IDAHO
DEPARTMENT OF FISH AND GAME

FEDERAL AID IN FISH RESTORATION
2003 Job Performance Report
Program F-71-R-28

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS
CLEARWATER REGION (Subprojects I-B, II-B, III-B, IV-B)

PROJECT I. SURVEYS AND INVENTORIES
- Job a. Clearwater Region Mountain Lakes Investigations
- Job b. Clearwater Region Lowland Lakes Investigations
- Job c. Clearwater Region Rivers and Streams Investigations

PROJECT II. TECHNICAL GUIDANCE
PROJECT III. HABITAT MANAGEMENT

By

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JOB PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-23

Project I: Surveys and Inventories

Subject I-B: 2003 Clearwater Region

Job: a

Title: Mountain Lake Investigations

Contract Period: July 1, 2003 to June 30, 2004

Period Covered: January 1, 2003 to December 31, 2003

ABSTRACT

Surveys were conducted on 15 mountain lakes in the Nez Perce National Forest to fill in gaps in the regional database. Regional personnel continue to compile 12 years of mountain lake management data into a comprehensive database/management plan. The plan addresses alpine lake management at the landscape level. Fifth and sixth level hydrologic unit codes (HUCs) were chosen as the landscape scale for management purposes.

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INTRODUCTION

The High Lakes Fisheries Project was initiated as a cooperative program of the U.S. Forest Service and Idaho Department of Fish and Game (IDFG) in 1986. The goal of the program is to develop baseline ecological data on high mountain lakes within the Clearwater and Salmon River drainages of north central Idaho. During the period 1986 through 2000, 431 individual mountain lakes were surveyed in the Clearwater and Nez Perce national forests (Bahls 1990, Bahls 1991, Bahls 1992, Cochnauer and Phillips 1994, Cochnauer and Murphy 1996, Cochnauer and Murphy 1997, Cochnauer and Murphy 1998, Cochnauer and Murphy 1999, Cochnauer and Peterson 2000). Of these, 211 lakes are on the Nez Perce National Forest and 220 on the Clearwater National Forest.

In 2003, the project continued on the Nez Perce National Forest as a partnership between the Nez Perce National Forest and IDFG. This report presents the findings for the 15 lakes surveyed in 2003.

OBJECTIVES

The objectives of the 2003 survey were to obtain, analyze, and summarize data to be used for:

1. biological, physical, and chemical inventory of mountain lakes;
2. long term monitoring;
3. ecological effect of fish introductions; and
4. development of fish management guidelines for individual lakes.

METHODS

The standardized high mountain lake survey methodology as described by Bahls (1991) was used to survey mountain lakes located in the Selway River (Figure 1) drainage from July 1 to August 30, 2003.

RESULTS AND DISCUSSION

A summary of data collected for each lake is presented in Table 1. Of the 15 lakes surveyed for the initial time, only two (Bear Creek Lake #10, Lone Creek Lake #1) contained fish. Spotted frogs *Rana lutieventris* were observed in all of the lakes except West Fork Three Links Creek Lake #3, while long-toed salamanders *Ambystoma macrodactylum* were observed in only two lakes (Louse Lake and Mud Lake). Salamanders were absent in lakes that supported fish. The following is a description of each lake, including management recommendations.

Figure 1. General location of high mountain lakes surveyed in Nez Perce National Forest, 2003.

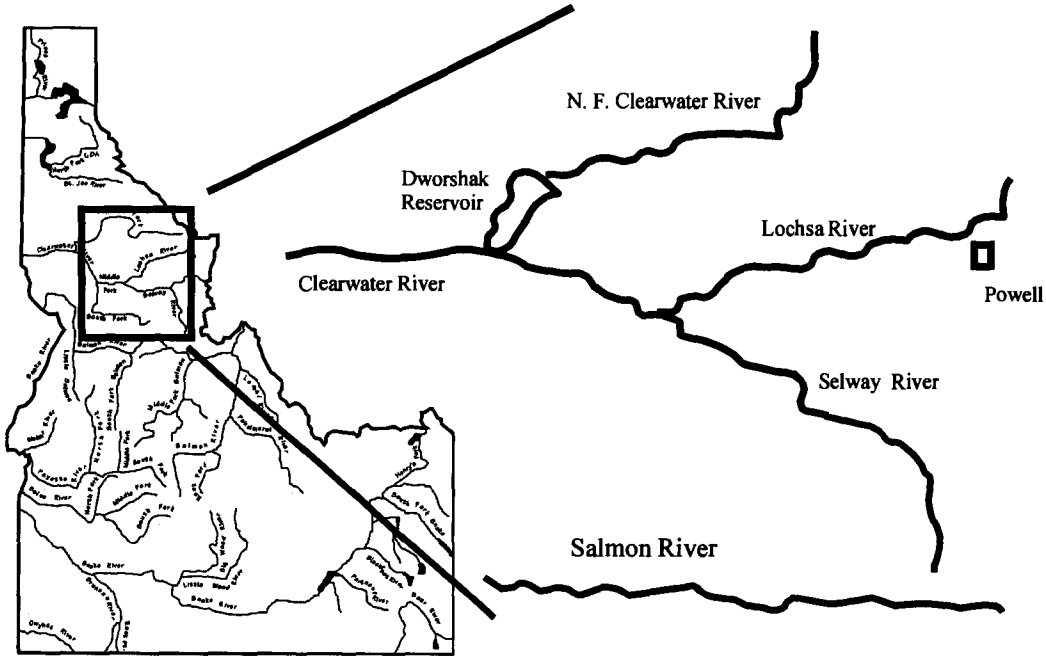

Table 1. Summary of information collected from high mountain lakes surveyed in the Clearwater National Forest, 2003.

Lake Name	Survey Date	Maximum Depth (m)	Fish Present	Amphibians Present
Bear Creek Lake # 10	8/7/2003	<0.5	CT	CSF
Bear Creek Lake # 11	8/7/2003	0.9	None	CSF
Bear Creek Lake # 12	8/7/2003	0.9	None	CSF
Bear Creek Lake # 13	8/7/2003	2.1	None	CSF
Bear Creek Lake # 14	8/7/2003	2.4	None	CSF
Bear Creek Lake # 15	8/7/2003	0.9	None	CSF
Bilk Mountain Lake	8/10/2003	2.4	None	CSF
Lone Creek Lake #1	7/27/2003	2.4	CT, RT	CSF
Louse Lake	7/13/2003	1.8	None	CSF, LTS
Mud Lake	8/11/2003	0.9	None	CSF, LTS
Rhoda Creek Lake	7/28/2003	0.8	None	CSF
West Fork Gedney Creek Lake	7/12/2003	2.6	None	CSF
West Fork Three Links Creek Lake #1	7/24/2003	<0.5	None	CSF
West Fork Three Links Creek Lake #2	7/24/2003	<0.5	None	CSF
West Fork Three Links Creek Lake #3	7/24/2003	Meadow	None	None

CT = westslope cutthroat trout; RT = rainbow trout
CSF = columbia spotted frog; LTS = long-toed salamander

Bear Creek Lake # 10

Bear Creek Lake # 10 is a small, shallow (<0.5m depth) mountain lake with one 8" westslope cutthroat trout *Oncorhynchus clarkii lewisi* present. The lake has no defined inlet or outlet and no spawning habitat. It is probable that the one fish present migrated into the lake in high water and was stranded. The lake supports a small population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

Bear Creek Lake # 11

Bear Creek Lake # 11 is a small, shallow (<2.0m depth) mountain lake with no fish present. The lake supports a large population of spotted frogs. This lake is connected to Bear Creek Lake #12 by a short channel. Fish stocking is not recommended because of the lake's shallow nature.

Bear Creek Lake # 12

Bear Creek Lake # 12 is a small, shallow (<2.0m depth) mountain lake with no fish present. The lake supports a large population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

Bear Creek Lake # 13

Bear Creek Lake # 13 is a small, shallow (<3.0m depth) mountain lake with no fish present. The lake supports a moderate population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

Bear Creek Lake # 14

Bear Creek Lake # 14 is a small, shallow (<3.0m depth) mountain lake with no fish present. The lake supports a moderate population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

Bear Creek Lake # 15

Bear Creek Lake # 15 is a small, shallow (<1.0m depth) mountain lake with no fish present. The lake supports a small population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

Bilk Mountain Lake

Bilk Mountain Lake is a small, shallow (<3.0m depth) mountain lake with no fish present. The lake supports a moderate population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

Lone Creek Lake #1

Lone Creek Lake #1 is a small, shallow (<3.0m depth) mountain lake with cutthroat trout and rainbow trout *O. mykiss* present in both the lake and inlet. The lake supports a moderate

population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature and existing natural reproduction of trout.

Louse Lake

Louse Lake is a small, shallow (<2.0m depth) mountain lake with no fish present. The lake supports a moderate population of spotted frogs and long-toed salamanders. Fish stocking is not recommended because of the lake's shallow nature.

Mud Lake

Mud Lake is a small, shallow (<1.0m depth) mountain lake with no fish present. The lake supports a moderate population of spotted frogs and long-toed salamanders. Fish stocking is not recommended because of the lake's shallow nature.

Rhoda Creek Lake

Rhoda Creek Lake is a small, shallow (<1.0m depth) mountain lake with no fish present. The lake supports a large population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

West Fork Gedney Creek Lake

West Fork Gedney Creek Lake is a small, shallow (<3.0m depth) mountain lake with no fish present and no suitable spawning habitat present. The lake supports a large population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

West Fork Three Links Creek Lake #1

West Fork Three Links Creek Lake #1 is a small, shallow (<0.5m depth) mountain lake with no fish present. The lake supports a moderate population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

West Fork Three Links Creek Lake #2

West Fork Three Links Creek Lake #2 is a small, very shallow (<0.5m depth) mountain lake with no fish present. The lake supports a small population of spotted frogs. Fish stocking is not recommended because of the lake's shallow nature.

West Fork Three Links Creek Lake #3

West Fork Three Links Creek Lake #3 at this time would be more accurately described as a meadow with a small stream meandering through the middle. The stream had neither fish nor amphibians present. Fish stocking is not recommended because of the lake's shallow nature.

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JOB PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-23

Project I: Surveys and Inventories

Subproject I-B: 2003 Clearwater Region

Job: b

Title: Lowland Lakes Investigations

Contract Period: July 1, 2003 to June 30, 2004

Period Covered: January 1, 2003 to December 31, 2003

ABSTRACT

Clearwater Region fisheries management personnel and Conservation Officers checked 70 anglers that spent 116 hours fishing lakes, ponds and reservoirs and caught 240 game fish. Fishery enhancements were conducted by stocking 139,038 fingerling size rainbow trout, 5,196 fingerling size kokanee salmon *O. nerka*, 241,810 catchable size rainbow trout, and 3,366 catchable size channel catfish *Ictalurus punctatus* in regional lowland lakes and ponds. Clearwater Region fisheries management personnel conducted standard surveys of five lowland lakes and a standard smallmouth bass *Micropterus dolomieu* survey in Dworkshak Reservoir. In Dworshak Reservoir, 258 smallmouth bass were collected, ranging in length from 50 to 369 mm.

A fisheries enhancement of Tolo Lake was conducted by transferring 104 largemouth bass *M. salmoides* from Winchester Lake and Mann Lake. Additionally, 1,749 black crappie *Pomoxis nigromaculatus* were removed from Mann Lake and exchanged with the Washington Department of Fish and Wildlife for tiger muskellunge *Esox lucius* X *E. masquinongy*. The tiger muskellunge are used to supplement existing populations in lowland lakes and as an experimental method for brook trout *Salvelinus fontinalis* removal in high mountain lakes.

Eight children's fishing clinics were held on Free Fishing Day, June 7, 2003. An estimated 198 children and 208 adults attended the events. The biggest fish caught was a 23" rainbow trout at Karolyn's Pond.

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OBJECTIVES

1. Utilize hatchery raised fish to provide or enhance fish populations for sport fishing in waters that are limited by a lack of reproduction or excessive fishing pressure or both.

2. Move naturally produced fish from other waters to provide or enhance fish populations for sport fishing in waters that are limited by a lack of reproduction or excessive fishing pressure or both.

3. Control, eradicate or remove undesirable fish from regional waters.

4. Conduct routine, impromptu creel surveys on lowland lakes and reservoirs to track fisheries composition and catch rate.

METHODS

We use tanker trucks of various sizes and standard stocking techniques to stock fish in streams, lakes, ponds and reservoirs. We collect fish for transplanting using standard electrofishing, trapping and netting techniques.

Fish community surveys are performed using Idaho Department of Fish and Game (IDFG) standard survey protocol. Results are reported in catch-per-unit-effort (CPUE). One "unit" of effort consists of: one hour of boat electrofishing, one floating and one sinking gill net, and one trap net. All standard lowland lake surveys in the Clearwater Region utilize one unit of effort per survey. Boat mounted electrofishing was conducted using pulsed D.C. current from a portable generator and a Coffelt VVP-2E pulsator. Standard floating and sinking experimental gill nets were 46 m long by 1.8 m deep with six panels of different size mesh. Mesh sizes were 19 mm, 25 mm, 32 mm, 51 mm, 2", and 63.5 mm square. Indiana style trap nets consisted of a front box maze of two six foot wide by 0.9 m high steel frames with center braces and four 0.8 m diameter hoops with two 203 mm throats, and a 15 m long x 1 m high leader. Mesh size was 19 mm throughout. Fisheries management personnel also utilize these standard electrofishing, trapping, and netting techniques for trapping and transplanting fish.

RESULTS

Fish Stocking and Population Management

We enhanced resident fish populations and sport fishing in lowland lakes and reservoirs of the Clearwater Region by stocking approximately 139,038 fingerling rainbow trout and 5,196 fingerling kokanee salmon in 2003 (Table 1). Lakes, ponds and reservoirs were stocked with 241,810 catchable size rainbow trout in 2003 (Table 2). Additionally, 3,366 catchable size channel catfish were stocked into Winchester Lake, and 104 largemouth bass were transferred from Winchester Lake and Mann Lake into Tolo Lake.

Table 1. Fingerling (192 mm – 152 mm) rainbow trout and kokanee stocked in the lowland lakes and reservoirs of the Clearwater Region, 2003.

Water	Month	Rainbow trout	Kokanee	Total
Mann Lake	May	19,976	0	19,976
Soldiers Meadow Reservoir	May	7,500	0	7,500
Spring Valley Reservoir	May	56,729	0	56,729
Waha Lake	June	16,375	5,196	21,571
Winchester Lake	May	38,458	0	38,458
Total		139,038	5,196	144,244

Table 2. Catchable size (203+ mm) rainbow trout stocked in lakes, ponds, and reservoirs of the Clearwater Region, 2003.

Water	April	May	June	July	August	September	October	Total
Campbell's Pond	2,025	3,861				500	876	7,262
Deer Creek Reservoir	7,808	12,192						20,000
Dworshak Reservoir	38,891	7,152						46,043
Elk Creek Reservoir		8,249	9,408	7,015				24,672
Fenn Pond		485	612	494		500	515	2,606
Five Mile Pond		560	1,592	499	250			2,901
Henrys Gulch Pond		490	1,050					1,540
Hordeman Pond	270							270
Karolyn's Pond		545	450	250		500	575	2,320
Levee Pond		808	648	204		315	622	3,077
Mann Lake	7,595		7,425			7,480		22,500
Moose Creek Reservoir	5,025	4,905	4,380			6,900		21,210
Powell Pond		1,471	498	499		500		2,968
Robinson Pond	1,050	1,981						3,031
Soldiers Meadow Reservoir		10,240						10,240
Spring Valley Reservoir	10,050		15,680	850		10,630	9,730	46,940
Waha Lake	5,250	2,453						7,703
White Sand Pond				494				494
Wilkins Pond			240					740
Winchester Lake		17,673	7,920			10,200		35,793
Total	70,964	60,713	49,735	10,305	250	37,525	12,318	241,810

Clearwater Region personnel collected 1,749 black crappie from Mann Lake on May 1, 2003 using electrofishing gear. These fish, which ranged from 160 mm to 239 mm in total length (Figure 1), were traded to the Washington Department of Fish and Wildlife for tiger muskellunge.

Creel Census

Clearwater Region fisheries management personnel and conservation officers checked 70 anglers that spent 116 hours fishing lakes, ponds and reservoirs and caught 240 game fish in 2003 (Table 3). These sport fisheries provided a catch rate of 2.53 fish per hour. Salmonid fishes accounted for 65% of the catch. The remaining 35% of the catch was made up of bluegill sunfish *Lepomis macrochirus* and largemouth bass.

Figure 1. Length frequency distribution of a sub-sample of black crappie collected from Mann Lake for the Washington Department of Fish and Wildlife on May 1, 2003.

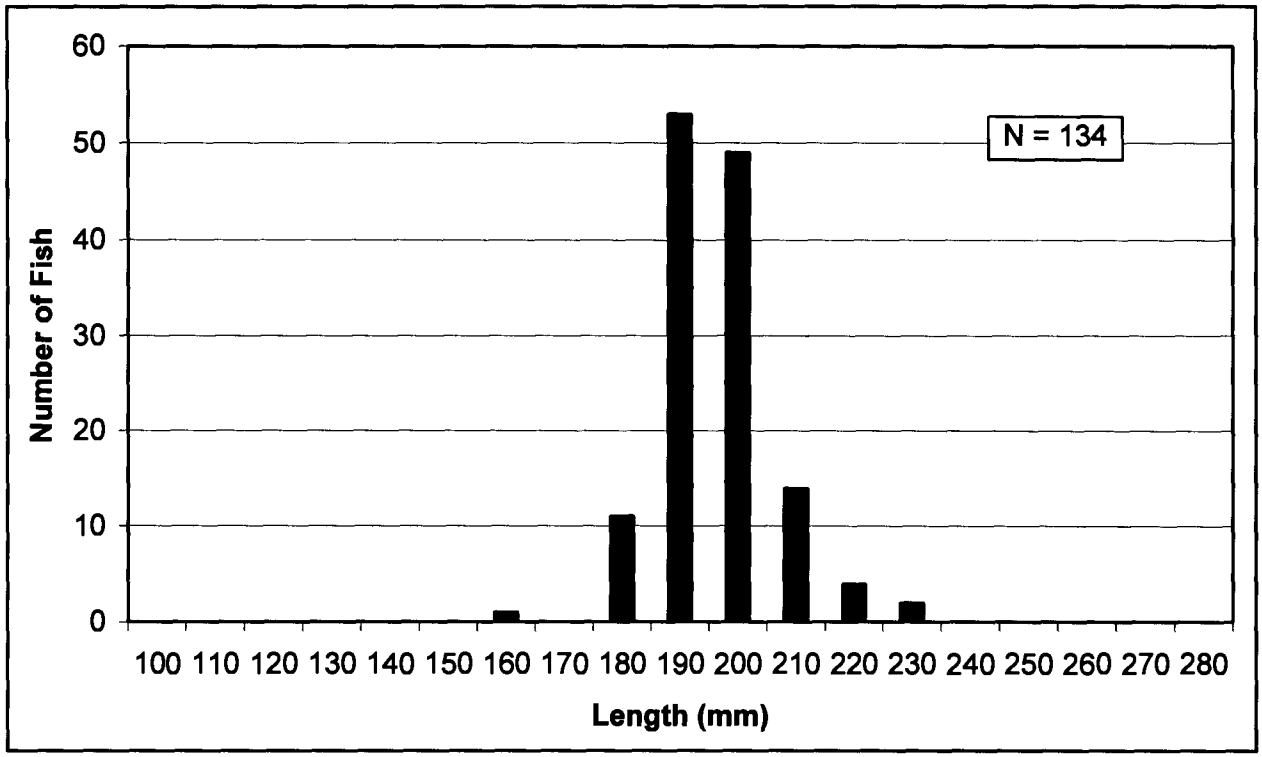


Table 3. Clearwater Region lowland lakes and reservoirs impromptu creel surveys, 2003.

Water/ Date	# Anglers	Total hours	Rainbow trout	Brook trout	Bluegill	Largemouth bass	Total	CPUE
Elk Creek Reservoir								
2/9/03	2	12	39	8			47	3.92
subtotal	2	12	39	8			47	3.92
Moose Creek Reservoir								
1/10/03	4	2	4				4	2.00
subtotal	4	2	4				4	2.00
Spring Valley Reservoir								
1/11/03	16	19	48				48	2.53
1/26/03	1	2	6				6	3.00
2/9/03	3	3	2				2	0.66
6/1/03	31	58	27		79		106	1.83
6/29/03	13	20	22		2	3	27	1.35
subtotal	64	102	105		81	3	189	1.85
Season Totals	**70**	**116**	**148**	**8**	**81**	**3**	**240**	**2.53**

Lake Surveys

Dworshak Reservoir

Over the past several years, IDFG has received numerous inquiries from the angling public regarding the smallmouth bass population in Dworshak Reservoir. Most of these anglers are concerned about a perceived lack of larger fish and have asked IDFG to conduct a study on the status of the smallmouth bass population in the reservoir. In response to these requests, Clearwater Region fisheries management personnel began preliminary work to determine if a full management study is needed. We conducted our annual smallmouth bass monitoring survey in Dworshak Reservoir from May 28-30, 2003. A total of 258 smallmouth bass were collected in 8,632 seconds of electrofishing. These fish ranged in length from 50 to 369 mm (Figure 2). Smallmouth bass length frequencies have been very similar over the past three years, indicating that the population has remained relatively stable during this time period. Smallmouth bass Proportional Stock Density (PSD) increased slightly in 2003 to 10.64 (Figure 3), the second small increase in a row, and supports the stability shown by the length frequency distributions. This is the first time since 1999 that PSD values have been above ten.

In addition to the population survey, a creel survey was conducted on Dworshak Reservoir from March 30-September 27 to provide additional data to determine if a full study is warranted. The results of the creel survey estimated angler effort at 188,305 hours, with a 95% confidence interval of 13,049 hours. This effort resulted in an estimated 214,631 fish caught, with 167,995 of those harvested (Table 4). This is an overall catch rate of 1.14 fish/hour, and a harvest rate of 0.89 fish/hour. Of the fish harvested, 161,501 were kokanee and 2,630 were smallmouth bass. This is a higher level of harvest than was expected. Due to the low PSD values over the past five years, and the high harvest level, it is recommended that an expanded study of smallmouth bass in Dworshak Reservoir be conducted in 2004 to determine if any changes in management strategy could be implemented to improve the population.

Mann Lake

Clearwater Region fisheries management personnel conducted a standard lake survey of Mann Lake on June 16, 2003. This survey resulted in the capture of 219 fish, including black crappie (N = 63), largemouth bass (N = 69), bluegill (N = 55), pumpkinseed *L. gibbosus* (N = 19), and channel catfish (N = 2). Comparisons of catch per unit effort (CPUE) and catch composition between 2001 and 2003 surveys are shown in Figures 5 and 6, respectively. They show a sharp reduction in the number of crappie collected, from 70.8% (N = 155) of fish collected in 2001 to 28.8% (N = 63) of the fish collected in 2003. This drop in numbers has resulted in the shift toward larger size fish seen in the length frequency distribution (Figure 6). Concurrently, we have seen increases in both largemouth bass and bluegill numbers. Length frequency distributions for both largemouth bass (Figure 7) and bluegill (Figure 8) show large increases in the number of young fish, evidence of good recruitment. The largemouth bass population has also seen a large increase in quality size fish, which has resulted in PSD values rising from 4.5 in 2001 to 52.6 in 2003. Pumpkinseed numbers have remained steady, but we have seen a drop in the number of large fish, with only one fish over 200 mm collected in 2003 as compared to 12 in 2001 (Figure 9). The number of channel catfish collected has also stayed steady, while no kokanee were collected in 2003.

