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DEPARTMENT OF FISH AND GAME

Rod Sando, Director

FEDERAL AID IN FISH RESTORATION
1997 Job Performance Report
Project F-71-R-22

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS
SOUTHEAST REGION (Subprojects I-F, II-F, III-F, IV-F)

PROJECT I.	SURVEYS AND INVENTORIES
Job b.	Southeast Region Lowland Lakes Investigations
Job c.	Southeast Region Rivers and Streams Investigations
PROJECT II.	TECHNICAL GUIDANCE
PROJECT III.	HABITAT MANAGEMENT
PROJECT IV.	POPULATION MANAGEMENT

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1997 ANNUAL PERFORMANCE REPORT

State of:	Idaho	Program:	F-71-R-22
Project I:	Surveys and Inventories	Subproject I-F:	Southeast Region
Job:	b	Title:	Lowland Lakes Investigations
Contract Period:	July 1, 1997 to June 30, 1998		

ABSTRACT

We conducted a creel survey on Blackfoot Reservoir throughout the open-water fishing season (May through October). We interviewed 128 boat angler parties who fished 1,159 hours and caught 247 trout (.21 trout/h). We also interviewed 114 shore angler parties who fished 1,200 hours and caught 189 trout (.16 trout/h). The total catch was composed of 94% rainbow trout *Oncorhynchus mykiss*, 5% Yellowstone cutthroat trout *O. clarki bouvieri*, and 1% Bear Lake cutthroat trout *O. clarki utah*. All creel survey data was evaluated using a program titled C-SAP (Creel Survey Analysis Program) to provide estimates of total fishing pressure and harvest.

In conjunction with employees of the Utah Division of Wildlife Resources, we conducted a creel survey on Bear Lake for the months of May, June, October and November in 1996 and January and February in 1997. An estimated 8,970 anglers spent an estimated 29,956 hours of effort to catch 29,266 fish during the six months surveyed. The catch consisted of 35% Bear Lake cutthroat trout, 15% lake trout *Salvelinus namaycush*, 40% Bonneville cisco *Prosopium gemmiferum*, and 10% whitefish *Prosopium spp*. The peak effort months were June (7,715 hours) and February (8,550 hours). Overall catch rate was 0.98 fish/h. Percent of fish caught that were harvested varied between species: cisco 100%, lake trout 75%, whitefish 86%, and cutthroat trout 36%.

We collected grit-marked fish from both Daniels and Treasureton reservoirs as an initial step in a study of differential growth rates between sterile rainbow trout (triploid) and normal rainbow trout (diploid). The reservoirs, along with others in the McCall Region, were chosen because of their restrictive angling size limits. Size limits help insure that enough marked fish survive for more than a single growing season. Regional personnel used both electrofishing and gillnetting techniques to collect the recommended minimum number (10) of each marked group.

We conducted lowland lake surveys on a number of Southeast Region reservoirs. These surveys provided information on current size frequencies, relative species compositions and general population fluctuations for comparison with past surveys. Surveys were done on American Falls, Blackfoot, Chesterfield, Deep Creek, Devils Creek, and Springfield reservoirs. Surveys were also done on Daniels and Treasureton reservoirs in conjunction with a sterile fish evaluation.

We collected length data on largemouth bass *Micropterus salmoides* caught during several tournament events. As the tournaments occur nearly every year, this is a good way to obtain data efficiently provides an opportunity for positive public relations. Tournaments were held on Condie, Glendale, and Twin Lakes reservoirs. Mean lengths for largemouth bass caught were 293 mm at Condie Reservoirs and 335 mm at Glendale Reservoir. Measurements provided by anglers from the Twin Lakes tournament were rounded to the

nearest inch preventing an accurate determination of mean length; however, the median length was around 203 mm.

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OBJECTIVES

1. Evaluate total fishing pressure and harvest on Blackfoot Reservoir to evaluate cost-effectiveness of stocking a significant portion of available hatchery fish in this one body of water.

2. Document the creel statistics for Bear Lake during peak fishing months.

3. Begin collection of data for evaluation of sterile fish growth.

4. Evaluate health of fisheries in various Southeast Region reservoirs.

INTRODUCTION AND METHODS

Blackfoot Reservoir Creel Survey

Blackfoot Reservoir is a 7,285 ha impoundment at approximately elevation 1,920 m. Historically, it was a premier fishery for Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* growing to large size (3.6 to 4.1 kg range). The fishery slowly deteriorated and eventually crashed in the early 1980s. In 1990, a comprehensive plan to reestablish a fishery for wild Yellowstone cutthroat trout was formulated after several years of study (LaBolle and Schill 1990). It called for elimination of wild cutthroat trout harvest from Blackfoot Reservoir. In order to provide a harvest fishery, large numbers of both hatchery rainbow trout *O. mykiss* and hatchery Bear Lake cutthroat trout *O. clarki utah* were stocked. Attempts were made to have the Bear Lake cutthroat trout establish their own wild spawning run into the Little Blackfoot River. Bear Lake cutthroat trout stocking was discontinued in 1994. Rainbow trout stocking was increased as a replacement. In 1996 alone, 25% (by weight) of all fish stocked in the Southeast Region were allocated for Blackfoot Reservoir.

A creel survey was conducted from May through November to evaluate the cutthroat trout recovery plan and determine the return to anglers of fish stocked in the reservoir. Previous creel surveys had been done only for the months of June through October (boating had been limited by a June season opener and ice-up often occurred in November). The survey helped determine what harvest occurred during less popular fishing periods. Creel clerks surveyed anglers twice a week, once on a weekday and once on a weekend. The reservoir was divided into two sections (Figure 1). Survey periods (AM vs. PM), sections (A vs. B) and days of the week were randomly selected. During each individual survey day, the clerk first made an absolute count of all anglers (boat and shore) within that section. The clerk then proceeded to interview as many anglers as possible before completing a second count at the end of the survey period. Angler counts for one section were used to estimate total number of anglers for the entire reservoir based on the relative numbers of anglers fishing each section.

Bear Lake Creel Survey

Bear Lake is a 31,000 ha natural lake located on the Idaho/Utah border in the extreme southeast corner of the state. The fishery is managed jointly by the Idaho Department of Fish and Game and the Utah Division of

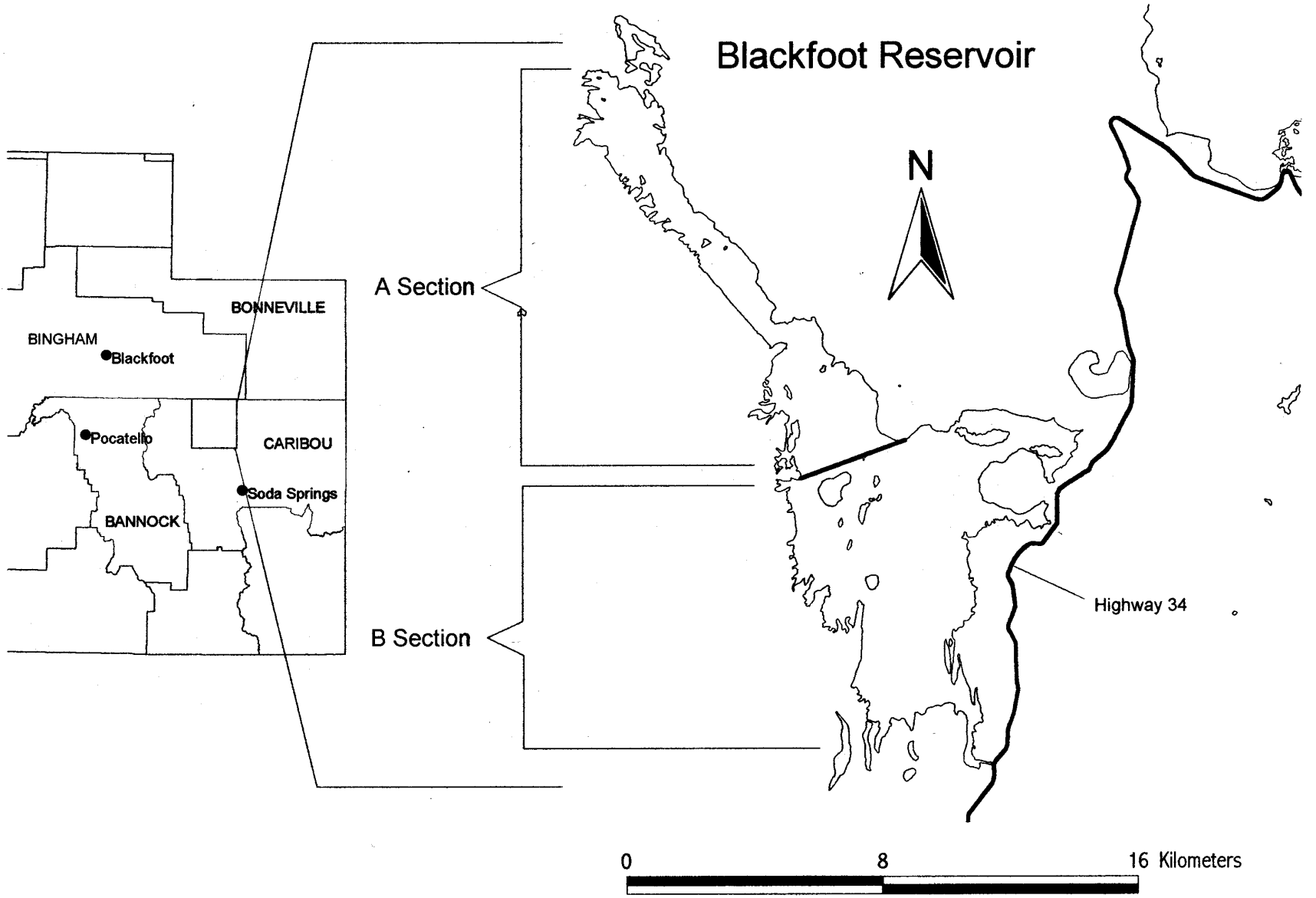


Figure 1. Map of Blackfoot Reservoir, Idaho, and designation of creel survey sections A and B.

Wildlife Resources. It is home to a fluvial strain of Bonneville cutthroat trout as well as the Bonneville cisco *Prosopium gemmiferum*, Bear Lake sculpin *Cottus extensus*, and Bonneville whitefish *P. spilonotus* that are found nowhere else in the world. In addition, a population of lake trout *Salvelinus namaycush* is maintained through periodic stocking of fingerlings. The cutthroat trout population is maintained by both natural and human-assisted reproduction.

Utah resource managers trap and spawn cutthroat trout out of relatively small Swan Creek. The eggs are hatched and resultant fry raised in a hatchery before being returned to the lake as fingerlings. Before being stocked, the fingerlings are fin-clipped (adipose, left pelvic, and right pelvic) to enable identification of hatchery-reared fish. Beginning in 1997, lake trout will also be clipped before planting. Fin-clipped fish will allow management to investigate several issues vital to the health of the valuable and easily exploited cutthroat trout fishery.

The first issue of concern is determining what percentage of the cutthroat trout harvest comes from hatchery-raised fish. Bear Lake itself provides habitat for a large number of fish; however, cutthroat trout numbers appear to be limited by the relatively small area of available spawning habitat. Besides Swan Creek, the only stream providing a significant amount of spawning habitat is St. Charles Creek. To reduce angler impact on the St. Charles Creek spawning run, several angling restrictions have been enacted for both the creek and the lake. The regulations deal mainly with restricting harvest of fish directly before and during the spawning season. Future restrictions may limit harvest of cutthroat trout from the lake to those fish reared in a hatchery (fin-clipped).

The second issue of concern is determining the reproductive status of lake trout in Bear Lake. During the initial introduction of lake trout into the system, it was determined that there would be little to no natural reproduction of the predator. Surveys found insufficient amounts of good lake trout spawning habitat. Control of lake trout numbers and their impact on the native fish populations was to be done through increased or decreased stocking rates. However, recently completed construction, primarily the enhancement of the lake's largest marina, may have increased the available lake trout spawning habitat. Young lake trout without fin clips recruiting to the harvest may indicate a future problem similar to those faced in Yellowstone Lake in Wyoming.

In 1996-97, a joint-effort creel survey was conducted on Bear Lake to determine standard creel statistics. Personnel from both the Idaho Department and the Utah Division contacted anglers during the six-month survey period. The months chosen (May, June, October, November, January, and February) are historically the months favored by anglers. May and June are the first months available to open-water fishing following the melting of cover-ice. October and November are when lake trout move out of the deeper waters in the lake in search of spawning sites and thus become accessible to a larger number of anglers. January and February are when dipnetting is allowed for the harvest of spawning Bonneville cisco.

Creel checks were conducted randomly twice a week with one check always during the weekend. Checks were further randomly divided into morning (AM) and afternoon (PM) periods. During each survey check, clerks made an initial count of all anglers present then proceeded to contact as many as possible. Anglers were asked their state of residence, hours spent fishing, number of fish caught (both kept and released), and harvested fish were measured for length to the nearest millimeter. At the end of the check period, a second count was conducted before the clerk left. The survey data was analyzed using C-SAP software developed by the Colorado Division of Wildlife Aquatic Research. Estimates were calculated for hours of effort, fish caught, fish harvested, and mean length of harvested fish.

Sterile Fish Evaluation

A statewide study was initiated to compare differential growth between sterile (triploid) and normal (diploid) rainbow trout. The two groups were grit-marked using red or green fluorescent pigments to allow identification of each group. The pigmented grit is embedded under the scales with a high-pressure sprayer. The method is quicker and less labor-intensive than the traditional method of fin clipping. The mark is detected by exposing fish to an ultraviolet light in a darkened enclosure and observing the fluorescence. The pigment fluoresces when subjected to the ultraviolet light. Sterile fish were marked using a red pigment; the fertile fish with a green pigment. Daniels and Treasureton reservoirs, along with others in the McCall region, were chosen as study locations because of their restrictive harvest size limits. Size limits should ensure that an adequate number of marked fish survive more than a single growing season.

We collected grit-marked fish using the lowland lakes surveys methods described below. The goal at both reservoirs was to collect at least 10 each of both marked groups (sterile and fertile).

Daniels Reservoir

Daniels Reservoir is a 152 ha reservoir at elevation 1,573 m in Oneida County, owned by the St Johns Irrigation Company. It is a relatively new reservoir, completed in 1970. As with all new reservoirs, it enjoyed high productivity during the first few years after construction. Anglers remember abundant, fast-growing trout caught in the 1970s. Non-game fish, notably Utah suckers *Catostomus ardens*, then colonized the reservoir. Department personnel chemically renovated Daniels Reservoir in 1988. It currently has a two trout (none under 20 inches) regulation combined with a no-bait regulation. We conducted a lowland lake survey at Daniels Reservoir on April 14 and 24, 1997.

Treasureton Reservoir

Treasureton Reservoir is located on Battle Creek in Franklin County. Its primary function is irrigation storage and flood control. Secondarily, the reservoir provides excellent sportfishing opportunities. The dam and reservoir are owned and operated by the Strongarm Reservoir Company. At full capacity, the reservoir is at 1,645 m elevation, covers 58 ha and contains 2,280,000 m^3 of water. The reservoir had been managed as a year-round fishery based on plants of catchable rainbow trout. In 1994, the reservoir management changed to quality management with a two trout (none between 12 and 16 inches) limit. We conducted a lowland lake survey at Treasureton Reservoir on May 28 and June 2, 1997.

Lowland Lake Surveys

We assessed the health of fish populations in several regional reservoirs during the summer of 1997. When a lowland lake survey was conducted, the following standardized gear was used. One unit of effort for each of the gear types, combined, equals one unit of "sampling effort." The minimum standard amount of sampling effort is dependent upon size of the water body.

1. Gill Nets. Floating and sinking monofilament nets, 150-ft x 6-ft, with six panels composed of ¾-in, 1-in, 1 ¼-in, 1 ½-in, 2-in and 2 ½-in bar mesh. One floating and one sinking net combined fished overnight equals one unit of gill net effort.

2. Trap Nets. Fifty ft lead, 3-ft x 6-ft sized frame, crowfoot throats on the first and third of five loops, ¾-in bar mesh, treated black. One trap net fished overnight equals one unit of trap net effort.

3. Electrofishing. A pulsed D.C. electrofishing boat with boom-mounted electrodes. One hour of current-on electrofishing equals one unit of electrofishing effort.

American Falls Reservoir

American Falls Reservoir is located on the Snake River in Bingham and Power counties. Its primary functions include irrigation storage, flood control, and hydropower production. Secondarily, the reservoir is an extremely productive trout fishery and may develop into a good smallmouth bass *Micropterus dolomieu* fishery. The original dam was completed in 1927 and modified in 1979. The U.S. Bureau of Reclamation regulates the dam and reservoir while the powerhouse is regulated by Idaho Power. At full capacity, the reservoir is at 1,327 m elevation, covers 22,685 ha and contains 2,100,000,000 m^3 of water. Refilling begins in October and continues through early spring. Irrigation use begins in April with drawdown beginning as irrigation demand exceeds inflow, usually in mid-June.

Large numbers of hatchery rainbow trout, both catchable and fingerling size, are stocked into the reservoir and the Snake River between Shelley and the headwaters of American Falls Reservoir. Since 1991, the Department has stocked fingerling trout, mostly rainbows in the Snake River upstream of American Falls Reservoir. Some of these fish move downstream and enter the reservoir. Additionally, all trout stocked into the reservoir are stocked at the upper end. Earlier research (Heimer 1974) determined that trout stocked near the head of the reservoir were caught at about twice the rate within the reservoir as were fish stocked nearer the dam. Most harvest of fish stocked near the dam, at Seagull Bay, occurred in the Snake River below American Falls Dam.

Smallmouth bass recently colonized American Falls Reservoir. In 1990 and 1991, the Department stocked 4,600 20 to 28 cm smallmouth bass into Gem Lake Reservoir on the Snake River at Idaho Falls. Some of the original smallmouth bass may have moved downstream and spawned in American Falls Reservoir, or younger smallmouth bass spawned at Gem Lake or in the river below Gem Lake, moved downstream to American Falls Reservoir. American Falls Reservoir, at a lower elevation and with a much larger storage-to-flow ratio than Gem Lake, may allow more successful spawning and young-of-the year (YOY) winter survival of smallmouth bass.

We conducted a lowland lake survey at American Falls Reservoir on two nights, July 22 and 30, 1997. Fish species present in the reservoir include: brown trout *Salmo trutta*, carp *Cyprinus carpio,* largemouth bass *Micropterus salmoides,* mottled sculpin *Cottus bairdi*, rainbow trout, redside shiner *Richardsonius balteatus,* smallmouth bass, Utah chub *Gila atraria,* Utah sucker, yellow perch *Perca flavescens* and brown bullhead *Ameiurus nebulosus.*

Blackfoot Reservoir

Blackfoot Reservoir is located on the Blackfoot River in Caribou County north of Soda Springs, ID. Its primary use is irrigation storage and flood control. The U.S. Bureau of Indian Affairs regulates the dam and reservoir. At full capacity, the reservoir is at 1,865 m elevation, covers 7,285 ha and contains 432,000,000 m^3 of water. Refilling begins in October and continues through spring. Irrigation use begins in June with drawdown beginning as irrigation demand exceeds inflow. Blackfoot Reservoir completely refilled in June 1996 after the 1987-1992 drought.

To assess the fishery status we conducted a lowland lake survey of Blackfoot Reservoir July 23, 1997. The most recent previous lowland lake survey was completed in 1991. The Upper Blackfoot System Fishery Management Plan was implemented in 1990.

Chesterfield Reservoir

Chesterfield Reservoir is located on the Portneuf River in Caribou County. Its primary use is irrigation storage and flood control. The dam and reservoir are owned and operated by the Portneuf-Marsh Valley Canal Company. At full capacity, the reservoir is at 1,645 m elevation, covers 647 ha and contains 29,200,000 m^3 of water. Refilling begins in October and continues through early spring. Irrigation use generally begins in June with drawdown beginning as irrigation demand exceeds inflow.

Chesterfield Reservoir is managed as a put-and-grow trout fishery with excellent growth and significant numbers of carryover fish. Hatchery rainbow trout dominate the catch with occasional reports of wild cutthroat trout and hatchery brown trout being taken. Most stocking is done with catchable and fingerling size rainbow trout. Plants of five to ten thousand fingerling brown trout have been made most years since 1993. In 1992, Department personnel chemically renovated Chesterfield Reservoir to rid it of undesirable species, specifically Utah chubs and common carp.

Fish species currently found in Chesterfield Reservoir include: brown trout, cutthroat trout, rainbow trout, cutthroat-rainbow trout hybrids *O. clarki x O. mykiss*, Utah chubs, and mountain suckers *Catostomus platyrhynchus*.

Deep Creek Reservoir

Deep Creek Reservoir is located in Oneida County. Its primary use is irrigation storage and flood control. The dam and reservoir are owned and operated by the Deep Creek Irrigation Company. At full capacity, the reservoir is at 1,571 m elevation, covers 74 ha and contains 5,550,000 m^3 of water. Refilling begins in October and continues through early spring. Irrigation use begins in June with drawdown beginning as irrigation demand exceeds inflow. Game fish species present include rainbow trout, rainbow/cutthroat trout hybrids, kokanee *Oncorhynchus nerka kennerlyi* and largemouth bass.

Deep Creek Reservoir is managed as a put-and-grow fishery with fair growth and significant numbers of carryover fish. Rainbow trout dominate the catch with occasional reports of wild cutthroat trout and kokanee being taken. Most stocking is done with catchable and fingerling size rainbow trout. The largemouth bass presence is the result of an unauthorized introduction that established a reproducing population.

A fish kill was reported on Deep Creek Reservoir during the summer of 1997. To assess the fish population status, we conducted a lowland lake survey on August 13, 1997. In addition, vertical stratification of dissolved oxygen and temperature were measured to determine if these parameters could have caused the fish kill.

Devils Creek Reservoir

Devils Creek Reservoir is located in Oneida County and is used primarily for irrigation storage and flood control. The Malad Valley Irrigation Company regulates the dam and reservoir. At full capacity, the reservoir is at 1,568 m elevation, covers 58 ha and contains 5,550,000 m^3 of water. Refilling begins in October and continues through early spring. Irrigation use generally begins in June with drawdown beginning as irrigation demand exceeds inflow.

