

**Upper North Fork Feather River Project
FERC No. 2105**

2000 Angler Creel Survey

Volume 1

Prepared for:

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TABLE OF CONTENTS

VOLUME I: TECHNICAL REPORT

LIST OF TABLES.....	ii
LIST OF FIGURES.....	iii
ACKNOWLEDGMENTS.....	1
1. INTRODUCTION.....	2
2. METHODOLOGY.....	3
2.1 Survey Area	3
2.2 Survey Methodology.....	3
3. RESULTS/DISCUSSION.....	6
3.1 Summary of Angler Response.....	6
3.2 Summary of Angler Effort.....	7
3.3 Fish Species and Composition.....	10
3.4 Angler Satisfaction.....	19
4. CONCLUSIONS.....	21
4.1 Summary of Angler Response.....	21
4.2 Summary of Angler Effort.....	21
4.3 Fish Species and Composition.....	21
4.4 Angler Satisfaction.....	21

VOLUME II: APPENDICES

- A. Completed Survey Forms
- B. Additional Data Summaries
- C. Data Printouts

LIST OF TABLES

- 2-1. Angler Creel Survey Dates for the Upper North Fork Feather River Project.
- 3-1. Reservoir and river survey responses in the Upper North Fork Feather River Project survey area, between April and October 2000.
- 3-2. Number of survey forms (interview and mail-in) handed out and returned during the course of the study at the reservoir sites in the North Fork Feather River Project survey area, between April and October 2000.
- 3-3. Number of survey forms (interview and mail-in) handed out and returned during the course of the survey at the river sites in the Upper North Fork Feather River Project survey area, between April and October 2000.
- 3-4. Total number of anglers, number of fish caught, numbers of hours fished, and catch per unit effort (CPUE) of anglers at the reservoir sites in the Upper North Fork Feather River Project survey area, between April and October 2000.
- 3-5. Total number of fish, per size range, caught in the reservoir areas, in the Upper North Fork Feather River Project survey area, between April and October 2000.
- 3-6. Total number of anglers, number of fish caught, number of hours fished, and catch per unit effort (CPUE) of anglers at the river sites in the Upper North Fork Feather River Project survey area, between April and October 2000.
- 3-7. Number of fish, per size range, caught at all river areas, in the Upper North Fork Feather River Project survey area, between April and October 2000.
- 3-8. Levels of satisfaction of anglers at all reservoir sites in the Upper North Fork Feather River Project survey area, between April and October 2000.
- 3-9. Levels of satisfaction of anglers at the river sites in the Upper North Fork Feather River Project survey area, between April and October 2000.

LIST OF FIGURES

- 3-1. Map of Project Area
- 3.2. Percent of total fish catch between reservoir and river sites in the Upper North Fork Feather River Project survey area between April and October 2000.
- 3-3. Percentage of anglers fishing at Butt Valley Reservoir and Lake Almanor between April and October 2000.
- 3-4. Percent composition of fish caught at the reservoir sites, in the Upper North Fork Feather River Project survey area between April and October 2000.
- 3-5. Total number of fish caught, by size range, at the reservoir sites, in the Upper North Fork Feather River Project survey area between April and October 2000.
- 3-6. Percent composition of fish caught in Lake Almanor, in the Upper North Fork Feather River Project survey area between April and October 2000.
- 3-7. Number of fish caught, by size range, in Lake Almanor, in the Upper North Fork Feather River Project survey area between April and October 2000.
- 3-8. Percent composition of fish caught in Butt Valley Reservoir, in the Upper North Fork Feather River Project survey area between April and October 2000.
- 3-9. Number of fish caught, by size range, at Butt Valley Reservoir, in the Upper North Fork Feather River Project survey area between April and October 2000.
- 3-10 Species composition of fish caught at all the river sites in the Upper North Fork Feather River Project between April and October 2000.
- 3-11. Total number of fish caught, by size range, at all the river sites in the Upper North Fork Feather River Project between April and October 2000.
- 3-12. Number of fish, by size range, caught at Belden Forebay, in the Upper North Fork Feather River Project between April and October 2000.
- 3.13. Number of fish, by size range, caught at Belden Reach, in the Upper North Fork Feather River Project between April and October 2000
- 3.14. Number of fish, by size range, caught in the Lower Butt Creek Reach, in the Upper North Fork Feather River Project between April and October 2000.
- 3-15. Number of fish, by size range, caught in the Seneca Reach, in the Upper North Fork Feather River Project between April and October 2000.

