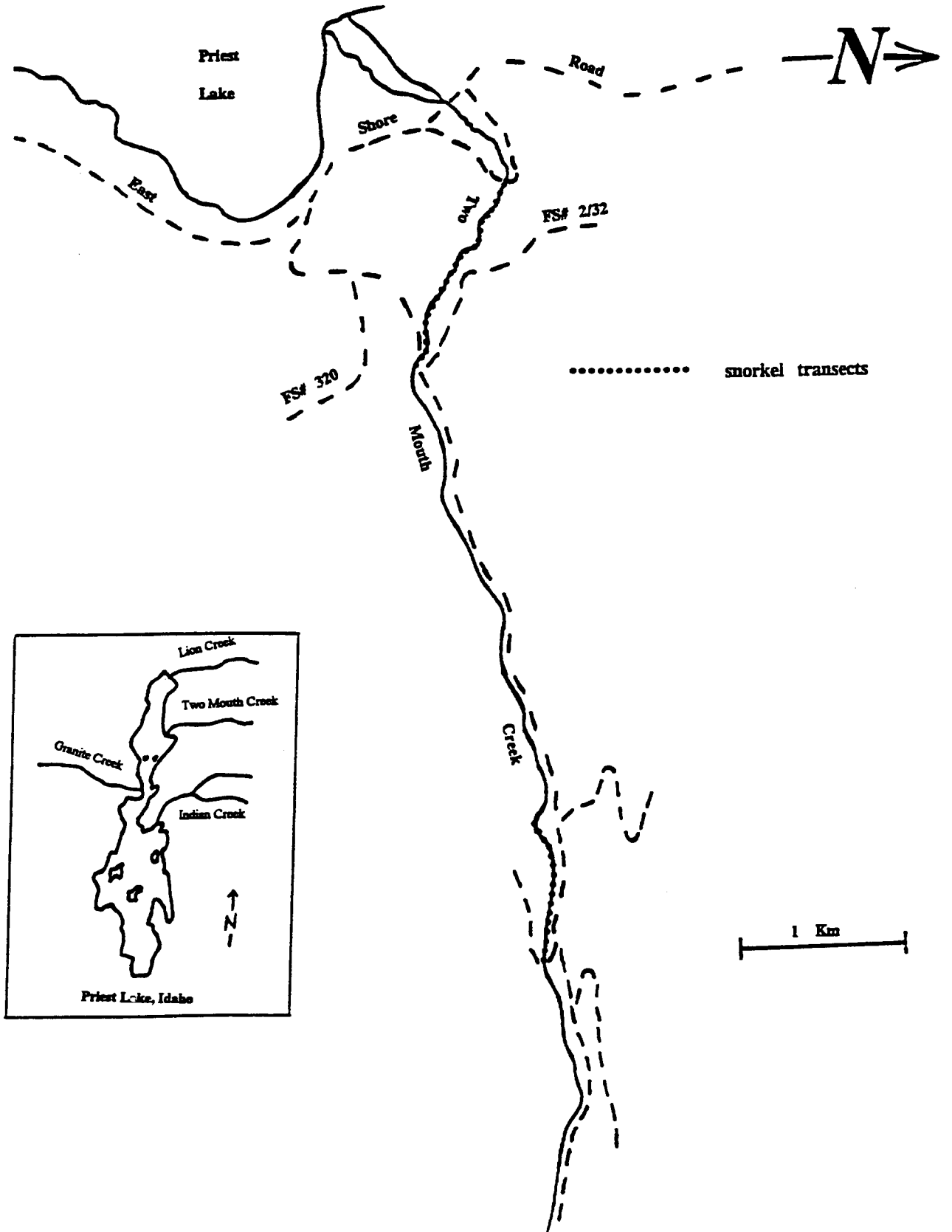
SNORKELING DATA:

Game Fish Species	Density #fish/100 m ²	Age Class (specify column)	
		0 yr.	≥ 1 yr.

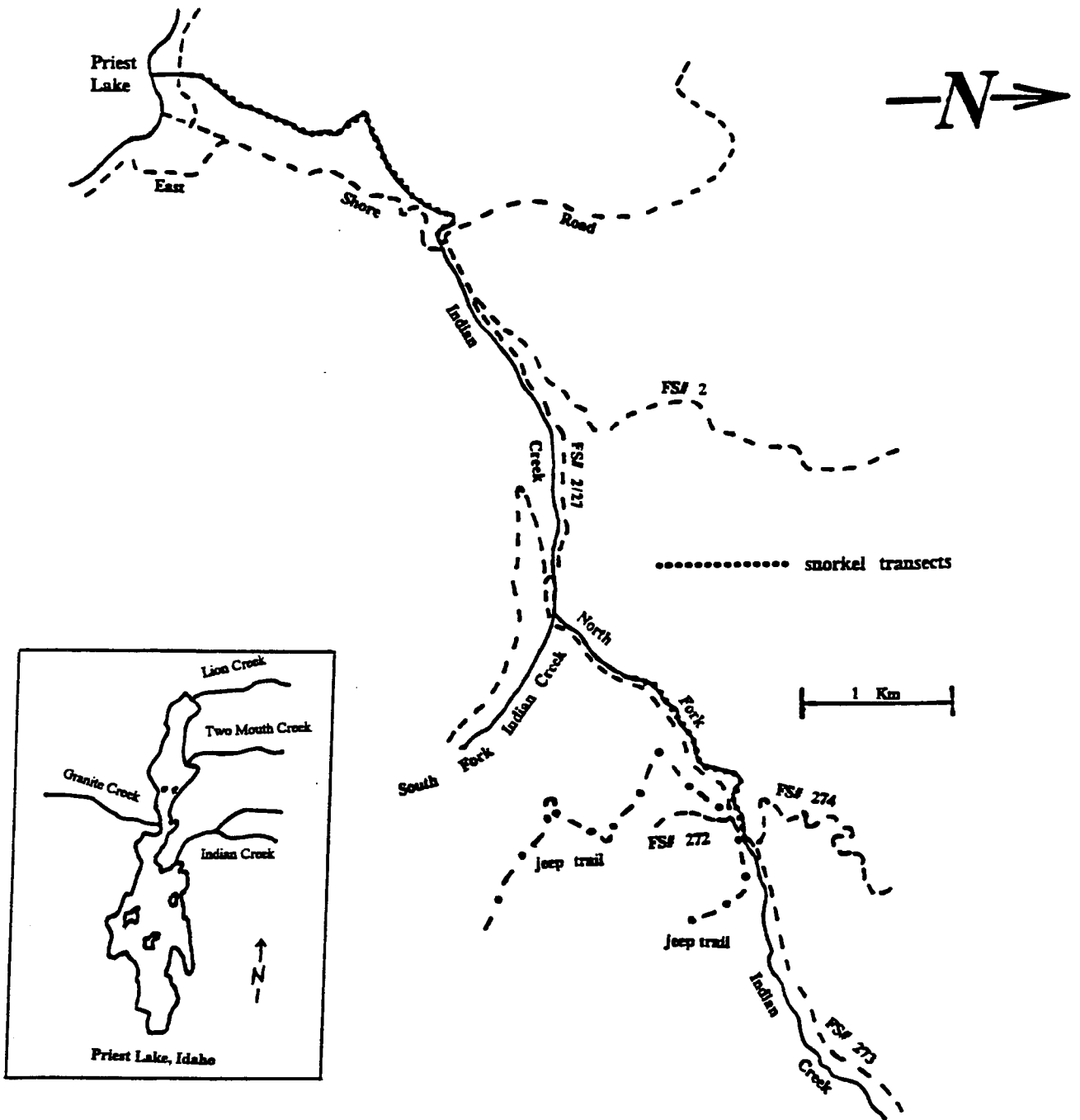
Appendix C. Map of Lion Creek showing snorkel transects, 1994.