Devils Creek Reservoir is managed as a put-and-grow rainbow trout fishery using both catchable and fingerling plants. Additional game species include rainbow/cutthroat trout hybrids, lake trout *Salvelinus namaycush* and splake *S. fontinalis x S. namaycush*. The reservoir's close proximity to Interstate 15, ease of access, and permanent camping facilities combine to produce heavy summer fishing pressure. In response to anglers' complaints of reduced fishing quality, we conducted a lowland lake survey at Devils Creek Reservoir on August 6, 1997.

Springfield Reservoir

Springfield Reservoir is on Danielson Creek near the town of Springfield in Bingham County. Its primary use is for irrigation with no flood control potential. At full capacity, the reservoir is at 1,338 m elevation, covers 27 ha and contains 432,000 m^3 of water. The reservoir is fed by a spring and the water level fluctuates only when water is lowered approximately 1 m to reduce dam safety concerns in winter. The inflow spring creek has a mud bottom; therefore, poor trout spawning habitat. Little, if any, trout spawning takes place.

Springfield Reservoir is situated about 5 km north of American Falls Reservoir, a major nesting area for thousands of fish-eating birds. The American white pelican *Pelecanus erythrorhynchos* and the double-crested cormorant *Phalacrocorax auritus* both nest around American Falls Reservoir. Springfield Reservoir is shallow, in part due to excessive sedimentation from irrigation practices in the past. The number of fish-eating birds, especially cormorants, appears to have increased dramatically in the area in the last decade. We have adjusted to the increased predation by stocking smaller numbers of rainbow trout more frequently and by stocking more bottom-oriented species such as splake and brook trout with limited success.

To assess our latest attempt to manage around the piscivorous bird problem using standard catchable size fish, we conducted a lowland lake survey on Springfield Reservoir on April 26, 1997. Fish species found in this water included: rainbow trout, splake, brook trout, Utah chub and Utah sucker.

RESULTS AND DISCUSSION

Blackfoot Reservoir Creel Survey

In total, 11,117 (± 3097 at α = .05) anglers spent 61,096 (± 12,780 at α = .05) hours on 7,285 ha Blackfoot Reservoir (8.1 h/ha) during the period of May through November 1997 (Table 1). Total catch was 12,373 (± 3500 at α = .05) fish (1.7 fish/ha), and 71% of all fish caught were harvested. Rainbow trout accounted for 99% of the harvest. Anglers caught 535 cutthroat trout but only harvested 62 fish (11%). This may be accounted for by only 33 hatchery cutthroat trout being reported along with the current no harvest regulation on wild cutthroat trout (evidenced by an intact adipose fin). Average catch rate was 0.2 fish/h and 1.1 fish/angler. Average length of fish harvested was 401 mm. Boat anglers accounted for 52% of the effort and 55% of the total catch. Highest effort was seen in June with 16,287 total hours followed by July with 14,910 hours. By September effort was only one third that estimated for June.

Bear Lake Creel Survey

During the six-month survey, 8,970 anglers spent 29,960 hours fishing on Bear Lake (0.97 h/ha). They caught 29,270 fish for a catch rate of 0.98 fish/h (Table 2). This catch rate is heavily skewed by the ease of catching Bonneville cisco in large numbers quickly. If we disregard the data from January (only month reporting catch of cisco), the catch rate falls to 0.58 fish/h (16,100 fish and 27,700 hours). Instead of disregarding only the Bonneville cisco catch numbers, the entire month is eliminated from the calculation because it is impossible to determine what level of effort (hours) was spent targeting Bonneville cisco exclusively.

Harvest percentage of fish caught was also affected by the anomalous Bonneville cisco data. Since effort is not included in the calculations, we can disregard only the cisco numbers and still use the other species data from January. With the cisco data included, 72% of all fish caught were harvested. Without the cisco, only 54% of all fish caught were harvested (Table 2). Cutthroat trout was the species most often caught during four of the six months. During October, lake trout were caught in higher numbers, and during January cisco dominated anglers catch and effort.

Catch rates varied from month to month and between methods. Excluding January bank anglers, the lowest recorded catch rate was for bank anglers during May and June (0.08 and 0.06 fish/h respectively). The highest catch rate was for boat anglers during January (6.47 fish/h). Bank anglers typically did best during the lake trout spawning season in October (0.62 fish/h).

Table 1. Catch and harvest of trout from Blackfoot Reservoir, Idaho, May through November 1997.

	No. Anglers	Effort (hours)	No. Fish caught	Catch rate (fish/h)	No. Fish harvested	No. Hatchery rainbow trout harvested
May WD	1245	6703	243	0.04	206	173
May WE	738	3523	622	0.18	307	295
June WD	2478	10159	3582	0.35	2413	2413
June WE	1082	4752	1297	0.27	1143	1143
July WD	1065	6567	897	0.14	262	262
July WE	990	9720	2552	0.26	2189	2124
Aug WD	1341	5512	1085	0.20	1004	987
Aug WE	662	4830	747	0.15	350	350
Sept WD	310	2116	78	0.04	78	78
Sept WE	725	3802	545	0.14	397	397
Oct WD	269	1619	118	0.07	0	0
Oct WE	100	1210	282	0.23	170	171
Nov WD	0	0	0	0.00	0	0
Nov WE	105	582	324	0.56	287	287
Totals	11117	61096	12373		8808	8680
Mean				0.20		

Table 2. Figures and statistics from the 1996-1997 Bear Lake, Idaho/Utah, creel survey.

		# Anglers	Effort (Hours)	Catch Rate (fish/h)	Cutthroat Trout		Lake Trout		Whitefish		Cisco	
					Caught	% Kept	Caught	% Kept	Caught	% Kept	Caught	% Kept
May 96	Shore	211	651	0.08	5	60%	47	100%				
	Boat	796	4153	0.30	662	36%	601	82%				
	Total	**1007**	**4804**	**0.27**	**667**	**36%**	**648**	**83%**	**0**	**0%**		
Jun 96	Shore	536	718	0.06	46	9%						
	Longline	290	1300	0.38	290	100%	210	100%				
	Boat	891	5697	0.35	1377	72%	595	98%	7	0%		
	Total	**1717**	**7715**	**0.33**	**1713**	**75%**	**805**	**98%**	**7**	**0%**		
Oct 96	Shore	1044	1778	0.62	96	85%	1006	89%				
	Boat	416	1791	0.54	614	44%	348	59%				
	Total	**1460**	**3569**	**0.58**	**710**	**50%**	**1354**	**81%**	**0**	**0%**		
Nov 96	Shore	678	1529	0.45	434	55%	143	42%	116	100%		
	Boat	380	1495	0.81	824	33%	362	94%	28	100%		
	Total	**1058**	**3024**	**0.63**	**1258**	**40%**	**505**	**79%**	**144**	**100%**		
Jan 97	Shore	40	63	0.00								
	Boat	310	1958	6.47	769	40%	78	81%	685	99%	11131	100%
	Ice	43	273	1.86	35	83%	43	49%			429	100%
	Total	**393**	**2294**	**5.74**	**804**	**42%**	**121**	**69%**	**685**	**99%**	**11560**	**100%**
Feb 97	Shore	2	12	0.08	1	100%						
	Boat	40	273	1.76	470	21%	5	100%	5	0%		
	Longline	17	74	0.24	18	100%						
	Ice	3276	8191	1.03	4653	24%	940	40%	2878	61%		
	Total	**3335**	**8550**	**1.05**	**5142**	**24%**	**945**	**40%**	**2883**	**61%**		
Subtotal					10294	36%	4378	75%	3034	86%	11560	100%
Total		8970	29956	0.98[a]	29266							

[a] Catch rate is grossly affected by large numbers of cisco caught during spawning run.

Sterile Fish Evaluation

Daniels Reservoir

A map of the areas sampled is provided in Figure 2. The lengths of collected trout (all species) ranged from 75 to 530 mm with a mean length of 430 mm (Figure 3). The largest rainbow trout measured 504 mm and was collected by electrofishing.

Relative species composition for all gear was 91% rainbow trout, 6% cutthroat trout and 3% cutthroat-rainbow trout hybrids. Of the 114 rainbows collected, 37 were grit-marked fish. We identified 16 sterile and 21 fertile fish. The marked fish were measured for length and weight, sacrificed and placed in plastic bags for freezing. They were transported to the Fishery Research Lab in Nampa for analysis of differential growth rates in both absolute size and gonad development. The unmarked rainbow trout lengths ranged from 75 to 530 mm, with a mean length of 404 mm. The mean length of the non-rainbow trout was 399 mm with a range of 310 to 530 mm.

Treasureton Reservoir

We conducted a lowland lake survey at 58-ha Treasureton Reservoir on two separate nights. The electrofishing equipment malfunctioned on the first outing so a second sampling was necessary. The first night we collected 47 total fish of which 14 were grit-marked. The second night we released all fish not grit-marked and collected another 28 marked fish for a total of 42. The marked fish were measured for length and weight, sacrificed and placed in plastic bags for freezing. They were transported to the Nampa Research facility. The mean length of the 25 non-marked fish was 399 mm and ranged from 310 to 516 mm.

The interest in using sterile fish for stocking is twofold. First, eliminating domestic and wild trout (especially cutthroat trout) hybridization is vitally important to the preservation of wild trout populations. Second, anglers would probably welcome the increased growth that may result from the lack of sexual development in sterile fish (Dunham 1990). If these sterile rainbow trout are shown to have enhanced performance characteristics, their use may benefit stillwater fisheries statewide. This entire project is being coordinated and overseen by fisheries research personnel from the Magic Valley Region. They will provide analysis and discussion of the results concerning this ongoing study. Our job was to assist in the collection of marked fish and simultaneously collect data on the relative health of the fishery at large.

Lowland Lakes Surveys

American Falls Reservoir

We conducted a lowland lake survey at 22,660 ha American Falls Reservoir on two nights, July 22 and 30, 1997. A map of the areas sampled is provided in Figure 4. Relative species composition for all gear types combined was 42% Utah suckers, 19% smallmouth bass, 17% yellow perch, 16% Utah chubs, 4% redside shiner, 1 % carp and <1% for largemouth bass and rainbow trout (Table 3). The different gear types collected

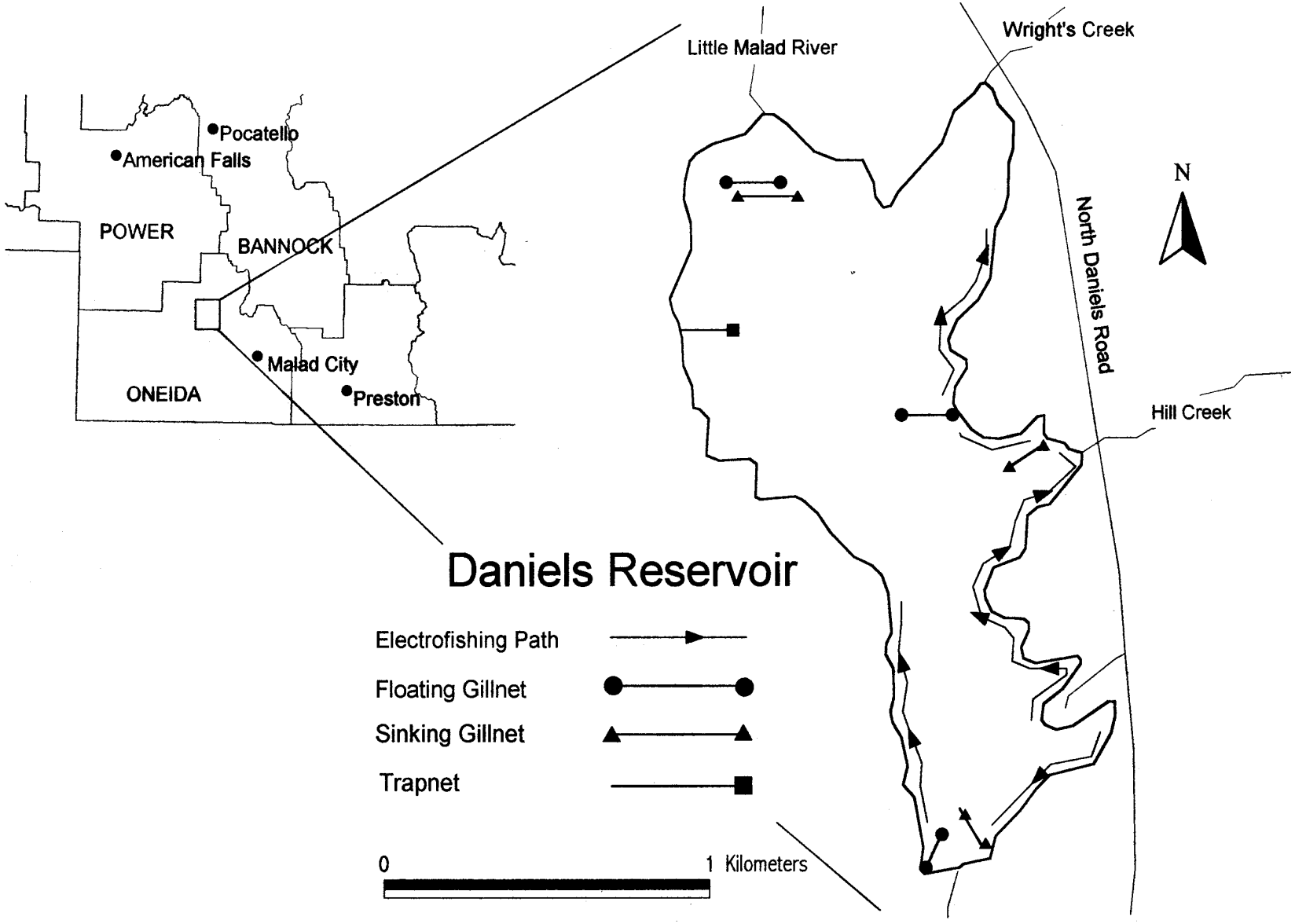
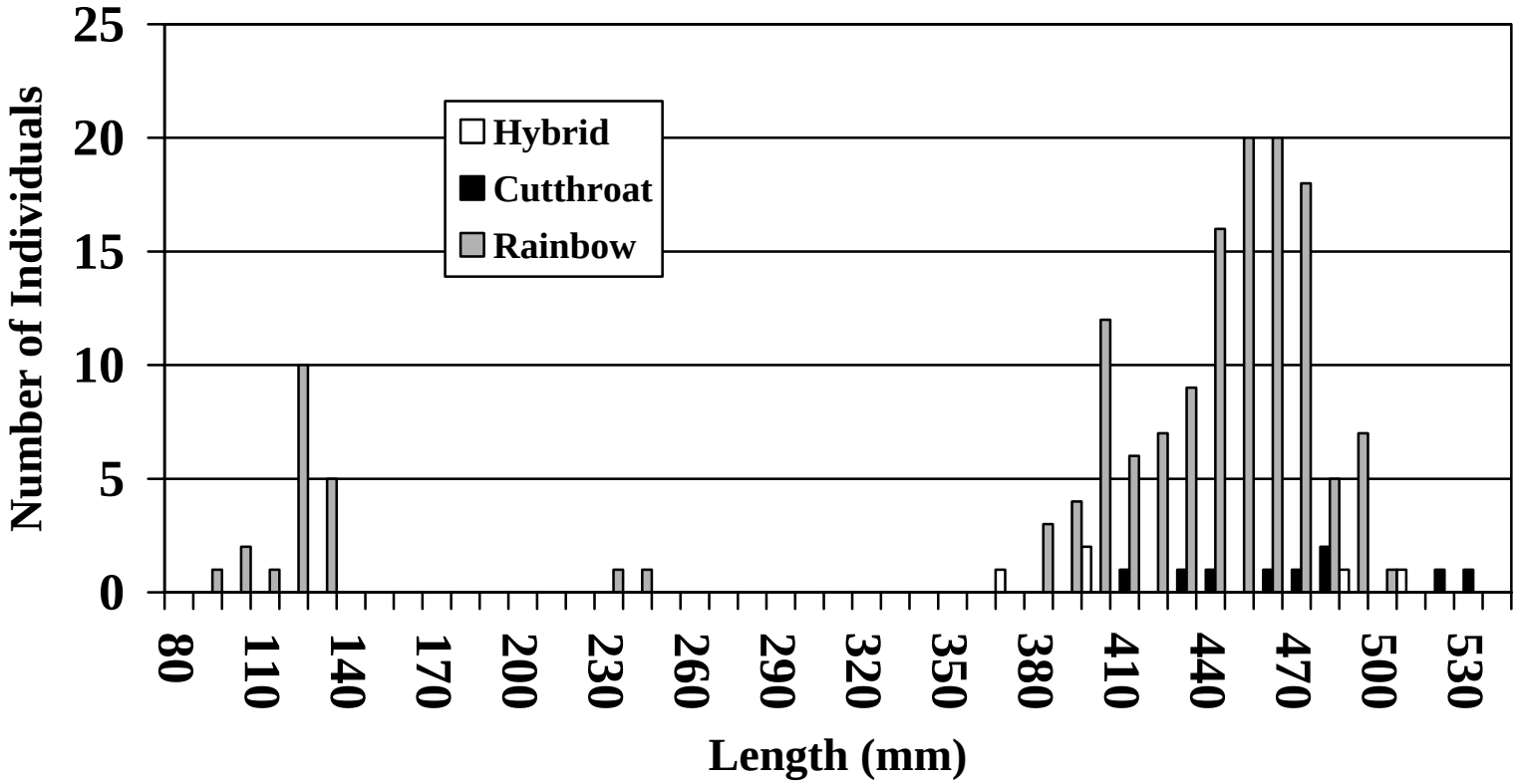


Figure 2. Map of Daniels Reservoir, Idaho, indicating gillnet and electrofishing sites, April 14, 1997.



	HYB	CUT	RBT
Mean Length (mm):	437	473	404
Length Std. Dev.:	63	39	114
Sample Size:	5	9	149
Fish >300 >400mm:	40%	100%	95%
Species Composition:	3.1%	5.5%	91.4%

Figure 3. Length frequency distribution of all trout sampled from Daniels Reservoir, Idaho, April 14 and 24, 1997.

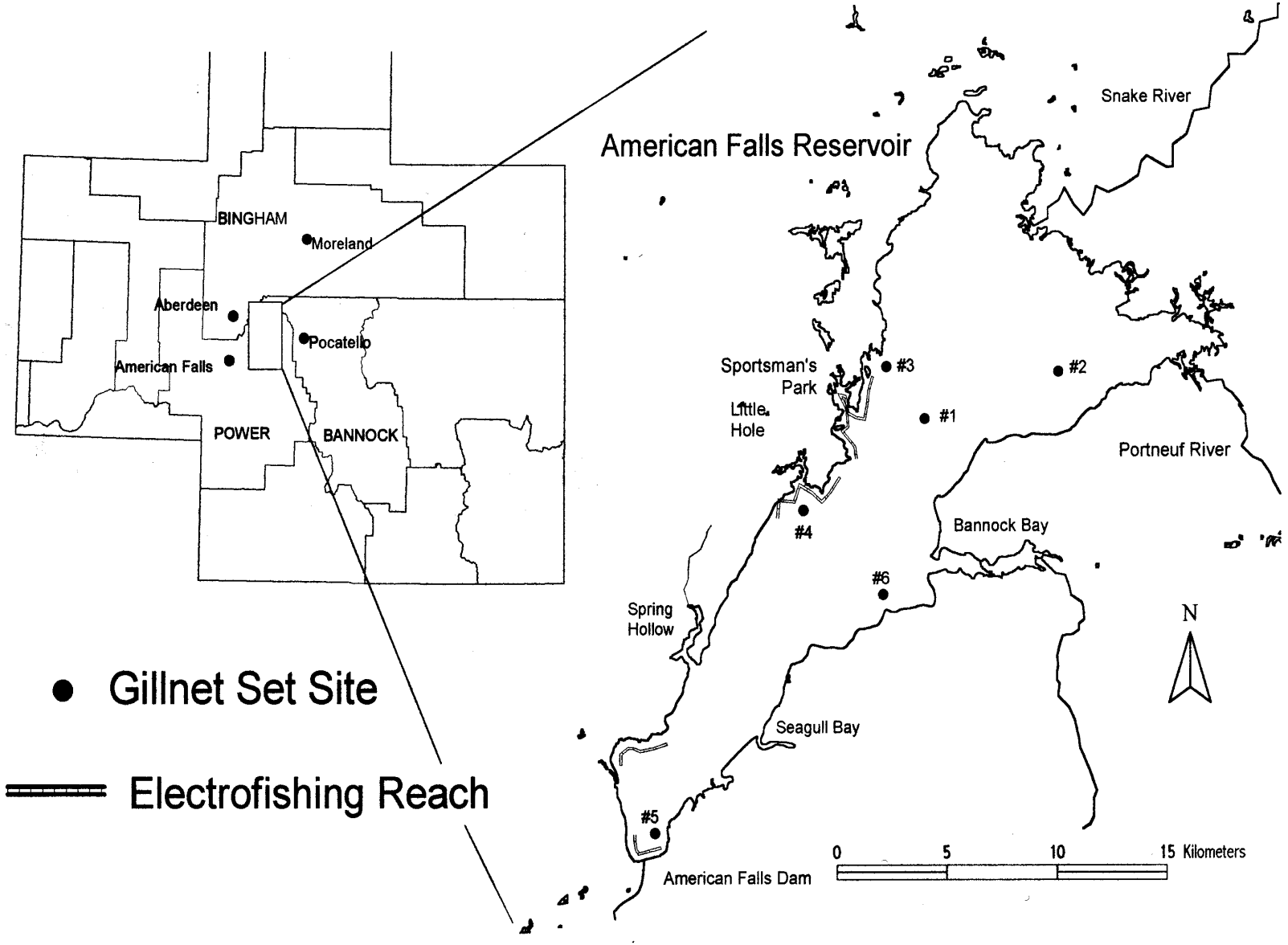


Figure 4. Locations of gillnet sites and electrofishing reaches on American Falls Reservoir, Idaho, July 22 and 30, 1997.

species in differing proportion, in particular Utah chubs (51%) and Utah suckers (42%) accounted for over 92% of the total gillnet catch, while over 22% of the shoreline electrofishing catch was smallmouth bass.

Collected smallmouth bass had a mean length of 218 mm, and a length range of 53 to 270 mm (Figure 5). The smallmouth bass appeared to be in good condition with weights near or slightly above the standard weight line (Figure 6). Yellow perch mean length was 122 mm with a range of 40 to 230 mm (Figure 7). Most fish (55%) were in the 100 to 130 mm range reflected in a proportional stock density (PSD) of 21%. As with the smallmouth bass, yellow perch were in good condition with weights at or just above the standard weight line (Figure 8). Only seven rainbow trout were collected during the survey (Table 3). This most likely reflects the difficulty in successfully sampling for the open-water species in such a large body of water.