3-16. Number of fish, by size range, caught in the Upper Butt Creek Reach, in the Upper North Fork Feather River Project between April and October 2000.

ACKNOWLEDGMENTS

Many individuals contributed to this investigation of angler use within the Upper North Fork Feather River Project area. Stuart Running was the PG&E technical manager, and provided overall guidance and logistical support. The primary EA field crewmember was Sheryl Crowe. Regina Argo, Susan Palmer, Nick Labedzki, and Laurie Harvey provided field survey assistance. Data analysis and report preparation was also provided by Regina Argo, Susan Palmer, Sheryl Crowe, and Laurie Harvey. Scott Wilcox was the EA project manager.

1. INTRODUCTION

Pacific Gas and Electric Company (PG&E) is in the initial phases of relicensing of the Upper North Fork Feather River Project (FERC No. 2105). As part of relicensing under the Federal Energy Regulatory Commission (FERC), technical studies are required for a variety of discipline areas that are potentially affected by hydroelectric project operations. Due to the influence of the hydroelectric project on the aquatic environment and recreation opportunities in the project area, angling opportunities are frequently affected. As a result of the potential project effects on this recreational activity, EA Engineering, Science, and Technology, Inc. (EA) conducted an angler creel survey to satisfy the requirements of FERC, the U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), and California Department of Fish and Game (CDFG).

This report describes the results of the angler survey performed by EA on behalf of PG&E on portions of the North Fork Feather River and Butt Creek, associated with the Upper North Fork Feather River Project (FERC No. 2105) in Plumas County, California. The areas included in the study are Lake Almanor, Butt Valley Reservoir, Belden Reservoir, and portions of upper and lower Butt Creek and the North Fork Feather River.

2. METHODOLOGY

2.1 Survey Area

The survey area for this project included Lake Almanor, Butt Valley Reservoir, Belden Reservoir, and portions of upper and lower Butt Creek and the North Fork Feather River (see Figure 2-1).

Reservoir surveys at Lake Almanor and Butt Valley Reservoir were conducted at the existing public accessible boat launches, and at private boat launches that EA had permission to enter. Four boat launches at Lake Almanor were surveyed during each survey effort: two public (Forest Service), and two private (Plumas Pines Resort and Northshore Campground). Both public boat launches were visited at least once per day during each survey effort. The private boat launches were visited at least once each per 3-day survey effort.

The single boat launch at Butt Valley Reservoir (Alder Creek Boat Launch) and the east bank of the reservoir between Butt Valley Dam and the Butt Valley Powerhouse tailrace were also visited at least once per day during each survey effort. Surveys at Belden Forebay were made at or in the vicinity of the public parking area.