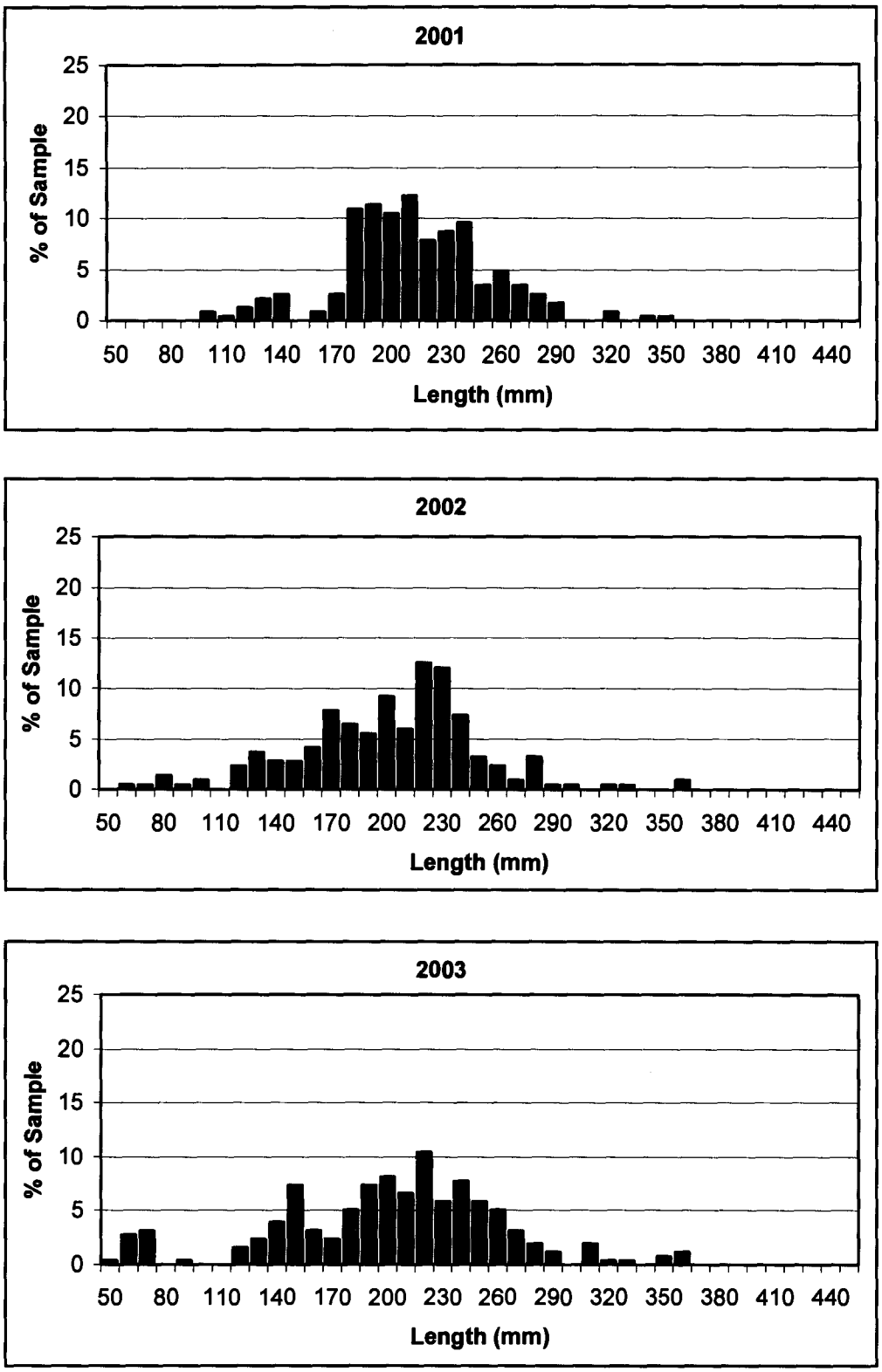


Figure 2. Length frequency distributions of smallmouth bass collected in Dworshak Reservoir, 2001-2003.

Figure 3. Proportional Stock Density values of smallmouth bass collected in Dworshak Reservoir, 1994-1996, 1998- 2003.

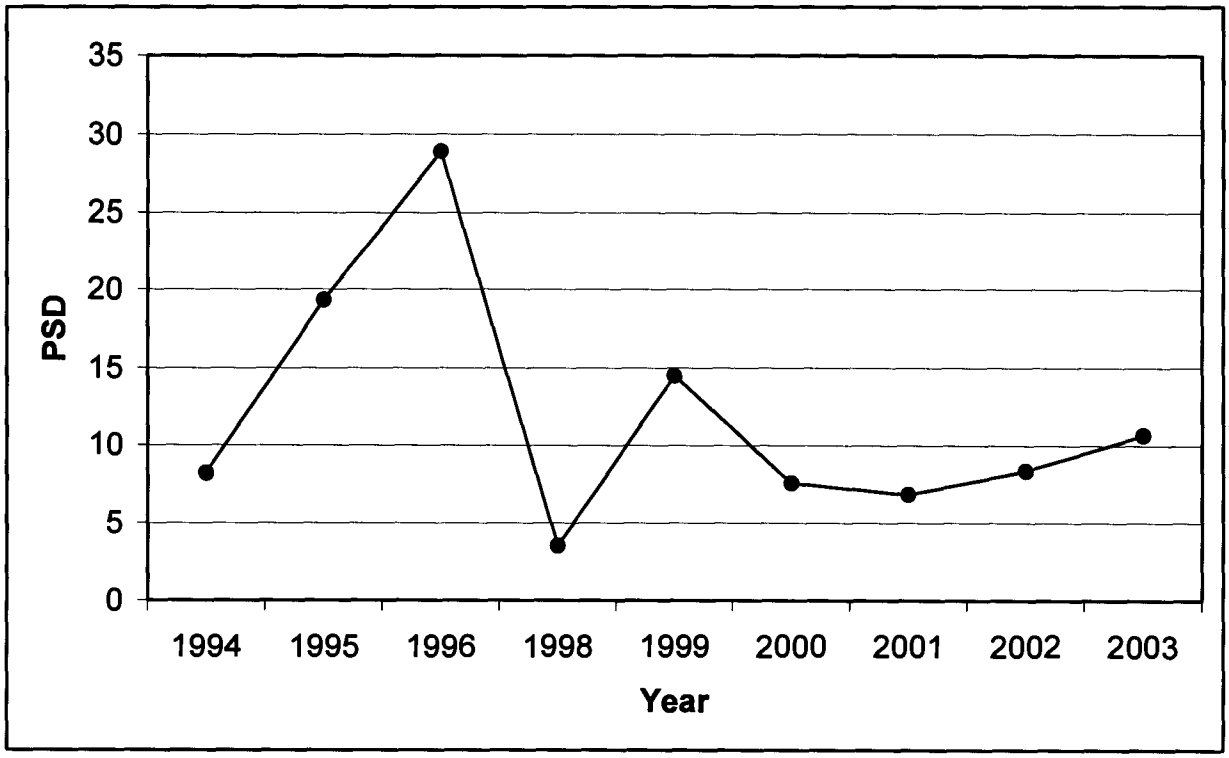


Table 4. Dworshak Reservoir creel survey harvest estimates, 2003.

Species	Estimated Harvest	95 % C.I.
Kokanee	161,510	39,068
Rainbow Trout	1,927	1,137
Cutthroat Trout	362	714
Hybrid Trout	1,035	2,138
Smallmouth Bass	2,630	1,747
Total Harvest	167,995	39,366

Figure 4. Catch-per-unit-effort of fish collected from standard lake surveys of Mann Lake in 2001 and 2003.

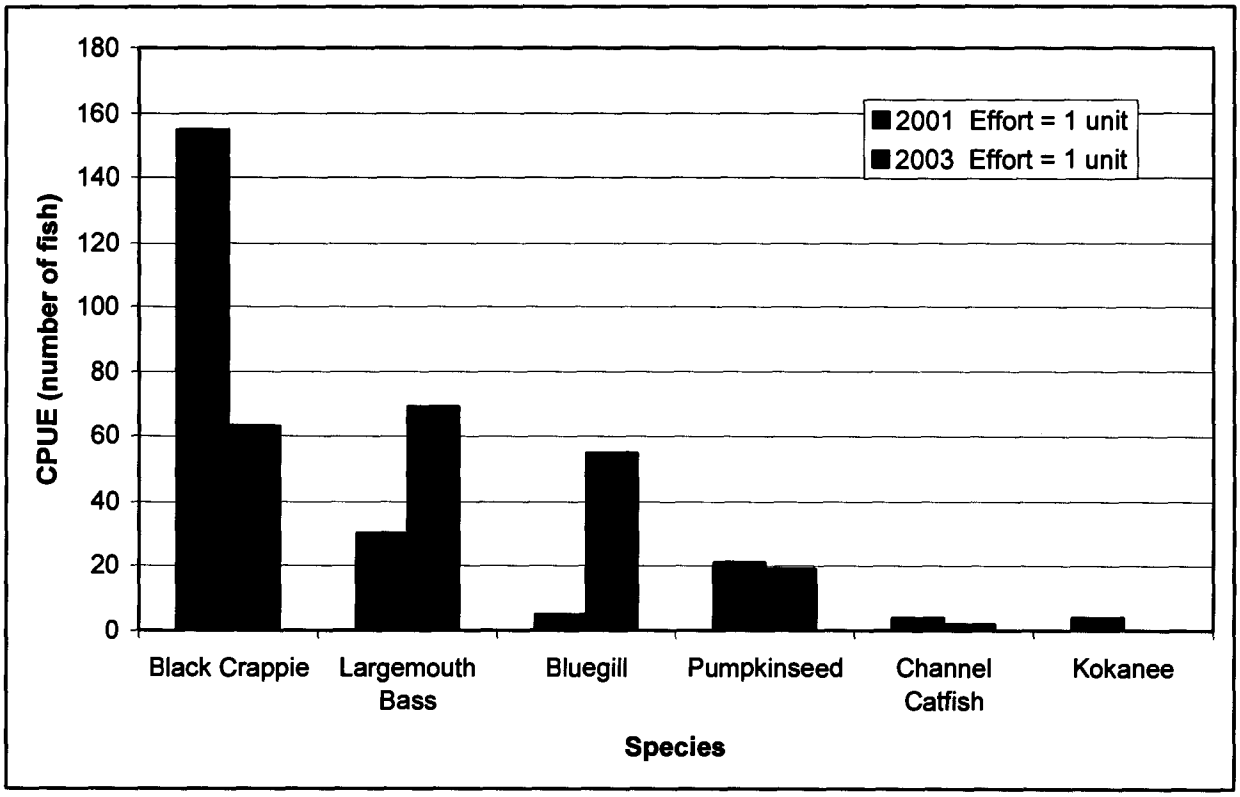


Figure 5. Catch composition of fish collected from standard lake surveys of Mann Lake in 2001 and 2003.

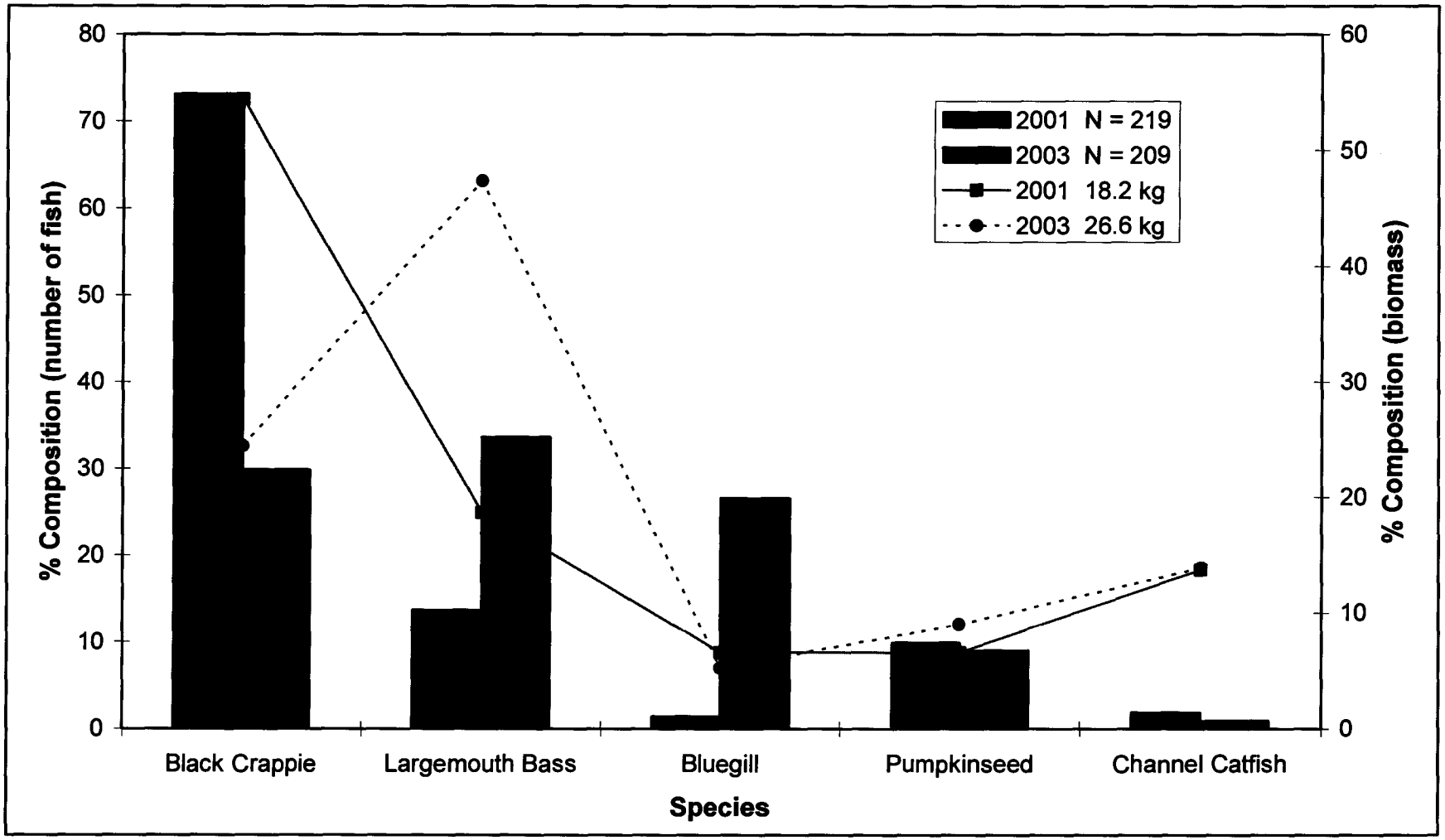


Figure 6. Length frequency distributions of largemouth bass collected from standard lake surveys of Mann Lake in 2001 and 2003.

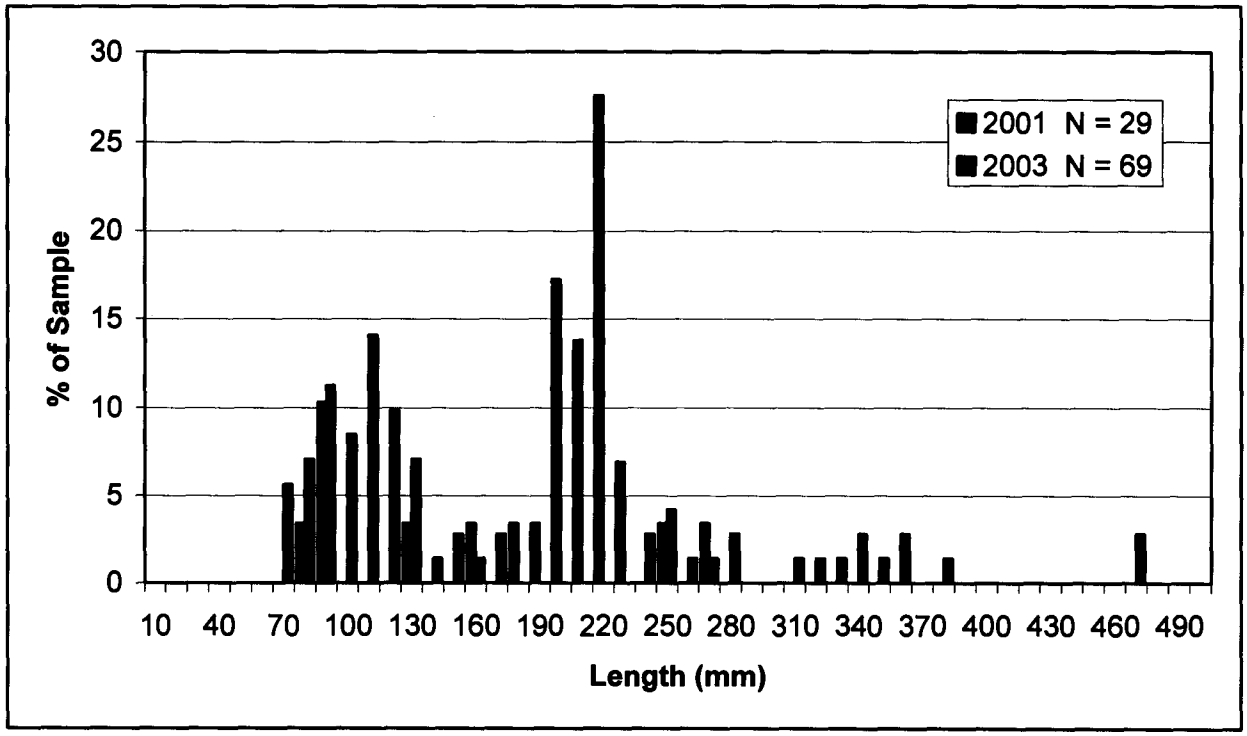


Figure 7. Length frequency distributions of bluegill collected from standard lake surveys of Mann Lake in 2001 and 2003.

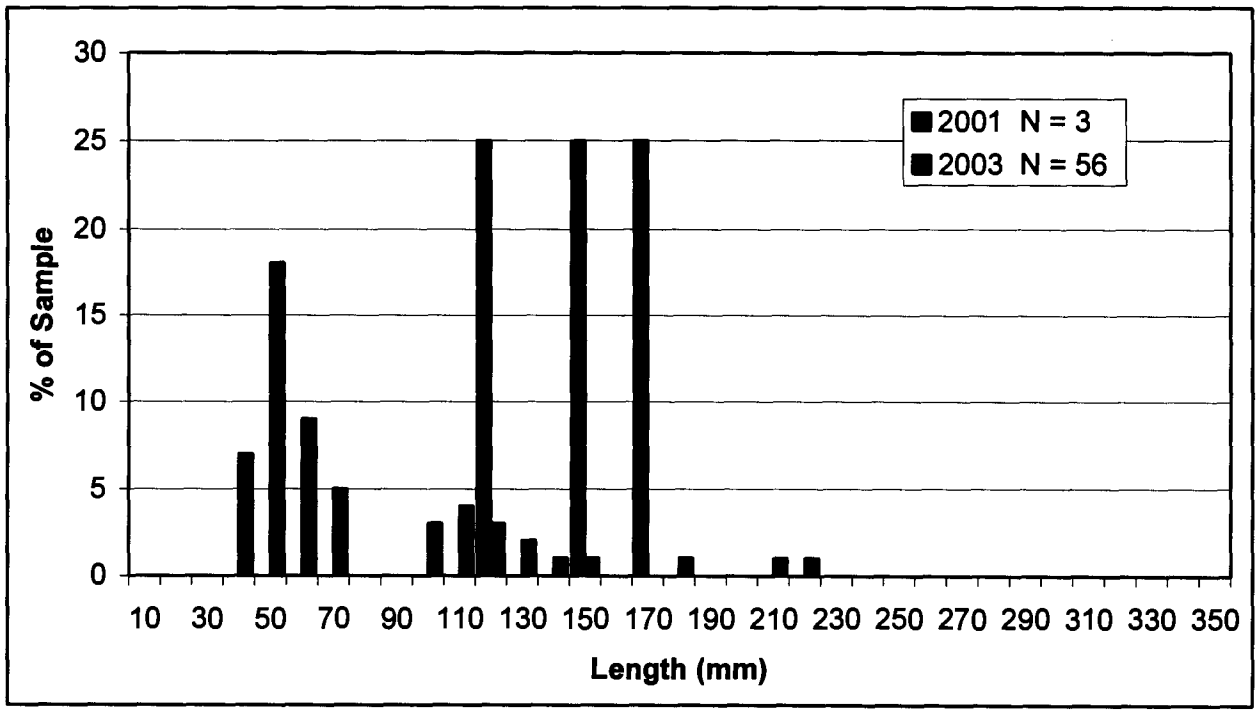


Figure 8. Length frequency distributions of black crappie collected from standard lake surveys of Mann Lake in 2001 and 2003.

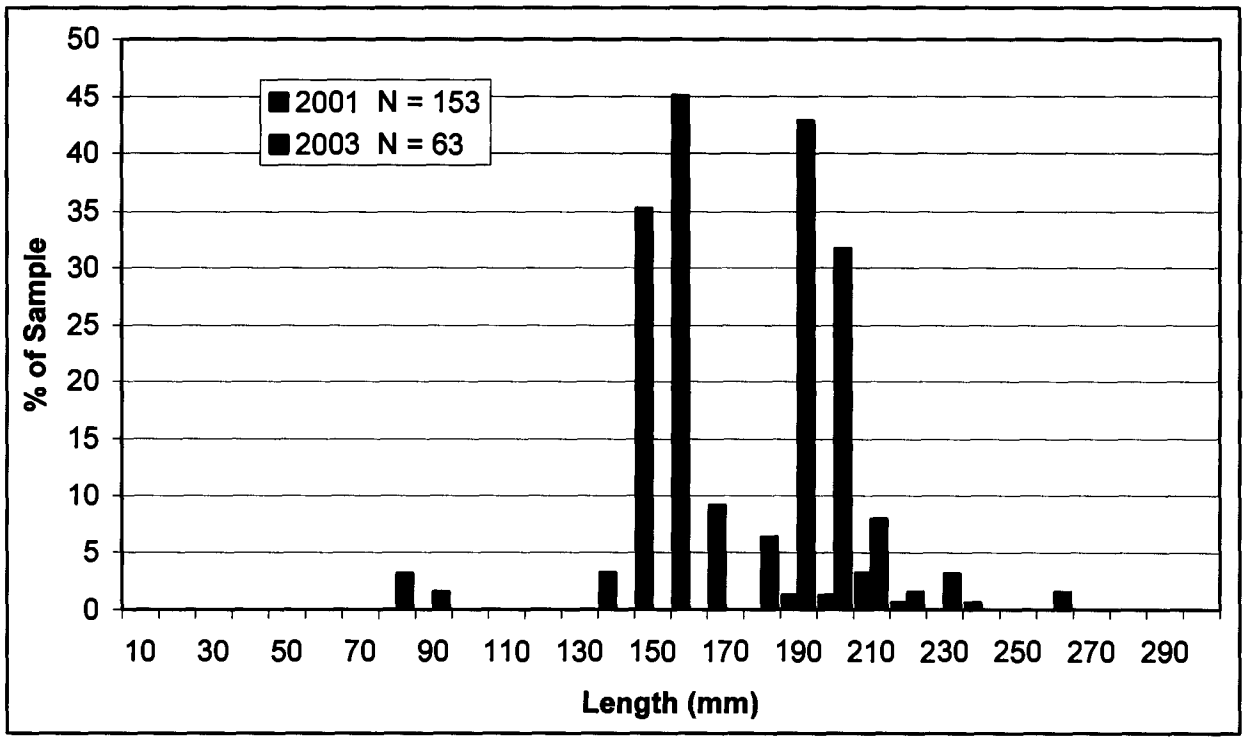
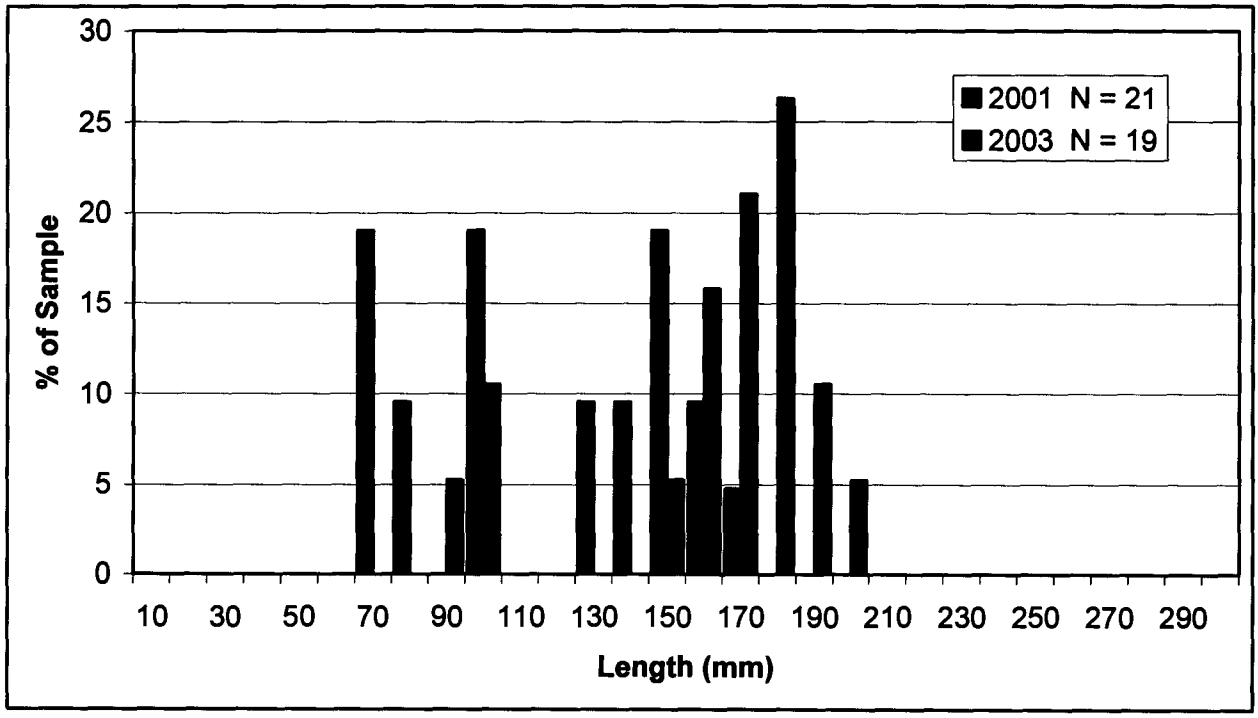


Figure 9. Length frequency distributions of pumpkinseed collected from standard lake surveys of Mann Lake in 2001 and 2003.