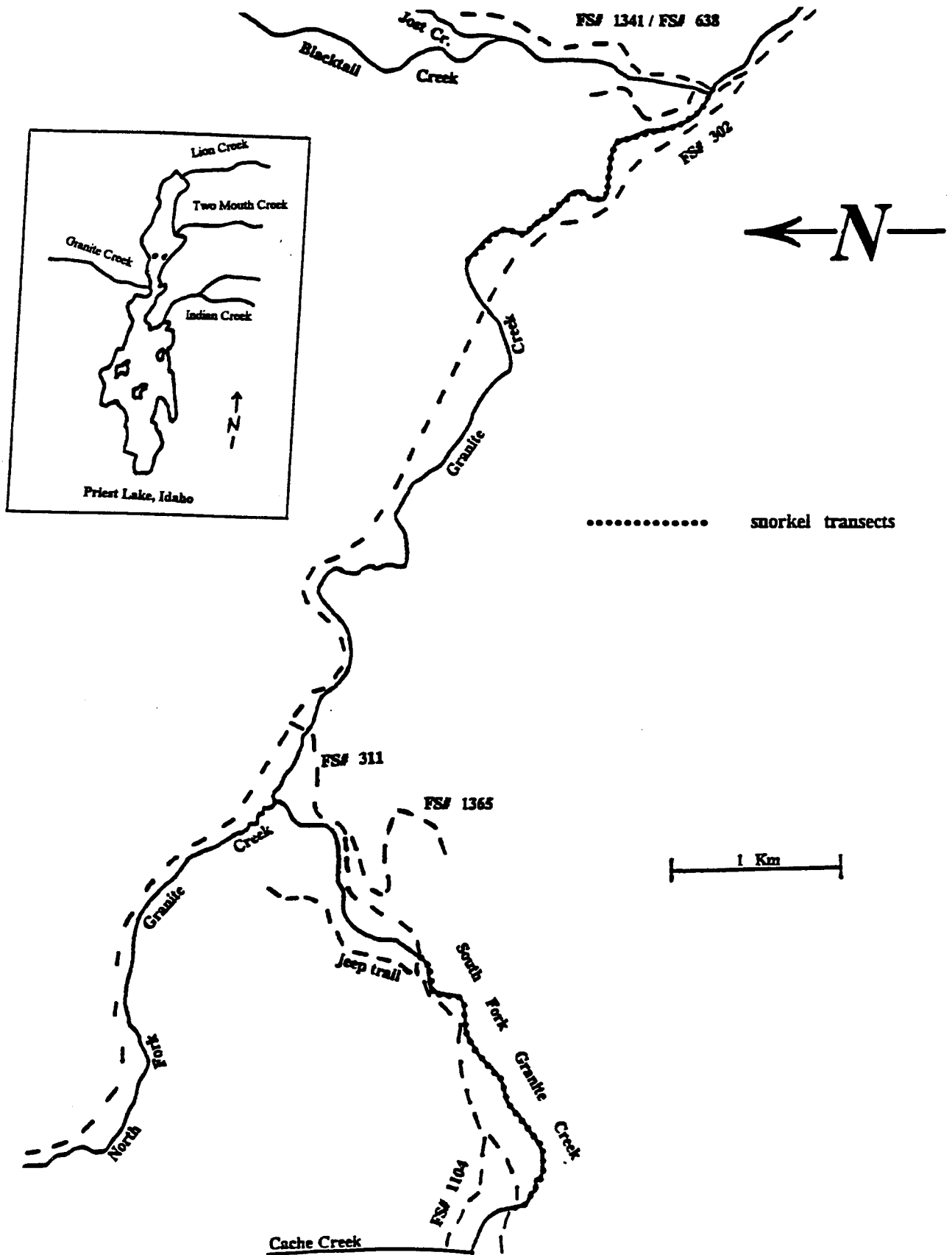
Appendix D. Map of Two Mouth Creek showing snorkel transects, 1994.



Appendix E. Map of Indain Creek showing snorkel transects, 1994.



Appendix F. Map of Granite and S.F. Granite creeks showing snorkel transects, 1994.