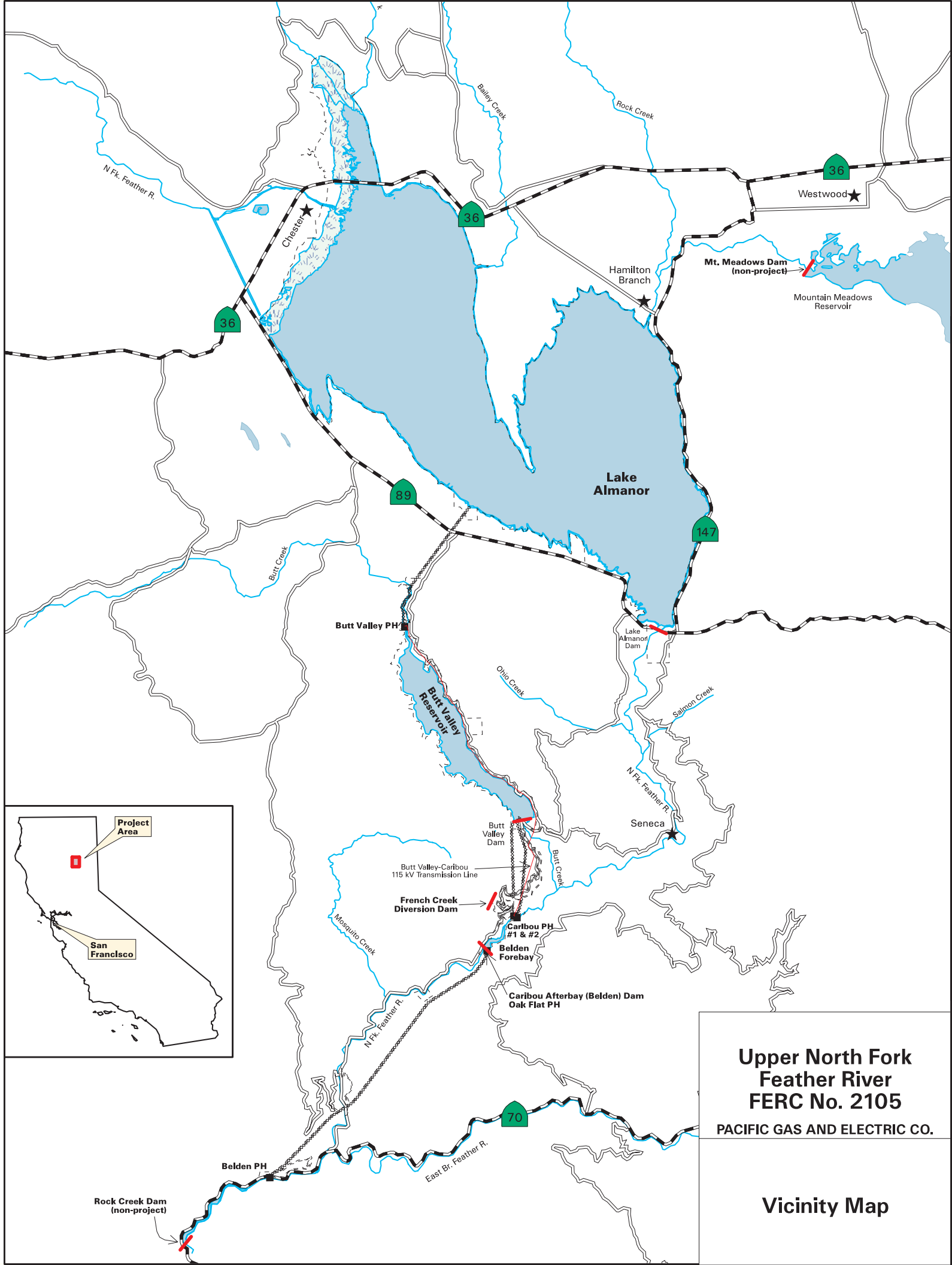
Upper Butt Creek was surveyed from the penstock crossing to the Powerhouse tailrace, and lower Butt Creek at the fishing access parking areas near Caribou 1 and 2 Powerhouses. The North Fork Feather River was surveyed from Canyon Dam down to Belden Powerhouse at Yellow Creek, and included areas where public accessible roads either crossed or were parallel to the river.

2.2 Survey Methodology

The angler creel survey was conducted with a combination of interviews and mail-in responses to forms left on vehicles in the project area. Anglers who were observed fishing in the study area at the various access points were personally interviewed using standardized forms developed by PG&E (Appendix B). Self addressed and stamped envelopes were placed on the windshield of vehicles in the vicinity (boat launches or parking sites) in order to encourage anglers who could not be personally interviewed to provide creel information for the project area.

The route traveled to conduct the surveys for Lake Almanor, Butt Valley Reservoir, and the various stream reaches was varied on a daily basis during each survey effort to more effectively document angler use of project waters throughout the day.

Surveys were conducted twice monthly on weekends from the opening day of trout season (the last Saturday of April) to July, once during the month of August, twice during the month of September, and once in mid-October on the days specified in Table 2-1. Survey dates included the Memorial Day, 4th of July and Labor Day holiday weekends.



N Fk. Feather R.

Bailey Creek

Rock Creek

Westwood

Mt. Meadows Dam (non-project)

Mountain Meadows Reservoir

Lake Almanor

Butt Valley PH

Butt Valley Reservoir

Lake Almanor Dam

Ohio Creek

Salmon Creek

N Fk. Feather R.

Seneca

Butt Valley-Caribou 115 kV Transmission Line

French Creek Diversion Dam

Butt Valley Dam

Butt Creek

Butt Creek

Caribou PH #1 & #2

Belden Forebay

Caribou Afterbay (Belden) Dam

Oak Flat PH

Mosquito Creek

N Fk. Feather R.

East Br. Feather R.

Belden PH

Rock Creek Dam (non-project)

Upper North Fork Feather River FERC No. 2105

PACIFIC GAS AND ELECTRIC CO.