Soldier's Meadow Reservoir

Clearwater Region fisheries management personnel conducted a standard lake survey of Soldiers Meadow Reservoir on June 25, 2003. This survey resulted in the capture of 64 fish, including black crappie (N = 55), brown bullhead *Ameiurus nebulosus* (N = 8), and largemouth bass (N = 1). CPUE and catch composition is shown in Figures 10 and 11, respectively. Black crappie accounted for 85.9% of the fish collected. These fish ranged from 120-219 mm in length (Figure 12). Bullhead accounted for 12.5% of the fish collected. These fish ranged from 60-299 mm in length (Figure 13). Only one largemouth bass (340 mm) was collected.

Tolo Lake

Clearwater Region fisheries management personnel conducted a standard lake survey of Tolo Lake on June 24, 2003. This survey resulted in the capture of 350 fish, including white crappie *P. annularis* (N = 337), largemouth bass (N = 10), and bluegill (N = 3). Comparisons of CPUE and catch composition between 1997 and 2003 surveys are shown in Figures 14 and 15, respectively. A massive increase in white crappie number has occurred since 1997 when only seven were collected. However, the fish collected in 2003 were almost exclusively in the 170-190 mm length range, compared to a 250-270 mm range in 1997 (Figure 16). This is indicative of overpopulation and stunting. Ten largemouth bass were collected in 2003 and ranged from 180-439 mm in length (Figure 17). Three bluegill were collected in 2003. These fish were not present in the 1997 sample. This suggests that they either persist in the lake in very low numbers or have been illegally introduced since the 1997 sample. No black crappie were collected in 2003.

Waha Lake

Clearwater Region fisheries management personnel conducted a standard lake survey of Waha Lake on June 23, 2003. This survey resulted in the capture of 80 fish, including smallmouth bass (N = 56), yellow perch *Perca flavescens* (N = 23), and splake *S. fontinalis X S. namaycush* (N = 1). This is substantially fewer fish than were collected in the 1997 (N = 849) and 2001 (N = 211) surveys. Comparisons of CPUE and catch compositions for recent surveys are shown in Figures 18 and 19 respectively. Smallmouth bass numbers have remained fairly steady, with a slight drop in the 2003 sample. A comparison of length frequency distributions shows a decline in the number of smaller bass, and an absence of fish over 260 mm in the 2003 sample (Figure 20). Length frequency distributions for both yellow perch (Figure 21) and splake (Figure 22), show a steady increase in size over time. This is to be expected, as the fish present in the 1997 sample grow, but lose numbers to mortality. However, numbers of both species have declined severely over the last three surveys. We are seeing a lack of small yellow perch which suggests that there is a recruitment problem. As for splake, the reduction in numbers and absence of smaller fish is a result of no splake having been stocked since 1998. No crappie or kokanee were collected during the 2003 sample. The number of kokanee collected has dropped substantially since 1997, when there were numerous fish in the 240-320 mm range (Figure 23). Kokanee fry have been stocked every year from 1999-2002, so this may indicate that there is poor survival of these stocked fish.

Figure 10. Catch-per-unit-effort of fish collected from a standard lake survey of Soldier's Meadow Reservoir in 2003.

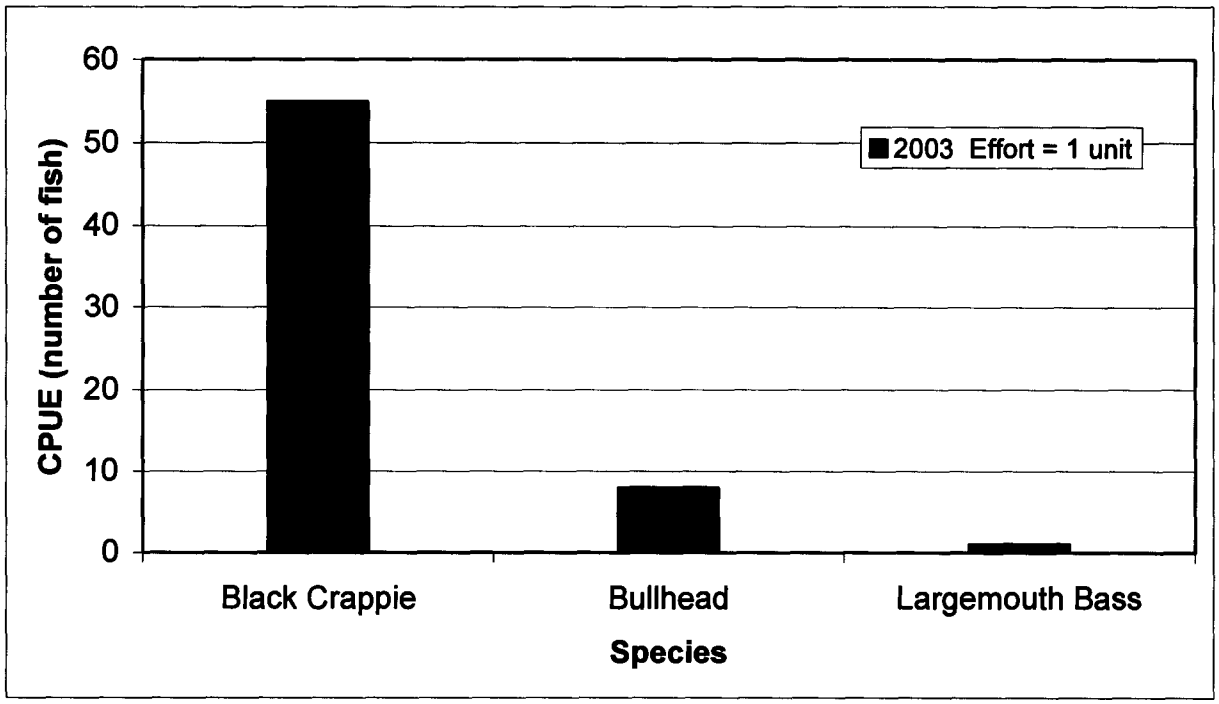


Figure 11. Catch composition of fish collected from a standard lake survey of Soldier's Meadow Reservoir, 2003.

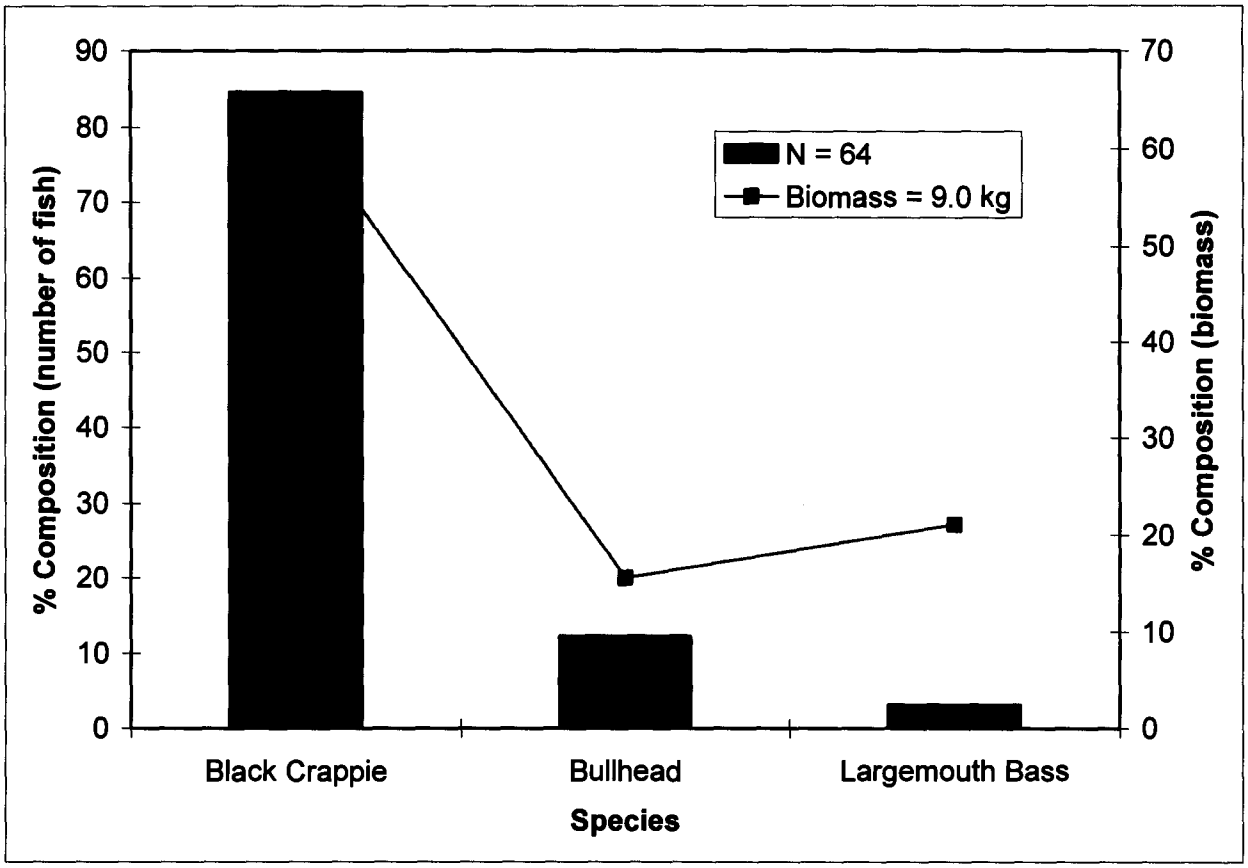


Figure 12. Length frequency distribution of black crappie collected from a standard lake survey of Soldier's Meadow Reservoir in 2003.

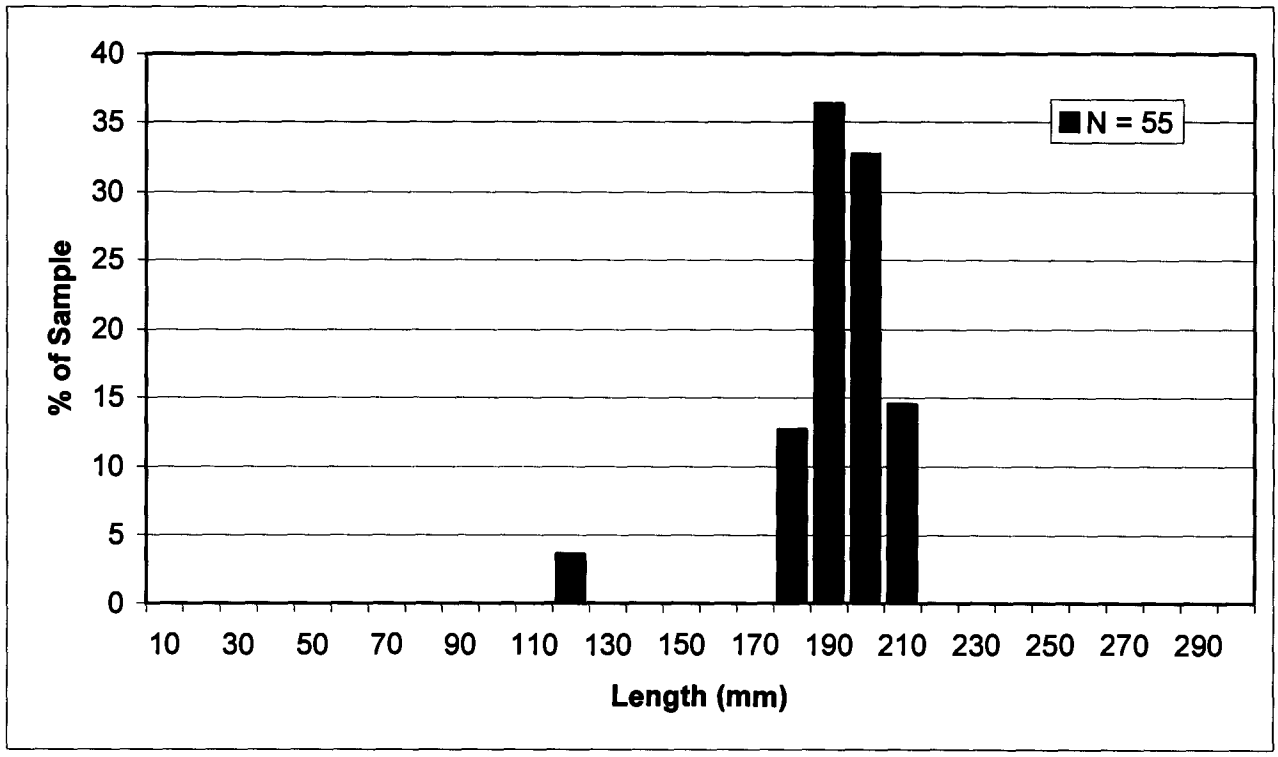


Figure 13. Length frequency distribution of bullhead collected from a standard lake survey of Soldier's Meadow Reservoir in 2003.

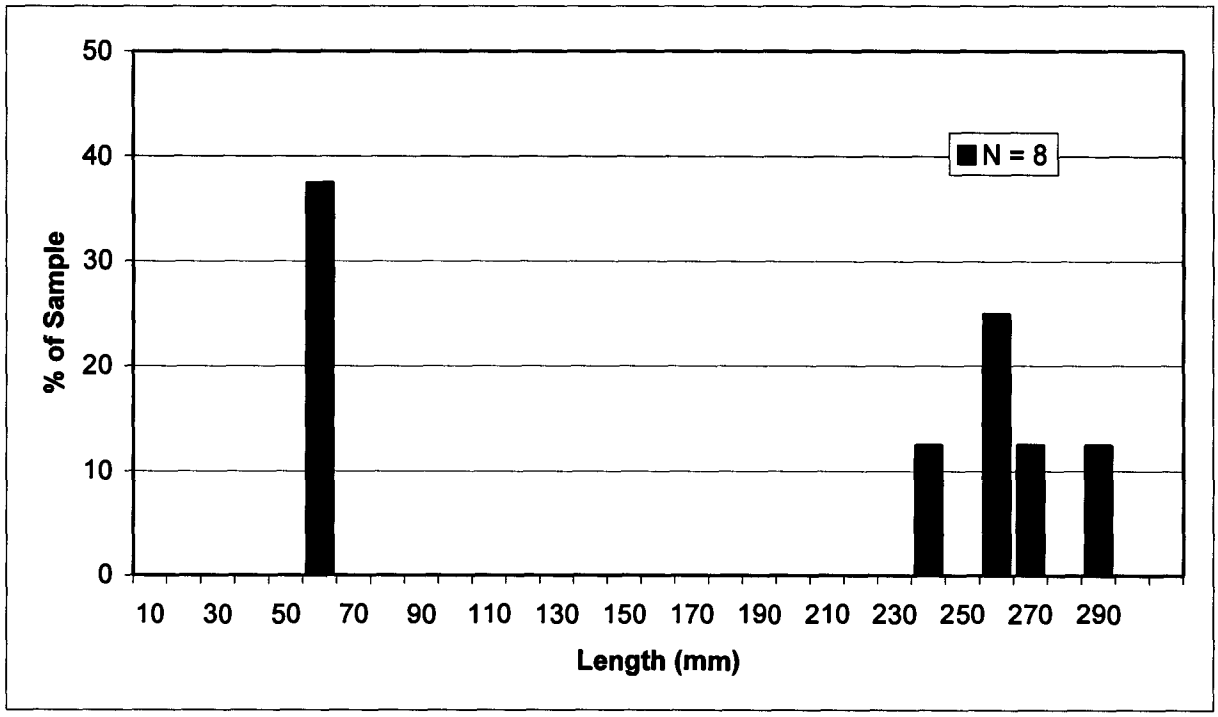


Figure 14. Catch-per-unit-effort of fish collected from standard lake surveys of Tolo Lake in 1997 and 2003.

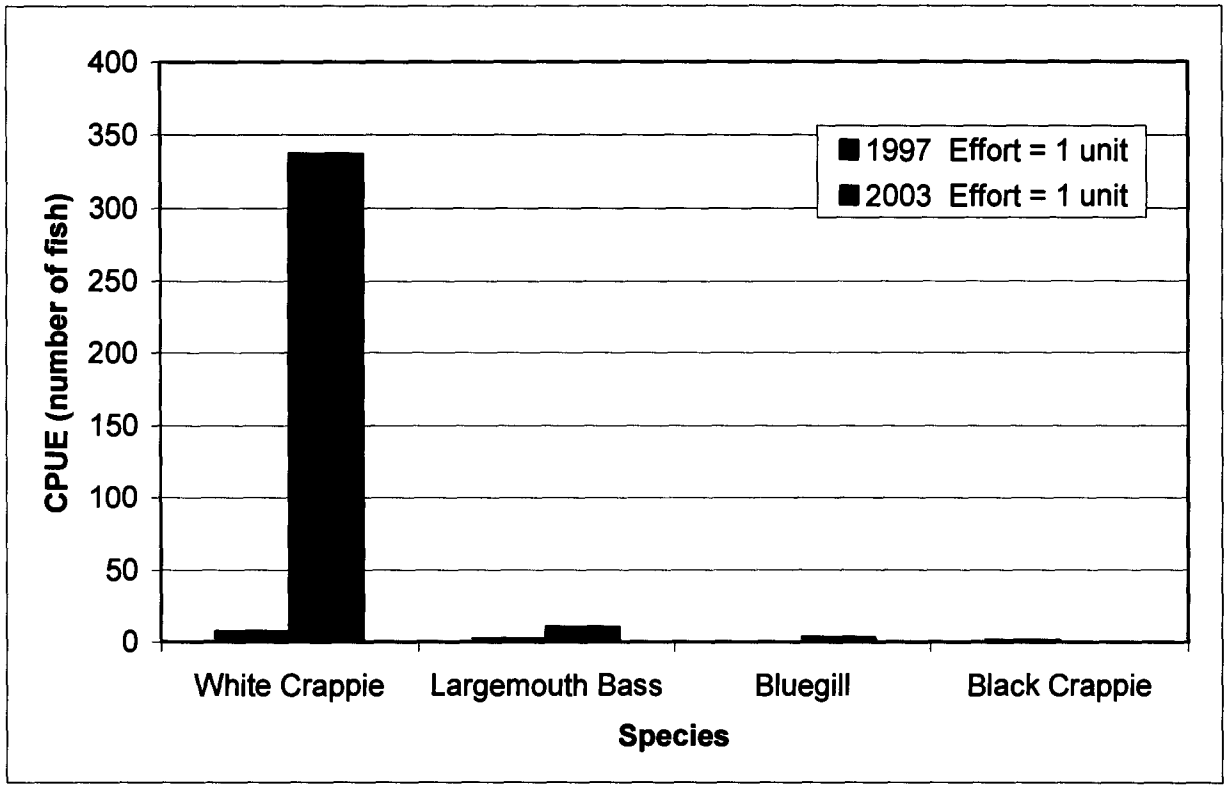


Figure 15. Catch composition of fish collected from standard lake surveys of Tolo Lake in 1997 and 2003.

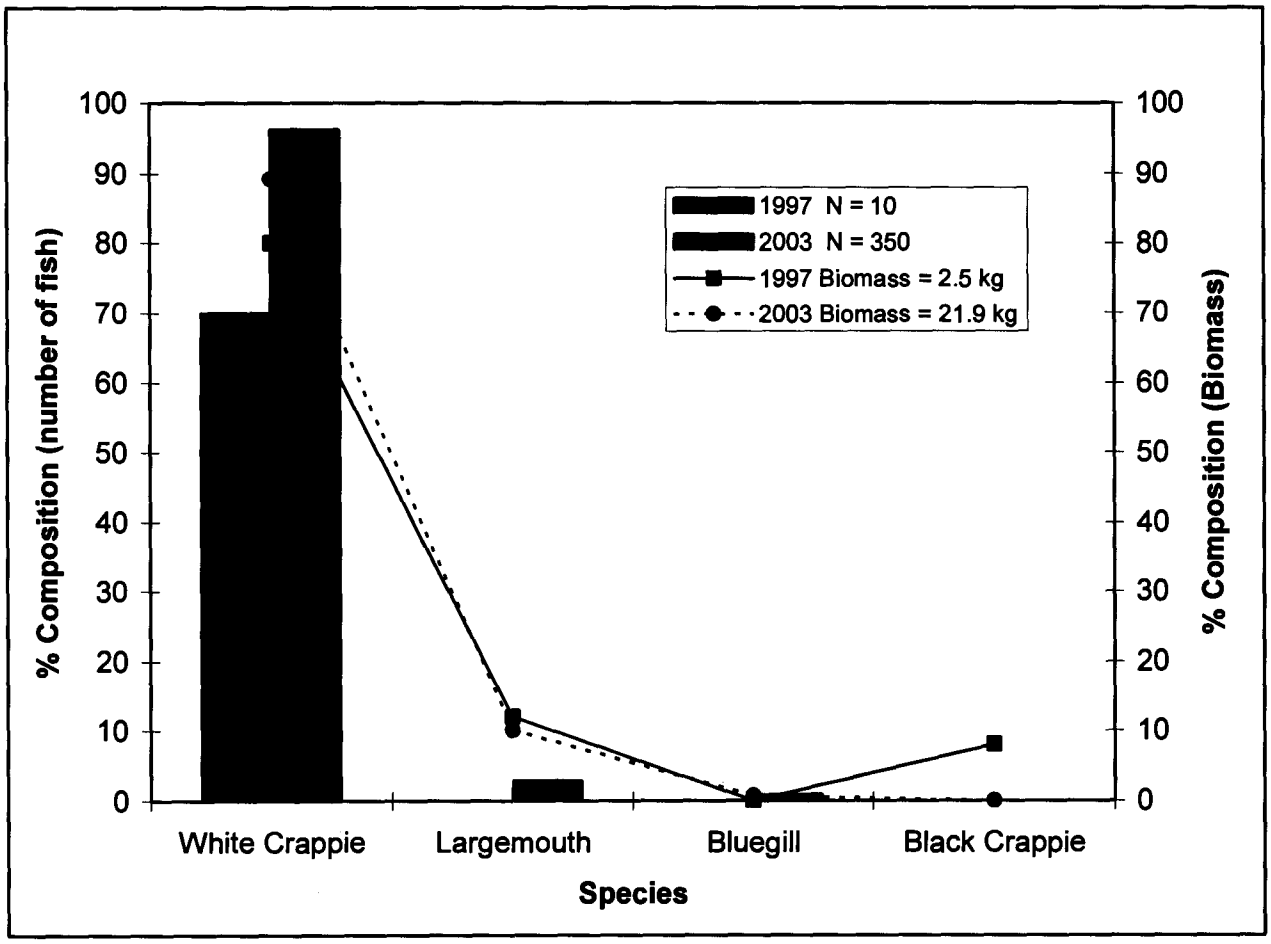


Figure 16. Length frequency distributions of white crappie collected in Tolo Lake, 1997 and 2003.