Appendix G. Summary of observations in snorkeling transects in the North Fork Coeur d'Alene River, Idaho, August 1994.

Transect number	River section ^c	Length (m)	Width (m)	Area (m ²)	Number of fish observed						
					Cutthroat		Wild rainbow		Hatchery rainbow	Whitefish ^a	Other ^b
					≤300 (mm)	>300 (mm)	≤300 (mm)	>300 (mm)			
1	4	40	16.8	672.0	2	0	0	0	0	0	0
2	4	110	15.2	1,672.0	0	0	0	0	0	0	0
3	4	82	14.8	1,213.6	0	0	0	0	0	0	0
4	4	155	17.5	2,712.5	0	7	0	0	0	0	0
5	4	189	11.7	2,211.3	0	1	0	0	0	0	0
6	3	95	18.3	1,738.5	35	15	0	0	0	30	0
7	3	63	11.4	718.2	0	0	0	0	0	0	0
8	3	95	13.8	1,311.0	9	1	0	0	0	0	0
9	3	95	22.2	2,109.0	54	11	0	0	0	100	0
10	3	180	21.7	3,906.0	38	3	0	0	0	124	0
11	2	60	26.0	1,560.0	2	0	0	0	0	0	0
12	2	120	18.9	2,268.0	0	0	0	0	0	0	0
13	2	315	27.8	8,757.0	3	0	0	0	0	29	0
14	2	200	19.7	3,940.0	28	6	0	0	18	105	0
15	2	185	32.5	6,013.0	23	2	0	0	0	12	0
16	1	104	38.8	4,035.0	29	0	5	0	0	37	0
17	1	140	30.3	4,242.0	14	0	2	0	0	220	1
18	1	165	35.0	5,775.0	14	2	0	0	0	23	0
19	1	190	27.5	5,225.0	11	0	10	6	1	1	0
20	1	115	38.0	4,370.0	5	0	12	0	0	200	0

Appendix G. Continued.

Transect number	River section ^c	Length (m)	Width (m)	Area (m ²)	Number of fish observed						
					Cutthroat		Wild rainbow		Hatchery rainbow	Whitefish ^a	Other ^b
					≤300 (mm)	>300 (mm)	≤300 (mm)	>300 (mm)			
21	1	170	41.5	7,055.0	15	1	7	0	0	161	0
22	1	11	40.0	440.0	15	1	20	1	0	53	0
23	1	180	28.4	5,112.0	18	0	25	0	0	280	0
34	5	120	15.1	1,812.0	0	0	0	0	0	0	0
35	5	47	8.9	418.3	0	1	0	0	0	0	0
36	5	35	17.1	598.5	3	5	0	0	0	0	0
37	5	60	15.3	918.0	16	5	0	0	0	26	0
38	5	72	11.6	835.2	24	6	0	0	0	35	0

^a Whitefish includes adults and juveniles.

^b Other includes squawfish and suckers.

^c Section 1 was from the confluence with the South Fork Coeur d'Alene River upstream to the confluence with the Little North Fork Coeur d'Alene River.
 Section 2 was from the confluence with the Little North Fork Coeur d'Alene River upstream to Yellowdog Creek.
 Section 3 was from Yellowdog Creek upstream to Teepee Creek.
 Section 4 was in Teepee Creek from the mouth upstream to Independence Creek.
 Section 5 was in the North Fork Coeur d'Alene River from the confluence of Teepee Creek upstream to Jordan Creek.

Appendix H. Densities of fish observed in snorkeling transects in the North Fork Coeur d'Alene River, Idaho, August 1994.

Transect number	River ^a section	Length (m)	Width (m)	Area (m ²)	Density of fish observed					
					Cutthroat		Wild rainbow		Hatchery rainbow	
					No./m ²	No./100 m ²	No./m ²	No./100 m ²	No./m ²	No./100 m ²
1	4	40	16.8	672.0	0.003	0.3	0	0	0	0
2	4	110	15.2	1,672.0	0	0	0	0	0	0
3	4	82	14.8	1,213.6	0	0	0	0	0	0
4	4	155	17.5	2,712.5	0.003	0.3	0	0	0	0
5	4	189	11.7	2,211.3	0.001	0.05	0	0	0	0
6	3	95	18.3	1,738.5	0.03	2.9	0	0	0	0
7	3	63	11.4	718.2	0	0	0	0	0	0
8	3	95	13.8	1,311.0	0.008	0.8	0	0	0	0
9	3	95	22.2	2,109.0	0.03	3.1	0	0	0	0
10	3	180	21.7	3,906.0	0.01	1.0	0	0	0	0
11	2	60	26.0	1,560.0	0.001	0.1	0	0	0	0
12	2	120	18.9	2,268.0	0	0	0	0	0	0
13	2	315	27.8	8,757.0	0.003	0.03	0	0	0	0
14	2	200	19.7	3,940.0	0.009	0.9	0.009	0.05	0.005	0.5
15	2	185	32.5	6,013.0	0.004	0.4	0	0	0	0
16	1	104	38.8	4,035.0	0.007	0.7	0.001	0.1	0	0
17	1	140	30.3	4,242.0	0.003	0.3	0.0005	0.05	0	0
18	1	165	35.0	5,775.0	0.003	0.3	0	0	0	0
19	1	190	27.5	5,225.0	0.003	0.3	0.002	0.2	0.0002	0.02
20	1	115	38.0	4,370.0	0.001	0.1	0.003	0.3	0	0
21	1	170	41.5	7,055.0	0.002	0.2	0.001	0.1	0	0
22	1	11	40.0	440.0	0.036	3.6	0.05	4.8	0	0
23	1	180	28.4	5,112.0	0.004	0.4	0.004	0.4	0	0

Appendix H. Continued.