It appears that a significant smallmouth bass population is rapidly developing in American Falls Reservoir. The various available bays and inlets should provide good habitat for both adult and juvenile fish. With continued abundant water, a shoreline fishery for smallmouth bass could develop within the next few years.

Recommendation-Conduct shoreline electrofishing surveys periodically to document any change in size structure of the colonizing species. Surveys should be timed to coincide with smallmouth bass spawning season in order to allow collection of the larger members of the population.

Blackfoot Reservoir

We conducted a lowland lake survey at 7,280 ha Blackfoot Reservoir on two nights, July 23 and August 7, 1997. As expected, Utah chubs were the most abundant fish species, followed by Utah suckers. Only about 4% of all fish sampled were trout. The largest and most robust trout in the samples were wild cutthroat trout. Relative species composition for all gear combined was 83% Utah chubs, 12% Utah suckers, 3% rainbow trout, 1% wild cutthroat trout and 1% carp (Table 4). The physical condition of the few rainbow trout collected was good for the smaller-sized fish (up to 380-mm) but appeared to decline for the larger fish (Figure 9).

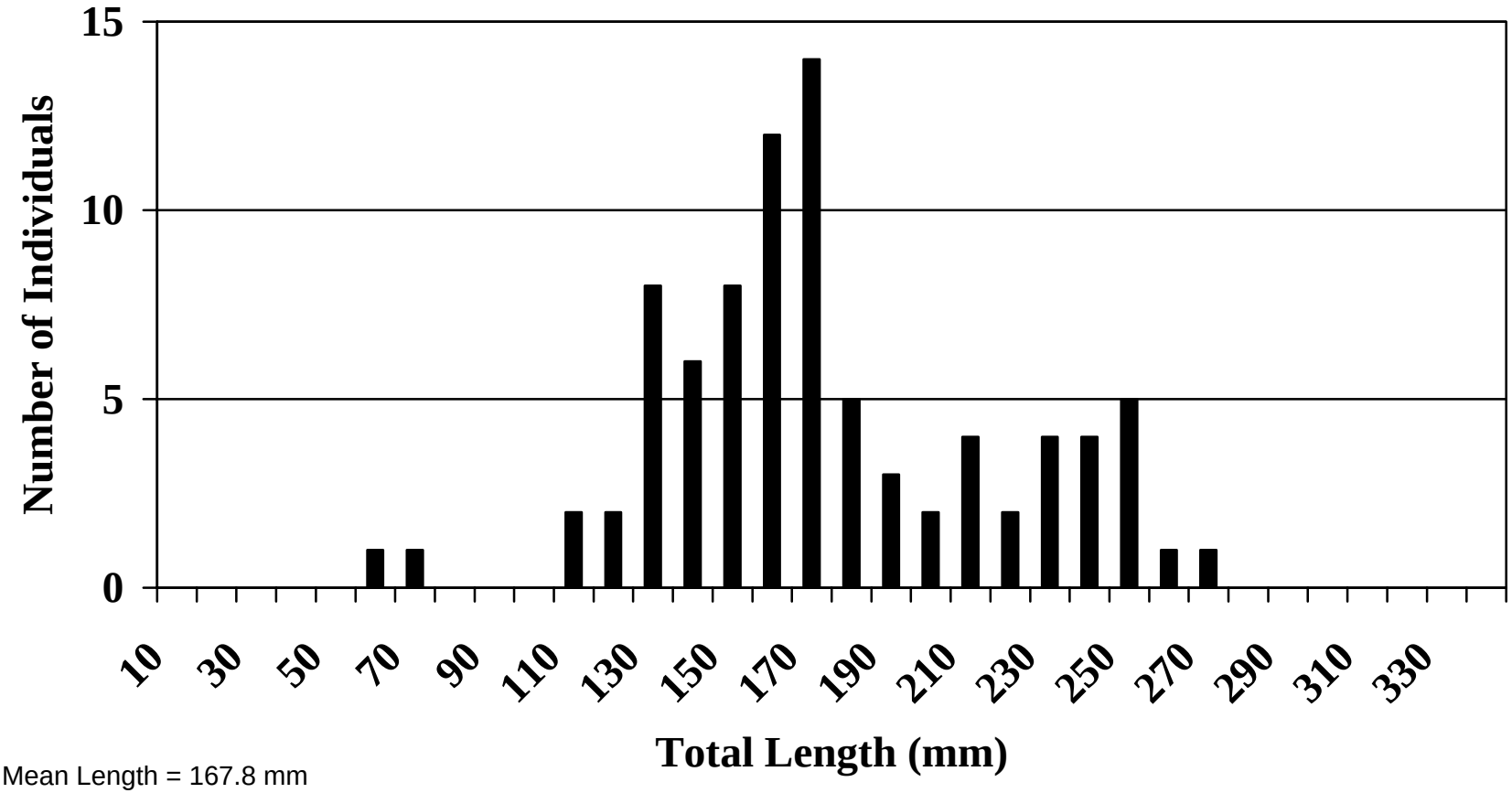
Chesterfield Reservoir

We conducted a lowland lake survey at 650 ha Chesterfield Reservoir on August 18, 1997. Relative species composition for all gear combined was 70% rainbow trout, 13% cutthroat/rainbow trout hybrids, 11% Utah chubs, 3% brown trout and 2% mountain suckers (Table 5). The different gear types had differential success in collecting the various species with the Utah chubs (51%) and mountain suckers (42%) collected only in the gillnets. Collected rainbow trout ranged in length from 180 to 577 mm with a mean length of 255 mm (Figure 10). Rainbow trout appeared to be in good condition with weight very near the standard weight line (Figure 11). Utah chubs and mountain suckers mean lengths were 200 and 130 mm, respectively. The largest fish collected was a 577 mm male rainbow trout taken by electrofishing.

Table 3. American Falls Reservoir, Idaho, standard survey findings of fish characteristics, July 22 & 30, 1997.

Species	Catch per Unit Effort*	Relative % Species Composition	Mean Length (mm)	Length Range (mm)	Relative Weight (Wr)
Game Fish					
Yellow perch	80.9	17.0	122	40-230	114.2
Smallmouth bass	44.3	18.7	168	53-270	107.8
Rainbow trout	4.2	0.6	373	300-480	101.6
Largemouth bass	0.2	0.1			
Subtotal	129.4	36.5			
Non-game Fish					
Utah sucker	133.6	41.9	262	61-622	
Utah chub	80.9	16.5	239	50-457	
Redside shiner	8.2	3.5			
Carp	2.9	1.2	559	66-719	
Mottled sculpin	0.9	0.4			
Subtotal	226.6	63.5			
All Species Total	356.0	100			

*One hour electrofishing, one trap net night, and one combined floating and sinking gill net night is equal to one unit of sampling effort.



Mean Length = 167.8 mm
Standard Deviation = 43 mm
Sample Size = 85
PSD = 0%

Figure 5. Length frequencies distribution of smallmouth bass sampled from American Falls Reservoir, Idaho, July 22 and 30, 1997.

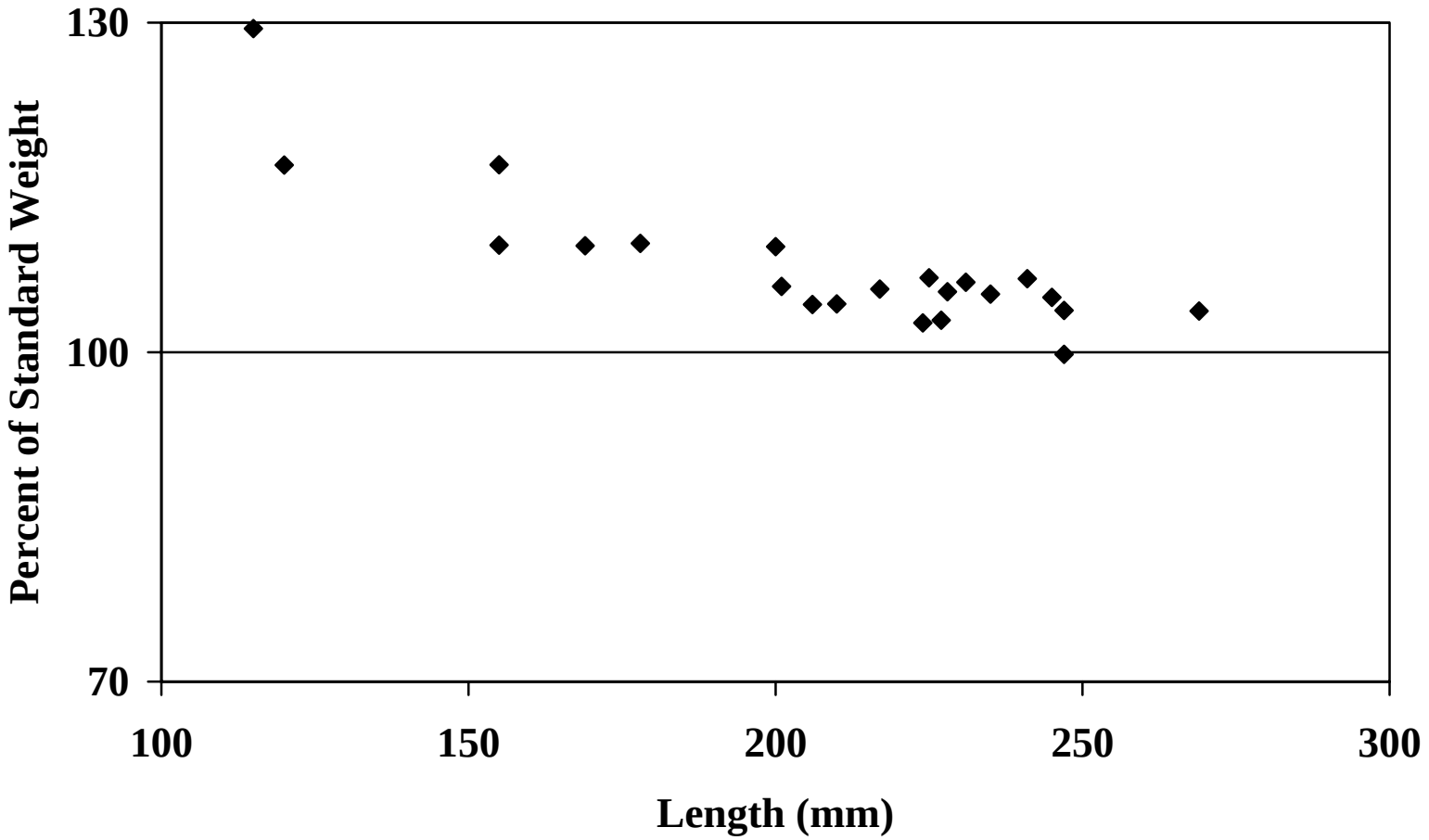
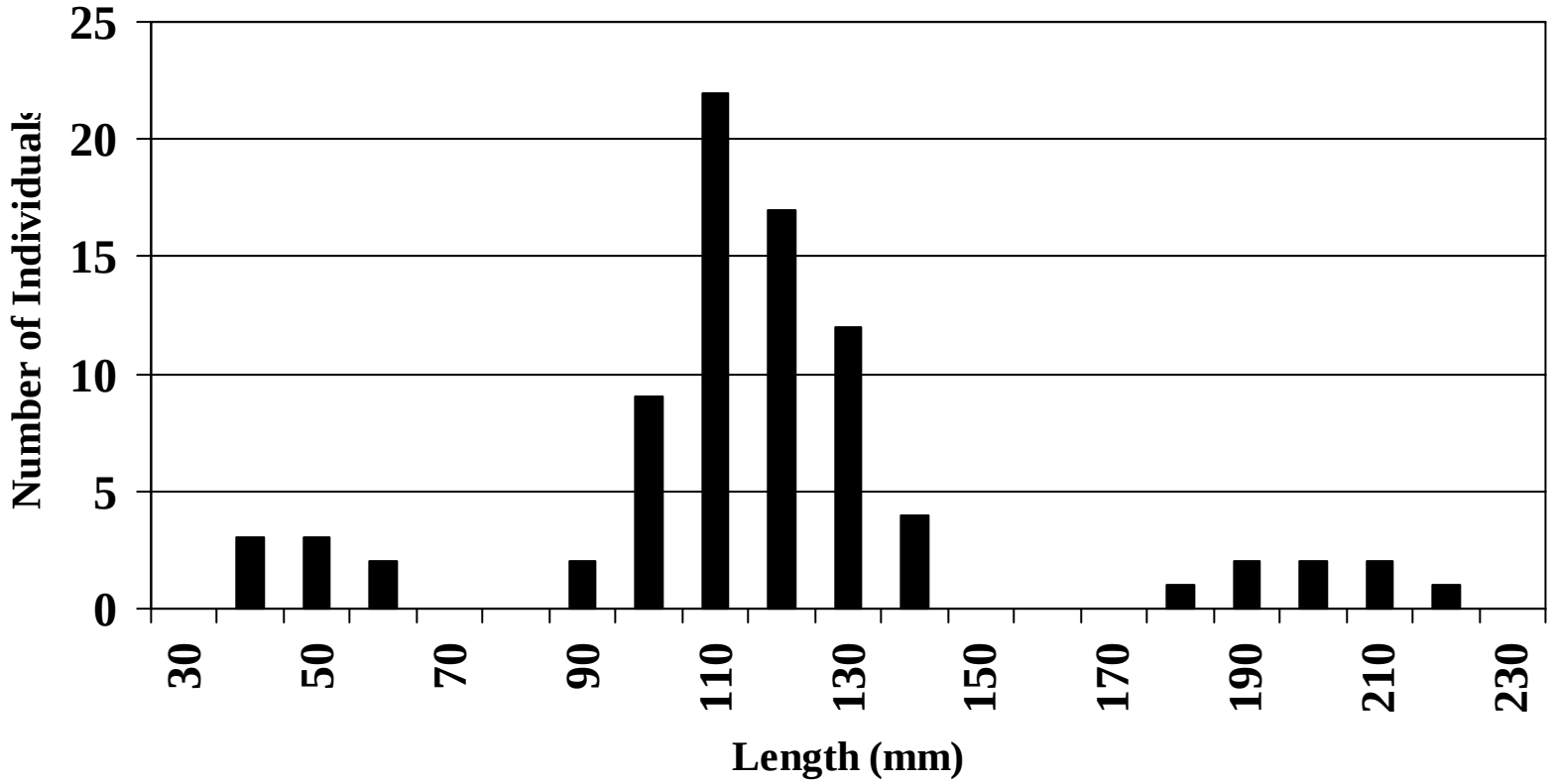


Figure 6. Relative weight analysis of smallmouth bass sampled from American Falls Reservoir, Idaho, July 22 and 30, 1997.



Sample Size = 82
Mean Length = 122 mm
Length Std. Dev. = 36 mm

Figure 7. Length frequency distribution of yellow perch sampled from American Falls Reservoir, Idaho, July 22 and 30, 1997.

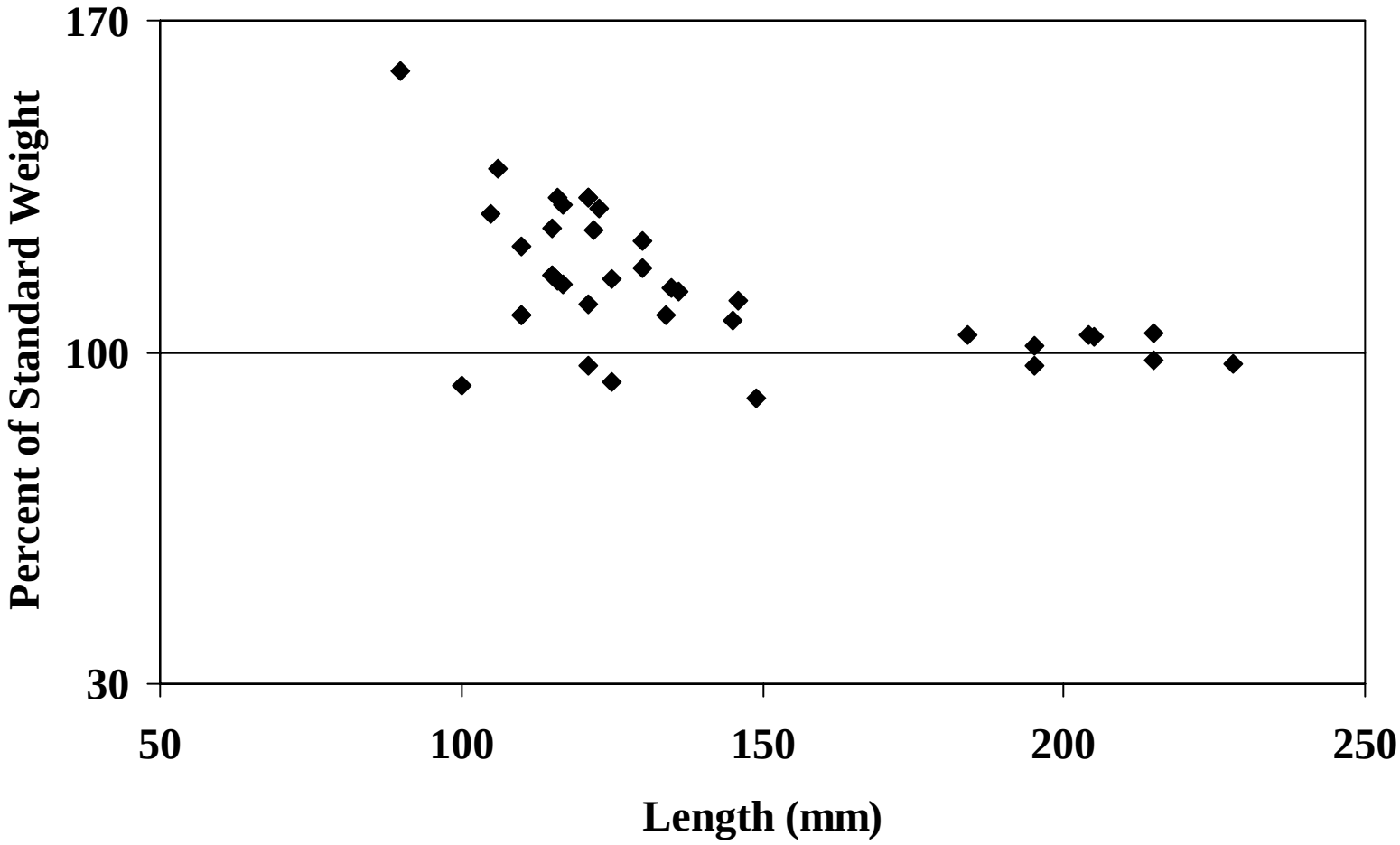


Figure 8. Relative weight analysis of yellow perch sampled from American Falls Reservoir, Idaho, July 22 and 30, 1997.

Table 4. Blackfoot Reservoir, Idaho, standard survey findings of fish community characteristics, July 23 and August 7, 1997.

Species	Catch per Unit Effort*	Relative % Species Composition	Average Length (mm)	Length Range (mm)	Relative Weight (Wr)
Game Fish					
Rainbow Trout	11.0	2.8	292	130-500	99.3
Wild Cutthroat Trout	5.0	1.1	498	488-511	
Subtotal	16.0	3.9			
Non-Game Fish					
Utah chub	365.3	83.0	231	79-419	
Utah Sucker	45.7	11.6	340	61-594	
Carp	6.7	1.5	188	183-201	
Subtotal	417.7	96.1			
All Species Total	433.7	100			

*One hour electrofishing, one trap net night, and one combined floating and sinking gill net night equals one unit of effort.

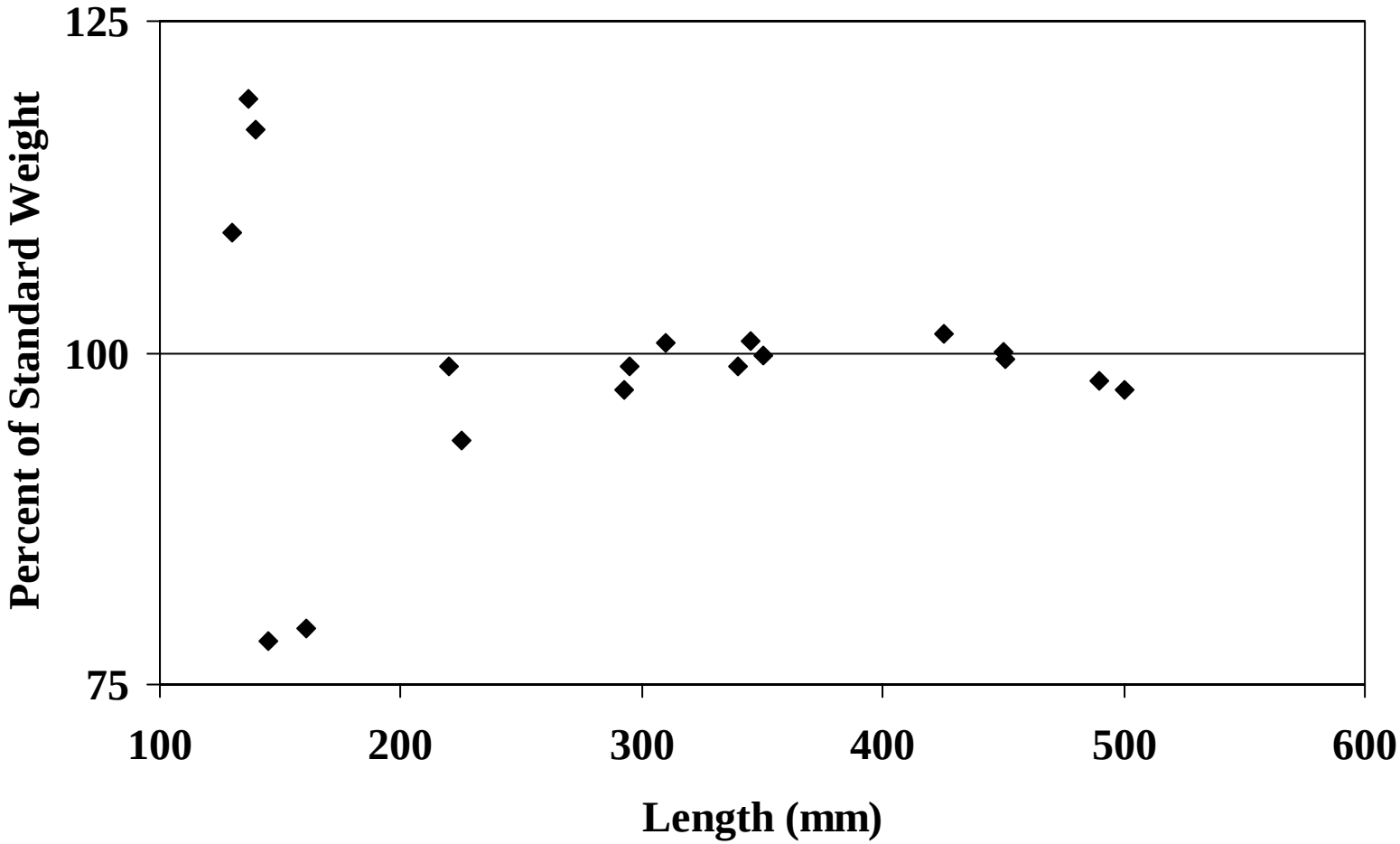


Figure 9. Relative weight analysis of rainbow trout sampled from Blackfoot Reservoir, Idaho, July 23 and August 7, 1997.