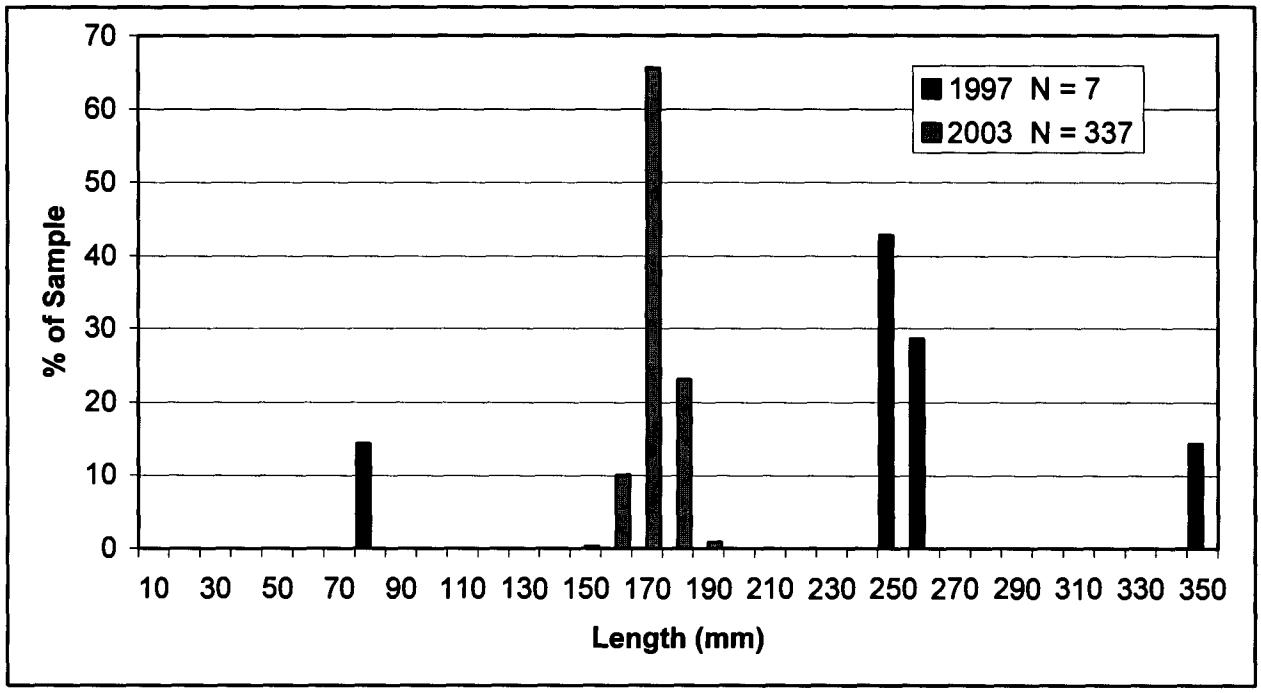


Figure 17. Length frequency distributions of largemouth bass collected from standard lake surveys of Tolo Lake in 1997 and 2003.

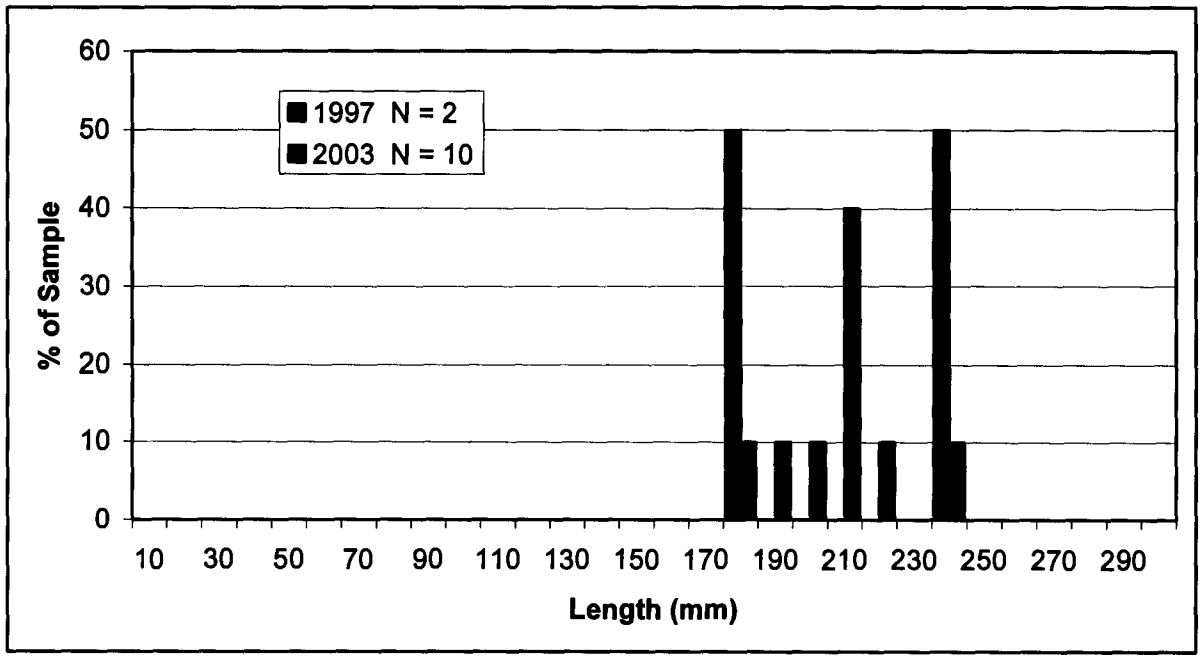


Figure 18. Catch-per-unit-effort of fish collected from standard lake surveys of Waha Lake in 1997, 2001, and 2003.

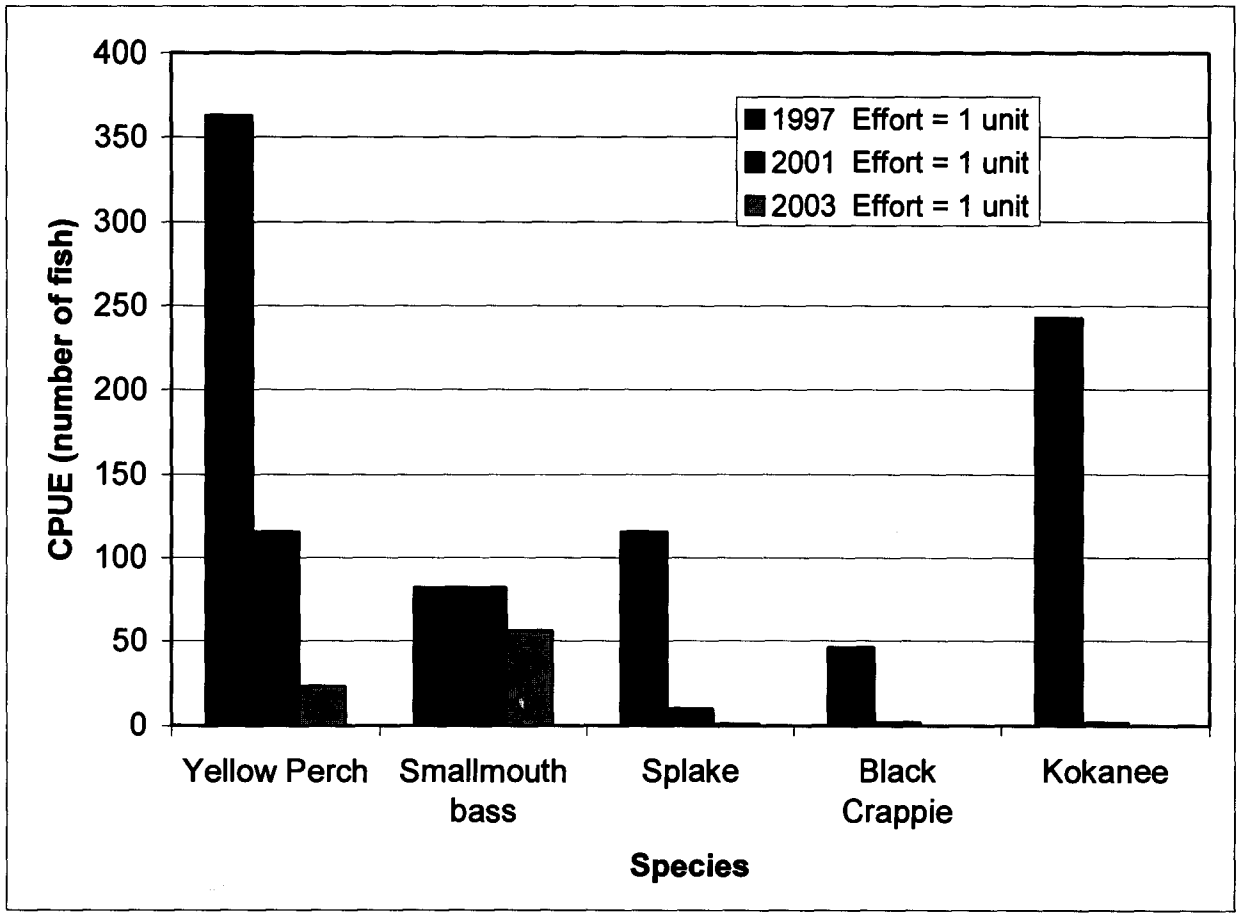
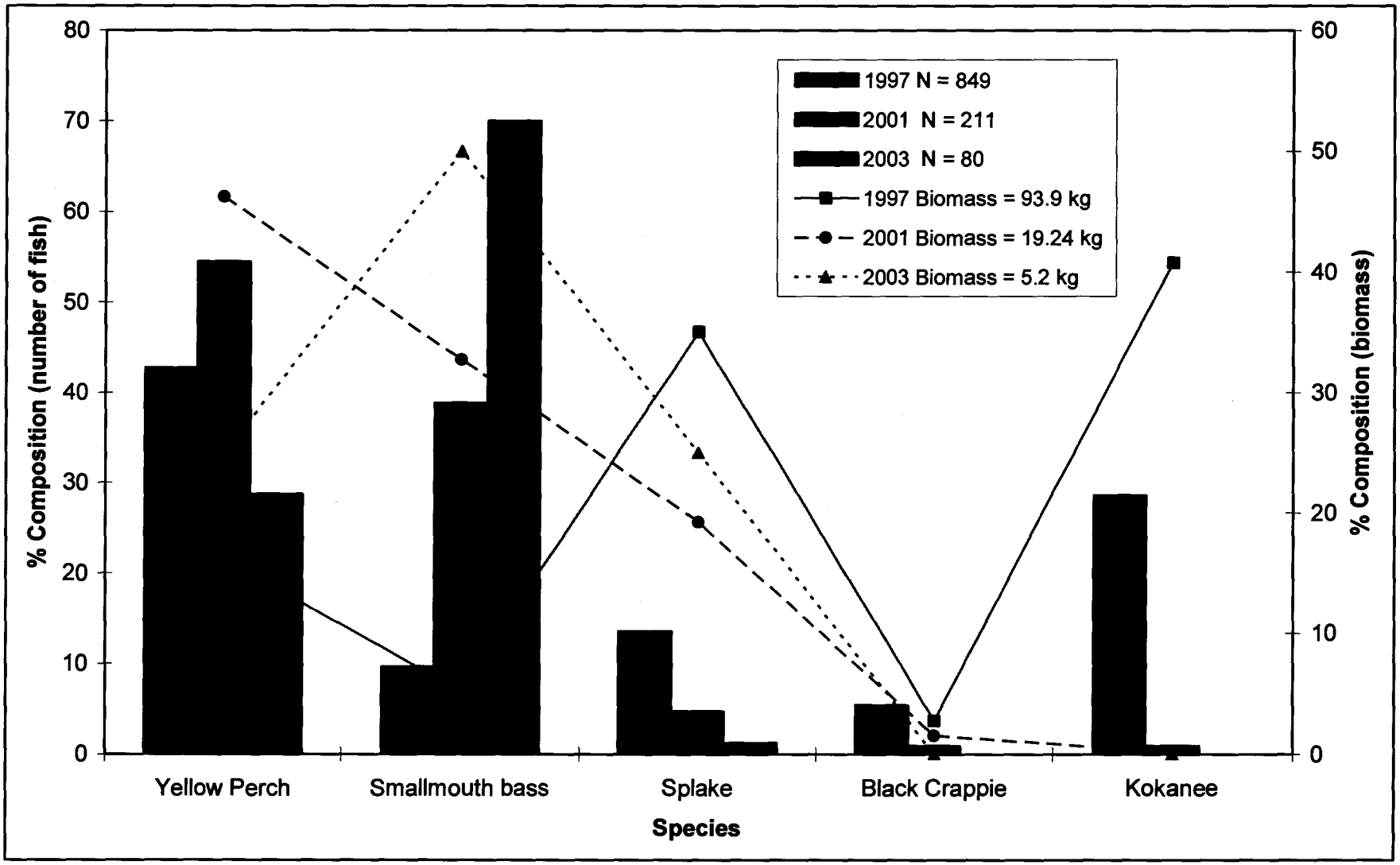


Figure 19. Catch composition of fish collected from standard lake surveys of Waha Lake in 1997, 2001, and 2003.



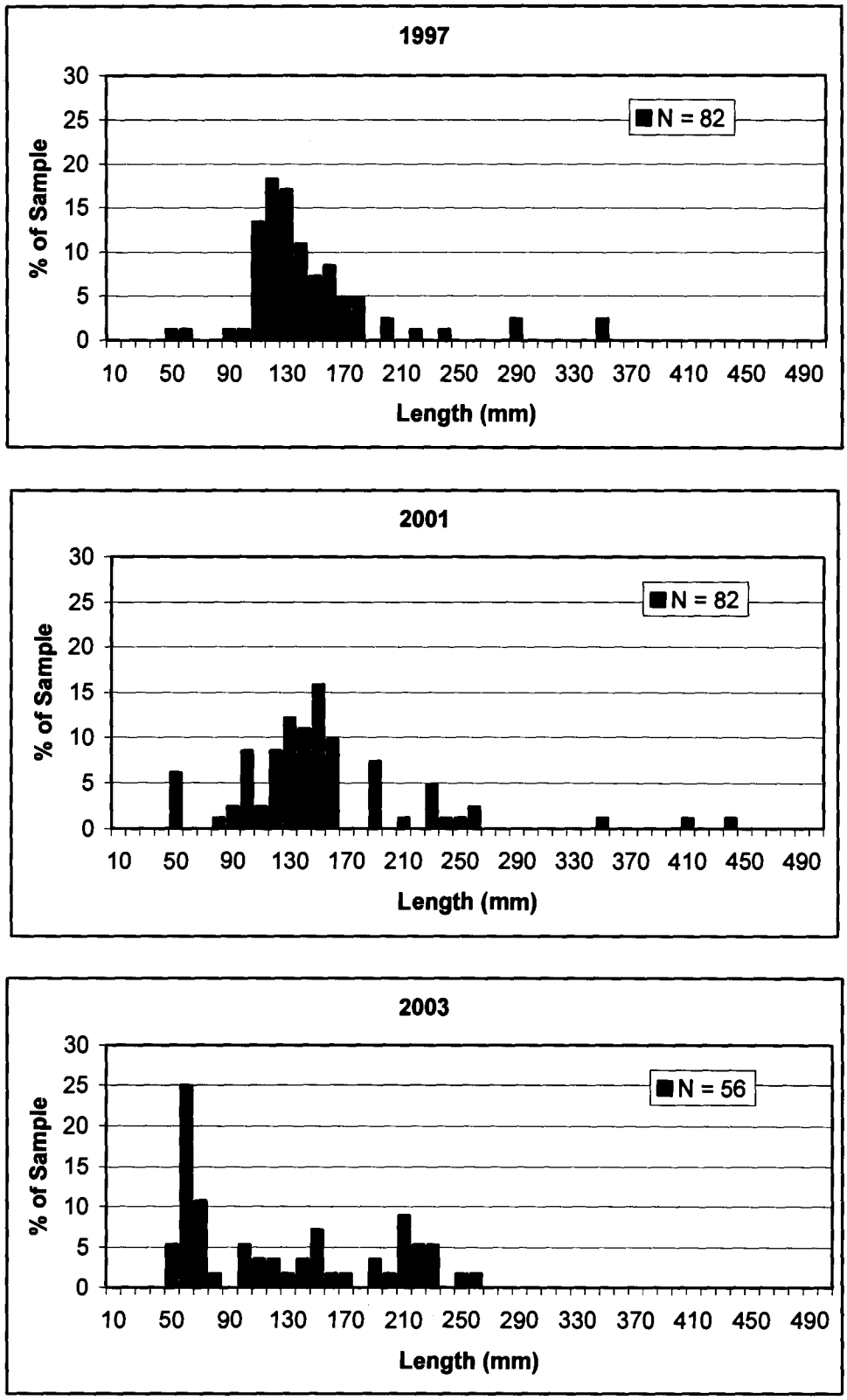


Figure 20. Length frequency distributions of smallmouth bass collected from standard lake surveys of Waha Lake in 1997, 2001, and 2003.

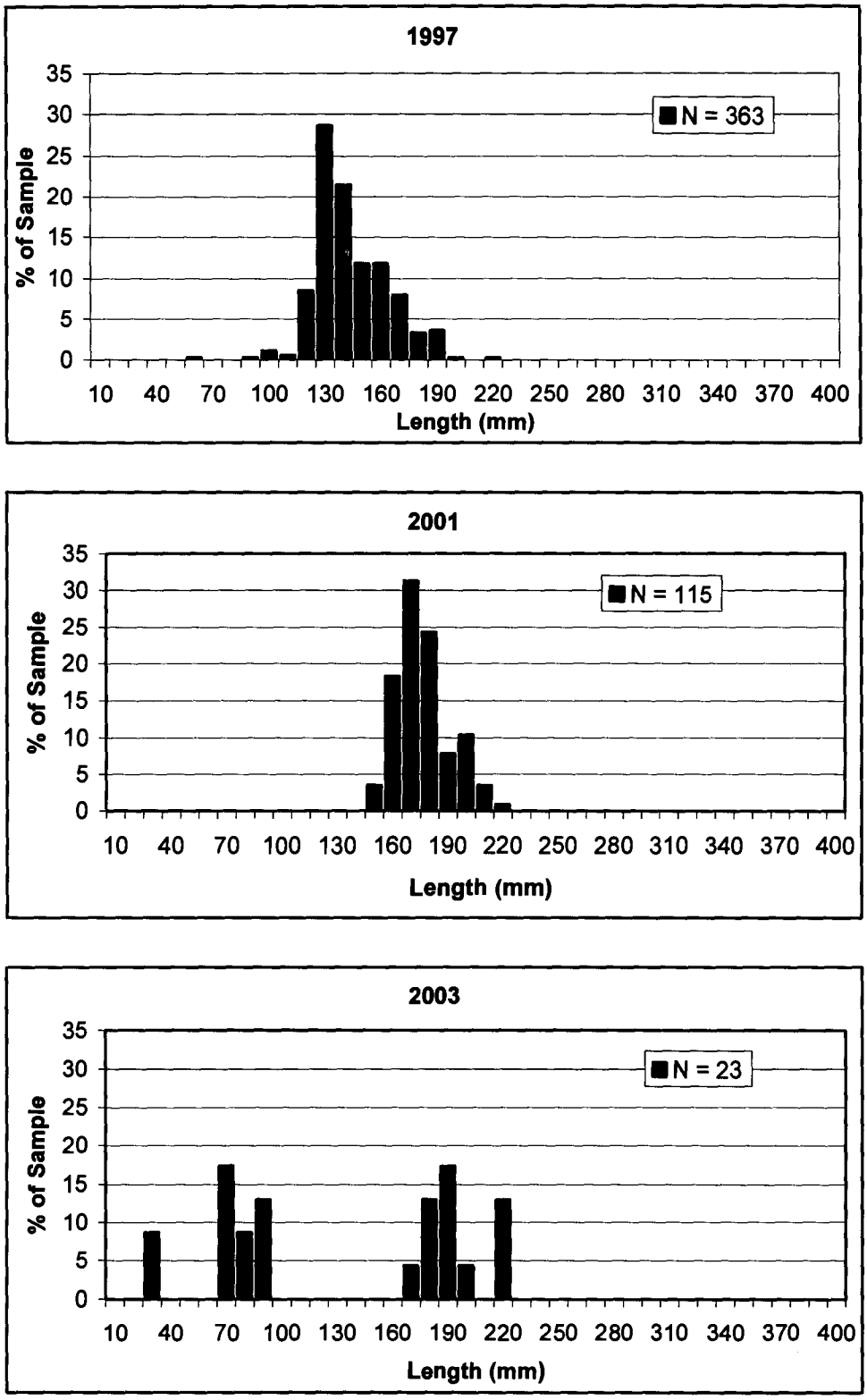


Figure 21. Length frequency distributions of yellow perch collected from standard lake surveys of Waha Lake in 1997, 2001, and 2003.