Transect number	River ^a section	Length (m)	Width (m)	Area (m ²)	Density of fish observed					
					Cutthroat		Wild rainbow		Hatchery rainbow	
					No./m ²	No./100 m ²	No./m ²	No./100 m ²	No./m ²	No./100 m ²
34	5	120	15.1	1,812.0	0	0	0	0	0	0
35	5	47	8.9	418.3	0.01	1.3	0	0	0	0
36	5	35	17.1	598.5	0.01	1.3	0	0	0	0
37	5	60	15.3	918.0	0.02	2.3	0	0	0	0
38	5	72	11.6	835.2	0.036	3.6	0	0	0	0

^a Section 1 was from the confluence with the South Fork Coeur d'Alene River upstream to the confluence with the Little North Fork Coeur d'Alene River.
 Section 2 was from the confluence with the Little North Fork Coeur d'Alene River upstream to Yellowdog Creek.
 Section 3 was from Yellowdog Creek upstream to Teepee Creek.
 Section 4 was in Teepee Creek from the mouth upstream to Independence Creek.
 Section 5 was in the North Fork Coeur d'Alene River from the confluence of Teepee Creek upstream to Jordan Creek.

Appendix I. Number and estimated densities of fish observed in snorkeling transects in the Little North Fork Coeur d'Alene River, Idaho, August 1994.

New transect number	Old transect number	River section ^c	Length (m)	Width (m)	Area (m ²)	Cutthroat		Wild rainbow		Hatchery rainbow	Whitefish ^a	Other ^b	Cutthroat		Wild rainbow		Hatchery rainbow	
						≤300 mm	>300 mm	≤300 mm	>300 mm				No.m ²	100 m ²	No.m ²	100 m ²	No.m ²	100 m ²
1	33	7	75	25.8	1,935.0	1	0	1	0	1	0	0	0.0005	0.05	0.0005	0.05	0.0005	0.05
2	32	7	140	21.5	3,010.0	2	0	10	0	11	0	0	0.0007	0.07	0.003	0.3	0.004	0.4
3	31	7	235	25.0	5,875.0	0	0	7	3	25	0	0	0	0	0.002	0.2	0.004	0.4
4	30	7	23	14.0	322.0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	29	7	82	16.0	1,312.0	0	0	7	1	0	0	0	0	0	0.007	0.7	0	0
6	28	7	100	12.6	1,260.0	0	0	7	1	0	0	0	0	0	0.006	0.6	0	0
7	27	7	55	19.0	1,045.5	0	0	0	0	0	0	0	0	0	0	0	0	0
8	26	7	100	11.9	1,190.0	2	0	0	0	0	0	0	0.002	0.2	0	0	0	0
9	25	8	50	18.0	900.0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	24	8	88	16.3	1,434.4	8	0	0	0	0	0	0	0.006	0.6	0	0	0	0
11	101	8	55	14.8	814.0	2	0	0	0	0	0	0	0.002	0.2	0	0	0	0
12	102	8	72	14.7	1,058.4	5	0	0	0	0	0	0	0.005	0.5	0	0	0	0
13	104	8	63	8.0	508.0	7	0	0	0	0	0	0	0.01	1.4	0	0	0	0

^a Whitefish includes adults and juveniles.

^b Other includes squawfish and suckers.

^c Section 7 was the catch-and-keep area from the mouth to Laverne Creek. Section 8 was the catch-and-release area above Laverne Creek.

Appendix J. Summary of observations in snorkeling transects in the St. Joe River, Idaho, August 1994.

Transect number	River section ^a	Length (m)	Width (m)	Area (m ²)	Number of fish observed								
					Cutthroat		Bull trout		Wild rainbow		Hatchery rainbow	Whitefish ^b	Other ^c
					≤300 (mm)	>300 (mm)	≤300 (mm)	>300 (mm)	≤300 (mm)	>300 (mm)			
1	c&k	85	34.2	2,907	0	0	0	0	0	0	0	0	0
2	c&k	89	21.9	1,949	12	1	0	0	0	0	0	300	125
3	c&k	85	11.8	1,003	6	1	0	0	0	0	0	8	0
4	c&k	68	13.2	898	12	1	0	0	0	0	0	11	1
5	c&k	90	21.4	1,926	8	0	0	0	0	0	0	11	15
6	c&k	155	33.7	5,224	7	0	0	0	0	0	4	12	30
7	c&k	90	28.0	2,520	6	0	0	0	0	0	12	6	12
8	c&r	143	21.2	3,032	15	8	0	0	3	0	4	25	15
9	c&r	125	19.8	2,475	21	10	0	0	0	0	0	15	7
10	c&r	193	17.7	3,416	11	38	0	0	0	0	0	0	28
11	c&r	82	18.8	1,542	1	12	0	0	0	0	0	0	2
12	c&r	55	22.3	1,227	10	3	0	0	0	0	0	8	6
13	c&r	95	23.0	2,185	24	3	0	0	0	0	0	8	15
14	c&r	90	18.2	1,629	15	3	0	0	0	0	0	15	12
15	c&r	79	14.1	1,107	32	8	0	0	6	0	0	15	1
16	c&r	91	14.7	1,330	20	3	0	0	0	0	0	15	3
17	c&r	122	15.0	1,830	12	5	0	0	0	0	0	6	6
18	c&r	96	13.7	1,315	82	6	0	0	0	0	0	12	5
19	c&r	121	19.8	2,396	31	3	0	0	0	0	0	0	0
20	c&r	70	16.4	1,148	11	0	0	0	0	0	0	0	0
21	c&r	43	17.8	765	25	2	0	0	0	0	0	15	25
22	c&r	58	20.6	1,195	10	17	0	0	0	0	0	40	1
23	c&r	50	13.8	690	2	2	0	0	0	0	0	0	0

Appendix J. Continued.