Vicinity Map

Each survey effort consisted of three (3) survey days (Saturday, Sunday, and either Friday or Monday), except for the Forth of July holiday, which consisted of four (4) days (Saturday, Sunday, Monday and Tuesday). The mid- June survey was conducted on the 9th, 11th, and 17th, due to personnel and logistical constraints. The August 25-27 survey was canceled and rescheduled for September 16-18, due to the forest fire that occurred in and around the survey area at that time. The Labor Day weekend was also shortened to two (2) days (Saturday and Sunday) due to poor weather and lack of anglers on both Saturday and Sunday. A one-day survey later in September (September 30th) was added to replace the shortened Labor Day weekend survey.

Table 2-1. Angler Creel Survey Dates for the Upper North Fork Feather River Project

Days	Dates
Sat., Sun., Mon.	May 13-15
Sat., Sun., Mon.	May 27-29 (Memorial Day weekend)
Fri., Sun.	June 9, 11
Sat.	June 17
Fri., Sat., Sun.	June 23-25
Sat., Sun., Mon., Tues.	July 1-4 (4 th of July weekend)
Fri., Sat., Sun.	July 14-16
Fri., Sat., Sun.	July 28-30
Fri., Sat., Sun.	August 12-14
Sat., Sun.	September 2-3 (Labor Day weekend)
Sat., Sun., Mon.	September 16-18
Sat.	September 30
Fri., Sat., Sun.	October 13-15

In general, surveys were conducted between 8 a.m. and 6 p.m. each day. During each weekend (Saturday and Sunday) survey, tailrace fisheries at both Butt Valley Powerhouse and Caribou 1 and 2 Powerhouses were also sampled at least once between 7 a.m. and 10 p.m.

3. RESULTS/DISCUSSION

3.1 Summary of Angler Response

A total of 1265 survey forms were used during the course of the study. Of those, 85 were interviews and 1180 were mail-in forms left on vehicles (Table 3-1). A total of 952 survey forms were used at the reservoir sites, consisting of 38 interviews and 914 mail-ins (Table 3-1). At the river sites, 313 survey forms were used, consisting of 47 interviews and 266 mail-ins (Table 3-1). The number of interviews and mail-in responses from each area was 232 from the reservoir sites and 112 from the river sites, for a total of 344 survey responses and a response rate of 27 (Table 3-1).

Of the 1180 mail-in forms placed on vehicles, 259 (22%) were returned. Of the 259 returned forms, 194 (75% return) were from the reservoir sites (Table 3-2), and 65 (25% return) were from the river sites (Table 3-3).

Table 3-1. Reservoir and river survey responses in the Upper North Fork Feather River Project survey area, between April and October, 2000.

Survey Type	Reservoir Surveys	Reservoir Responses	River Surveys	River Responses	Total Surveys	Total Responses
Mail-in	914	194	266	65	1180	259
Interview	38	38	47	47	85	85
Total	952	232	313	112	1265	344

Table 3-2. Number of survey forms (interview and mail-in) handed out and returned during the course of the study at the reservoir sites in the Upper North Fork Feather River Project survey area, between April and October, 2000.

Reservoir Region	Number surveys handed out	Mail-in surveys handed out	Mail-in surveys returned	% Mail-in returned	Number of interviews	Total Responses
Lake Almanor	806	779	158	20%	27	185
Butt Valley Reservoir	146	135	36	27%	11	47
Total	952	914	194	21%	39	232

Table 3-3. Number of survey forms (interview and mail-in) handed out and returned during the course of the survey at the river sites in the Upper North Fork Feather River Project survey area, between April and October, 2000.

River Region	Number surveys handed out	Mail-in surveys handed out	Mail-in surveys returned	% Mail-in returned	Number of interviews	Total Responses
Belden Forebay (& lower Butt Creek)	76	61	15	25%	15	30
Belden Reach	88	69	18	26%	19	37
Seneca Reach	10	4	1	25%	6	7
Upper Butt Creek	139	132	31	23%	7	38
Total	313	266	65	24%	47	112

3.2 Summary of Angler Effort

Reservoir and river results are presented below. A total of 67% of the total reported catch was from the reservoir areas, while 33% was from the river areas (Figure 3-2).