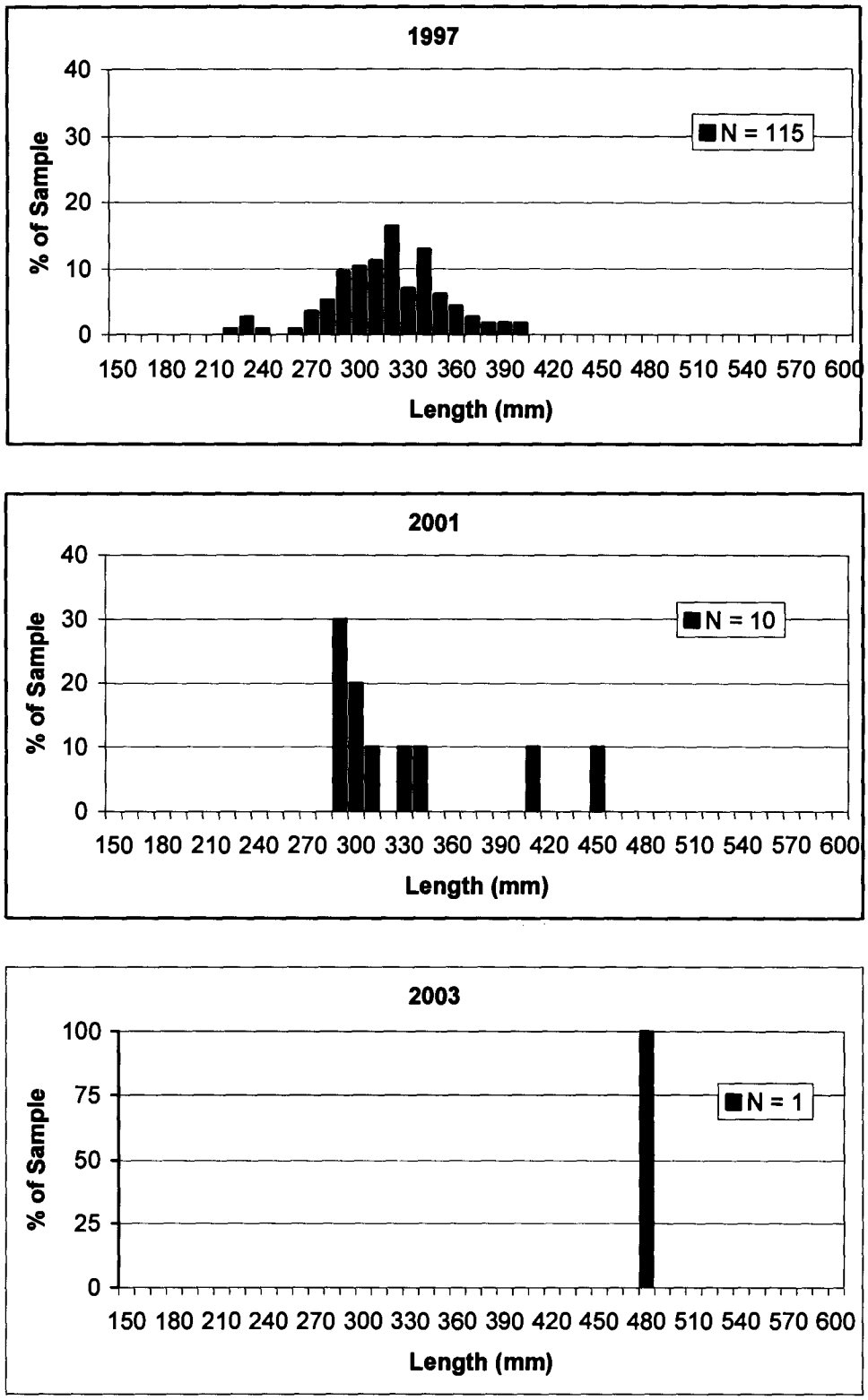
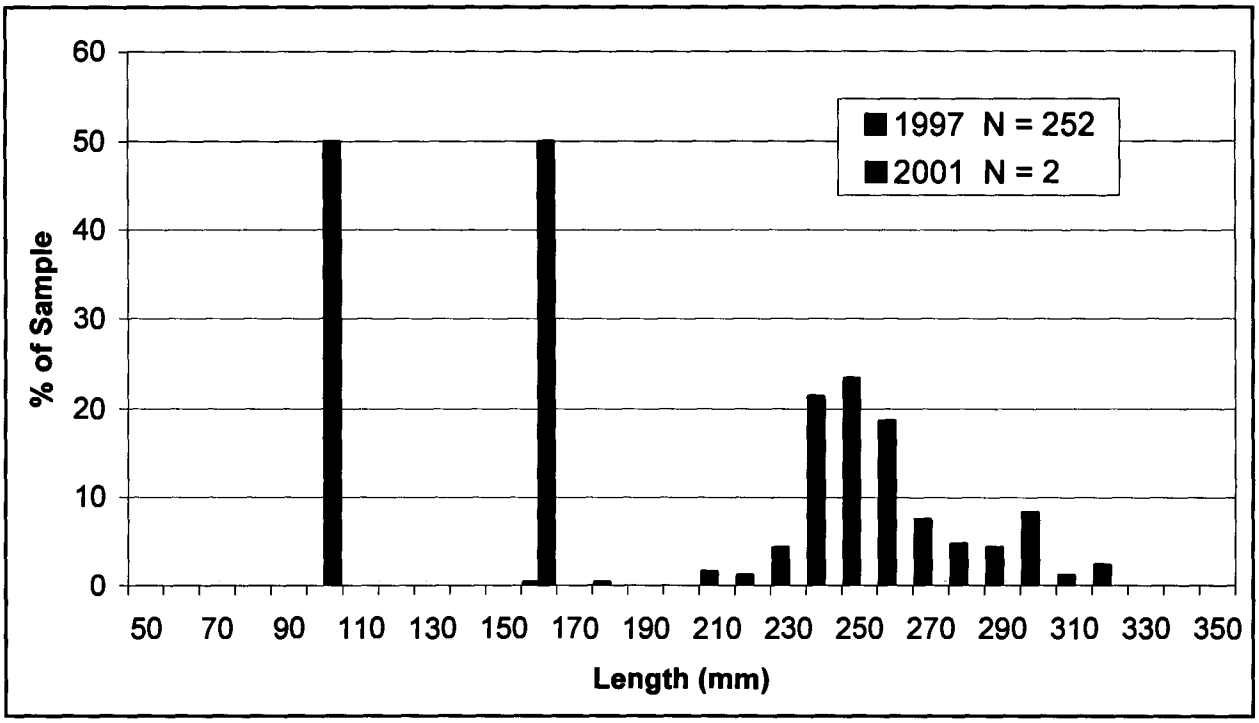


Figure 22. Length frequency distributions of splake collected from standard lake surveys of Waha Lake in 1997, 2001, and 2003.

Figure 23. Length frequency distribution of kokanee collected from standard lake surveys of Waha Lake in 1997 and 2001 (no kokanee collected in 2003).



Winchester Lake

Clearwater Region fisheries management personnel conducted a standard lake survey of Winchester Lake on June 19, 2003. This survey resulted in the capture of 294 fish, including largemouth bass (N = 105), bluegill (N = 81), yellow perch (N = 100), black crappie (N = 5), brown bullhead (N = 1), and tiger muskellunge (N = 2). Comparisons of CPUE and catch compositions for surveys conducted in 1997, 2000, 2001, and 2003 are shown in Figures 24 and 25, respectively. Largemouth bass numbers have been declining steadily over this time. However, a comparison of length frequencies (Figure 26) shows a trend toward more large fish and several distinct age classes in 2003 which was not evident in previous samples. Largemouth bass PSD had dropped tremendously from 35 in 1997 to a low of 1.4 in 2001 (Figure 27). In 2003, it recovered slightly to 8.7. Bluegill numbers have remained fairly steady, but a comparison of length frequency distributions (Figure 28) shows a slight shift to larger fish from 2000 to 2003. Yellow perch numbers were back up in 2003 after very few were collected in 2001. These fish ranged in length from 50-269 mm (Figure 29). Black crappie, another popular game fish in the lake, has also seen a drop in numbers since the 1997 survey. Winchester Lake should be sampled again in 2004 to monitor the decline in popular game fish and the effect of the hypolimnetic aeration system.

Figure 24. Catch-per-unit-effort of fish collected from standard lake surveys of Winchester Lake in 1997, 2000, 2001, and 2003.

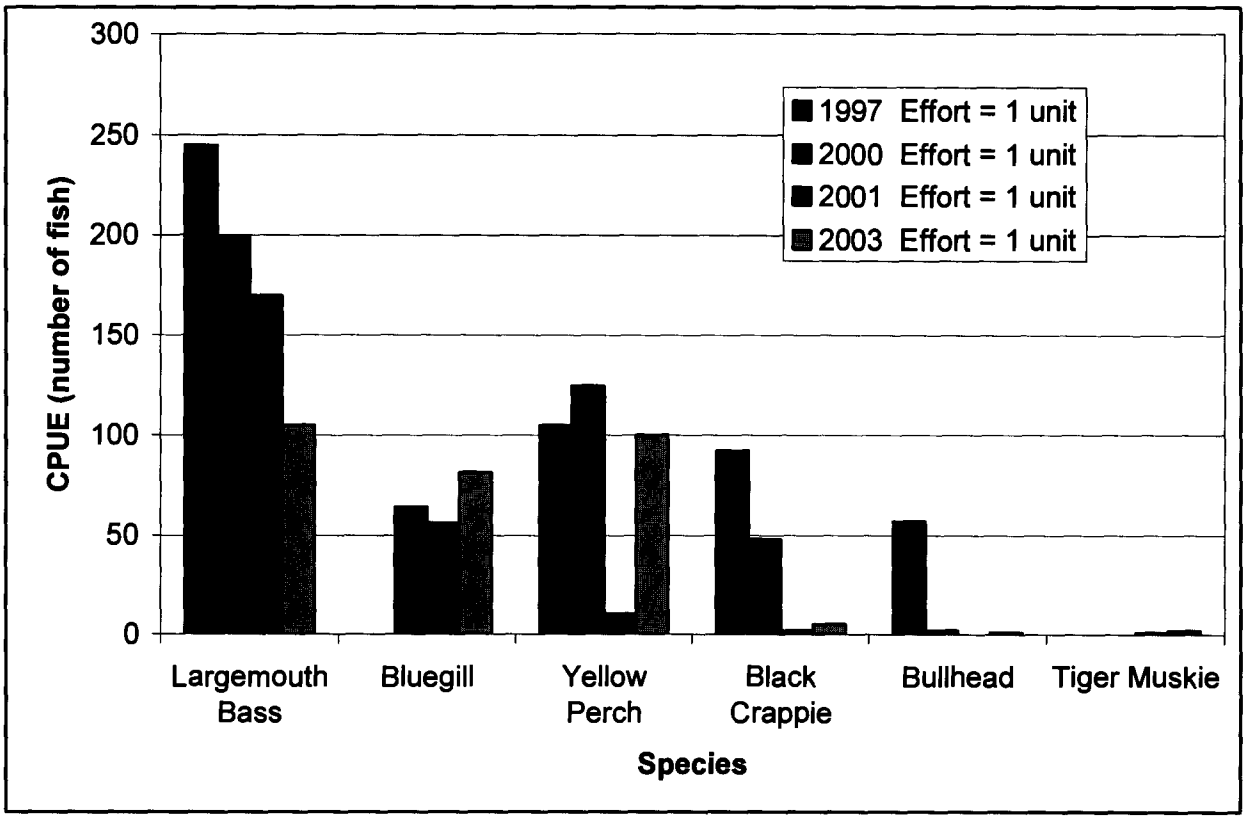
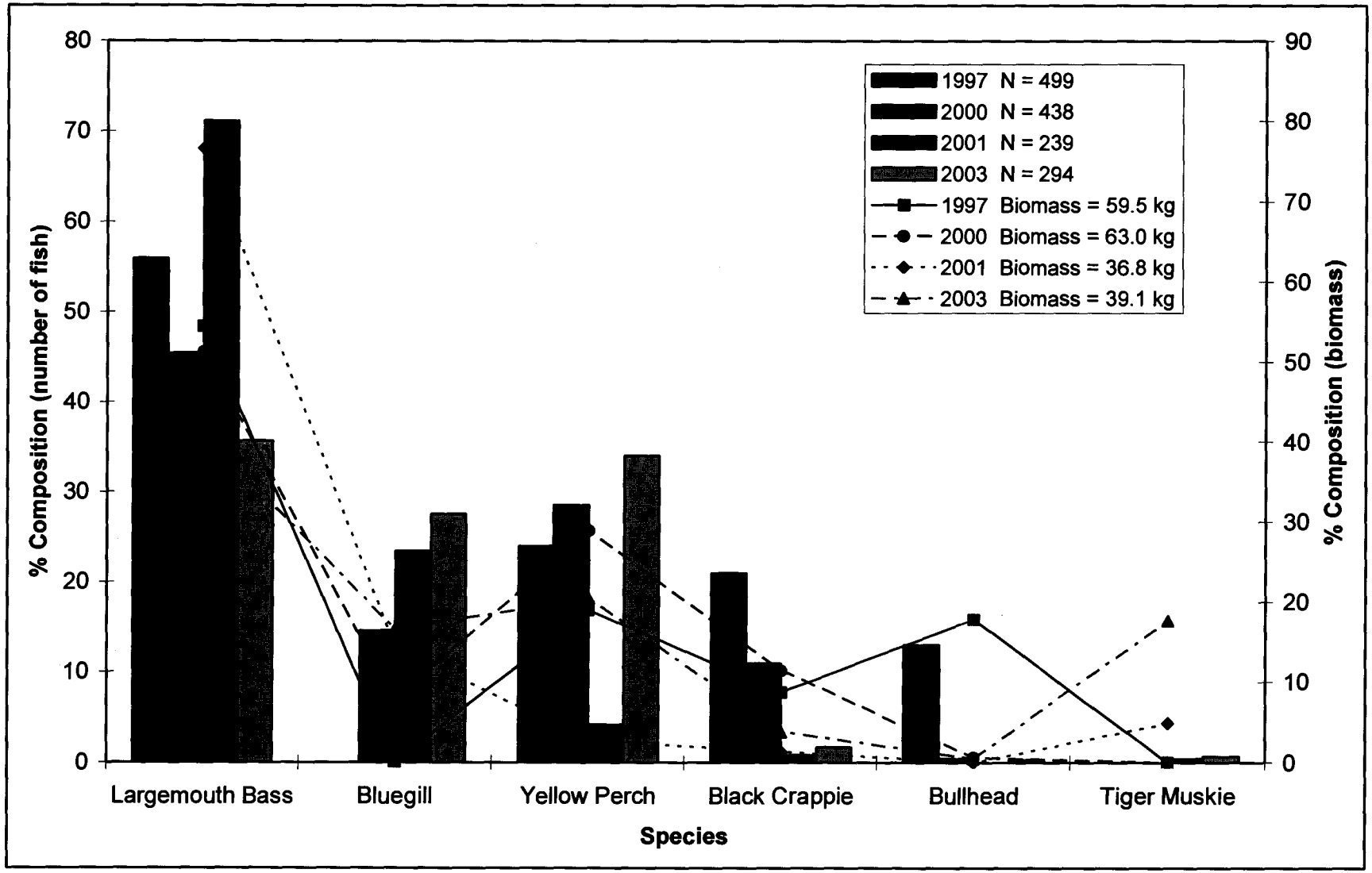


Figure 25. Catch composition of fish collected from standard lake surveys of Winchester Lake in 1997, 2000, 2001, and 2003.



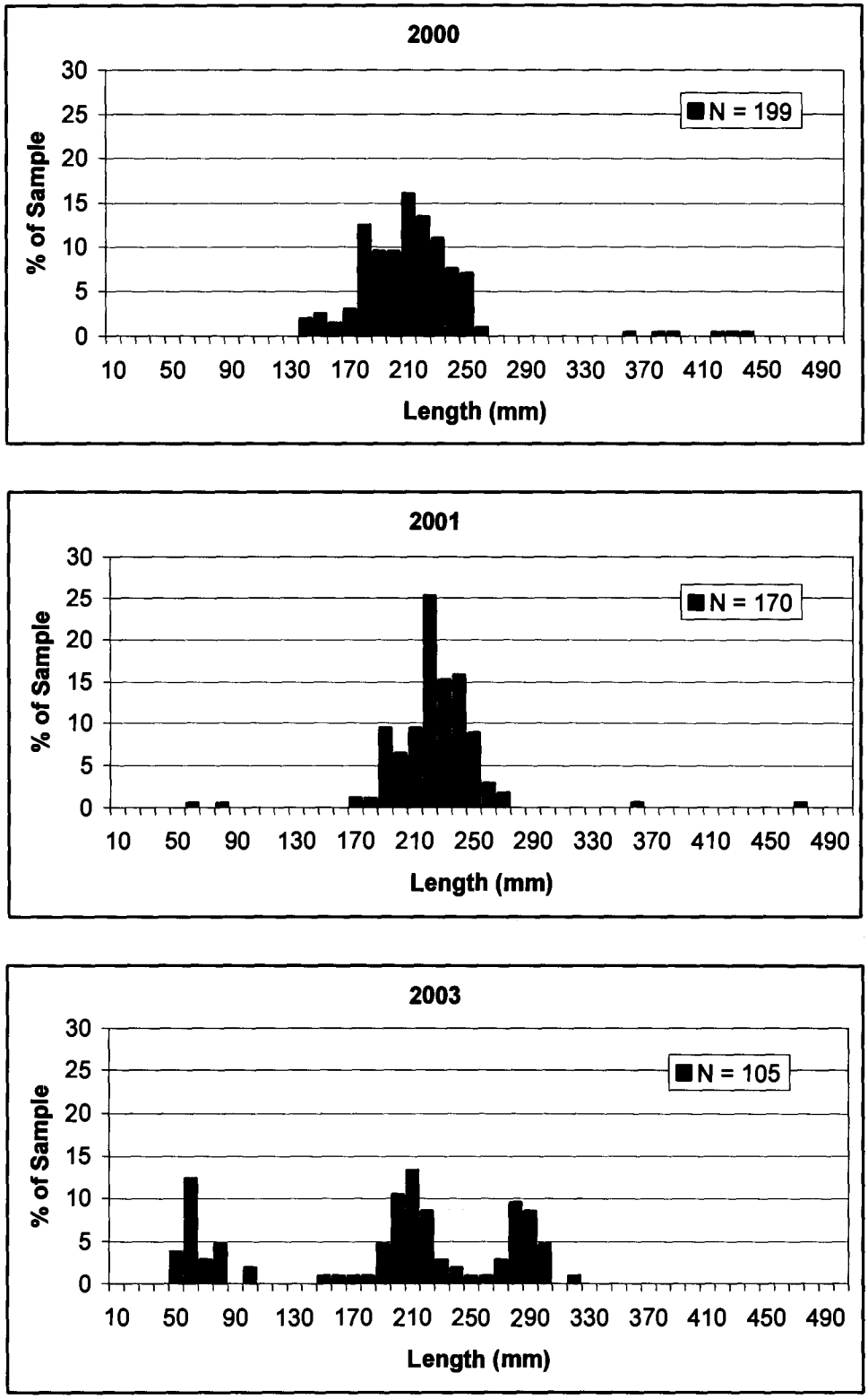
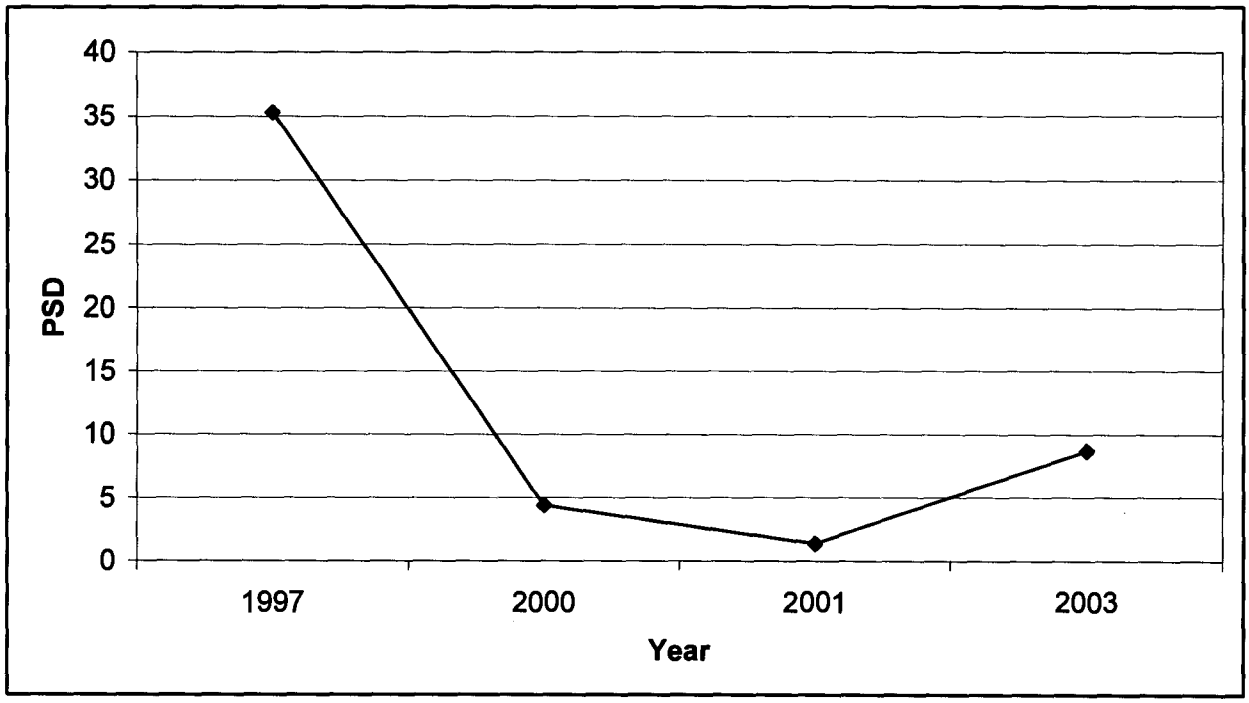


Figure 26. Length frequency distributions of largemouth bass collected from standard lake surveys of Winchester Lake in 2000, 2001, and 2003.

Figure 27. Largemouth bass PSD in Winchester Lake, 1997, 2000, 2001, 2003.



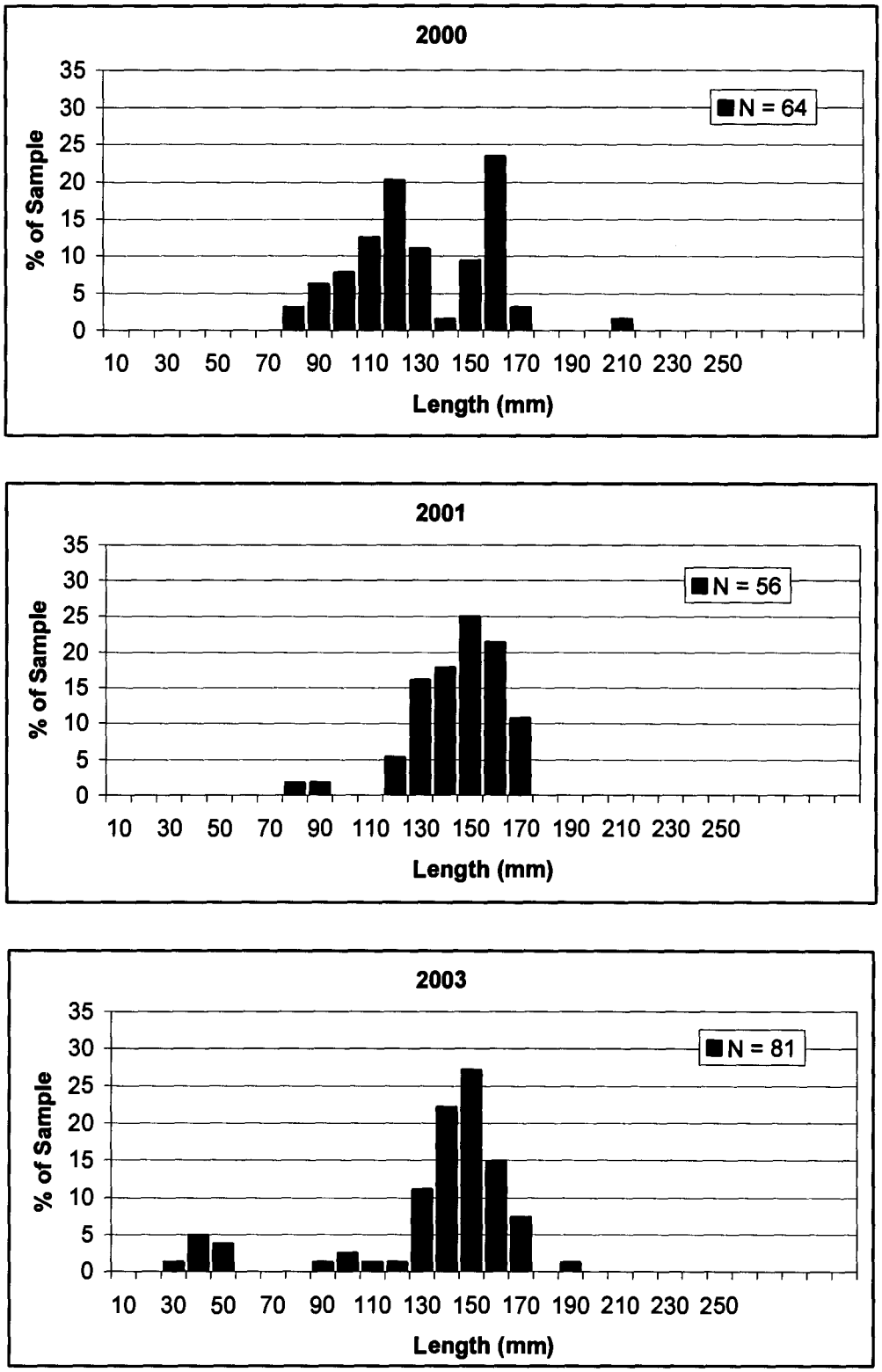


Figure 28. Length frequency distributions of bluegill collected from standard lake surveys of Winchester Lake in 2000, 2001, and 2003.