Transect number	River section ^a	Length (m)	Width (m)	Area (m ²)	Number of fish observed						Hatchery rainbow	Whitefish ^b	Other ^c
					Cutthroat		Bull trout		Wild rainbow				
					≤300 (mm)	>300 (mm)	≤300 (mm)	>300 (mm)	≤300 (mm)	>300 (mm)			
24	c&r	88	16.9	1,487	20	5	0	0	0	0	0	8	6
25	c&r	50	17.3	865	8	2	0	0	0	0	0	0	0
26	c&r	80	19.3	1,544	5	15	0	0	0	0	0	0	0
27	c&r	46	20.1	925	24	6	1	0	0	0	0	50	0
28	c&r	40	22.8	901	0	0	0	0	0	0	0	8	0
29	c&k	180	38.0	6,840	7	1	0	0	0	0	0	0	24
30	c&k	230	40.0	9,200	4	0	0	0	18	0	0	0	100
31	c&k	200	40.0	8,000	5	0	0	0	7	0	0	10	30
32	c&k	64	48.3	3,077	7	2	0	0	9	0	1	0	30
33	c&k	150	47.5	7,125	0	0	0	0	0	0	0	0	0
34	c&k	86	21.9	1,883	16	12	0	0	0	0	0	30	12
35	c&k	75	33.3	2,498	30	3	0	0	3	0	0	30	50

^a c&k = catch-and-keep; c&r = catch-and-release.

^b Whitefish includes the number of juveniles and adults.

^c Includes squawfish and suckers.

Appendix K. Densities of fish observed in snorkeling transects in the St. Joe River, Idaho, August 1994.

Transect number	Densities of fish observed										
	Cutthroat		Bull trout		Wild rainbow		Hatchery rainbow		Total salmonids		
	No./m ²	No./100 m ²	No./m ²	No./100 m ²	No./m ²	No./100 m ²	No./m ²	No./100 m ²	No./m ²	No./100 m ²	
1	0	0	0	0	0	0	0	0	0	0	0
2	0.007	0.7	0	0	0	0	0	0	0.007	0.7	0.7
3	0.007	0.7	0	0	0	0	0	0	0.007	0.7	0.7
4	0.01	1.4	0	0	0	0	0	0	0.01	1.4	1.4
5	0.004	0.4	0	0	0	0	0	0	0.004	0.4	0.4
6	0.001	0.1	0	0	0	0	0.001	0.08	0.001	0.1	0.1
7	0.002	0.2	0	0	0	0	0.005	0.5	0.002	0.2	0.2
8	0.008	0.8	0	0	0.001	0.1	0.0001	0.13	0.009	0.9	0.9
9	0.01	1.3	0	0	0	0	0	0	0.01	1.3	1.3
10	0.01	1.4	0	0	0	0	0	0	0.01	1.4	1.4
11	0.008	0.8	0	0	0	0	0	0	0.008	0.8	0.8
12	0.01	1.1	0	0	0	0	0	0	0.01	1.1	1.1
13	0.01	1.2	0	0	0	0	0	0	0.01	1.2	1.2
14	0.01	1.1	0	0	0	0	0	0	0.01	1.1	1.1
15	0.04	3.6	0	0	0.005	0.5	0	0	0.04	4.2	4.2
16	0.02	1.7	0	0	0	0	0	0	0.02	1.7	1.7
17	0.009	0.9	0	0	0	0	0	0	0.01	0.9	0.9
18	0.07	7.0	0	0	0	0	0	0	0.07	7.0	7.0
19	0.01	1.4	0	0	0	0	0	0	0.01	1.4	1.4
20	0.01	1.0	0	0	0	0	0	0	0.01	1.0	1.0
21	0.04	3.5	0	0	0	0	0	0	0.04	3.5	3.5

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Appendix K. Continued.

Transect number	Densities of fish observed									
	Cutthroat		Bull trout		Wild rainbow		Hatchery rainbow		Total salmonids	
	No./m ²	No./100 m ²	No./m ²	No./100 m ²	No./m ²	No./100 m ²	No./m ²	No./100 m ²	No./m ²	No./100 m ²
22	0.02	2.3	0	0	0	0	0	0	0.02	2.3
23	0.006	0.6	0	0	0	0	0	0	0.006	0.6
24	0.02	1.7	0	0	0	0	0	0	0.02	1.7
25	0.01	1.2	0	0	0	0	0	0	0.01	1.2
26	0.01	1.3	0	0	0	0	0	0	0.01	1.3
27	0	0	0.001	0.1	0	0	0	0	0.03	3.4
28	0	0	0	0	0	0	0	0	0	0
29	0.001	0.1	0	0	0	0	0	0	0.001	0.1
30	0.0004	0.04	0	0	0.002	0.2	0	0	0.002	0.2
31	0.0006	0.06	0	0	0.001	0.1	0	0	0.002	0.2
32	0.003	0.3	0	0	0.003	0.3	0	0	0.006	0.6
33	0	0	0	0	0	0	0	0	0	0
34	0.01	1.5	0	0	0	0	0	0	0.01	1.5
35	0.01	1.3	0	0	0.001	0.1	0.0003	0.03	0.01	1.4

1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project II: Technical Guidance

Subproject II-A: Panhandle Region

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

Panhandle Region fisheries management personnel provided private individuals, organizations, public schools, and state and federal agencies with technical review and advice on various projects and activities that affect the fishery resources in northern Idaho. Technical guidance also included numerous angler informational meetings, presentations, and letters, development of the Panhandle Region portion of the 1-800 ASK-FISH program, and fishing clinics.

Authors

Lance Nelson
Regional Fishery Biologist

Ned Horner
Regional Fishery Manager

OBJECTIVES

1. To furnish technical assistance, advice, and comments to other agencies, organizations, or individuals regarding projects that affect fishery resources in northern Idaho.
2. To promote the understanding of fish biology and fish habitat needs and the ethical use of the fishery resource through individual contact, public school curriculum, club meetings, public presentations, informational brochures, and fishing clinics.

METHODS

Regional fisheries management personnel provided both written and oral technical guidance.

RESULTS

The technical guidance provided by Panhandle Region fish management personnel focused on activities that directly affected fishery resources or resource users in north Idaho. Numerous presentations and programs were made to civic and sportsmen's groups throughout the year. Letters were sent to numerous individuals and organizations in response to specific questions about the fisheries in northern Idaho.