Table 5. Chesterfield Reservoir, Idaho, standard survey findings of fish community characteristics, June 18, 1997.

Species	Catch per Unit Effort*	Relative % Species Composition	Average Length (mm)	Length Range (mm)	Relative Weight (Wr)
Game Fish					
Rainbow trout	75	69.8	328	170-577	102.1
Rainbow-cutthroat trout hybrid	20.6	13.2	251	198-297	
Brown trout	3.8	3.1	478	292-556	
Cutthroat trout	0.6	0.8	480		
Subtotal	100	86.8			
Non-Game Fish					
Utah chub	16.9	10.9	201	130-254	
Utah sucker	2.5	2.3	130	104-175	
Subtotal	19.4	13.2			
All Species Total	119.4	100			

*One hour electrofishing, one trap net night, and one combined floating and sinking gill net night equals one unit of effort.

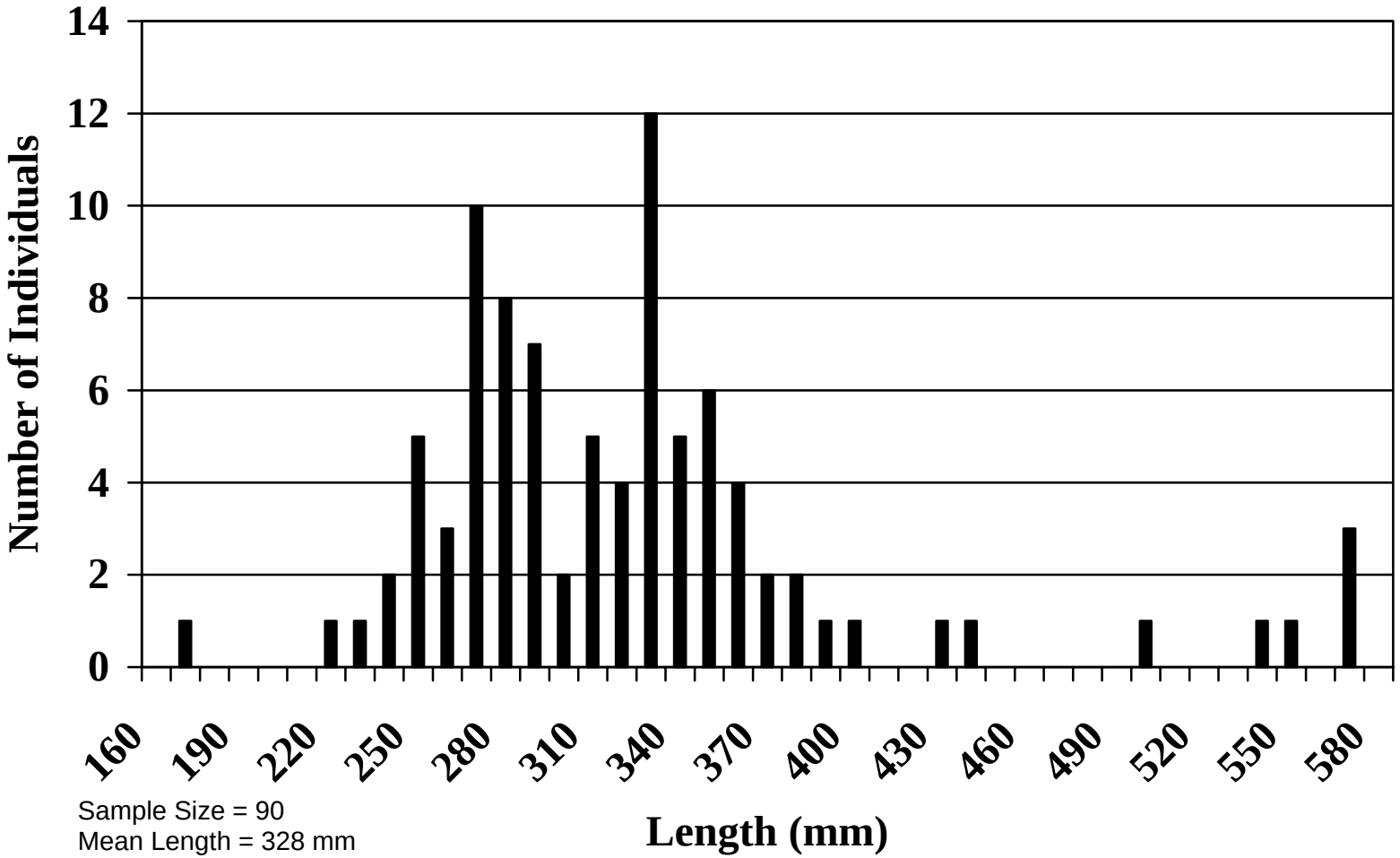


Figure 10. Length frequency distribution for rainbow trout sampled from Chesterfield Reservoir, Idaho, June 18, 1997.

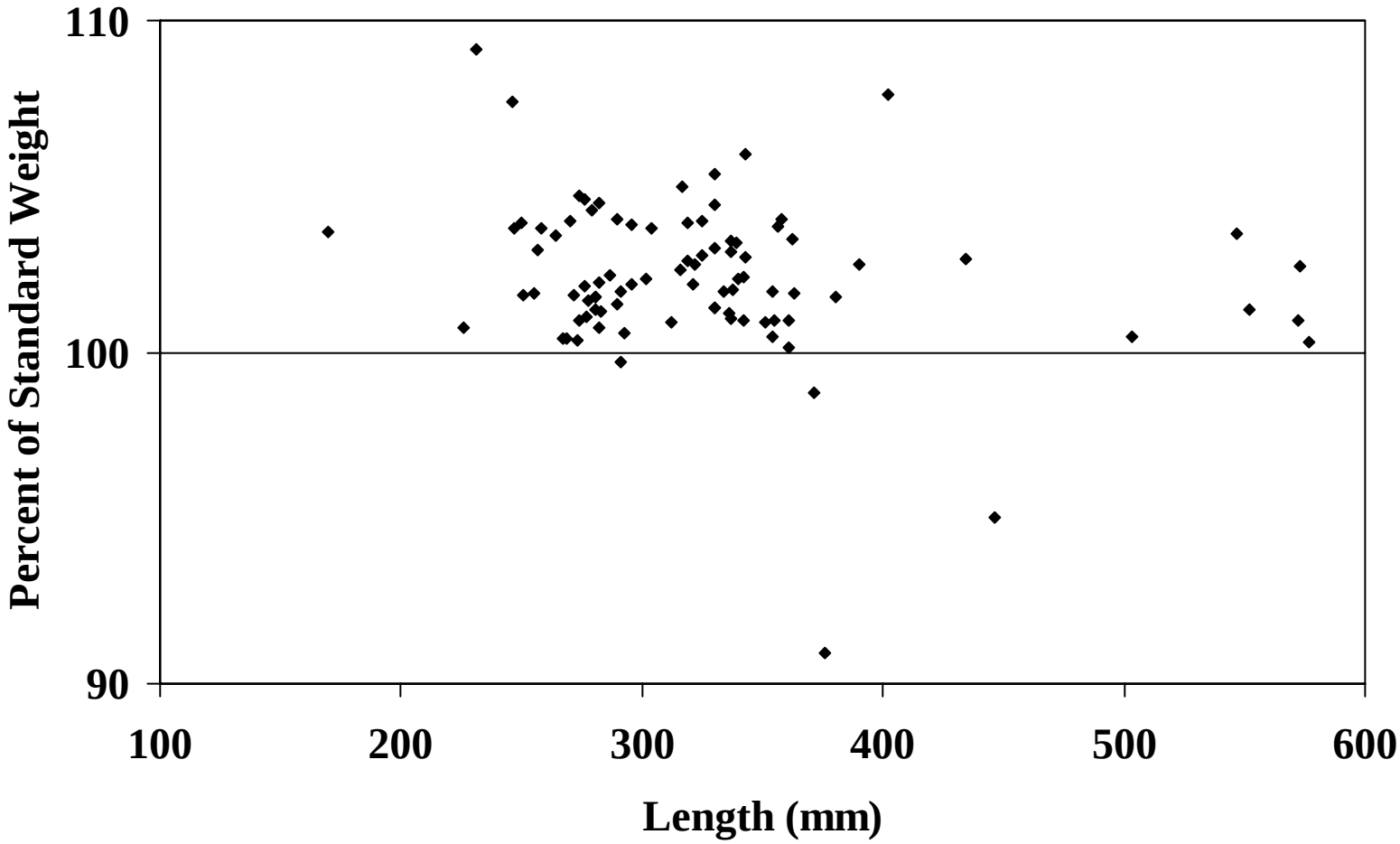


Figure 11. Relative weight analysis of rainbow trout sampled from Chesterfield Reservoir, Idaho, June 18, 1997.

The discovery of Utah chubs in Chesterfield Reservoir is a concern relative to their impact on the rainbow trout fishery. Trout growth and carryover of large fish have been excellent in the last several years. This may be the result of a combination of factors including high productivity, small annual drawdowns and few non-game fish competitors. If the Utah chub population expands, it will have a negative impact on trout growth. Possible chemical renovation, similar to the effort in 1992, may become necessary to eliminate this competition.

Recommendation-Monitor relative species composition to track changes in the Utah chub population with consideration of chemical renovation if this competitor begins to affect trout growth and persistence.

Deep Creek Reservoir

We conducted a lowland lake survey at 74 ha Deep Creek Reservoir on August 13, 1997. Relative species composition for all gear combined was 58% largemouth bass, 29% kokanee and 13% rainbow trout (Table 6). The different gear types collected species in differing proportion with most of the largemouth bass collected while electrofishing. Largemouth bass dominated the total catch (58%) and ranged in length from 50 to 280 mm (mean 180 mm). The rainbow trout length ranged from 269 to 533 mm (mean 330 mm). The largest fish collected was a 533-mm rainbow trout. No non-game species were collected. All identified dead fish from a recent fish kill were kokanee 255 mm to 330 mm long.

The survey demonstrated that most of the fish biomass in the reservoir was hatchery rainbow trout and kokanee. However, shoreline areas had an abundance of small largemouth bass. Dissolved oxygen in water deeper than 4.6 m declined from a range of 7-5 ppm at sundown to 5-2 ppm at 1 AM. This low concentration of dissolved oxygen is most likely the result of a combination of macrophyte respiration and a decreased photosynthetic output after several cloudy days. The fish kill was only partial as numerous kokanee were captured in gillnets. The dead kokanee most likely died of anoxia during nighttime hours. The deeper, cooler waters preferred by kokanee experienced a large decrease in dissolved oxygen levels as night progressed. A livestock feeding operation near where First Creek enters Deep Creek Reservoir may eutrify the reservoir and contribute to high levels of biological oxygen demand and low dissolved oxygen.

Wild cutthroat trout do spawn in the three tributaries to Deep Creek Reservoir but their contribution to the reservoir fishery is unknown. Wild Bonneville cutthroat trout were a minor part of the salmonid population (only one individual captured during the survey). We are concerned that fry and fingerling cutthroat trout entering the reservoir would be preyed upon by the abundant largemouth bass.

Devils Creek Reservoir

We conducted a lowland lake survey on 57 ha Devils Creek Reservoir on August 6, 1997. Relative species composition for all gear combined was 34% Utah chubs, 15% carp, 13% kokanee, 13% rainbow trout, 8% redside shiners, 7% feral goldfish *Carassius auratus*, 5% splake, 3% cutthroat trout and < 1% lake trout. (Table 7). The fish population, which had contained only trout and kokanee in the past, now has the additional species of Utah chub, carp and feral goldfish. Non-game fish dominated the gillnet catch. Trout appeared thin and had grown little compared to initial size at time of stocking (Figure 12). Kokanee which would spawn soon (and therefore were as large as they were going to get) were 300 to 330 mm in length (Figure 13).

Table 6. Deep Creek Reservoir, Idaho, lowland lake survey findings of fish community characteristics August 13, 1997.

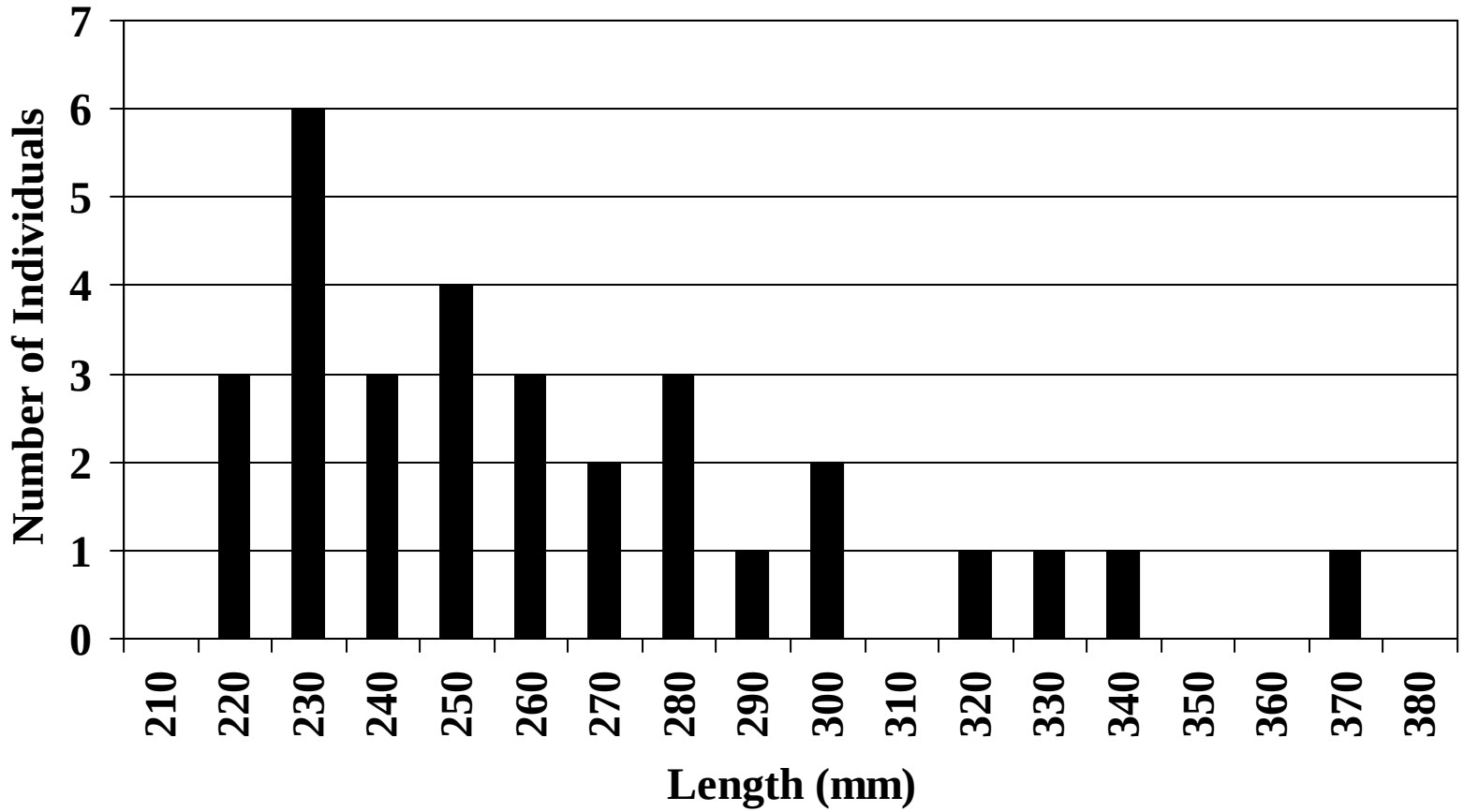
Species	Catch per Unit Effort*	Relative % Species Composition	Average Length (mm)	Length Range (mm)	Relative Weight (Wr)
Largemouth bass	148.3	55.0	168	51-269	106.7
Kokanee	62.0	32.6	323	211-411	
Rainbow trout	23.0	12.4	335	270-533	101.3
All Species Total	233.3	100			

*One hour electrofishing, one trap net night, and one combined floating and sinking gillnet night equals one unit of effort.

Table 7. Devils Creek Reservoir, Idaho, standard survey findings of fish community characteristics, August 6, 1997.

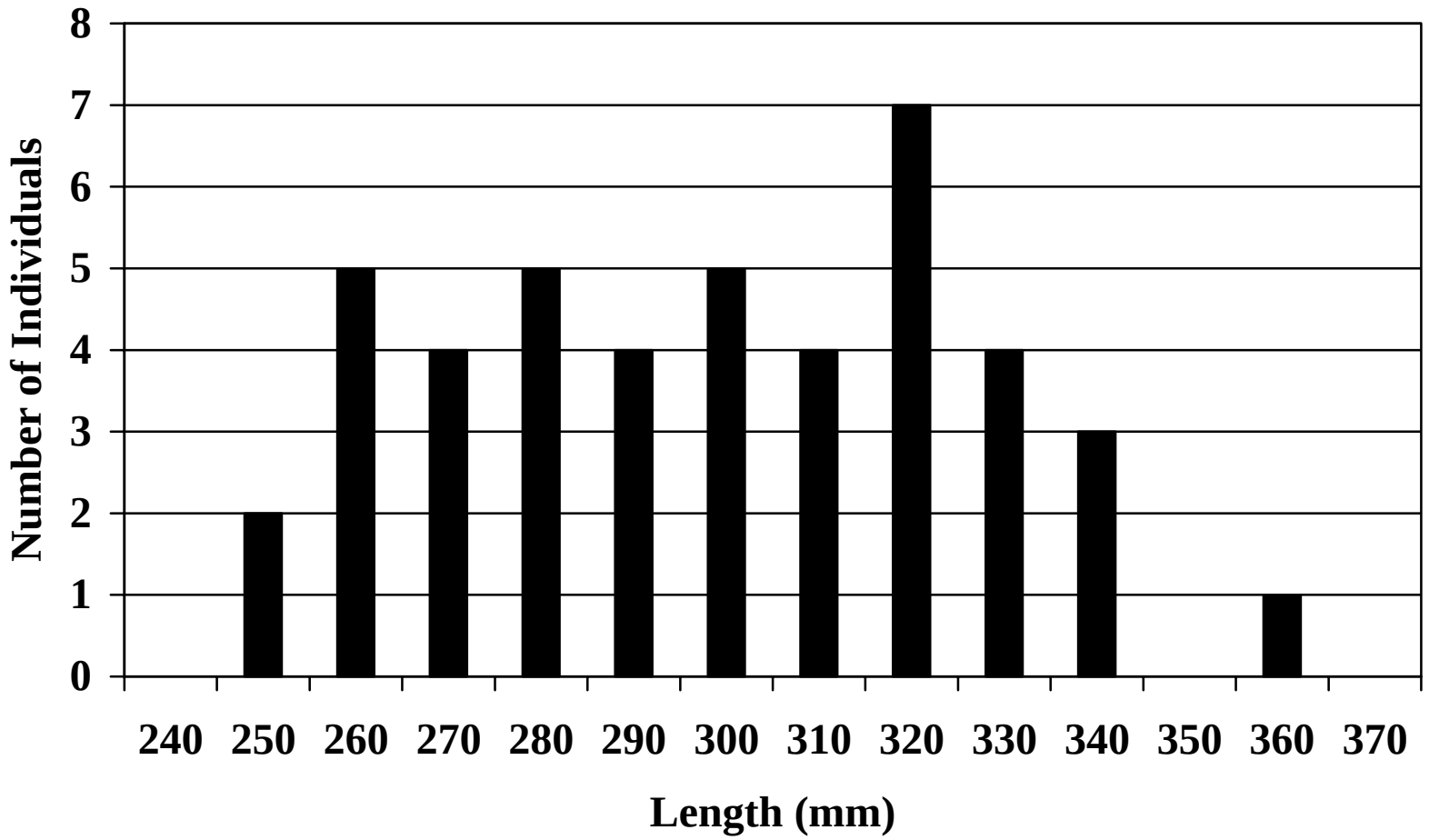
Species	Catch per Unit Effort*	Relative % Species Composition	Average Length (mm)	Length Range (mm)	Relative Weight (Wr)
Game Fish					
Rainbow trout	46.3	13.8	264	221-371	99.5
Kokanee salmon	45.3	13.2	300	249-361	
Splake trout	15.0	4.5	229	145-274	
Wild cutthroat trout	10.3	3.0	351	211-419	
Lake trout	2.0	0.6	411	330-483	
Subtotal	118.9	35.1			
Non-Game Fish					
Utah chub	131.7	34.4	155	71-249	
Carp	49.3	15.3	302	51-500	
Redside shiner	34.7	7.8	84	30-119	
Goldfish	29.7	6.8	124	30-262	
Dace	2.7	0.6			
Subtotal	248.1	64.9			
All Species Total	367.0	100			

*One hour electrofishing, one trap net night, and one combined floating and sinking gill net night equals one unit of effort.



Sample Size = 31
Mean Length = 244 mm
Length Std. Dev. = 38 mm
Fish >300 > 400 mm = 0%

Figure 12. Length frequency distribution for rainbow trout sampled from Devils Creek Reservoir, Idaho, August 6, 1997.



Sample Size = 44
Mean Length = 301 mm
Length Std. Dev. = 28 mm

Figure 13. Length frequency distribution for kokanee sampled from Devils Creek Reservoir, Idaho, August 6, 1997.

In 1991, 400-mm kokanee were common in the ice fishery and 460-mm individuals were reported in mid-summer. Competition from non-game fish is limiting salmonid growth and probably reducing salmonid survival.