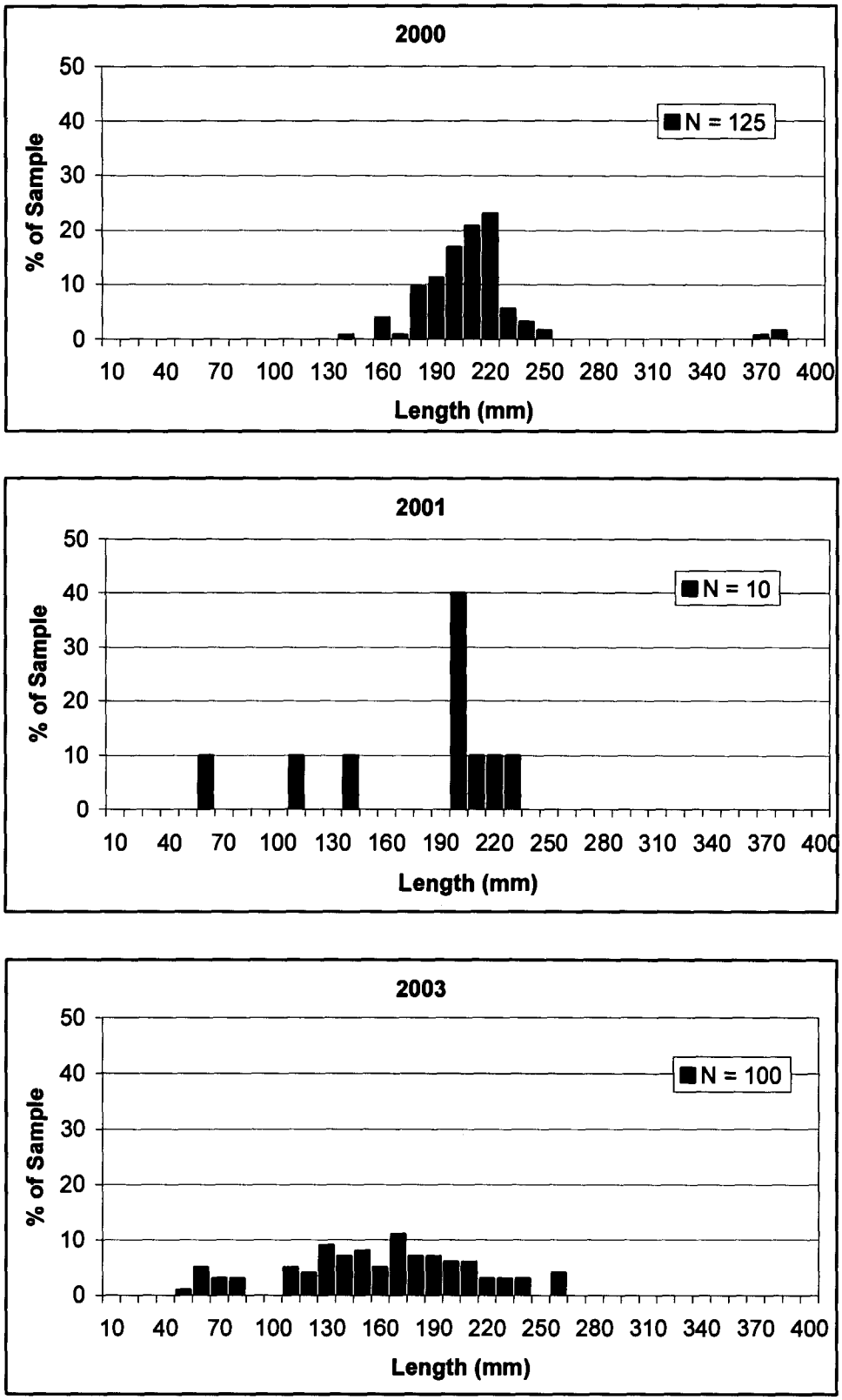


Figure 29. Length frequency distributions of yellow perch collected from standard lake surveys of Winchester Lake in 2000, 2001, and 2003.

JOB PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-23

Project I: Surveys and Inventories

Subproject I-B: 2003 Clearwater Region

Job: c

Title: Rivers and Streams Investigations

Contract Period: July 1, 2003 to June 30, 2004

Period Covered: January 1, 2003 to December 31, 2003

ABSTRACT

A population estimate was conducted for westslope cutthroat trout in the Lochsa River. A total of 728 westslope cutthroat trout were counted in 60 transects, of which 202 were 356 mm or greater in length. The population estimates were calculated to be 11,533 considering the river as a whole, and 16,474 calculating each section separately. A hook and line survey was conducted for westslope cutthroat trout in the Selway River. A total of 134 cutthroat trout were collected over three days of sampling. These fish ranged in length from 130 to 426 mm. A hook and line survey was also conducted for smallmouth bass and Kamloops rainbow trout in lower Salmon River. A total of 98 smallmouth bass were collected, while only one Kamloops was collected. The smallmouth bass ranged in total length from 160-419 mm.

Author:

Robert Hand
Regional Fishery Biologist

OBJECTIVES

1. Develop long-term fish population database on selected streams throughout the Clearwater Region.

2. Develop a population estimate for westslope cutthroat trout in the Lochsa River.

METHODS

Westslope Cutthroat Trout Population Estimate

Standard snorkeling techniques were used to develop a population estimate for westslope cutthroat trout in the. The survey was conducted on the mainstem from it's confluence with the Selway River to the confluence of White Sand Creek and Crooked Fork Creek (108.7 river km). For the survey, the river was divided into three sections: from the confluence with the Selway River upstream to the Wilderness Gateway bridge (42.2 river km); from the Wilderness Gateway bridge upstream to Post Office Creek (34.5 river km); and from Post Office Creek upstream to the confluence of White Sand Creek and Crooked Fork Creek (32.0 river km). Within each section, 20 transects were randomly selected for sampling. Each transect consisted of one habitat type (flat, broken, or pocket water). The population estimate was calculated using the Area Density Method (Van Den Avyle 1993). Each transect was measured for length and multiple widths to provide an area measurement. Total area calculations for the Lochsa River (by habitat type and river section) were obtained from a habitat survey by the U.S. Forest Service (USFS) in 1994 (USFS Publication 53-0276-3-46, 1994). Population estimates were calculated two ways: treating the river as a whole, and treating each of the three sections separately and then adding the results to get an estimate for the whole river.

RESULTS

Creel Census

No impromptu creel surveys were conducted on Clearwater Region rivers and streams in 2003.

Rivers and Streams Monitoring and Surveys

Lochsa River

Snorkel surveys were conducted from August 10-13, 2003 to develop population estimates for westslope cutthroat trout and mountain whitefish *Prosopium williamsoni* in the Lochsa River. A total of 728 westslope cutthroat trout were counted in 60 transects, of which 202 were 356 mm or greater in length (Figure 1). The population estimates were calculated to be 11,533 considering the river as a whole, and 16,474 calculating each section separately (Table 1). Additionally,

Figure 1. Length frequency distribution of westslope cutthroat trout observed in the Lochsa River during population estimate snorkeling surveys in August 2003.

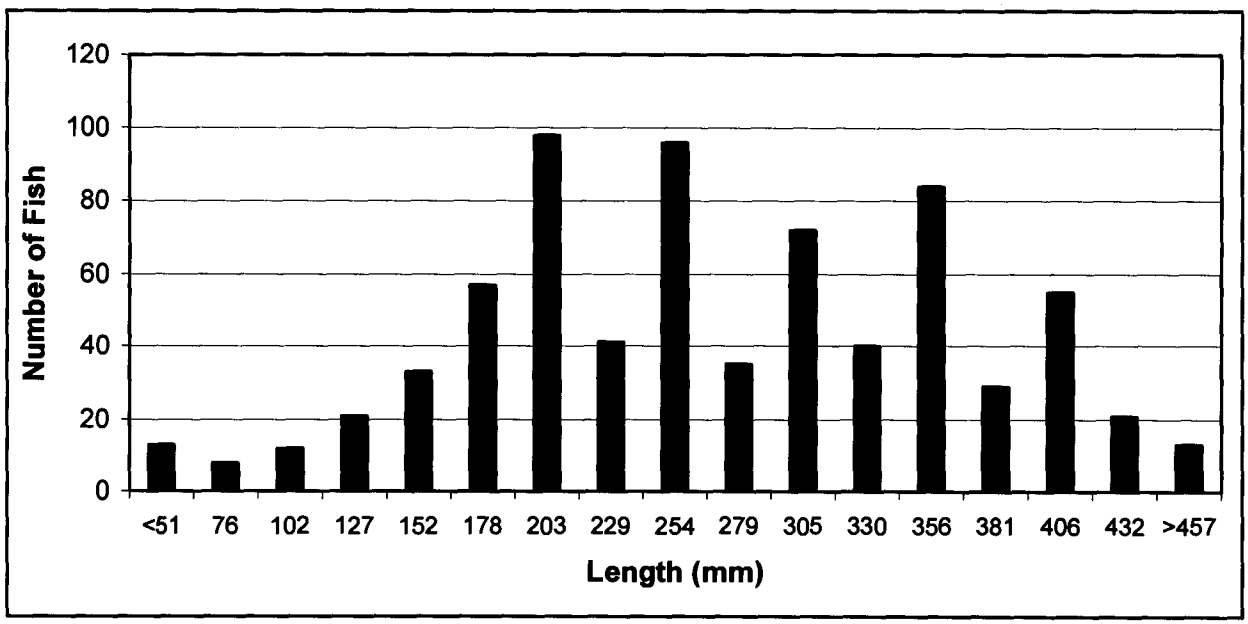


Table 1. Population estimates for westslope cutthroat trout and mountain whitefish in the Lochsa River, 2003.

Westslope Cutthroat Trout - Whole River	Population Estimate	95%CI + -	% Error
total population	11,533	3,683	32
fish >=356 mm	3,976	1,868	47
Westslope Cutthroat Trout - By Section			
total population	16,474	7,495	45
fish >=356 mm	6,733	3,373	50
White Fish - Total River			
total population	82,572	48,904	59
fish <305 mm	25,948	14,279	55
fish >= 305 mm	56,625	39,692	70
White Fish - By Section			
total population	131,262	124,594	95
fish <305 mm	33,027	35,566	108
fish >= 305 mm	98,235	92,972	95

4,045 mountain whitefish were counted in the 60 transects. Of these, 2,837 were 305 mm or greater in length. The population estimate was calculated to be 82,572 considering the river as a whole, and 131,262 calculating each section separately (Table 1).

Selway River

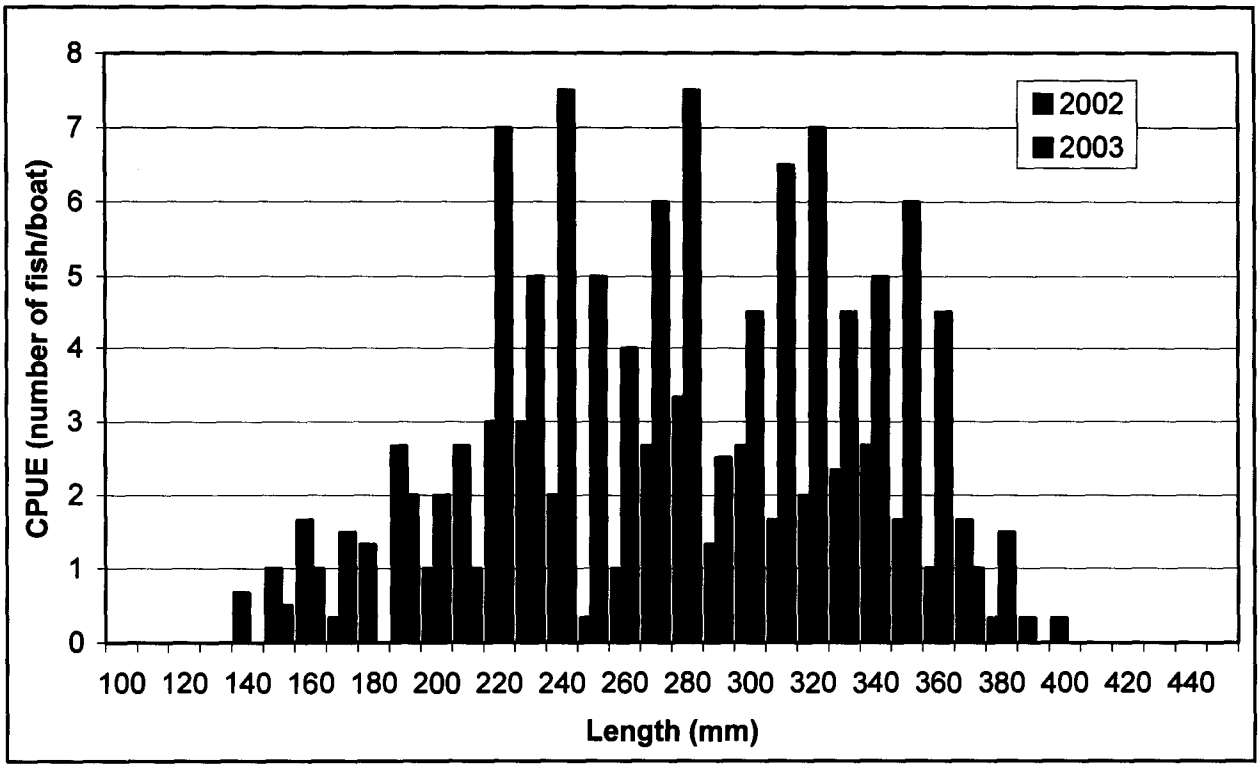
A hook-and-line survey of westslope cutthroat trout was conducted on the Selway River from August 1-3, 2003. A total of 134 were collected over three days of sampling. These fish ranged in length from 130 to 426 mm (Figure 2). In 2003, sampling in the main-stem Selway River was only conducted from White Cap Creek to Moose Creek due to muddy water conditions below Moose Creek.

Salmon River

IDFG annually stocks resident rainbow trout into the lower 100 km of the Salmon River. This stocking is funded by the Lower Snake River Compensation Plan (LSRCP) as part of their resident fisheries mitigation program. These fish are sampled annually by hook and line to collect population and food habit information. From August 17-20, 2003, approximately 80 rod hours resulted in the collection of only one domestic Kamloopss by Clearwater Region personnel. This fish was 400 mm long with a left ventral fin clip.

Additionally, 98 smallmouth bass were collected during this sampling period. These fish ranged in total length from 160-419 mm (Figure 3). In comparison, 315 fish were collected from the same section of river in 2002. A comparison of the length frequency distributions from 2002 and 2003 shows a similar distribution, but with fewer fish (Figure 3). PSD values for smallmouth bass in the lower Salmon River have been declining over the last three years (Figure 4).

Figure 2. Length frequency distribution of westslope cutthroat trout caught by hook and line in the Selway River from White Cap Creek to Moose Creek, 2002-2003.



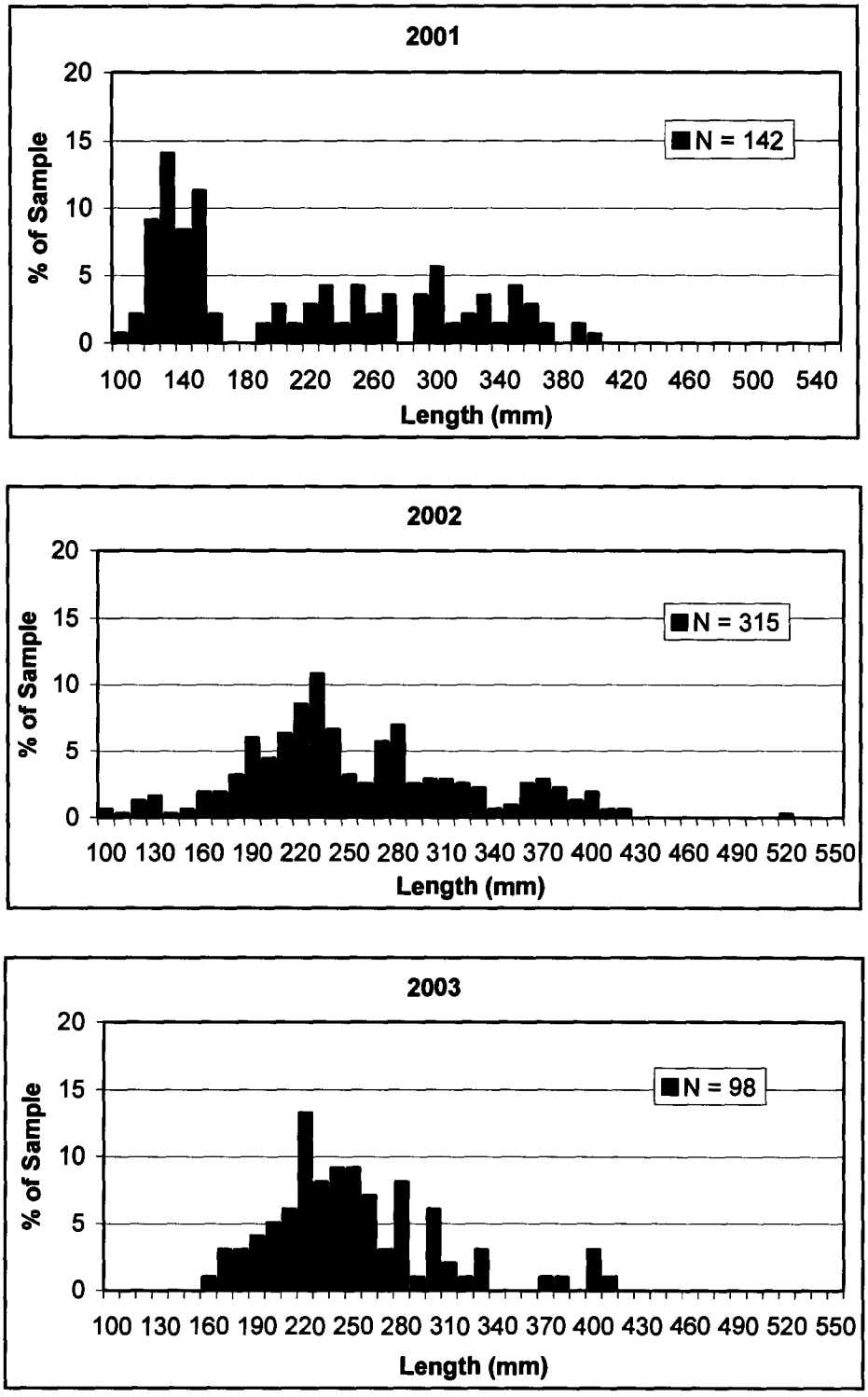
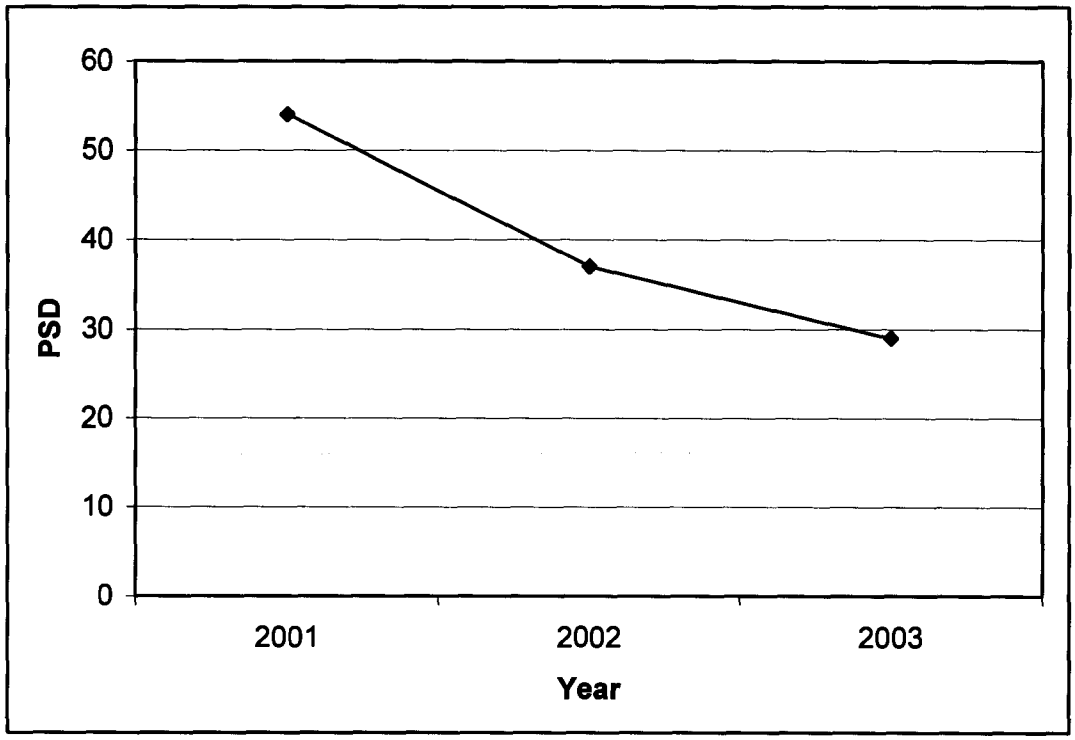


Figure 3. Length frequency distribution of smallmouth bass caught by hook and line in the Lower Salmon River, 2001-2003.

Figure 4. Proportional Stock Density values for smallmouth bass collected by hook and line in the lower Salmon River 2001-2003



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Van Den Avyle, M. J. 1993. Dynamics of exploited fish populations. Pages 105-135 *in* C. C. Kohler and W. A. Hubert, editors. Inland fisheries management in North America. American Fisheries Society, Bethesda, Maryland.

JOB PERFORMANCE REPORT

State of: Idaho | Program: Fisheries Management F-71-R-23

Project II: Technical Guidance | Subject II-B: 2003 Clearwater Region

Contract Period: July 1, 2003 to June 30, 2004

ABSTRACT

Clearwater Region fishery management personnel provided technical review and advice to private individuals, organizations, state and federal agencies, Indian tribes, and public schools on various projects and activities that affect the fishery resources in north central Idaho. This guidance included angler informational meetings, public presentations, serving on technical committees, and providing information and/or literature in response to telephone and walk-in customers. Additionally, regional personnel coordinate projects with federal agencies including USFWS, USFS, NOAA, COE, and EPA, state, county and local governments, and the University of Idaho. Additionally, regional fisheries personnel spent considerable time in the sub-basin planning process for the Salmon, Snake, and Clearwater rivers.

Author:

Robert Hand
Regional Fishery Biologist

JOB PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-23

Project III: Habitat Management Subject III-B: 2003 Clearwater Region

Contract Period: July 1, 2003 to June 30, 2004

ABSTRACT

The construction of Deer Creek Reservoir is nearing completion at this time. Construction of the dam is being finalized, and the lake is currently filling. In October 2003, IDFG personnel conducted a rotenone treatment of the water collected in the reservoir and the tributary streams. The purpose of this treatment was to remove the undesirable non-native brook trout from the watershed of the new reservoir. This new reservoir on Deer Creek near the town of Pierce will be approximately 100 acres in size upon its completion.

Fish habitat and water quality issues are being addressed in Winchester Lake through the implementation of a hypolimnetic aeration system. This project is primarily funded by the Idaho Department of Environmental Quality through a 319 Water Quality Grant. Construction has been completed on eight aeration units, which draw water from the bottom of the lake, aerate it in a tub at the surface, and return the water to the bottom of the lake to prevent destratification. The increase in oxygen in the hypolimnion will increase habitat available for fish, and reduce the levels of phosphorous in the water by preventing it from being released from the lake substrates. The reduction in phosphorous will in turn lower the amount of aquatic vegetation and algae that are a nuisance in the summer and fall months. A hypolimnetic aeration system with two units has also been installed into Waha Lake. This system will provide similar benefits to the Winchester Lake system.