School Aquarium Program

Technical advice was provided to public schools in Naples, Kellogg, Plummer, and Coeur d'Alene, Idaho, to develop an educational aquarium curriculum showing the development of fish eggs to fry and the subsequent release of those fish to rivers and lakes in the area. Fish eggs from a Department hatchery and required permits were also supplied for the programs.

Fishing Clinics

Regional fishery management personnel coordinated four Free Fishing Day fishing clinics in the region. Department-sponsored clinics were held in Coeur d'Alene, Mullan, Bonners Ferry, and Round Lake State Park. We also provided fish and guidance for clinics at Priest Lake and St. Maries sponsored by the U.S. Forest Service. The clinics were geared toward teaching young anglers how to fish (casting, baiting hooks, etc.), fish identification, the reasons for regulations, fishing ethics and how to clean fish. The emphasis was on education and not competition. Numerous regional personnel, people from other state and federal agencies, and sportsmen's groups assisted in making the clinics a big success.

1-800-ASK-FISH

Regional fishery management personnel provided information on northern Idaho fishing opportunities for the 1-800-ASK-FISH angler information program. Several tackle shops and local fishing experts were consulted biweekly to provide additional information on fishing activities.

Kootenai River Sturgeon and Burbot

The Panhandle Region Fisheries manager continued to participate in technical discussions with other Department personnel, Kootenai Tribal members, Bonneville Power Administration, Corps of Engineers, U.S. Fish and Wildlife Service, local, state and federal politicians, and other interested parties in an attempt to resolve problems with the aquatic ecosystem in the Kootenai River. Kootenai River white sturgeon *Acipenser transmontanus* were listed as an endangered species under the Endangered Species Act in September of 1994.

Lake Pend Oreille Water Management

The Regional Fisheries Manager continued to participate in efforts to change lake level management on Lake Pend Oreille. The proposal to reduce the existing 11.5 ft drawdown to a 6.5 ft drawdown has met with strong support from the public and equally strong opposition from the Corps of Engineers, electric utility industry, and Kalispell Indian Tribe. Efforts were made to include the Tribe's concerns in the comprehensive study proposal submitted to the Northwest Power Planning Council.

Bull Trout Conservation Plan

The Regional Fisheries Manager and Environmental Staff Biologist participated in an effort to develop a local Conservation Agreement for the Pend Oreille Lake population of bull trout. IDFG, the U.S. Forest Service, Bonner County, timber industry representatives, sportsmen's clubs, and conservation groups were involved in the discussions. If a local Conservation Agreement can be developed and implemented, the U.S. Fish and Wildlife Service has agreed to drop the Pend Oreille bull trout population from conditions that would apply to other bull trout populations when and if bull trout are listed as a threatened or endangered species.

Miscellaneous

The Regional Fisheries Manager provided input on numerous information requests for bull trout as related to the petition to list bull trout under the Endangered Species Act. Several coordination meetings were held with hatchery, research, and enforcement personnel to insure management goals were achieved. Several minor fish kills were addressed. Requests for commercial guiding on regional waters were reviewed and commented on. Input on the upcoming 1996-2000 Five Year Fish Management Plan were solicited from the public.

1993 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program Fisheries Management F-71-R-19

Project III: Habitat Management

Subproject III-A: Panhandle Region

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

In November of 1994, assistance was provided to the Lake Pend Oreille Idaho Club to design and obtain permits for a rock check dam and removable fishway to aid in the passage of spawning kokanee salmon *Oncorhynchus nerka kennerlyi* from Lake Pend Oreille into Trestle Creek.

During the winter of 1994-1995 and the early spring of 1995, the fishway at the outlet of McArthur Reservoir was rebuilt to facilitate fish passage into McArthur Reservoir from Deep Creek.

During March of 1995, a rock check dam and removable fishway were installed near the mouth of Yellowbanks Creek, a tributary to Hayden Lake, to improve upstream fish passage through a road culvert.

Authors:

Lance Nelson
Regional Fishery Biologist

Ned Homer
Regional Fishery Manager

METHODS

Trestle Creek

The detachable fishway design was obtained from a publication by Clancy and Reichmuth (1990) (Figure 1). The design of the rock check dam was a modified version of designs presented by Reichmuth (1993) (Figure 2).

McArthur Dam

The Engineering Bureau of Idaho Department of Fish and Game was responsible for the design and reconstruction of the McArthur Dam and fishway at the outlet of McArthur Reservoir.

Yellowbanks Creek

The design for the rock check dam and removable fishway for Yellowbanks Creek was the same as those for Trestle Creek (Figures 1 and 2).

RESULTS AND DISCUSSION

Trestle Creek

In November of 1994, assistance was provided the Lake Pend Oreille Idaho Club in the design of and permit acquisition for a rock check dam and removable fishway. These modifications were designed to enhance the upstream passage of spawning kokanee salmon *Oncorhynchus nerka kennerlyi* in Trestle Creek.

The rock dam was constructed at the outflow of a Highway 200 cement culvert in a secondary stream channel of Trestle Creek located approximately 0.5 km north of the main stream channel. The dam increased the stream elevation approximately 0.2 m providing fish with less of a jump to access the culvert mouth. Passage through the culvert, once the fish made the jump, was not considered to be a problem.

The removable fishway was installed downstream of the rock check dam in a second, smaller, concrete culvert at the mouth of the secondary channel as it flows into the boat basin at the mouth of Trestle Creek. Large cobble size rocks were placed in the fishway to catch bedload gravel, thus improving the fish passage ability of the fishway. Access to the culvert was improved with the rearranging of several large boulders that were already in the stream channel. The culvert itself was an old cement culvert that was laid at a relatively steep angle. The placement of the removable fishway in the culvert improved passage for spawning kokanee salmon.