Recommendation-Approach Malad Valley Irrigation about draining the reservoir in preparation of a chemical renovation of Devils Creek Reservoir during the summer of 1998. The water would be restocked with rainbow trout and kokanee the following fall.

Springfield Reservoir

We conducted a lowland lake survey at 27 ha Springfield Reservoir on April 26, 1997. Relative species composition for all gear combined was 41% Utah suckers, 38% Utah chubs and 21% rainbow trout (Table 8). The rainbow trout lengths ranged from 200 to 585 mm (mean 320 mm). The majority of the rainbow trout were in the 230 to 300 mm size range (Figure 14). Three rainbow trout > 500 mm were also collected. The rainbow trout appeared to be in good condition with weight very near the standard weight line (Figure 15). Mean length and length range for Utah chubs were 241 mm and 76 mm to 355 mm, respectively. Mean length and length ranges for Utah suckers were 292 mm and 75 mm to 610 mm, respectively. Water conditions were poor with high turbidity and very little water deeper than 1.5 m.

We conducted a creel survey of Springfield Reservoir anglers in 1993 to obtain an estimate of fishing hours expended and number of fish caught. We also wanted to know whether spring-stocked catchables (200-250 mm) or fall-stocked fingerlings (130-175 mm) produced the most catch for anglers (approximately the same number of pounds of each stocked). Almost none of the catchables were caught. Of 8,500 stocked, a harvest of only 8 fish was estimated. From the time the catchables were stocked in May through the end of the year, anglers harvested less than 0.1% of the catchables stocked. Of the 25,000 fingerlings stocked in the fall of 1992, anglers caught 16%, mainly as 250-275 mm fish during the first three or four months of 1993. With such a low return to creel, it was initially thought that the creel clerk had made a mistake in his data recording. The number of fish stocked was a higher density than at several other reservoirs of similar size. Anglers should have had excellent fishing. It is possible an agricultural pesticide had killed the fish, although nobody reported seeing any dead fish.

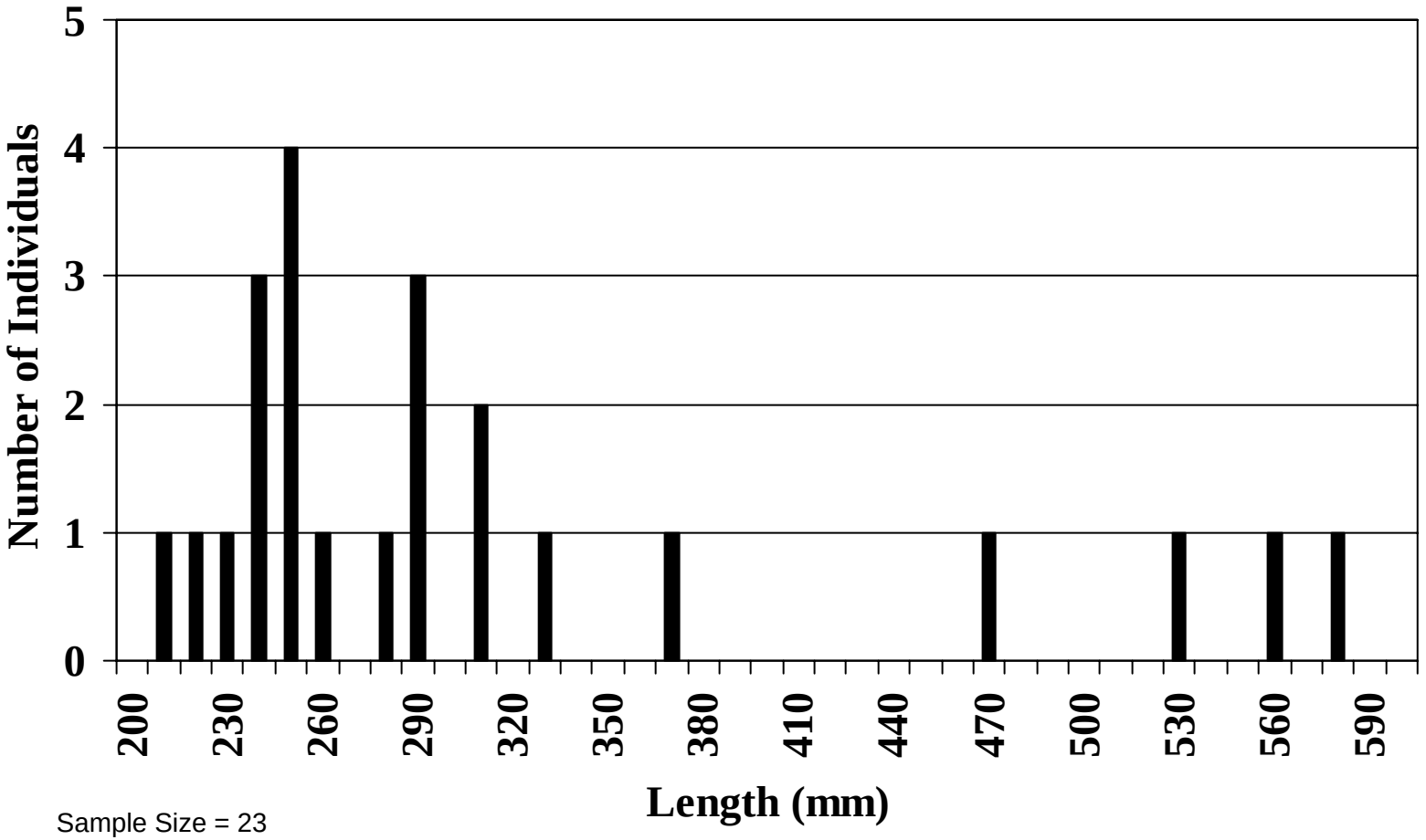
In 1994 we repeated the stocking amounts and schedule of 1993. We then watched for problems. After stocking 8,500 catchables the first week of May, we waited a week and then electrofished the reservoir to make a population estimate. Too few fish were collected to make the estimate. Local anglers were asked for their observations since the fish had been stocked. Several of the anglers reported large flocks of black birds on the water. Later, the birds were identified as double-crested cormorants. Excess trout production that spring allowed American Falls Hatchery personnel to stock another 8,500 catchables. Observers watched Springfield Reservoir to see the birds' reactions. The first day two cormorants were observed feeding. By the fourth day after stocking, the largest count at any one time was 182 birds.

Cormorants can dive and chase fish throughout the entire water column in the shallow, clear waters of Springfield Reservoir. Cormorants can eat about five of the 200-250 mm long trout stocked per day (Hepworth 1992). During early May, they may also be carrying fish back to their nests to feed hatchlings. The 182 double-crested cormorants may have been only one of several visiting groups of birds from nearby American Falls Reservoir. At this rate, it would have been entirely possible for the cormorants to remove most of the 8,500 catchables within a week. A week after stocking the rainbow trout catchables, Springfield Reservoir was

Table 8. Springfield Reservoir, Idaho, standard survey findings of fish community characteristics, April 26, 1997.

Species	Catch per Unit Effort*	Relative % Species Composition	Average Length (mm)	Length Range (mm)	Relative Weight (Wr)
Game Fish					
Rainbow trout	23	9.9	320	216-579	99.7
Splake trout	1	0.4	310		
Subtotal	24	10.3			
Non-Game Fish					
Utah chub	142	61.2	241	66-345	
Utah sucker	66	28.4	292	79-612	
Subtotal	208	89.7			
All Species Total	232	100			

*One hour electrofishing, one trap net night, and one combined floating and sinking gill net night equals one unit of effort.



Sample Size = 23
Mean Length = 320 mm
Length Std. Dev. = 110 mm
Fish >300 > 400 = 50%

Figure 14. Length frequency distribution for rainbow trout sampled from Springfield Reservoir, Idaho, April 26, 1997.

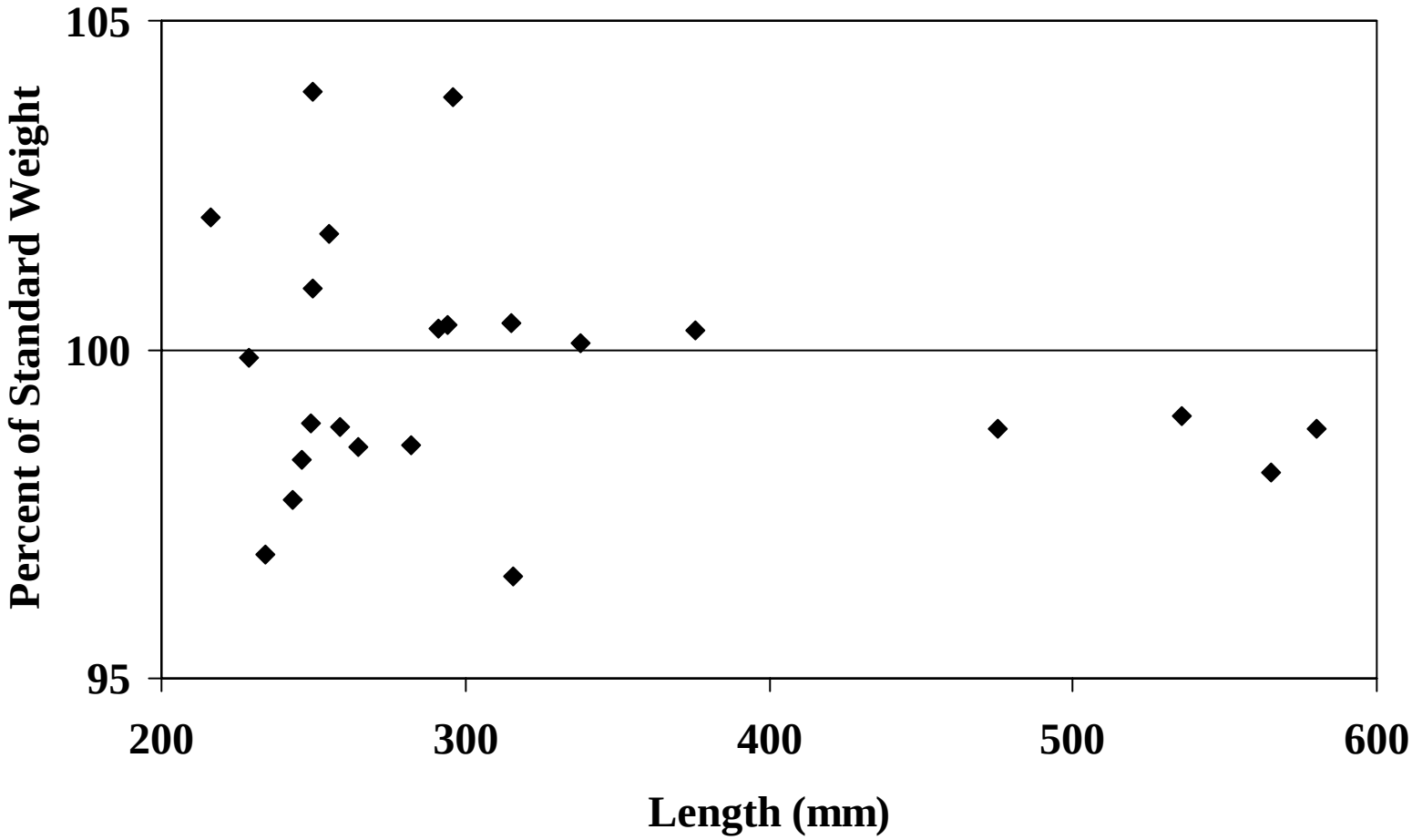


Figure 15. Relative weight analysis of rainbow trout sampled from Springfield Reservoir, Idaho, April 26, 1997.

gillnetted. The nets collected only one of the May-stocked trout, none of the June-stocked trout, 129 Utah chubs and 28 Utah suckers. Either cormorants prefer eating trout to Utah chubs and Utah suckers or the latter species are much better at avoiding predation. Before anglers had learned that the rainbow trout were there, both batches of spring-stocked catchables were nearly gone. Only a few of the fish survived, providing poor catch rates, but they grew to large size.

Fisheries literature suggested the following ways to manage around the bird problem:

1. Don't stock large numbers of fish at any one time, instead stock smaller batches throughout the year.

2. Stock in the winter when the birds are not present.

3. Stock species that are more bottom-oriented than rainbow trout (brook trout and splake).

4. Haze the birds with zon-guns or cracker shells.

5. Discontinue stocking trout and instead stock warmwater species to develop a self-sustaining population of yellow perch and black bass.

6. Stock trout too large for the birds to eat (>405 mm).

The Department attempted methods 1, 2, and 3 from 1995 to 1997, with little success. Local anglers said the fishing was somewhat better (but still not good) for rainbow trout than it was in 1993 and 1994, but those anglers had caught very few of the splake or brook trout.

Successfully hazing the birds (method 4) is probably not possible. They arrive at dawn every day and sometimes even come at night. Also, Springfield Reservoir and the surrounding area is designated as a bird sanctuary. Killing the birds is not an option at this time. They are protected by the federal Migratory Bird Act. The Fish and Wildlife Service will not issue permits to kill cormorants as a means to protect fish in lakes and reservoirs.

We have considered stocking black bass and yellow perch (method 5). However, the reservoir is spring-fed and it may be too cold for successful spawning of largemouth bass. The reservoir bottom is mostly mud with dirt banks, not good smallmouth bass habitat. The yellow perch would become very abundant in Springfield Reservoir, but without an efficient predator they would become stunted. The largest yellow perch at Springfield Reservoir would most likely be 150 to 200 mm in length.

Recommendation-Implement method 6 and stock rainbow trout too large for the birds to eat. The average cost to raise and stock trout from Department hatcheries is $1.86 per pound. Based on this value, the 17-inch rainbow trout would cost about $5.10 each to raise and stock. In January 1998, 1,500 of these large trout were stocked into Springfield Reservoir. If this program produces a satisfactory fishery, we will stock about the same number of large rainbow trout annually. To prevent harvest of such expensive fish immediately after stocking, Springfield Reservoir now has a 20-inch (508 mm) minimum size regulation. The fish could reach 508 mm by summer or fall of 1998. To prevent hooking mortality on this small number of fish, the reservoir also has a no-bait restriction.

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1997 ANNUAL PERFORMANCE REPORT

State of:	Idaho	Program:	Fisheries Management F-71-R-22
Project I:	Surveys and Inventories	Subproject I-F:	Southeast Region
Job:	c	Title:	Rivers and Streams Investigations

Contract Period: July 1, 1997 to June 30, 1998

ABSTRACT

American Falls Hatchery personnel conducted a creel survey on the Snake River below American Falls Reservoir (Power County). Along with estimating the standard statistics of fishing effort, catch rate, and catch, the survey evaluated the performance of adipose-fin clipped rainbow trout *Oncorhynchus mykiss* stocked into the river in May. Anglers spent a total of 42,790 hours fishing and caught a total of 18,641 fish (0.43 fish/h). The catch was composed of 96.8% rainbow trout, 1.4% yellow perch *Perca flavescens*, 0.9% brown trout *Salmo trutta*, 0.5% wild cutthroat trout *O. clarki*, and 0.4% white sturgeon *Acipenser transmontanus*. The adipose-clipped fish comprised 11.4% of all rainbow trout harvest. Anglers harvested an estimated 1,441 of the 8,000 ad-clipped fish (18% return) during the 1997 general fishing season.

We conducted electrofishing surveys of three sites on Marsh Creek along the Arimo Ranch stretch. The surveys were done to establish baseline data on relative species composition for future comparisons. The Arimo Ranch is currently experimenting with several different grazing plans intended to improve riparian habitat. Along with riparian habitat improvement, relative species composition will be used to document changes in the overall environment. We documented that over 97% of all fish present were non-game species, with Utah suckers *Catostomus ardens* the dominant species present (66%).

Fisheries biologists, with assistance from the Utah Division of Wildlife Resources, snorkeled six sections of St. Charles Creek to monitor Bear Lake cutthroat trout *O. clarki utah* and brook trout *Salvelinus fontinalis* populations. Post-spawning, 18 to 22 inch, cutthroat trout were more abundant in 1997 than 1996. Young-of-the-year (YOY) cutthroat trout were present in all sections. Brook trout remain abundant in St. Charles Creek with numerous individuals in the 8-14 inch range.

To fulfill our obligation to the Thomas Fork Drainage Conservation Agreement on Bonneville cutthroat trout *O. clarki utah*, we electrofished seven sections within three reaches of Preuss Creek the last week of August. This sampling provides data for a long-term monitoring program. Cutthroat trout densities declined in 1991 and 1993 and began a slight increase in 1995. Densities of cutthroat trout parr in 1997 were more than double those found in 1995. Also in 1997, cutthroat trout fry were numerous in each stream reach. Mean parr density for the seven sections sampled in 1997 was 8.5/100 m^2.

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OBJECTIVES

1. Evaluate total fishing pressure and harvest from the Snake River below American Falls Reservoir as well as determine relative percent of harvest coming from fish stocked directly into the river versus wild trout and trout originally stocked in the reservoir.

2. Establish baseline data on relative species composition of Arimo Ranch stretch of Marsh Creek.

3. Document status of cutthroat trout and brook trout populations in several designated sampling sites of St. Charles Creek.

4. Collect data concerning Bonneville cutthroat trout parr densities on several sample sites of Preuss Creek in the Thomas Fork drainage.

INTRODUCTION AND METHODS

Snake River below American Falls Dam Creel Survey

We conducted a creel survey in the Snake River reach immediately below American Falls Dam downstream, approximately 18 km, to Massacre Rocks State Park. A three-kilometer section of the reach was not accessible due to non-navigable rapids. The survey began Memorial Day weekend and continued through October 1997, which is the entire fishing season for the river reach. Idaho Department of Fish and Game, American Falls Hatchery personnel conducted all creel survey interviews.

This section of the Snake River traditionally receives concentrated fishing pressure during the opener and for 10 days to two weeks afterward, until catch rates decline significantly. The size and number of fish caught attracts anglers from distant locations to collect their "six fish". The large size of fish is assumed to be the result of excellent growing conditions in American Falls Reservoir. The fish, averaging 1-1.5 kilograms, move downstream through the dam spillway and concentrate in a three-kilometer section immediately below the dam. Few hatchery catchables have been stocked in the area. The reasoning for not stocking many catchables was that anglers would not be satisfied with the smaller fish and the hatchery rainbow trout would possibly be displaced downstream, out of the reach. To answer the questions of acceptability and residence time of stocked catchable rainbow trout, 4,000 adipose fin-clipped fish were planted in the river, half on May 21 and half on July 2, 1997. The fish were planted at the Oregon Trail Crossing Aquatic Park, Mary's Mine Access Site and River Vista Access Site. To follow their performance, we conducted a creel survey on the Snake River from late-May through early-October 1997.

Survey intervals were approximately 28 days long and stratified by weekends and weekdays. Four randomly selected days were sampled from both the weekend days and weekdays per interval. We counted bank and boat anglers at least once each survey day. The counts were conducted either in the morning (AM) or afternoon (PM). Anglers were asked the number of hours they had fished and the numbers of fish caught. All fish kept were measured to the nearest quarter inch and weighed to the nearest one-eighth pound. The measurements were later converted to metric units for analysis and comparison with other data sets.

We were particularly interested in how the fishery performed on opening day, and an intensive survey was undertaken during the opener. Fisheries, enforcement, hatchery, and other regional personnel cooperated in an attempt to interview as many anglers as possible and measure all fish harvested on opening day.

Game species found in this Snake River reach include: brown trout *Salmo trutta,* cutthroat trout O*ncorhynchus clarki,* rainbow trout *O. mykiss,* white sturgeon *Acipenser transmontanus,* kokanee salmon *O. nerka kennerlyi,* smallmouth bass *Micropterus dolomieu,* yellow perch *Perca flavescens,* and occasionally coho salmon *O. kisutch.*

Marsh Creek Monitoring

The Marsh Creek watershed is located in southeast Idaho within the south-central part of Bannock County. The total watershed area is approximately 1040 km^2. Marsh Creek generally flows northward from the headwaters area near Red Rock Pass for a distance of 70 km, to its confluence with the Portneuf River at Inkom. The stream gradient is relatively flat, approximately 0.08%; therefore, the channel is meandering with low velocity. Historically, the creek has been subjected to intensive cattle grazing and much of the streambank lacks stabilizing vegetation. Not only do cattle graze on riparian vegetation; they also physically impact the streambanks directly. The stream is wide, shallow, and generally turbid.

In early spring, prior to runoff and irrigation seasons, Marsh Creek contributes 1/4 to 1/3 of the Portneuf River's flow below their confluence. During the irrigation season, the creek may contribute two to three times as much water as the Portneuf River because of major irrigation diversions from the river 23 km upstream from the confluence.

An EPA 319 Nonpoint Source Grant was awarded in 1994 to improve riparian and streamside habitat in Marsh Creek as an essential component to restoration of the Portneuf River/Marsh Creek watershed for fisheries, wildlife, water quality, and recreation. As part of our responsibilities as a 319 Grant agency cooperator, the Department was to monitor stream channel and streambank habitat, water quality, and fish population on a regular basis. Three reaches of Marsh Creek's Arimo Ranch 319 habitat restoration area were electrofished on September 17 and 24, 1997. We used a boat-mounted Coffelt VVP-15 powered by a 5,000 watt portable generator. All fish collected were identified by species, and depending on the section, some portion of the catch was measured for length and weight and then released.

Fish species found in Marsh Creek include: brown trout, carp *Cyprinus carpio,* cutthroat trout, mountain whitefish *Prosopium williamsoni,* rainbow trout, redside shiner *Richardsonius balteatus,* Utah chub *Gila atraria,* and Utah sucker *Catostomus ardens*.

St. Charles Creek Monitoring

St. Charles Creek is a second order tributary to Bear Lake originating in the Bear Lake Range and flowing eastward into Bear Lake. The lower portion (approximately 13 km) flows through private property where it splits into Big and Little St. Charles Creek. Much of St. Charles Creek is diverted for agricultural purposes. The stream is the only tributary to Bear Lake that has a history of maintaining a viable population of naturally reproducing Bear Lake cutthroat *O. clarki utah*. The Department has in recent years completed several

projects on Little St. Charles Creek to improve habitat for the Bear Lake cutthroat trout. Completed projects include cattle-exclosure fencing and screening of several irrigation diversions.

Both the public and fishery professionals have expressed concern about the dense brook trout S*alvelinus fontinalis* population in St. Charles Creek. Several reports of 406+ mm brook trout raised concern about potential predation on Bear Lake cutthroat fry. The fry use the stream for rearing prior to entering Bear Lake. With the assistance of Utah Division of Wildlife Resources biologists, we snorkeled six sections of St. Charles Creek (Bear Lake County), two sections on Little St. Charles Creek, two sections on Big St. Charles Creek and two above the split (Figure 1). Teams of two observers (using snorkeling gear) and one recorder slowly crawled upstream identifying and estimating the size (to the nearest inch) of each fish sighted.