Water quality is also being addressed in Elk Creek Reservoir through the application of barley straw as an algaecide. As the barley straw decomposes, it releases a chemical that is toxic to algae, thus providing a natural way to control excess algae growth.

Author:

Robert Hand
Regional Fishery Biologist

OBJECTIVES

1. Develop new fishing waters in the Clearwater Region.

2. Address water quality and fish habitat problems in regional lowland lakes and reservoirs.

METHODS

Deer Creek Reservoir has been constructed near the town of Pierce. The dam was completed in the fall of 2003. This construction included a chemical fish removal in the water collected behind the dam and the tributary streams to eliminate undesirable brook trout from the drainage upstream of the new impoundment.

Hypolimnetic aeration systems have been installed in Winchester and Waha lakes to address both water quality and fish habitat issues. Barley straw was utilized on Elk Creek Reservoir to control nuisance algae blooms.

RESULTS

New Fishing Waters

Deer Creek Reservoir

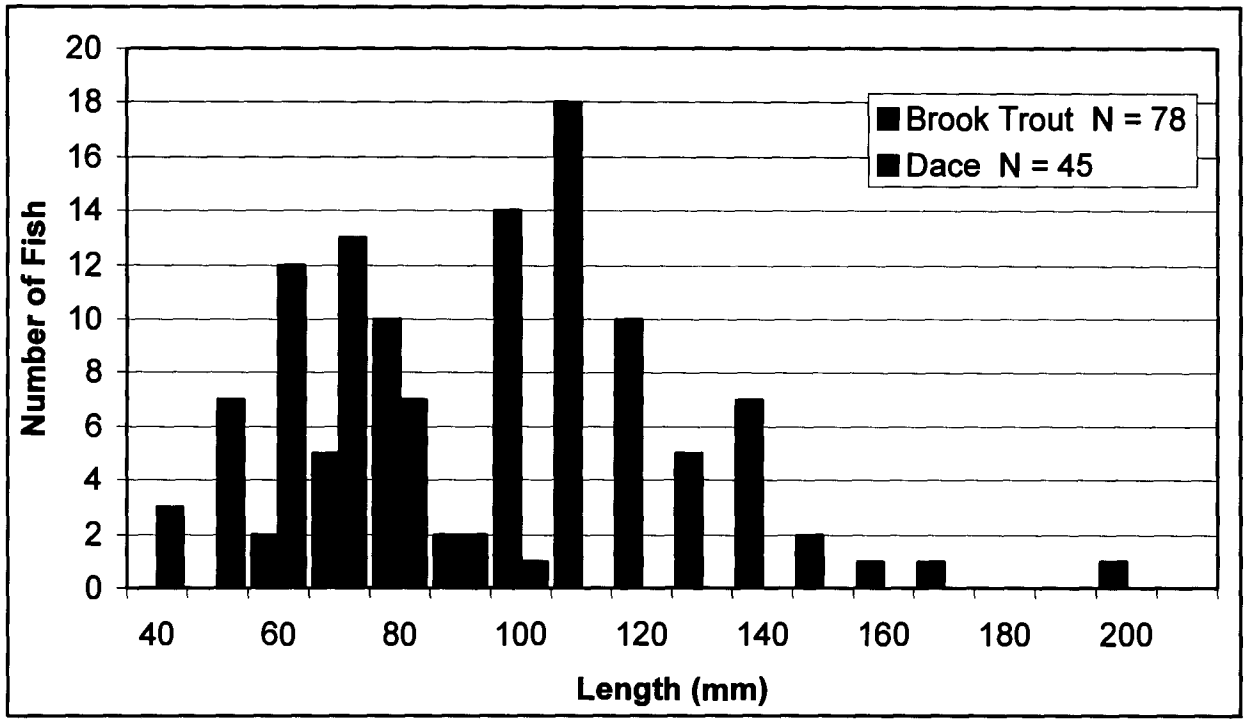
This new reservoir will be approximately 40.5 ha in size upon its completion. On October 8, 2003, IDFG personnel conducted a rotenone treatment upstream of the water collected in the reservoir and the tributary streams. The purpose of this treatment was to remove the undesirable non-native brook trout from the watershed of the new reservoir.

We estimated stream flow in Deer Creek at the project area to be 0.02 m/s. We determined the left and right forks of the creek to be providing 60% and 40% of the flow, respectively. Two chemical drip stations on the left fork and one station on the right fork were established. These stations were spaced approximately 0.8 km apart were calibrated to run for two hours per fill. They were each filled three times, for a total treatment of six hours. A fourth drip station was established immediately down stream of the confluence of the left and right forks, approximately 0.8 km above the dam. This station was calibrated to run for 10 hours. All drip stations were calibrated to deliver a concentration of 4 mg/l rotenone. A total of 8.2 liters of rotenone was delivered via the drip stations.

The volume of standing water impounded by the dam was estimated to be 14.7 ha. This area was treated with rotenone using a pump and spray nozzle mounted in a small boat. Shallow areas were treated with surface spray application and deeper areas were treated with sub-surface application utilizing a weighted hose method. A total of 143.5 liters of rotenone was applied to the standing water to achieve a treatment concentration of 4 mg/l. Live brook trout were collected and placed in live cars immediately upstream of the drip stations and the standing water to determine effectiveness of treatment dosages.

We treated at 4 mg/l, 1 mg/l below the product label limit for fish removal above a new impoundment. We chose 4 mg/l because of the high organic load and large areas of newly exposed soil related to construction of the impoundment. The outlet valve of the dam effectively controlled all outflow, precluding any need for detoxification below the project area. The treatment effectively removed brook trout from the project area. Secondary species affected were dace Rhinichthys sp. and crayfish. We counted 78 brook trout and 45 dace from 234 m of stream in seven transects located throughout the treatment area. An estimated 1945 m of stream was treated. Thus, an estimated 648 brook trout and 374 dace were removed from the project area. The brook trout collected ranged in length from 60 to 200 mm, and the dace ranged in length from 40 to 100 mm (Figure 1). No fish were observed or collected from the standing water in the project area. Reconnaissance below the project area on October 9, 2003 verified the treatment was confined to the project area, as live fish were observed directly downstream of the dam.

Figure 1. Length frequency distributions of brook trout and dace collected from rotenone treatment of Deer Creek Reservoir and tributary streams, 2003.



ADDITIONAL 2003 CLEARWATER REGION PROJECTS

Idaho Supplementation Studies

Idaho Supplementation Studies (ISS) is a cooperative study of chinook salmon *O. tshawytscha* supplementation in the Clearwater and Salmon river basins. The project involves researchers from IDFG research, Clearwater region, McCall Subregion, Salmon Region, the Shoshone-Bannock tribe, Nez Perce Tribe, and the Fish and Wildlife Service. The Clearwater Region is responsible for data collection on three study streams; American, Crooked, and Red Rivers. Operations on these streams include juvenile fish trapping using screw traps, redd counts, and adult trapping on Red and Crooked Rivers in conjunction with the Clearwater Fish Hatchery activities.

Juvenile trapping activities began in March and ended in early November. Juvenile chinook salmon were tagged using PIT tags and trapping efficiencies were calculated using recaptures. In addition to chinook salmon, all fish trapped were enumerated and a sub-sample measured for length and weight. Juvenile steelhead in Red River were tagged and scale samples are taken for another project.

Fish traps ran from March through October on the three study rivers. A total of 31,568 juvenile chinook salmon were trapped, 22,237 from American River, 1,028 from Crooked River, and 8,303 from Red River. Daily migrants trapped are shown in Figure 1. Trapping peaks correspond to the movement of smolts in the spring, parr in the summer, and a presmolt emigration in the fall. The Crooked River trap did not operate effectively beginning in late July due to low water. American and Red River traps operated consistently, however short stoppages did occur for hatchery releases, low water, and debris.

Redd counts were conducted from August 28 through October 6, 2003. Table 1 shows the redd count sections and number of redds, live fish, and carcasses sampled in each section. Further information on trend counts can be found in the annual "Spawning Ground Surveys Report" for 2003. Additional counts were completed in the region by IDFG research personnel and the Nez Perce Tribe. These counts can also be found in the Spawning Ground Surveys Report and in the Streamnet database.

Further information on ISS project activities and data summaries can be found in the following BPA reports; Salmon Supplementation in Idaho Rivers Experimental Design, Idaho Supplementation Studies Annual Reports, Idaho Supplementation Studies Five Year Reports (1992-1996, 1997-2001), and Evaluation and Statistical Review of Idaho Supplementation Studies 1991-2001. Future summaries of data will be in annual reports by brood year beginning with brood year 2002.

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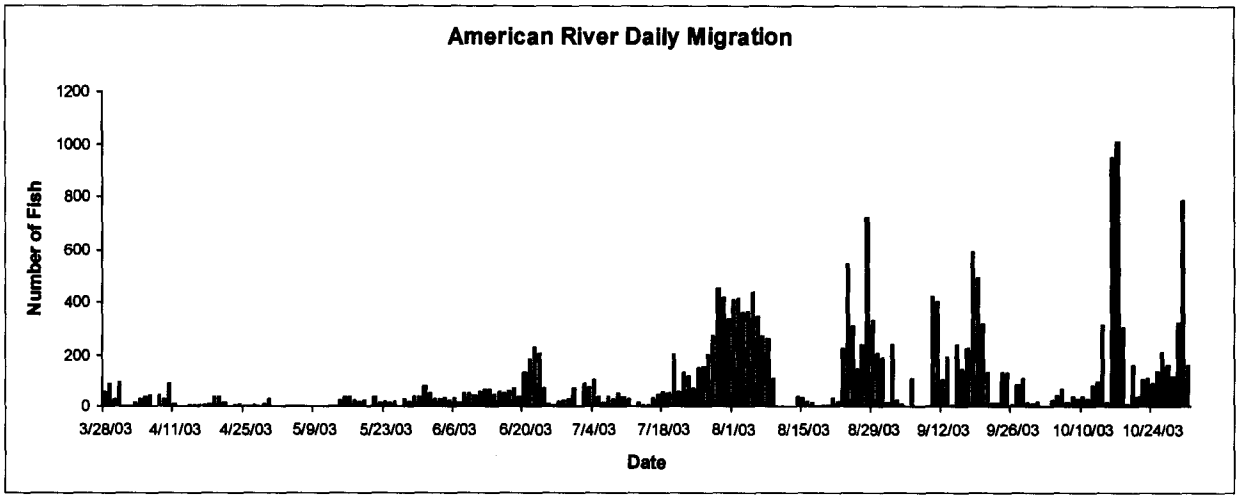
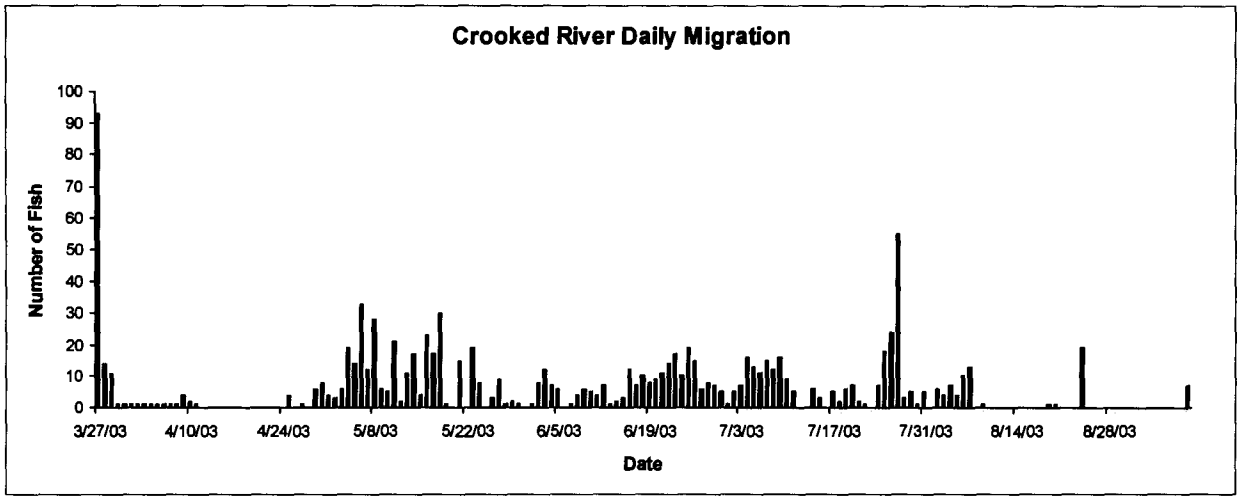
Figure 1. Number of juvenile Chinook salmon trapped daily in the fish traps of the three ISS study streams.





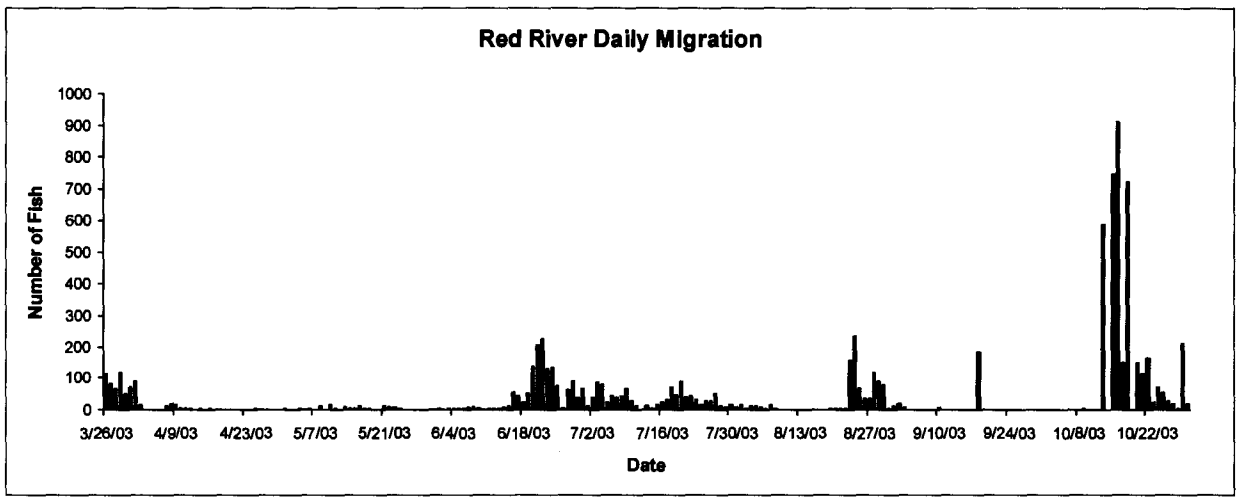


Table 1. Redd counts completed in the Clearwater Region in 2003 by regional personnel.

SELWAY

Aerial surveys were attempted but canceled due to dangerous visibility from fires and smoke in the drainage. Moose Creek was the only aerial survey completed.

Drainage	Reach	Type	Description	Date	Method	Redds	Fish Live	Fish Dead
Moose Cr.	WC-3	T	Mouth to Cedar Cr.	9/3	Aerial	8	2	0
Selway	WC-7	T	Magruder Crossing to Little Clearwater River	8/30	Ground	10	5	2
			Selway Drainage Ground Count Total			**10**	**5**	**2**
			Selway Drainage Aerial Count Total			**8**	**2**	**0**

SOUTH FORK CLEARWATER RIVER

Only ground counts were conducted in 2003. The number of redds and carcasses reported for the trend counts include those counted up to and including the survey data. Live fish are for those only observed on the survey date. **NOTE: Ground counts in nontrend areas on subsequent dates are new redds only.**

Drainage	Reach	Type	Description	Date	Method	Redds	Fish Live	Fish Dead
Red River	NC-1	T	Weir to Cole 66 Bridge	9/10	Ground	29	30	4
	NC-2a		Strata 1: Red River Campground-Shissler Creek	8/28	Ground	0	15	0
				9/10	Ground	5	0	0
				9/21	Ground	11	0	0
	NC-2b		Strata 2: Weir-Red River Campground	8/28	Ground	0	34	1
				9/10	Ground	5	1	2
				9/23	Ground	1	0	0
		ISS&C	Strata 3/4 (Dawson creek to weir)	8/28	Ground	1	178	3
				9/10	Ground	24	17	0
				9/21	Ground	12	2	0
		ISS&C	Strata 5 (Gold Point to Dawson Cr)	8/28	Ground	0	9	3
				9/10	Ground	10	7	4
				9/21	Ground	8	1	7

Table 1 (continued). Redd counts completed in the Clearwater Region in 2003 by regional personnel.

Drainage	Reach	Type	Description	Date	Method	Redds	Fish	
							Live	Dead
Red River		ISS&C	Strata 6 (Mouth to Gold Point)	8/27	Ground	0	37	0
				9/5	Ground	15	54	6
				9/18	Ground	24	1	3
SF Red River	NC-3	NT	Mouth to Trapper Creek	9/12	Ground	0	0	0
			Red River Ground Count Total			**116**	**356**	**29**
American River	NC-4	T	Lick Creek to Kirks Fork	9/11-12	Ground	31	5	0
		ISS&C	Strata 1 (Corrals to Limber Luke)	8/26	Ground	2	44	2
				9/11	Ground	34	2	0
				10/5-6	Ground	3	0	0
		ISS&C	Strata 2 (Box Sing Cr to Corrals)	8/27	Ground	2	41	2
				9/12	Ground	16	8	16
				10/4	Ground	8	0	0
		ISS&C	Strata 3 (Mouth to Box Sing Creek)	8/25	Ground	0	40	0
				9/5,9	Ground	25	36	7
				9/23,10/4	Ground	15	0	0
			American River Ground Count Total			**105**	**171**	**27**

Table 1 (continued). Redd counts completed in the Clearwater Region in 2003 by regional personnel.

Drainage	Reach	Type	Description	Date	Method	Redds	Fish Live	Fish Dead
Crooked River*	NC-5	C	Relief Cr. to upper end of airstrip Not done					
	NC-6	T	Mouth to forks above Old Orogrande	9/4-9	Ground	34	24	1
			Mouth to weir		Ground	10		
			Strata 3-lower (weir to bottom of meanders)		Ground	5		
			Strata 4 (the meanders)		Ground	2		
			Strata 3-upper (top of meanders to narrows)		Ground	0		
			Strata Canyon (the narrows)		Ground	2		
			Strata 2 (top of narrows to bridge)	Ground	14			
			Strata 1 (bridge to forks)		Ground	17		
			Crooked River Ground Count Total			**50**	**69**	**32**

* Crooked River was counted on three passes, however data collection errors prevent splitting passes by strata and date. Carcass and Live fish data cannot be separated by strata.

Natural Production Monitoring

The Natural Production Monitoring Project is also a large cooperative study involving IDFG research and several regions. Clearwater Region efforts are snorkel and habitat surveys (intermittent) throughout the region. In 2003, 139 snorkel sites in region 2 were surveyed and entered into the stream survey database. Figures 2-5 illustrate the average densities of game species in large subbasins of Clearwater Region over time for this project. Trends are highly variable however it appears westslope cutthroat trout and juvenile steelhead densities are variable with no definite long term trend. Chinook salmon densities are extremely variable with improved numbers in recent years.

Brook trout densities are generally low throughout the region with the exception of the Lower Clearwater and South Fork Clearwater tributaries. These areas indicate a larger and perhaps growing brook trout population with both higher densities in recent years and greater presence as indicated in Figure 6.

The proceeding analysis is based on all sites snorkeled in each year. Sites for this project are not chosen randomly and vary in number from year to year. Bias in the trends is possible. Numbers of sites snorkeled appeared to explain little variation as Figure 7 illustrates well. Similar patterns were true for all species of fish analyzed.

Further statewide analysis and summary of natural production monitoring efforts can be found in Idaho Habitat and Natural Production Monitoring reports 1989-1995 and Natural Production Monitoring and Evaluation 2000-2001. Additional annual reports will be produced for BPA including 2003 data.

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Figure 2. Brook trout densities from snorkel surveys in major subbasins of IDFG Clearwater Region. (Salmon River subbasin numbers include only snorkel sites).

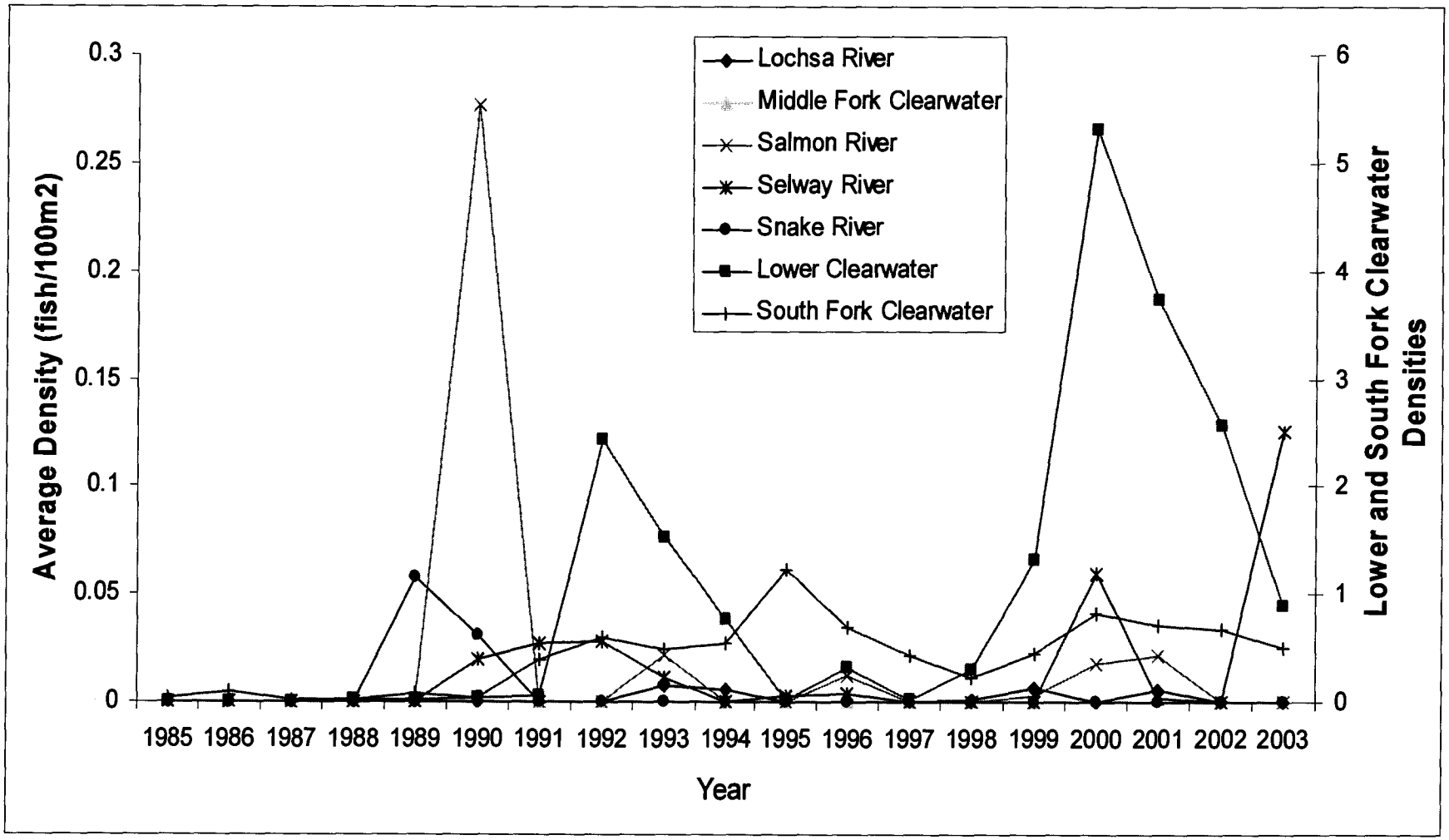


Figure 3. Westslope cutthroat trout densities from snorkel surveys in major subbasins of IDFG Clearwater Region. (Salmon River subbasin numbers include only snorkel sites in Clearwater Region tributaries).