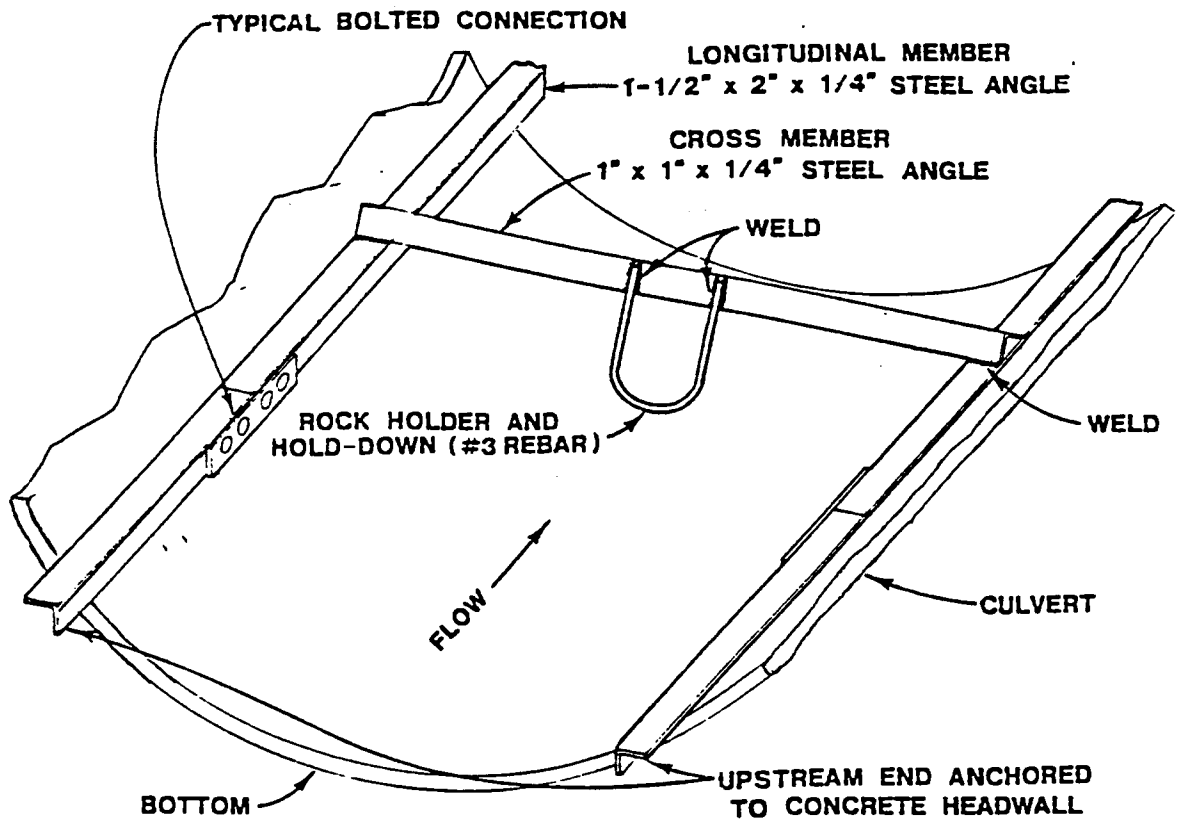


Figure 1. Detail of a fishway for use in culverts (not to scale).