Preuss Creek Monitoring

Wallace (1978 and 1980) determined that essentially pure (with a trace of hybrid contamination) Bonneville cutthroat trout *O. clarki utah* populations inhabited upper Giraffe, Preuss and Dry creeks. The streams are tributaries to the Thomas Fork of the Bear River in southeast Idaho (Bear Lake County). This followed discovery by Behnke (1979) of Bonneville cutthroat trout occurring within Wyoming's reach of the Thomas Fork system. In 1993 the Department with assistance from Caribou National Forest personnel, collected cutthroat trout from 11 streams scattered throughout Idaho's reach of the Bear River drainage. The fish were sent to Colorado State University for meristic analysis and to determine their level of purity as Bonneville cutthroat trout. In 1994, a Conservation Agreement for the protection and enhancement of the Bonneville cutthroat trout was developed for the Thomas Fork tributaries on Forest Service land.

Department personnel have monitored fry ($\leq$ 75 mm) and parr ($\geq$ 75 mm) densities of Bonneville cutthroat trout in the Thomas Fork tributaries since 1979. In recent years sampling has been done in alternate years using backpack-shocking units. Sampling was done in measured stream sections using either the Seber two-pass removal technique or the Peterson mark and recapture technique (Everhart et al 1975). After two consecutive electrofishing passes, fish were identified, counted and measured in a given section. They were then released into the stream near the site of capture.

RESULTS AND DISCUSSION

Snake River below American Falls Dam Creel Survey

During the 1997 survey of the Snake River below American Falls Reservoir, anglers fished an estimated 42,791 hours (± 24%) and caught 18,642 fish (± 38%) for an average catch rate of 0.45 fish/h (Table 1). Approximately 1/3 of the total fish caught, 5,682 (30%), were released. During the creel survey American Falls Hatchery personnel conducted a total of 229 angler interviews. Boat and shore anglers accounted for 48% and 52% of fishing hours, respectively. During the survey period, high river flows made the reach difficult to fish, particularly from the shore, for the first several weeks. The interval with the highest catch rate was September at 0.6 fish/h (Table 1).

The majority of fish caught during the survey were rainbow trout (96 %) and most of them (70 %) were harvested. Small numbers of other salmonids were also caught, including brown trout and cutthroat trout.

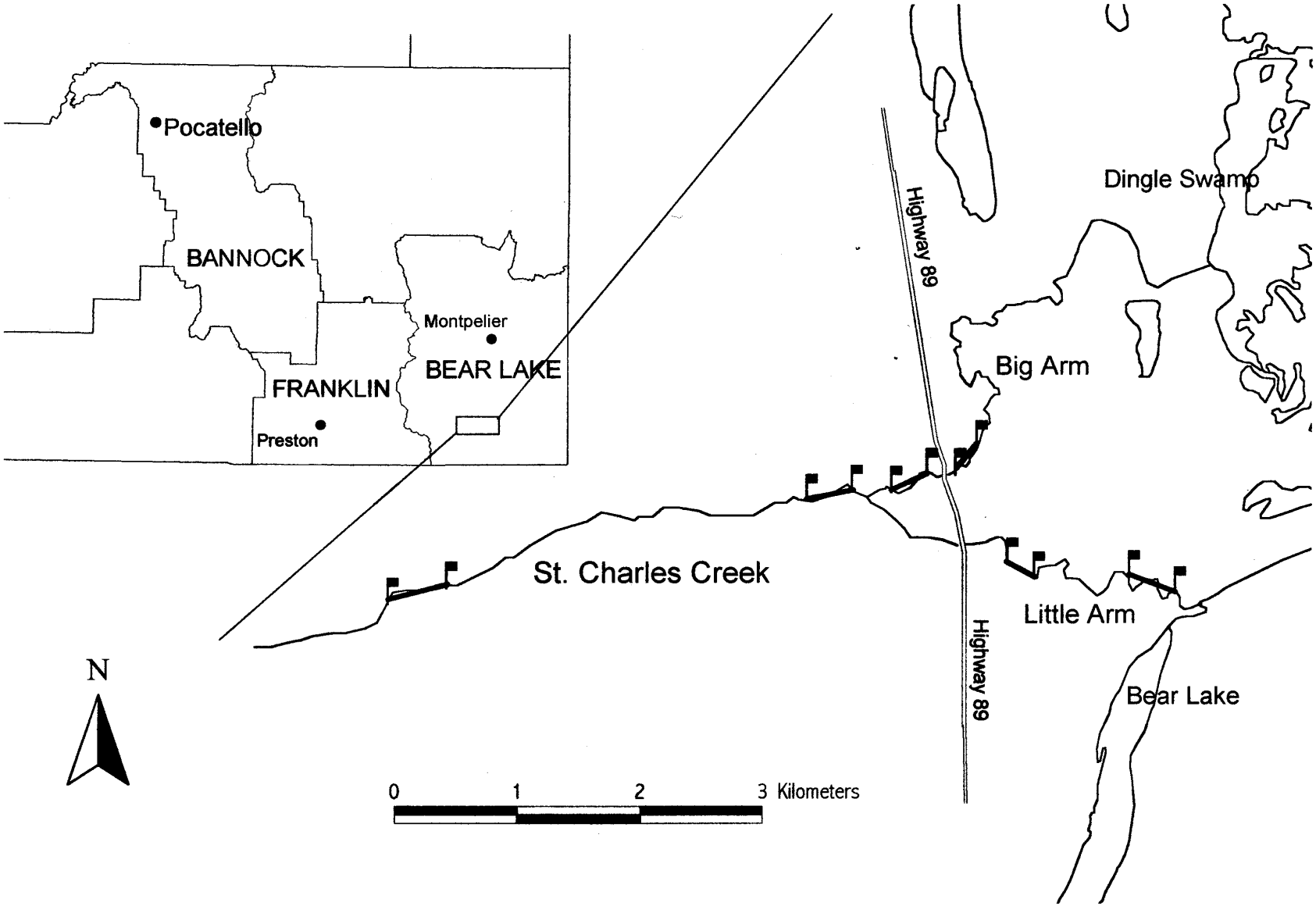


Figure 1. Map of St. Charles Creek, tributary to Bear Lake, Idaho/Utah, indicating snorkeling survey sites.

Table 1. Basic creel statistics from the Snake River, Idaho, below American Falls Dam in 1997.

	Angling Effort (hours)			No. Fish Caught	Trout Catch Rate	Fish Kept	
	Bank	Boats	Total			Total Number and (Percent)	Ad-clipped Rainbow Trout Number and (Percent of Total Catch)
Opener			506	519	1.03	382 (74)	0
May WD	1,740	1,020	2,760	1,173	.43	829 (71)	428 (10)
May WE	1,260	1,305	2,565	818	.32	443 (54)	0
June WD	1,785	1,365	3,150	1,403	.45	1,185 (84)	279 (24)
June WE	1,282	0	1,282	122	.10	47 (38)	6 (13)
July WD	3,897	3,861	7,758	2,950	.38	2,038 (69)	342 (17)
July WE	1,552	2,480	4,033	1,584	.39	962 (61)	134 (14)
Aug WD	588	980	1,568	1,450	.92	1,450 (100)	0
Aug WE	1,960	2,100	4,060	1,988	.49	1,506 (76)	271 (18)
Sept WD	1,507	1,449	2,955	2,375	.80	1,080 (45)	223 (21)
Sept WE	800	936	1,736	1,474	.85	857 (58)	19 (2)
Oct WD	0	0	0	0	0	0	0
Oct WE	888	192	1,080	333	.31	85 (25)	82 (96)
Totals	17,259	15,688	33,453	18,642	.44	18,864 (58)	1,786 (11)

Two weeks after planting, the adipose-clipped trout began to recruit to the fishery. We estimated 36% of the ad-clipped fish by number were harvested for the season and accounted for 11.4% of the total rainbow trout harvest. Mean length of clipped rainbow trout harvested during the survey was 325 mm (Figure 2).

Anglers fished 506 hours on opening day and caught 519 fish, catch rate of 1.03 fish/h. This was less than a third of the rate recorded in 1996. Of the 382 trout measured, four were cutthroat trout, five were brown trout, and one was a splake *Salvelinus fontinalis x S. namaycush* (probably came down from Springfield Reservoir). In addition, one white sturgeon and one smallmouth bass were reported. Rainbow trout comprised 98% of the opening day catch. Mean trout length was 432 mm and ranged from 280 to 635 mm, similar to that of 1996.

Recommendation-Repeat this evaluation in 1998 to determine variability of results and to document any harvest of carryover adipose-clipped trout. Additionally, the 1998 survey will demonstrate the effect of a new fishing rule on fishing effort and harvest. If comparable results are found in 1998, continue stocking catchable rainbow trout in the Snake River below American Falls Reservoir.

Marsh Creek Monitoring

We sampled section 1 on September 19 and sections 2 and 3 on September 24, 1997. The sections were all approximately 0.8 km long and were located in different grazing management areas. Two thirds of the 527 fish collected were suckers: 41% in section 1, 68% in section 2 and 83% in section 3. The remaining relative species composition was 17% redside shiners, 10% Utah chubs and 6% carp. Only 13 individual salmonids were collected: six brown trout, four cutthroat trout, two mountain whitefish and one rainbow trout. The trout were found scattered in all sections near small spring inflows. Mean lengths and length ranges for all species per section is provided in Table 2. The largest individual fish collected was a 670-mm carp. Because of the physical difficulty in netting all fish seen, the 527 fish collected represents only a portion of the fish in each area. However, great care was taken to ensure that fish were collected relative to their abundance.

Recommendation-Although streambanks in many areas show improvement, the stream remains wide, shallow, highly turbid, and unacceptably warm. The current situation provides a habitat well suited for the non-game fish dominating our sample. Continued efforts in this particular stretch and within the watershed as a whole will be needed to produce measurable improvements, particularly in the resident fishery.

St. Charles Creek Monitoring

Brook trout remain the dominant, if not most abundant, fish in St. Charles Creek with numerous individuals in the 203 to 356 mm (8 to 14 inch) range. Cutthroat trout, while more numerous than brook trout, were mostly young-of-the-year fish. Post-spawning, 457 to 559 mm (18 to 22 inch), cutthroat trout were more abundant in 1997 than 1996. Young-of-the-year cutthroat trout were present in all surveyed sections. Riparian landowner Roger Pugmire reported seeing many 305 mm cutthroat trout spawning in his reach of St. Charles Creek, while he had seen no more than a single pair of spawners in recent years.

Throughout all sample sections, the relative species composition was 56% (447) Bear Lake cutthroat trout, 41% (347) brook trout and 3% (24) rainbow trout. Mean lengths of cutthroat trout were 76 mm, brook trout 127 mm, and rainbow trout 305 mm. (Figures 3, 4, and 5). The cutthroat trout size range was greatly

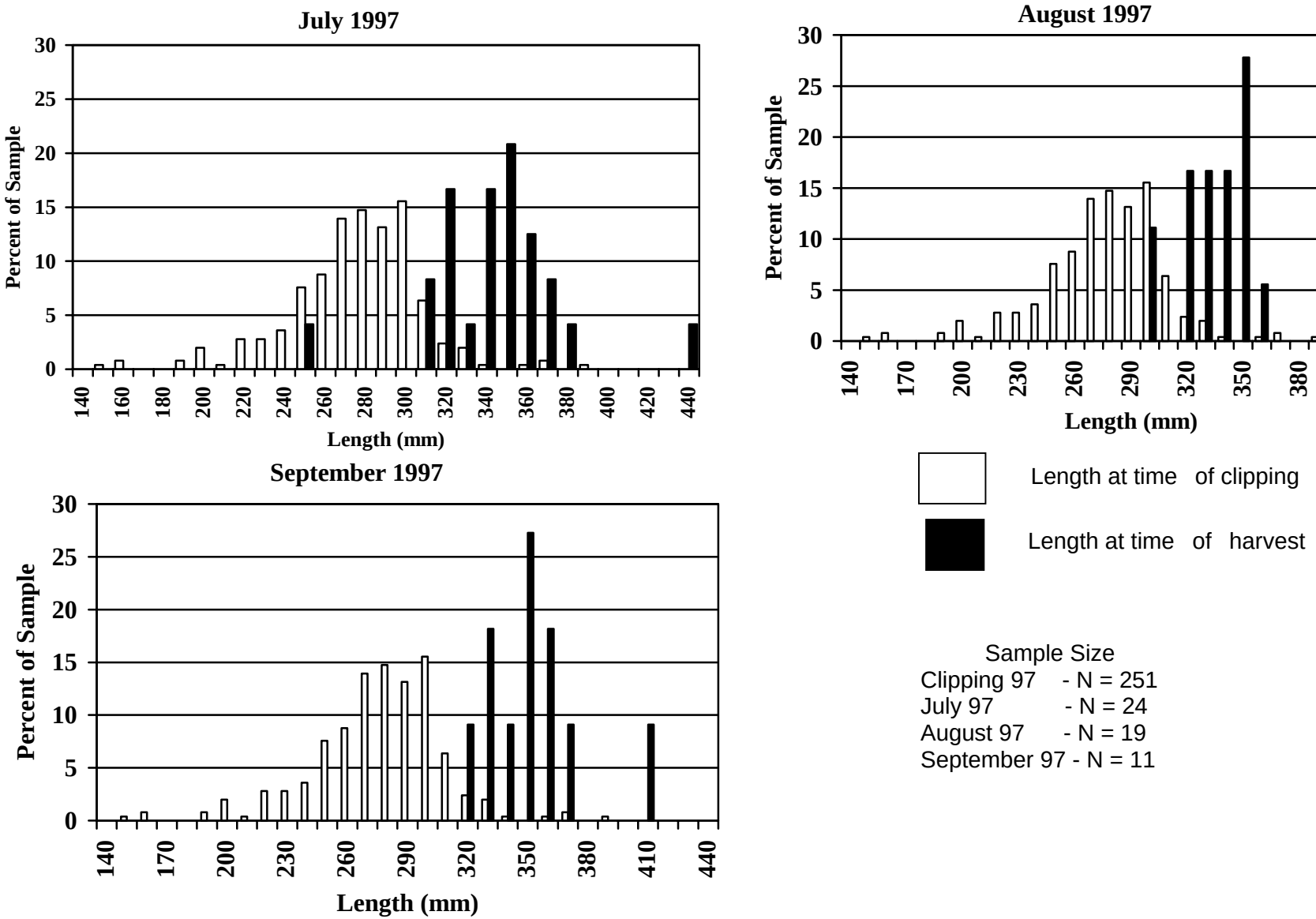


Figure 2. Length frequency distributions of adipose clipped fish harvested from Snake River, Idaho, below American Falls Dam during 1997.

Table 2. Size and relative species composition of non-game fish from three sections of Marsh Creek's Arimo Ranch, tributary to the Portneuf River, Idaho. The thirteen salmonids collected are not included in this table.

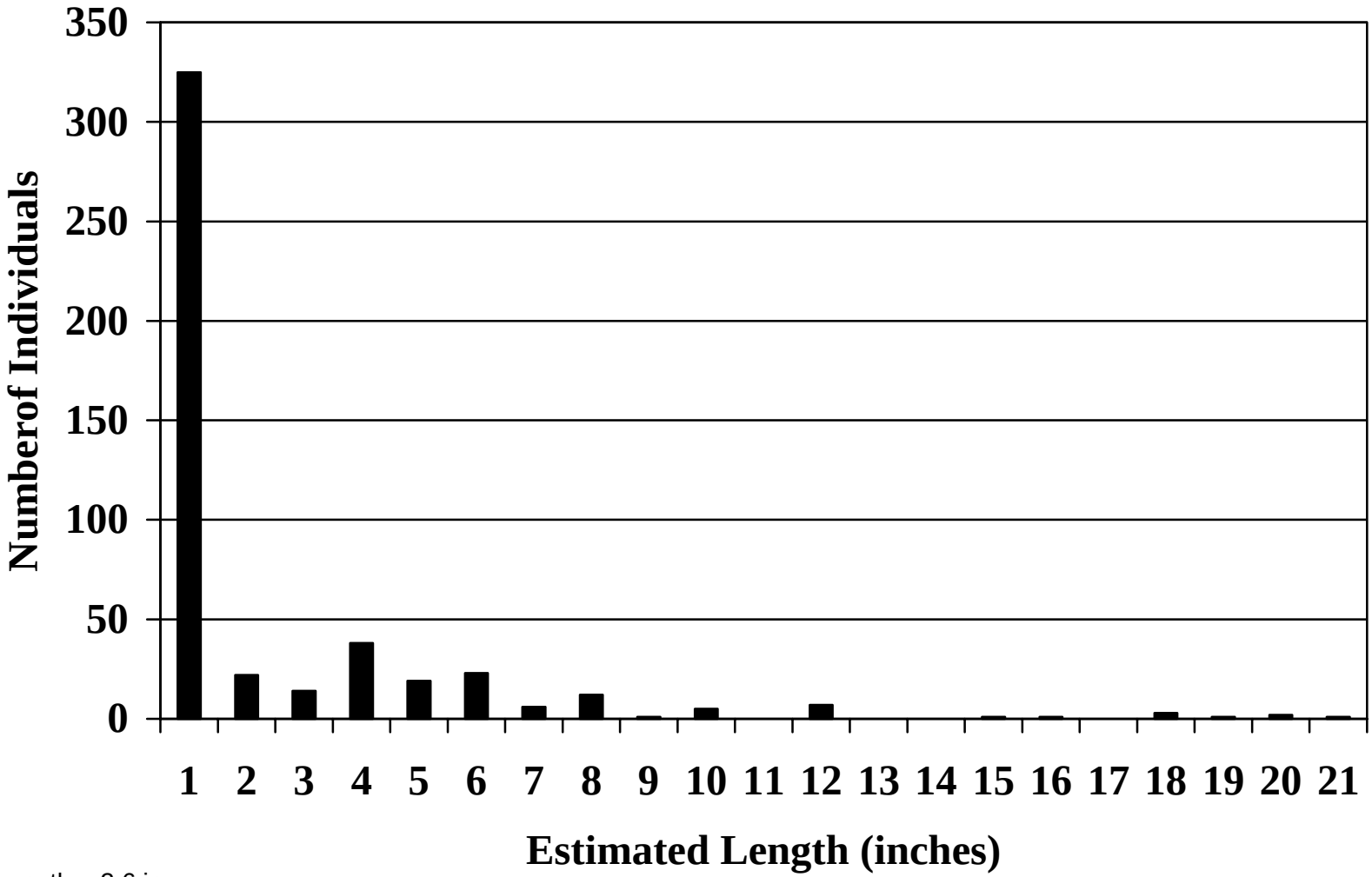
Species	Section 1	Section 2	Section 3	Totals
Utah sucker				
Sample size and (%)	56 (41)	129 (68)	165 (83)	350 (66)
Mean length (mm)	391	384	--	--
Length range (mm)	203-533	163-531	--	--
Carp				
Sample size and (%)	14 (10)	15 (8)	--	29 (6)
Mean length (mm)	356	259	--	--
Length range (mm)	203-671	104-640	--	--
Utah chub				
Sample size and (%)	18 (13)	21 (11)	8 (4)	47 (10)
Mean length (mm)	145	112	--	--
Length range (mm)	89-196	48-188	--	--
Redside shiner				
Sample size and (%)	46 (33)	20 (10)	22 (11)	88 (17)
Mean length (mm)	79	91	--	--
Length range (mm)	--	--	--	--
Sub-totals	**134 (26)**	**185 (36)**	**195 (38)**	**514**

skewed with 69% of the fish #25 mm (Figure 3). The brook trout and rainbow trout distributions were more uniform (Figures 4 and 5). Distributions for the individual sections per species are provided in Appendices A, B, and C.

Preuss Creek Monitoring

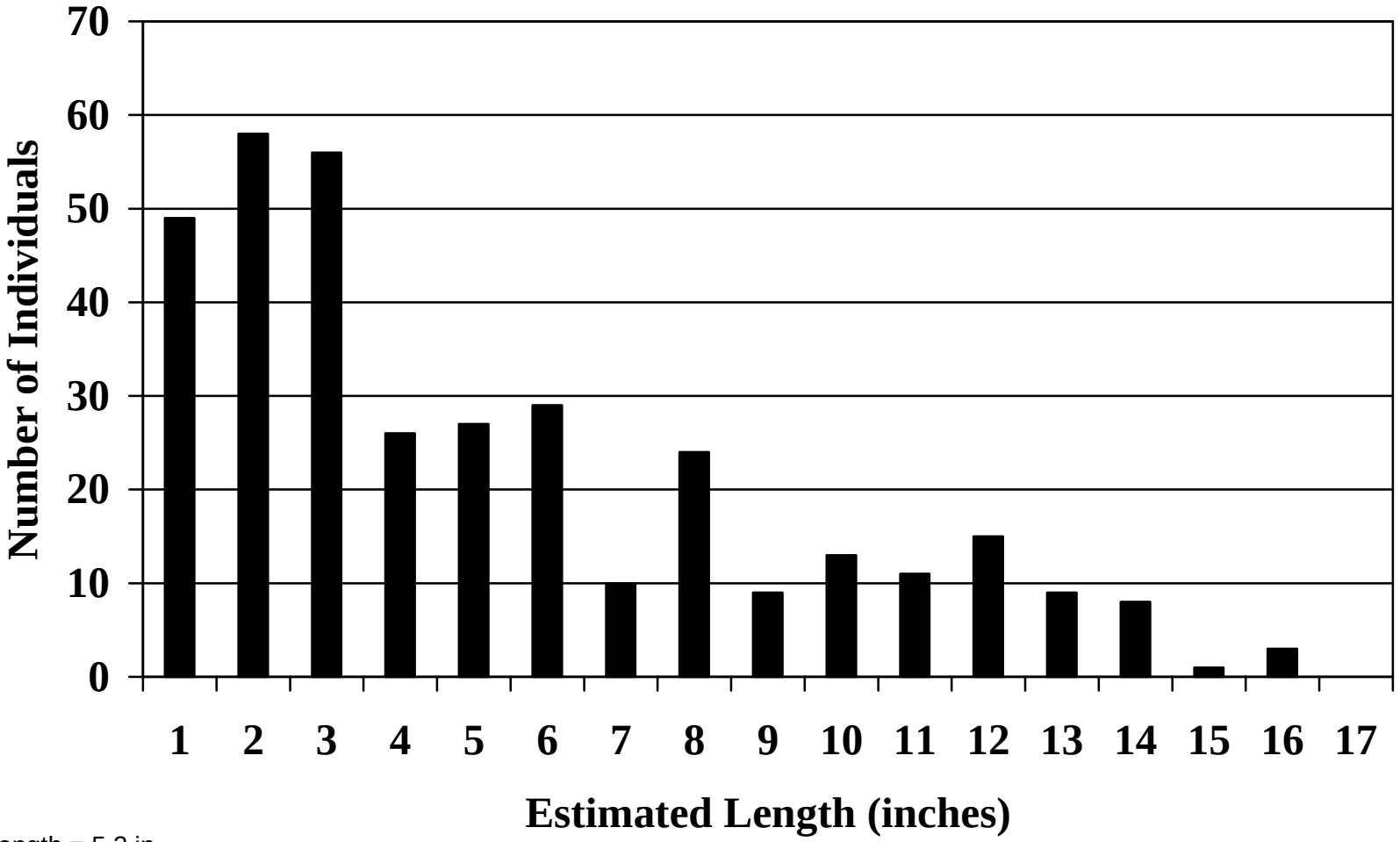
We electrofished seven, approximately 100 m sections within three reaches of Preuss Creek the last week of August. The sampling provides data for a long-term monitoring program. Cutthroat trout densities declined in 1991 and 1993, and then began a slight increase in 1995 (Tables 3 and 4). Densities of cutthroat trout parr in 1997 were more than double those found in 1995, and cutthroat trout fry in 1997 were numerous in each stream reach. Mean parr density for the seven sections sampled in 1997 was 8.5/100 m^2. In the inside vs. outside comparison of the old livestock exclosure in stratum B on Preuss Creek, the density inside was 11.1/100 m^2 and outside 4.9/100 m^2.