Reservoir Areas

Over the course of the study, a total 533 anglers reported using the reservoir sites, and caught a total of 1,208 fish (Table 3-4). Many anglers fished in more than one area during a trip, and when filling out the mail-in form, gave information for all areas that they fished. The majority of the anglers, 82%, fished at Lake Almanor, while the other 18% fished at Butt Valley Reservoir (Figure 3-2).

Table 3-4. Total number of anglers, number of fish caught, number of hours fished, and catch per unit effort (CPUE) of anglers at the reservoir sites in the Upper North Fork Feather River Project survey area, between April and October, 2000.

Location	Total number and percent of anglers		For anglers reporting fish And hours			
			Total number of fish caught	Number of fish caught	Number of hours fished	CPUE
Lake Almanor)	439	82%	1057	514	2017.5	0.25
Butt Valley Reservoir	94	18%	150	90	333	0.27
Total	533	100%	1207	604	2350.5	.26

Note: Only survey forms that reported both number of fish caught and number of hours fished were used to calculate CPUE.

Figure 3-1. Percent of total fish catch between reservoir and river sites in the Upper North Fork Feather River Project survey area between April and October, 2000.

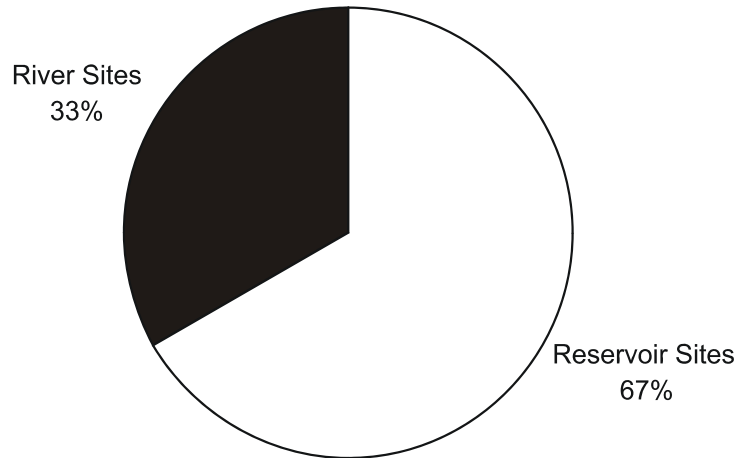
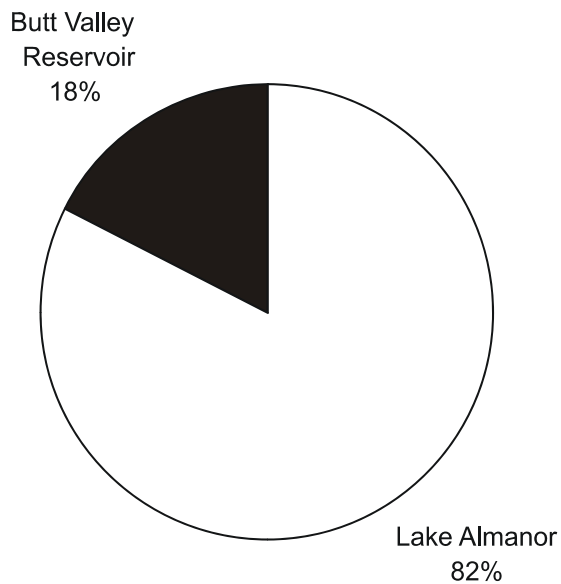


Figure 3-2. Percentage of anglers fishing at Butt Valley Reservoir and Lake Almanor in the Upper North Fork Feather River Project survey area between April and October, 2000.



River Areas

Over the course of the study, a total of 251 anglers reported using the river sites (Table 3-5), catching 606 fish (Table 3-6). The breakdown of angler effort by river site is presented in Table 3-5.

Table 3-5. Total number of anglers, number of fish caught, number of hours fished, and catch per unit effort (CPUE) of anglers at the river sites in the Upper North Fork Feather River Project survey area, between April and October, 2000.

For anglers reporting fish AND hours						
Location	Total number and percent of anglers		Total number of fish caught	Number of fish caught	Number of hours fished	CPUE
Belden Forebay	53	21%	85	63	99	0.64
Belden Reach	67	27%	122	96	146	0.66
Seneca Reach	46	18%	104	68	113	0.60
Lower Butt Creek	3	1%	56	6	4	1.50
Upper Butt Creek	82	33%	239	85	205	0.41
Total:	240	100%	606	318	567	0.56

Note: Only survey forms that reported both number of fish caught and number of hours fished were used to calculate CPUE.