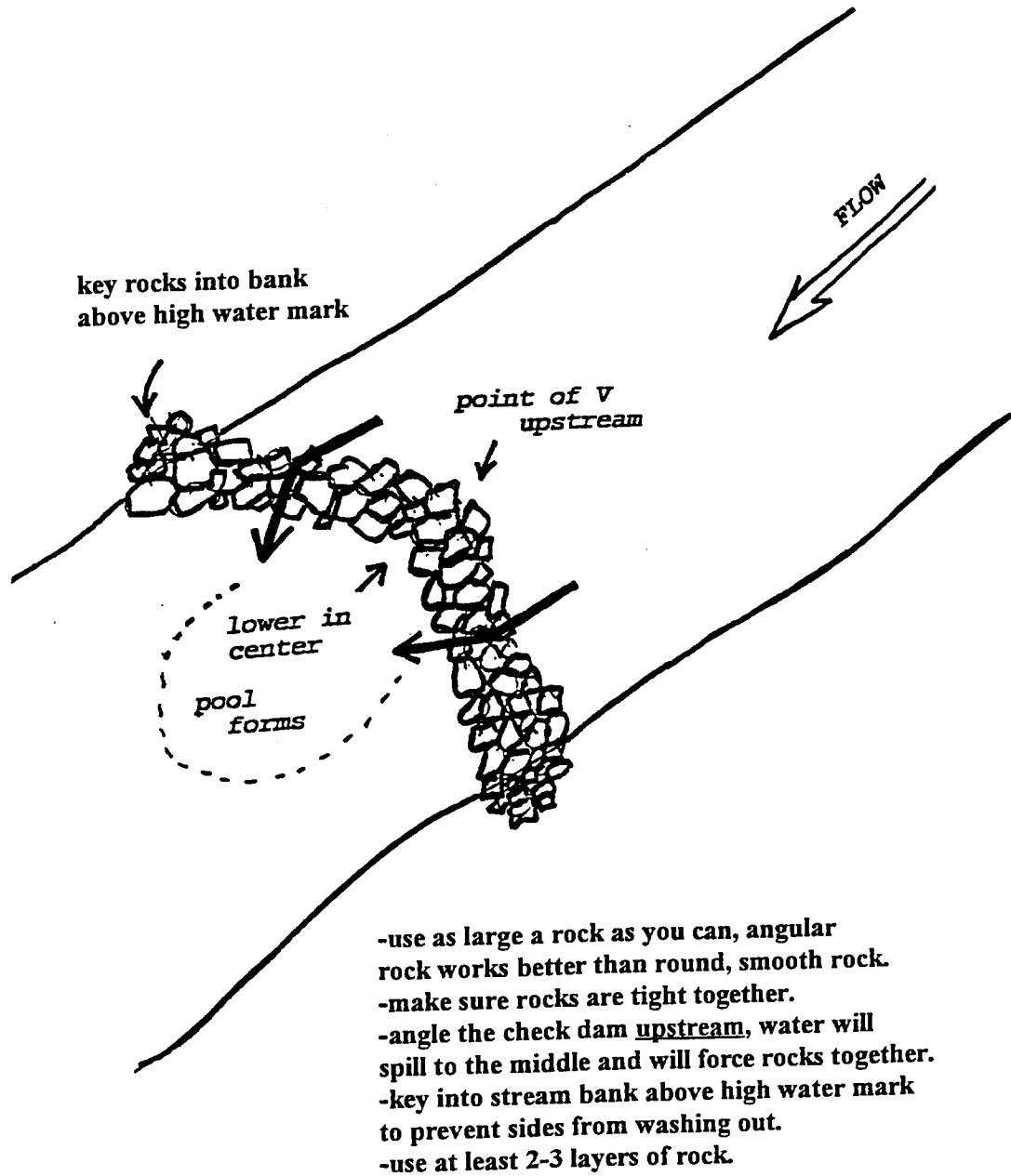


Figure 2. Schematic for the construction of a rock check dam designed to increase water elevation upstream of the dam.

McArthur Dam

During the winter of 1994-1995 and early spring of 1995, the reconstruction of the dam and fishway at the outlet of McArthur Reservoir was completed. Contractors hired by the Idaho Department of Fish and Game removed the southern portion of the McArthur Dam and fishway and rebuilt the structure to allow the passage of fish from Deep Creek into McArthur Reservoir. Associated with the reconstruction of the dam was a lowering of the reservoir level throughout the winter. This reduction in pool level resulted in the death of and loss to entrainment of most of the yellow perch *Perca flavescens* that were in the reservoir. Yellow perch were considered to be overpopulated in McArthur Reservoir, resulting in a stunted population. With the reduction in population size during the drawdown, plans were made to restock McArthur Reservoir with predators that would help control yellow perch numbers in the future and provide anglers with other, more desirable, fish to catch. Largemouth bass *Micropterus salmoides*, black crappie *Pomoxis nigromaculatus*, and bluegill sunfish *Lepomis macrochirus* were selected for transplant to McArthur Reservoir. Prior to any fish being moved to McArthur Reservoir, however, a new management scheme for waterfowl and migratory shore birds was proposed for the system. This new management scenario would involve the yearly drawdown of McArthur Reservoir to encourage aquatic and terrestrial plant growth beneficial to waterfowl and shore birds. As McArthur Reservoir's primary management objective is waterfowl production, the transplant of fish to McArthur Reservoir was canceled. With an annual drawdown, substantial numbers of fish can be expected to be lost from McArthur Reservoir to entrainment and other mortality factors. The yellow perch population will be monitored to determine if the population reduction due to frequent drawdown will result in an increase in the average size of yellow perch in McArthur Reservoir.

Yellowbanks Creek

In March of 1995, a rock check dam and a removable fishway were installed in Yellowbanks Creek to facilitate passage of spawning trout through a road culvert. The North Idaho Fly Casters Club and other volunteers were very instrumental in the completion of this project.

A double culvert through which Yellowbanks Creek flows, several hundred meters upstream from Hayden Lake, has presented passage problems for spawning westslope cutthroat trout *Oncorhynchus clarki lewisi* and rainbow trout *O. mykiss* in the past. The outfall from the culvert dropped 60 to 70 cm even during spring runoff, to a deep plunge pool. This drop, while not a complete barrier to fish, did provide an obstacle that not only stressed the fish but left them vulnerable to unlawful harvest as they gathered in the small pool at the culvert outfall. The construction of the rock check dam, approximately 8 m downstream from the culvert, cut the drop in half. The removable fishway, installed in the south culvert, reduced the water velocity by about two-thirds.

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1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project IV: Population Management

Subproject IV-A: Panhandle Region

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

No lakes in the Panhandle Region were restored with rotenone during this contract period.

One private fish pond, located in the Hayden Lake drainage, was gillnetted to remove an unwanted fish species.

Authors

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Regional Fishery Biologist

Ned Homer
Regional Fishery Manager

OBJECTIVES

1. Eliminate unwanted brook trout *Salvelinus fontinalis* from an unpermitted private fish pond in the Hayden Lake drainage. Brook trout in the Hayden Lake drainage could have deleterious impacts on adfluvial populations of westslope cutthroat trout *Oncorhynchus clarki lewisi* and rainbow trout *O. mykiss*.

METHODS

Regional fishery management and enforcement personnel set gill nets in a private 0.1 ha pond, owned by Mr. Dexil Rold, in the spring of 1995. Explosive devices were thrown into the pond to encourage fish movement and subsequent contact with the gill nets.

RESULTS

During five days of gillnetting Rold's pond, a total of 25 fish were captured. Only one of these fish was a brook trout, measuring 280 mm. The remaining catch consisted of two cutthroat trout, 242 mm and 270 mm in length, and 22 rainbow or rainbow/cutthroat hybrids ranging in length from 200 mm to 470 mm. Netting was discontinued when no fish were present in the gill nets after an overnight set. A warning was issued to the pond owner for failing to obtain proper permits for his fish pond. A Private Fish Pond Permit for the pond was also issued providing for future stocking of the pond. The permit specifically prohibits brook trout. Cutthroat trout and rainbow trout are approved for the Hayden Creek drainage.

RECOMMENDATIONS

1. Inform other state and federal agencies involved in the permitting and/or design assistance of farm ponds as to the Idaho Department of Fish and Game's permit requirements for private fish ponds.
2. Contact commercial fish farms that offer their product to private individuals for private pond stocking as to the Idaho Department of Fish and Game's permit requirements for private fish ponds.

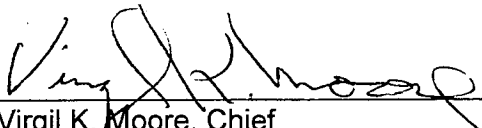
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