The overall trend of increasing cutthroat trout density can be attributed to a combination of increased precipitation in 1993 and 1995-1997 following the extended drought of 1987-1992, improved livestock management and to the Closed to Fishing rule implemented in 1992. Two large livestock exclosures are on meadow reaches of Preuss Creek. The overall riparian grazing management plan attempts to maintain 102 to 152 mm of stubble height along streambanks outside of the exclosure. There has been qualified success at attaining both goals, keeping cattle outside the exclosures and maintaining desirable stubble height.



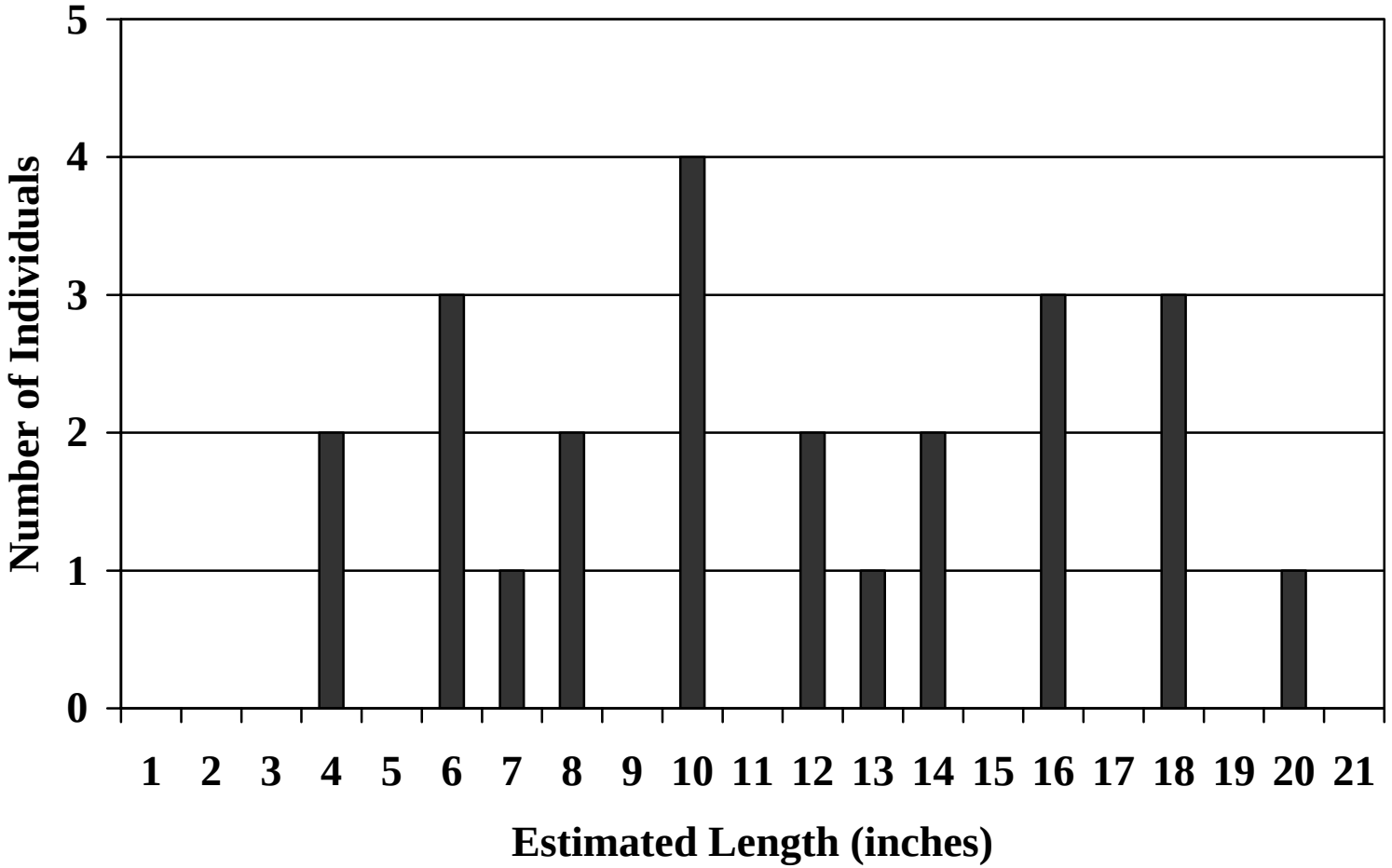
Mean Length = 2.6 in.
Length Std. Dev. = 3.4 in.
Sample Size = 481

Figure 3. Estimated length frequency distribution of Bear Lake cutthroat trout snorkel surveyed in St. Charles Creek, tributary to Bear Lake, Idaho, September 1997.



Mean Length = 5.2 in.
Length Std. Dev. = 3.8 in.
Sample Size = 348

Figure 4. Estimated length frequency distribution for brook trout snorkel surveyed in St. Charles Creek, tributary to Bear Lake, Idaho, September 1997.



Mean Length = 11.5 in.
Length Std. Dev. = 4.8 in.
Sample Size = 24

Figure 5. Estimated length frequency distribution for rainbow trout snorkel surveyed in St. Charles Creek, tributary to Bear Lake, Idaho, September 1997.

Table 3. Densities of Bonneville cutthroat trout parr inside and out of the Stratum B livestock exclosure on Preuss Creek, Bear Lake county, Idaho, from 1981 through 1997.

Year	Inside Exclosure parr/100 m^2	Outside Exclosure parr/100 m^2
1981	16.3	6.2
1985	31.6	20.5
1986	17.5	15.0
1987 [August]	15.7	9.3
1987 [October]	14.2	10.1
1989	2.6	2.0
1990	3.5	3.1
1991	2.0	0.3 (0.6 and 0.0)
1993	1.5	0.3 (0.5 and 0.0)
1995	5.9	2.3
1997	11.1	4.9

Table 4. Fish population density statistics from Preuss Creek, Bear Lake county, Idaho, August 29, 1997.

Strata-Section	Mean Width (m)	Mean Length (m)	Surface Area (m^2)	Cutthroat Pop. Est.	95% Conf. Limits	Trout/ 100 m^2
B-Exclos	1.80	225	405	45	44.0-48.3	11.1
B-1	2.47	114	282	10	10.0-10.7	3.5
B-2	5.31	122	647	41	37.0-49.8	6.3
C-1	2.36	110	259	10	10.0-10.8	3.9
C-2	2.10	114	239	16	16.0-16.6	6.7
D-1	1.98	120	237	21	19.0-27.4	8.8
D-2	2.38	110	276	53	53.0-54.8	19.2

ACKNOWLEDGEMENTS

The Southeast Region fishery personnel would like to extend their gratitude and thanks to Ned Horner for his thorough critique and helpful suggestions concerning earlier drafts of this report.

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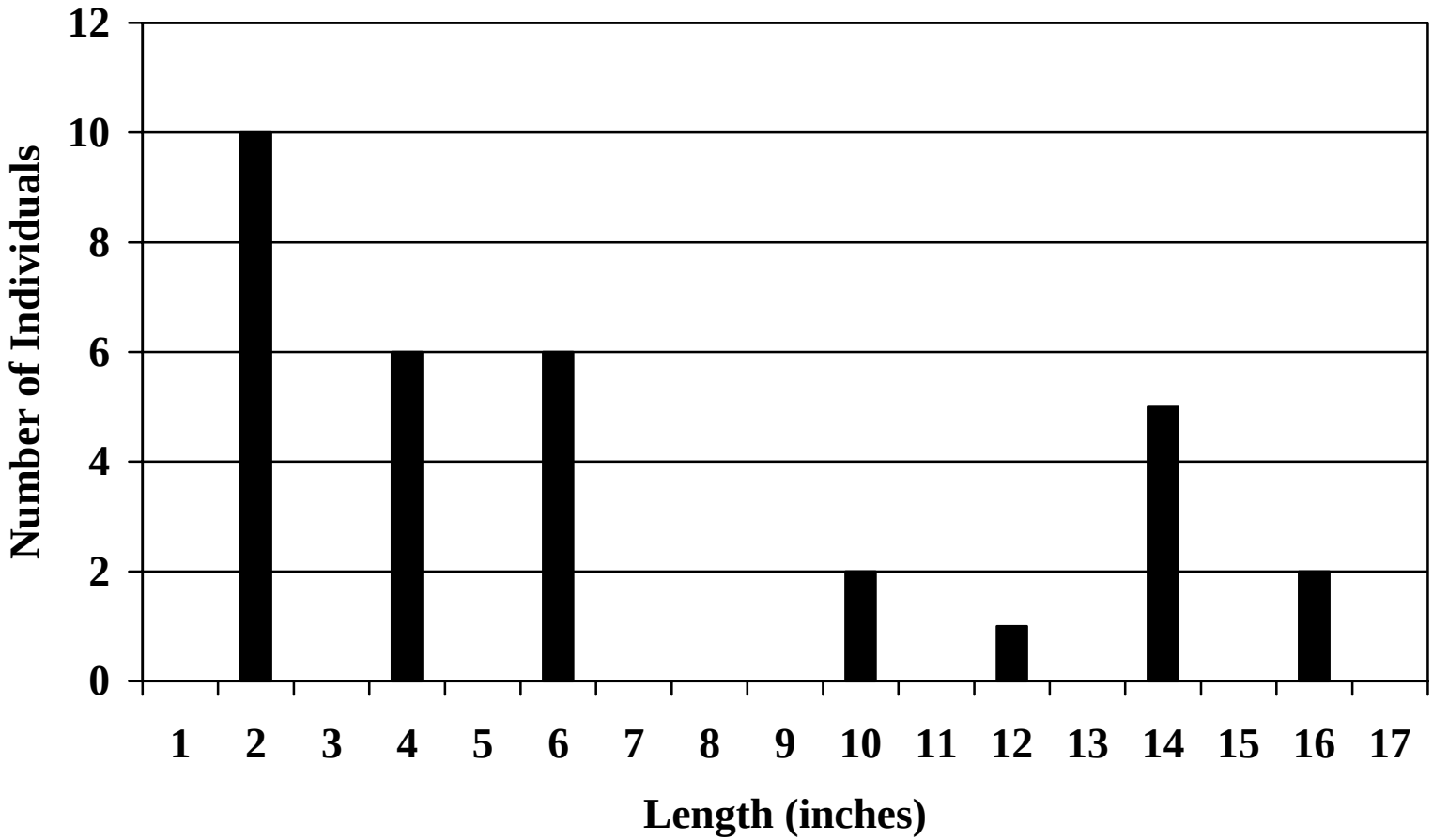
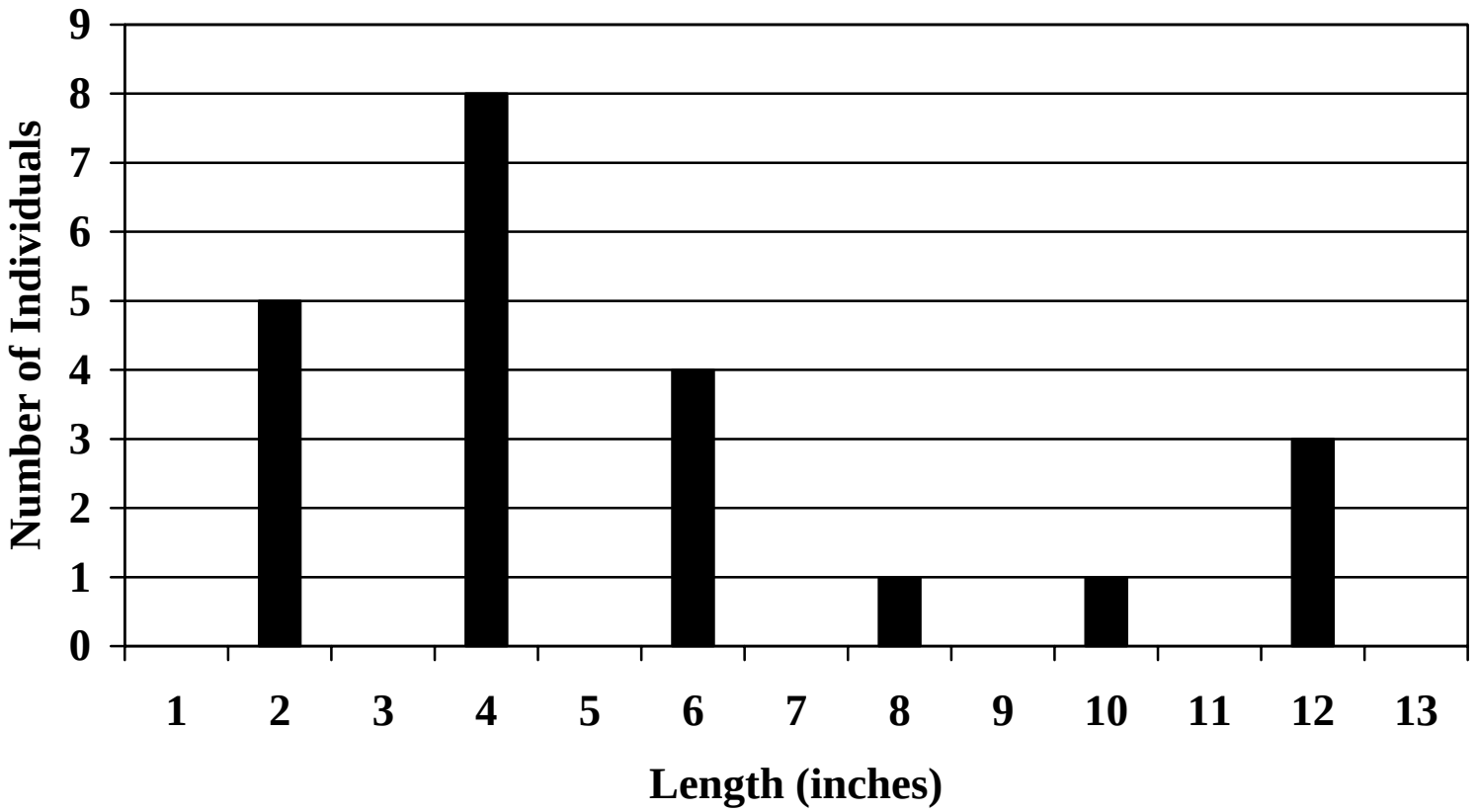
Wallace, R.L. 1980. Report on purity of Bonneville cutthroat trout, *Salmo clarki utah*, from Preuss and Dry creeks, Bear Lake County, Idaho. Project completion report to Caribou National Forest. 5pp

APPENDICES



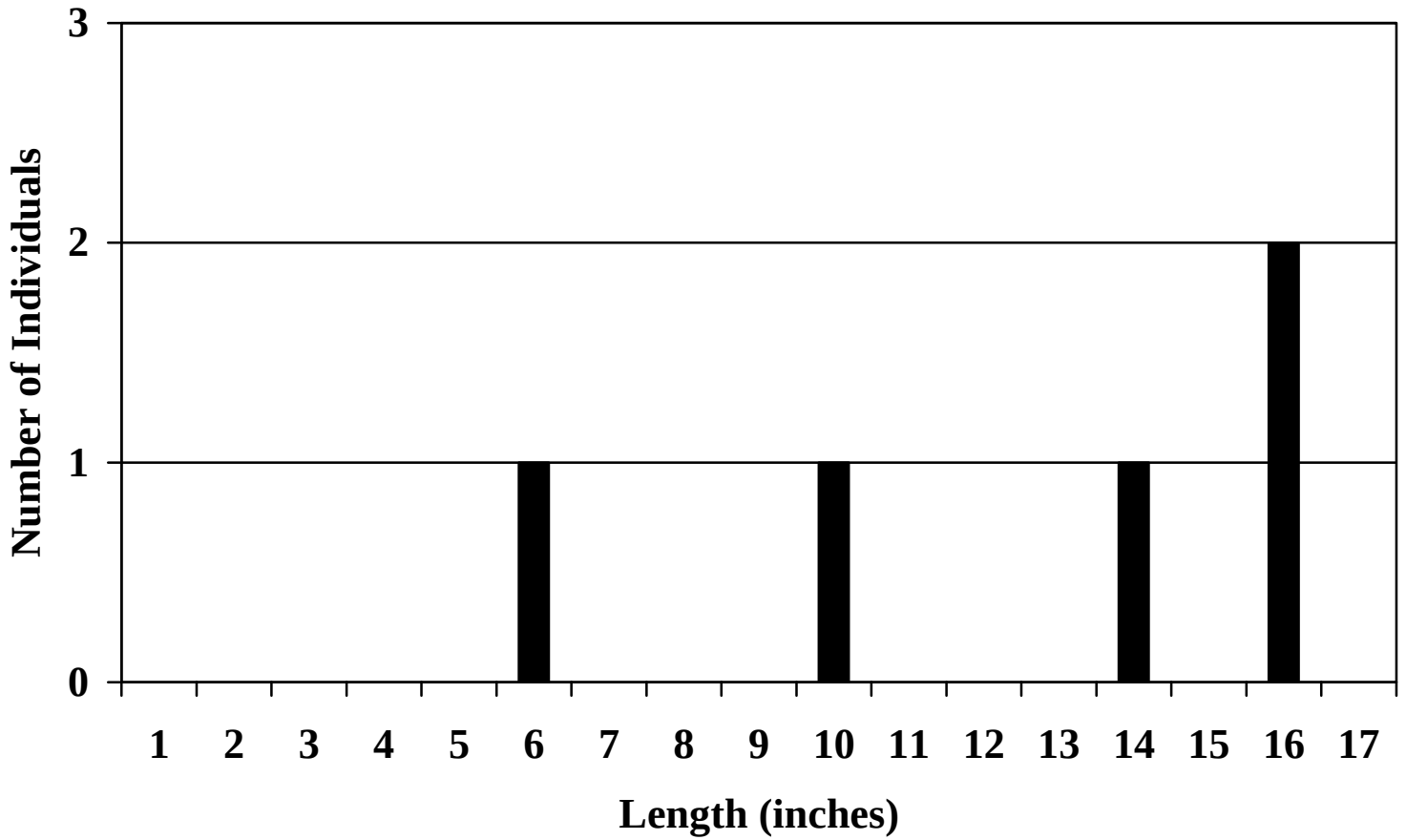
- Average Length = 6.69 in
- Standard Deviation = 4.94
- Sample Size = 32

Appendix A-1. Estimated length frequency distribution for brook trout snorkel surveyed in the Big Arm of St. Charles Creek, tributary to Bear Lake, Idaho, August 20, 1997.



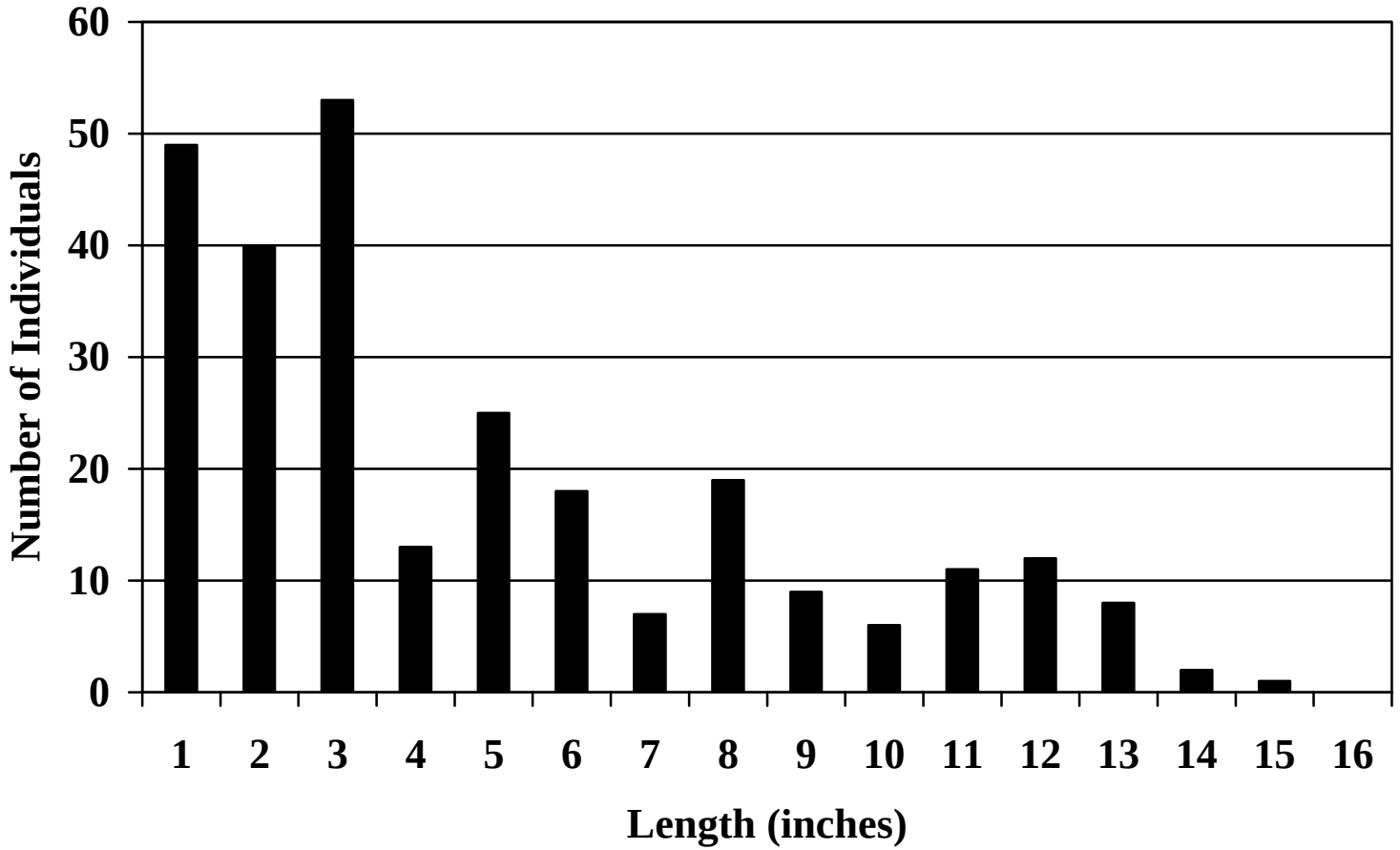
- Average Length = 5.45
- Standard Deviation = 3.33
- Sample Size = 22

Appendix A-2. Estimated length frequency distribution for cutthroat trout snorkel surveyed in the Big Arm of St. Charles Creek, tributary to Bear Lake, Idaho, August 20, 1997.