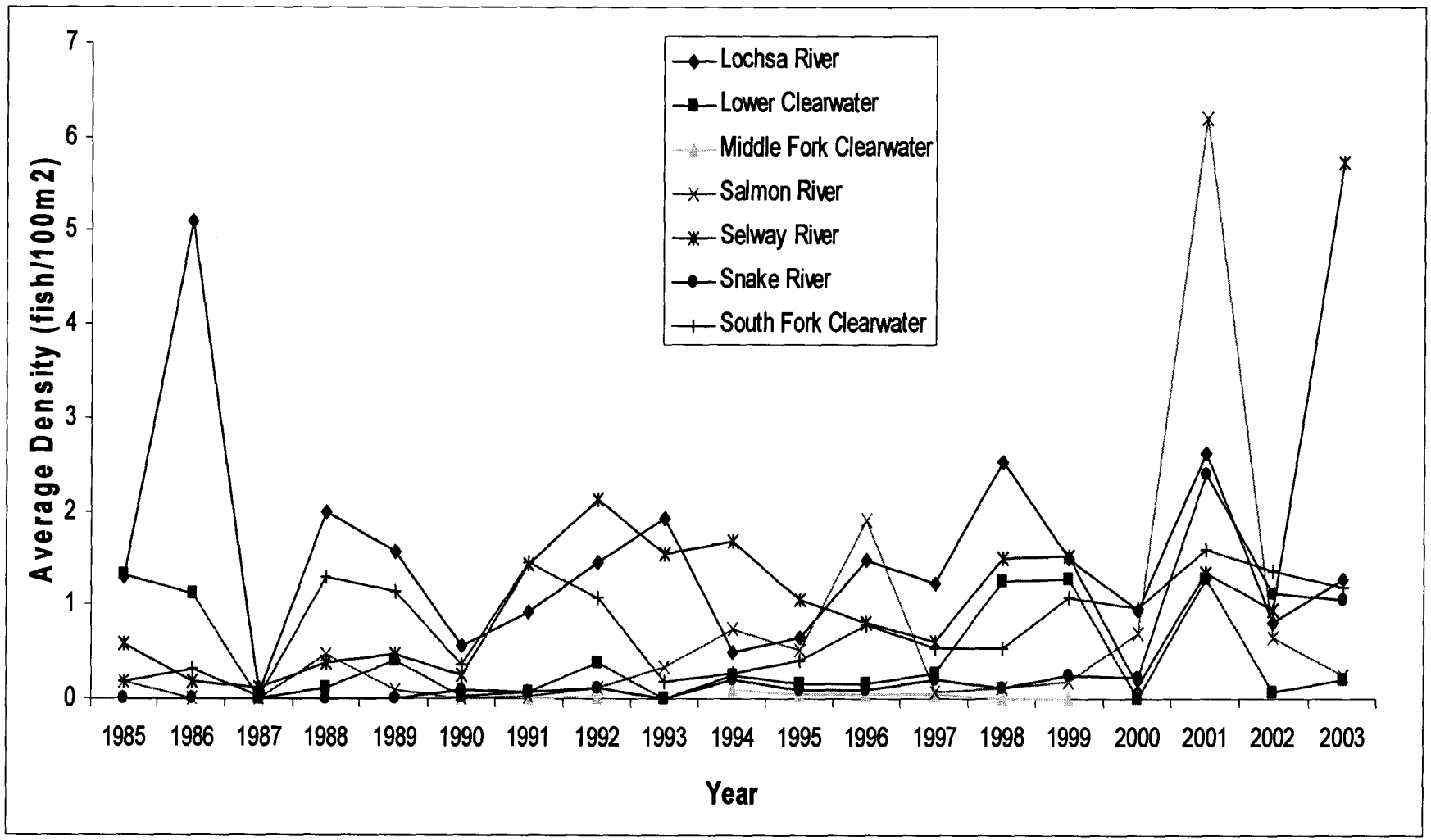


Figure 4. Wild juvenile chinook (age 0 & 1) densities from snorkel surveys in major subbasins of IDFG Clearwater Region (Salmon River subbasin numbers include only snorkel sites in Clearwater Region tributaries).

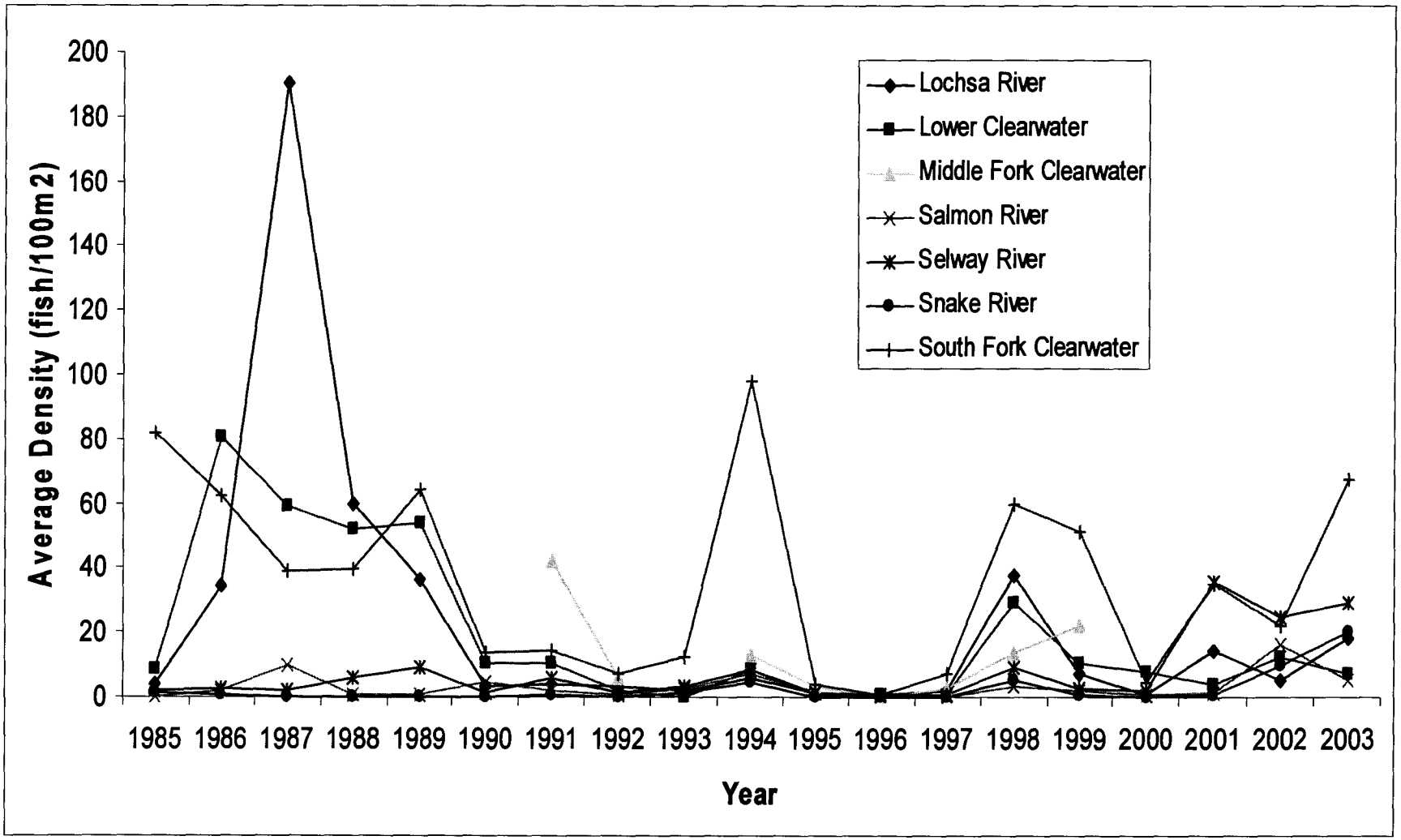


Figure 5. Wild juvenile steelhead densities from snorkel surveys in major subbasins of IDFG Clearwater Region (Salmon River subbasin numbers include only snorkel sites in Clearwater Region tributaries).

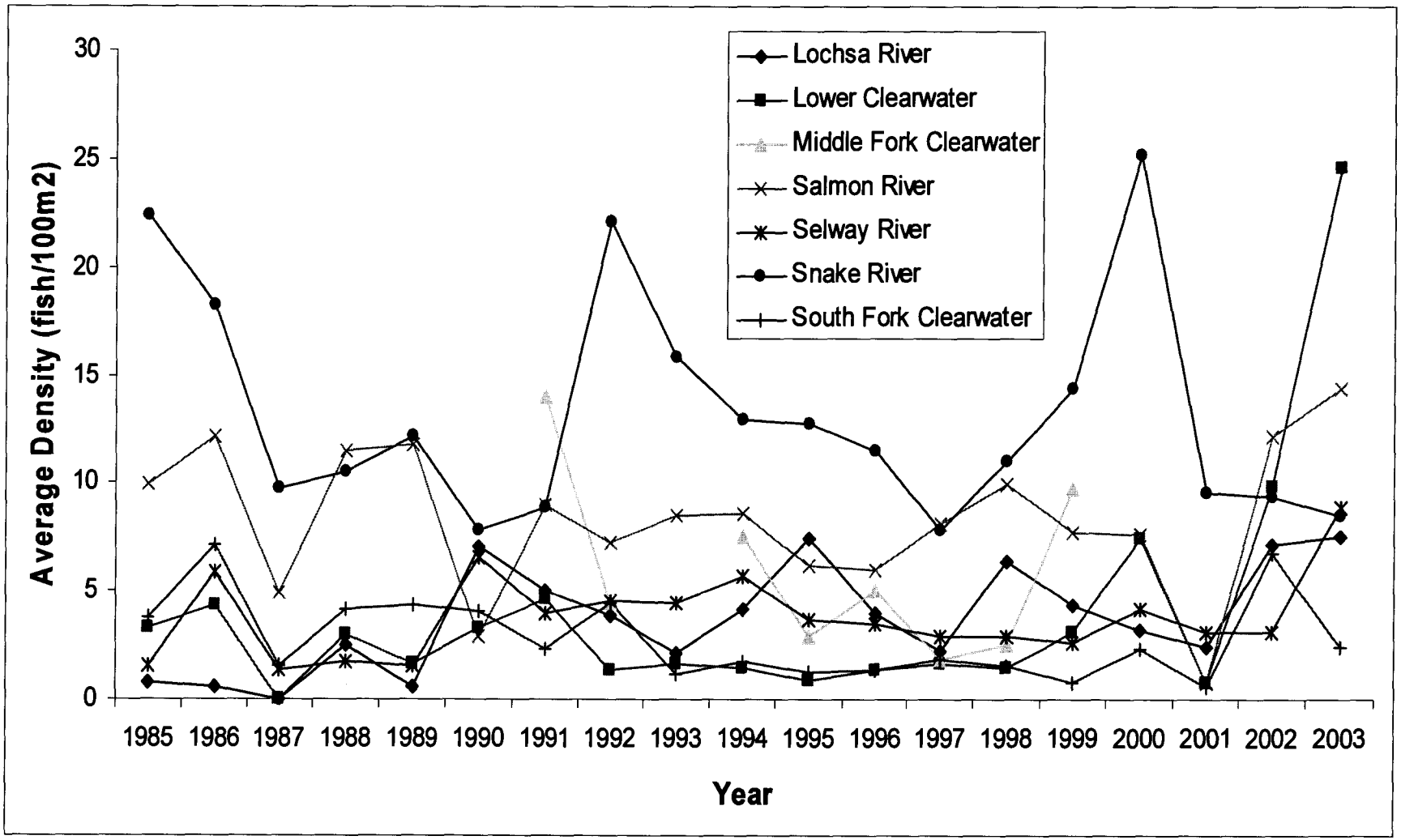


Figure 6. Percent of snorkel sites with brook trout detected by major subbasin.

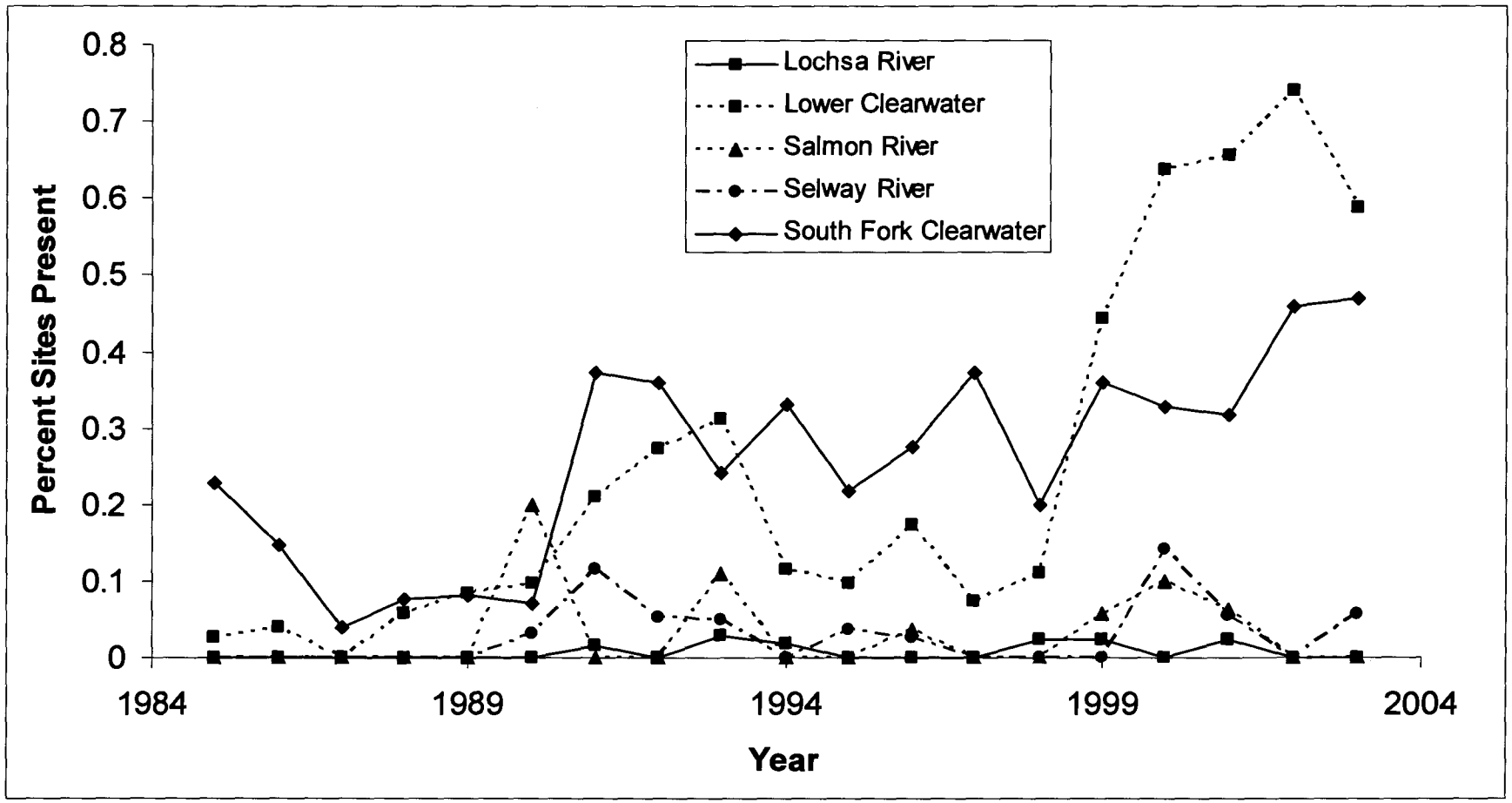
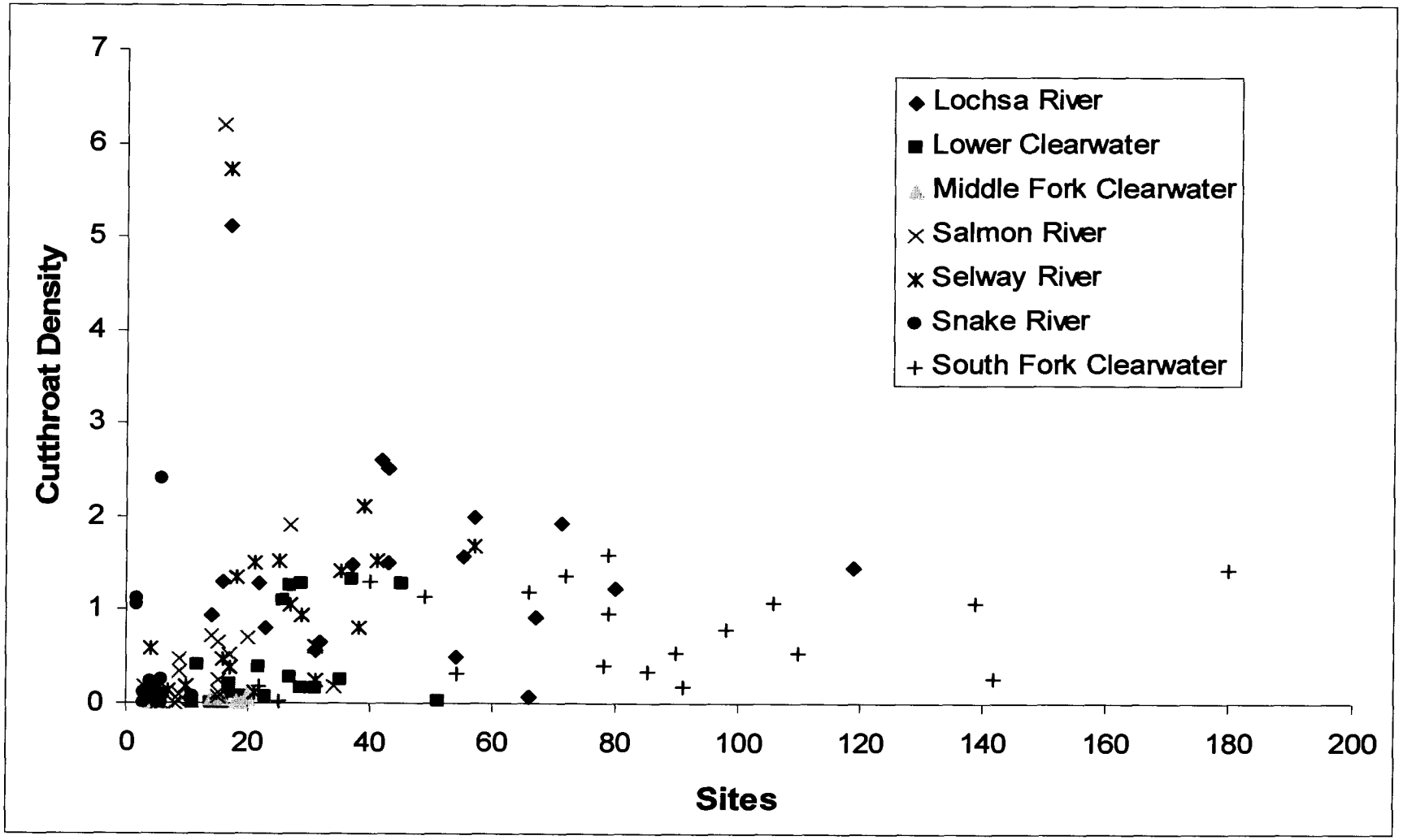


Figure 7. Westslope cutthroat density versus the number of snorkel sites.



HARVEST MONITORING

A spring chinook salmon sport-fishing season was held during portions of April through August, 2003, in the Clearwater River drainage, and April 25 through June 22, 2003 on the mainstem Salmon River in north central Idaho. The season was held to harvest surplus hatchery salmon returning to Dworshak (DNFH), Kooskia National Fish Hatcheries (KNFH), and Clearwater Anadromous Fish Hatchery (CLWFH) in the Clearwater River drainage and to Rapid River Fish Hatchery (RRFH) on the Salmon River. We conducted a creel census to estimate angler effort and harvest.

In the Clearwater drainage, we estimated anglers fished 105,968 hours to catch 5,137 spring Chinook, of which 3,010 were harvested. Jacks accounted for 106 of the fish harvested. Of the estimated 2,125 fish released, 1,630 were non-adipose clipped adults and 257 were adipose clipped adults. The average catch rate for all fish harvested during the season was 35 hours/fish and for all fish caught was 21 hours/fish. We estimated that of the 3,010 fish harvested in the drainage, 2,228 were DNFH origin, 426 were KNFH origin, 175 were CLWFH Powell origin, and 181 were CLWFH South Fork origin. Approximately 87% of the fish harvested were five-year olds.

On the Salmon River, we estimated anglers fished 45,774 hours to catch 3,580 salmon, of which 2,111 were harvested. Of the 1,476 fish released, 477 were non-adipose clipped adults and 288 were adipose clipped adults. Catch rates averaged 13 fish/hour for all fish caught, and 22 fish/hour for harvested fish. Of the 2,111 fish harvested in the lower Salmon River, we estimated 2,048 were RRFH origin, and 63 were McCall Fish Hatchery origin. The season average catch rate was 13 hours per fish caught. We estimated that 72% of the fish harvested were five-year olds.

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Table 2. Estimated angler effort, catch, and harvest of Chinook salmon in IDFG Clearwater Region during the 2003 spring chinook salmon season.

Clearwater River Section	# Angler Hours			# Salmon Kept			# Salmon Released					Hours / Fish	
	Boat	Bank	Total	Adults	Jacks	Total	Ad-Clipped Adults	Ad-Clipped Jacks	Unmarked Adults	Unmarked Jacks	Total	Caught	Kept
Section 1	56,624	8,857	**65,481**	1,403	16	**1,419**	85	20	953	28	**1,086**	26	46
Section 2	11,430	14,919	**26,349**	1,141	50	**1,191**	60	88	379	4	**531**	15	22
Section 3	3,724	3,186	**6,910**	146	0	**146**	31	0	73	0	**104**	28	47
Section 4	0	256	**256**	0	0	**0**	0	0	0	0	**0**	-	-
Section 5	0	4,424	**4,424**	159	22	**181**	71	72	183	19	**345**	8	24
Section 6	0	184	**184**	0	0	**0**	0	0	0	0	**0**	-	-
Section 7	0	2,364	**2,364**	55	18	**73**	10	7	42	0	**59**	18	32
Total	**71,778**	**34,190**	**105,968**	**2,904**	**106**	**3,010**	**257**	**187**	**1,630**	**51**	**2,125**	**21**	**35**
Salmon River													
Section 1	9,917	5,818	**15,735**	359	3	**362**	18	6	260	0	**284**	24	43
Section 2	14,547	15,492	**30,039**	1,644	105	**1,749**	270	655	217	50	**1,192**	10	17
Total	**24,464**	**21,310**	**45,774**	**2,003**	**108**	**2,111**	**288**	**661**	**477**	**50**	**1,476**	**13**	**22**

Section Descriptions:

Clearwater River:

Section 1: Mainstem Clearwater-railroad bridge upstream to lower end of Magill hole (rm 37.2)

Section 2: Mainstem Clearwater-lower end of Magill hole upstream to Orofino Bridge (rm 44.6) and North Fork Clearwater River below Dworshak Dam

Section 3: Mainstem and Middle Fork Clearwater River from the Kamiah Bridge (rm 67.2) upstream to a posted boundary above Clear Creek (rm 78)

Section 4: South Fork Clearwater-mouth upstream to Hungry Ridge Road Bridge (rm 33)

Section 5: South Fork Clearwater-Hungry Ridge Road Bridge upstream to confluence of American and Red Rivers (rm 62.5)

Section 6: Lochsa River-mouth upstream to Bald Mountain Creek (rm 33.1)

Section 7: Lochsa River- Bald Mountain Creek upstream to the twin bridges just upstream of the confluence of Colt Killed and Brushy Fork Creeks (rm 70.1)

Lower Salmon River:

Section 1: Hammer Creek boat ramp upstream the Time Zone Bridge (rm 84.1)

Section 2: Time Zone Bridge upstream to the mouth of the Little Salmon River (rm 86.7)

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