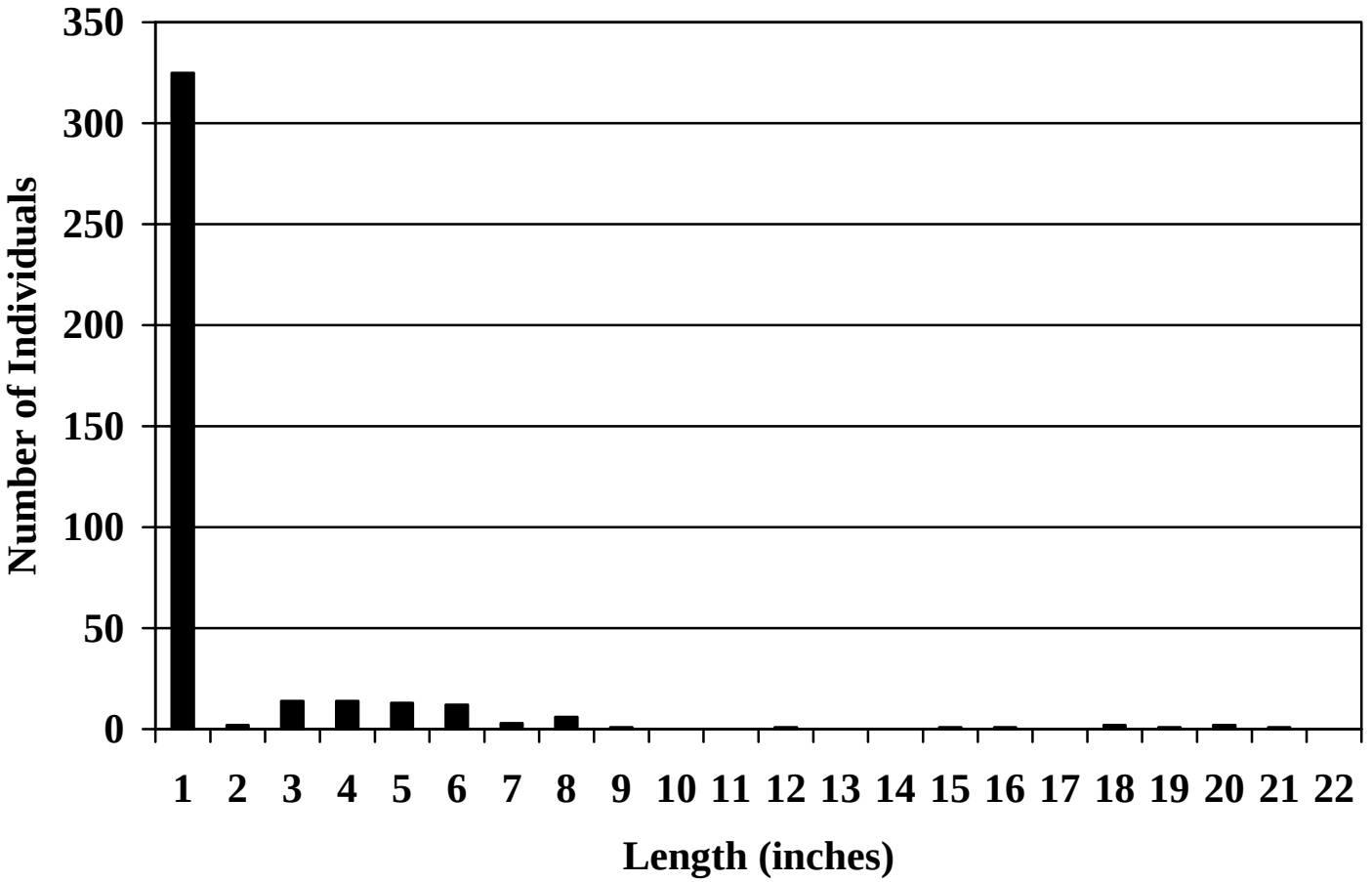
- Average Length = 12.4 in
- Standard Deviation = 4.35
- Sample Size = 5

Appendix A-3. Estimated length frequency distribution for rainbow trout snorkel surveyed in the Big Arm of St. Charles Creek, tributary to Bear Lake, Idaho, August 20, 1997.



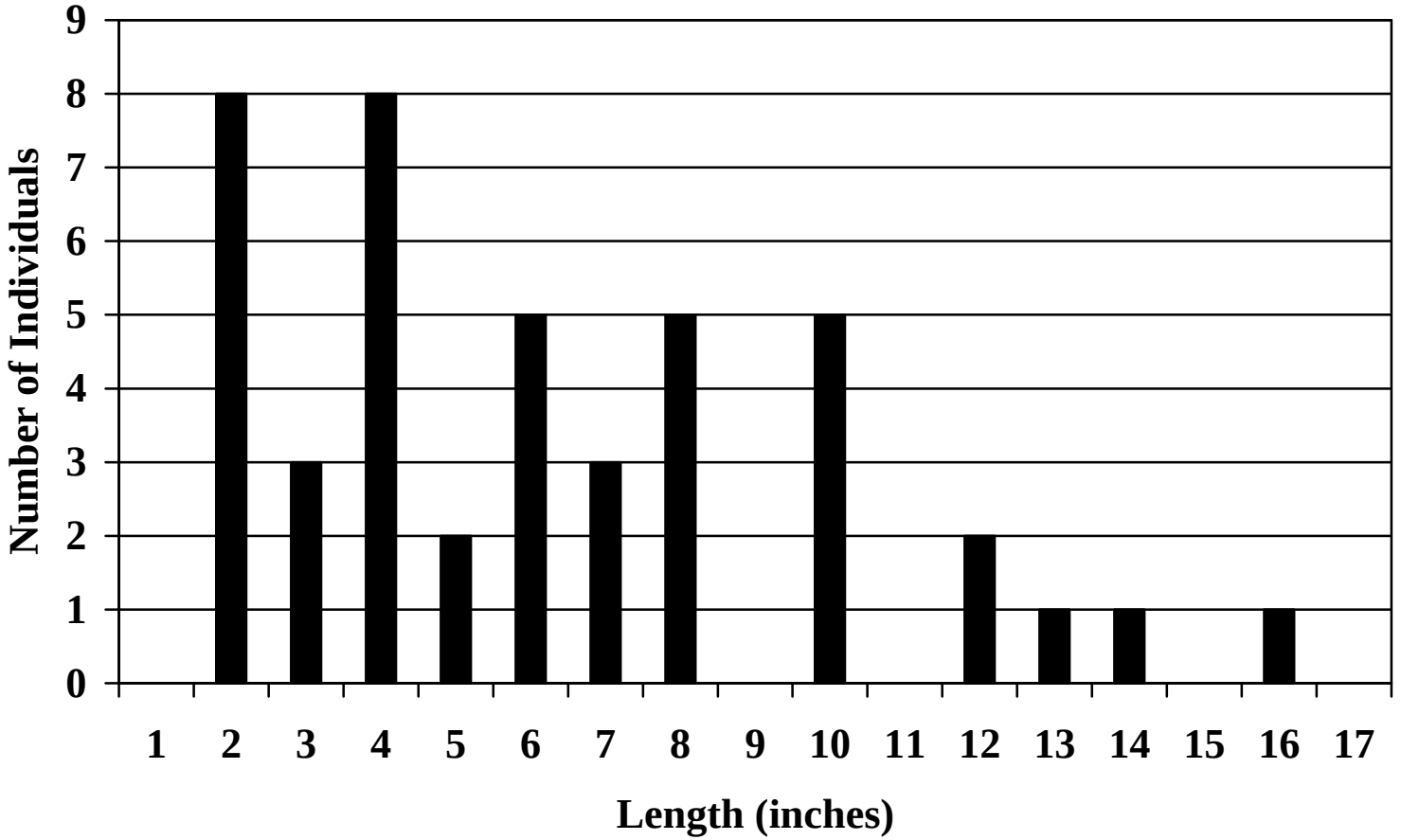
- Average Length = 4.86 in
- Standard Deviation = 3.66
- Sample Size = 273

Appendix B-1. Estimated length frequency distribution for brook trout snorkel surveyed in the Little Arm of St. Charles Creek, tributary to Bear Lake, Idaho, August 20, 1997.



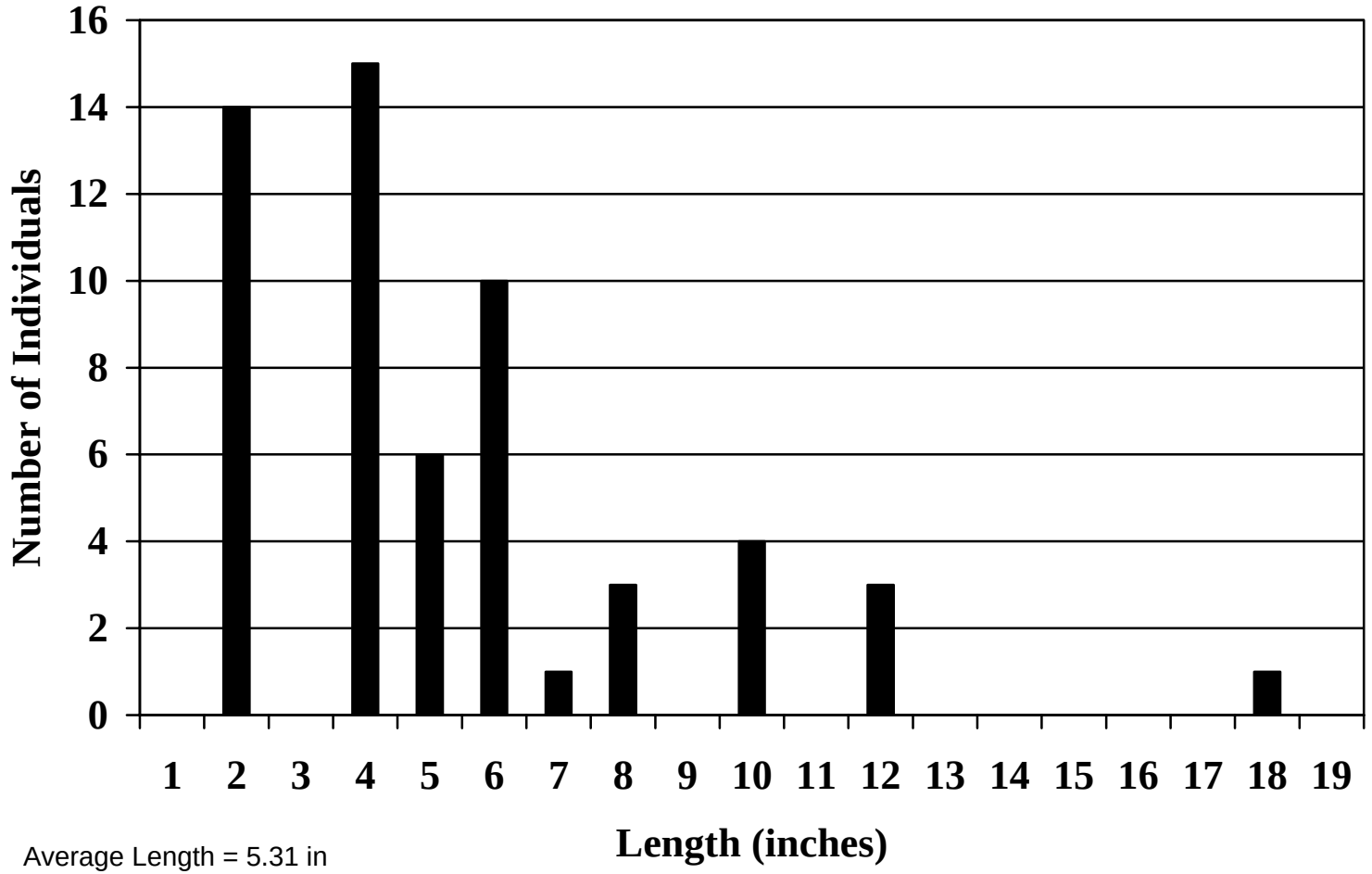
- Average Length = 2.01 in
- Standard Deviation = 2.90
- Sample Size = 399

Appendix B-2. Estimated length frequency distribution for cutthroat trout snorkel surveyed in the Little Arm of St. Charles Creek, tributary to Bear Lake, Idaho, August 20, 1997.



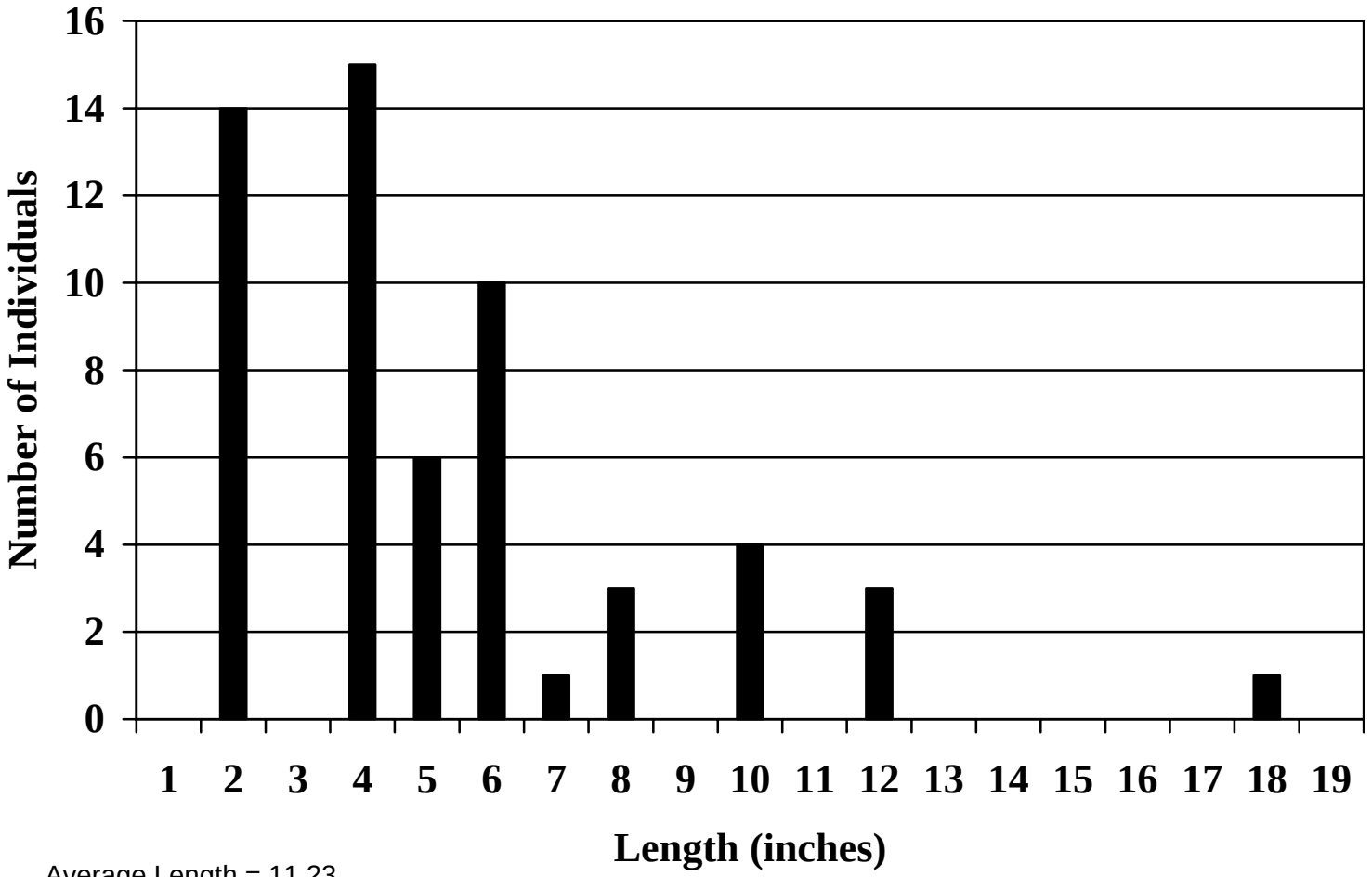
- Average Length = 6.25 in
- Standard Deviation = 3.65
- Sample Size = 44

Appendix C-1. Estimated length frequency distribution for brook trout snorkel surveyed in St. Charles Creek, tributary to Bear Lake, Idaho, above the Big and Little Arm split August 20, 1997.



- Average Length = 5.31 in
- Standard Deviation = 3.25
- Sample Size = 57

Appendix C-2. Estimated length frequency distribution for cutthroat trout snorkel surveyed in St. Charles Creek, tributary to Bear Lake, Idaho, above the Big and Little Arm split August 20, 1997.



- Average Length = 11.23 in
- Standard Deviation = 5.29
- Sample Size = 17

Appendix C-3. Estimated length frequency distribution for rainbow trout snorkel surveyed in St. Charles Creek, tributary to Bear Lake, Idaho, above the Big and Little Arm split August 20, 1997.

1997 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-22

Project II: Technical Guidance Subproject II-F: Southeast Region

Contract Period: July 1, 1997 to June 30, 1998

ABSTRACT

We provided input to the Regional Environmental Staff Biologist on activities affecting fish and anglers. We coordinated with personnel of various agencies on hydropower, mining, road building, stream alteration, grazing allotments, National Pollution Discharge Elimination Systems permits, fill/excavation, and other projects. The Southeast Region fisheries personnel worked with anglers to improve rapport and open communication with agencies and the public.

Authors:

Richard Scully
Regional Fishery Manager

Jim Mende
Regional Fishery Biologist

1997 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-22

Project III: Habitat Management Subproject III-F: Southeast Region

Contract Period: July 1, 1997 to June 30, 1998

ABSTRACT

We worked with 15 AmeriCorps volunteers to transport and build a Christmas tree revetment along an eroded section of the upper Blackfoot River. The area is part of the Blackfoot River Wildlife Management Area. We also repaired a previously installed aspen revetment located immediately downstream.

We continued monitoring several ongoing habitat restoration projects. Some, but not all, of the duties performed by regional personnel include: photo-point repetition and revetment inspections on the Portneuf River, upper Blackfoot River and Marsh Creek; inspection and repair of cattle exclosure fences along 6.5 kilometers of the upper Portneuf River; developed an agreement with landowner Lin Whitworth for livestock exclosure fence along 0.8 km of Marsh Creek; approached three other landowners on Portneuf River and one on Marsh Creek about constructing livestock exclosure fences (they later declined to sign agreements).

Regional Fisheries personnel, along with AmeriCorps volunteers, assisted Department engineers with construction of a dam on the upper Blackfoot River. Solutia, a local phosphate ore processing company, provided geographical survey crews and expertise as well as some of the funds for dam construction. The dam is equipped with removable boards to facilitate flood control during spring runoff as well as a fish ladder to ensure cutthroat trout *Oncorhynchus clarki bouvieri* passage during spawning runs. The dam's purpose is to redirect Blackfoot River water away from a human-created channel and back into the naturally meandering channel. In effect, we exchanged 1.1 km of poor habitat (human channel) for 3.1 km of excellent trout habitat. The project was completed with the approval and assistance of Lonnie Cellan and Bruce Dredge, landowners directly affected by the altered river flow.

Authors:

Richard Scully
Regional Fishery Manager

Jim Mende
Regional Fishery Biologist

1997 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-22

Project IV: Population Management Subproject IV-F: Southeast Region

Contract Period: July 1, 1997 to June 30, 1998

ABSTRACT

In June, we used drift boat-mounted electrofishing equipment to capture spawning-size wild Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* from the upper Blackfoot River. The fish were transported to a holding facility near Grace State Fish Hatchery. They were later examined and determined to be in pre-spawning condition. Twenty-six females were selected for spawning, and at least three males were spawned with each female. A total of 88,624 green eggs were collected, fertilized, and placed in Whitlock Vibert hatch boxes. The 83,126 eyed-eggs were returned to select tributaries of the upper Blackfoot River and placed in incubation boxes provided by the Shelley High School Honors Biology class. Students assisted in locating suitable planting sites. The project resulted in an additional 75,544 cutthroat-fry (hatch success of 91%) being released into the drainage. The goal is to enhance the recovery of the wild Yellowstone cutthroat trout fishery.

In late March 1997, Treasureton Reservoir filled and excess flow went over the spillway into Battle Creek, carrying spawning size rainbow trout *O. mykiss*. The small, ephemeral stream would not support the large rainbow trout for long. Anglers asked the Department to salvage the fish and return them to the reservoir, as had been done in 1996. A weir had been installed at the reservoir spillway to prevent fish from escaping. With the assistance of several local anglers, we electrofished Battle Creek on April 2, 1997. We captured and returned 120 trout to Treasureton Reservoir. The trout ranged from 180 to 535 mm with a mean length of 395 mm.

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