Catch per Unit Effort

Catch per unit effort (CPUE) is the average number of fish caught per hour fished. Not all anglers that returned survey forms reported both the number of hours fished and number of fish caught. For CPUE to be accurate, both of these values are required. Therefore, the CPUE was calculated using only survey forms that reported both number of fish caught and number of hours fished. Of the responses from the reservoir areas, 71% (166) included both number of hours fished and number of fish caught, and 79% (89) of the responses from the river areas included both number of hours fished and number of fish caught. The equation used to calculate catch per unit effort was:

$$\text{CPUE} = \frac{\text{Total number fish caught}}{\text{Total number hours fished}}$$

Catch per unit effort was 0.26 fish/hour at the reservoir sites (Table 3-4), and 0.56 fish/hour at the river sites (Table 3-5).

3.3 Fish Species and Composition

Reservoir Areas

A total of 1,208 fish were reported caught at the reservoir sites during the course of the study (Table 3-6). Trout was the dominant species caught with 618 individuals, 51% of the total number of fish, smallmouth bass were second with 508 individuals or 42% of the total (Figure 3-3). Largemouth bass, catfish, and chinook salmon made up the remaining 7% of fish reported caught.

The dominant size range for trout caught at the reservoir sites was 11 to 14 inches, whereas the dominant size range for smallmouth bass caught at the reservoir sites was under 8 inches (Figure 3-4).

Species composition and size ranges varied between Lake Almanor and Butt Valley Reservoir. In Lake Almanor, 46% smallmouth bass and 47% trout were caught with approximately the same frequency (Figure 3-5). In comparison, anglers at Butt Valley Reservoir reported trout as the primary species caught (75% of the total fish caught) (Figure 3-7). The dominant size range for trout caught in Lake Almanor, between 11 and 14 inches, was smaller than in Butt Valley Reservoir, greater than 17 inches, (Figures 3-6 and 3-8). The dominant size range for smallmouth bass caught in Lake Almanor was also smaller, under 8 inches, than in Butt Valley Reservoir, 8 to 11 inches, (Figures 3-6 and 3-8).

River Areas

A total of 606 fish were reported caught in the river areas (Table 3-7). Rainbow trout made up the majority of fish caught (n=579, 96% of the total fish caught) (Table 3-7, Figure 3-9). The dominant size range was between 8 and 11 inches (Figure 3-10).

Table 3-7 and Figures 3-11 to 3-15 illustrate the minor variations between dominant size ranges of fish caught at the different river sites. Belden Forebay reported the second largest dominant size range (11 to 14 inches), with 34 fish caught in that size range (Figure 3-11). Belden reach reported the smallest dominant size range, with most fish caught (55) being less than 8 inches (Figure 3-12). Lower Butt Creek reach (Figure 3-13) and the Seneca reach (Figure 3-14) reported a dominant size range of 8 to 11 inches, with 28 and 36 fish caught, respectively. Anglers at the Upper Butt Creek reach reported the dominant size to be greater than 17 inches, with 82 fish caught in that size range (Figure 3-15).

Table 3-6 Total number of fish, per size range, caught in the reservoir areas, in the Upper North Fork Feather River Project survey area, between April and October, 2000.

	Size Ranges					
Species	<8”	8-11”	11-14”	14-17”	>17”	TOTAL
Lake Almanor						
Trout	53	85	159	109	99	505
Smallmouth bass	168	106	106	87	16	483
Largemouth bass	0	0	4	4	0	8
Catfish/Bullhead	0	0	0	0	0	0
Other	11	11	29	3	7	61
Subtotal	232	202	298	203	122	1057
Butt Valley Reservoir						
Trout	4	13	25	34	37	113
Smallmouth bass	0	10	9	6	1	25
Largemouth bass	0	0	0	0	0	0
Catfish/Bullhead	4	0	0	0	1	5
Other	1	3	1	0	7	7
Subtotal	9	26	35	40	41	151
All Reservoir Areas						
Trout	57	98	184	143	136	618
Smallmouth bass	168	116	115	93	17	509
Largemouth bass	0	0	4	4	0	8
Catfish/Bullhead	4	0	0	0	1	5
Other	12	14	30	3	9	68
Total	241	228	333	243	163	1208

Figure 3-3. Percent composition of fish caught at the reservoir sites, in the Upper North Fork Feather River Project survey area between April and October, 2000

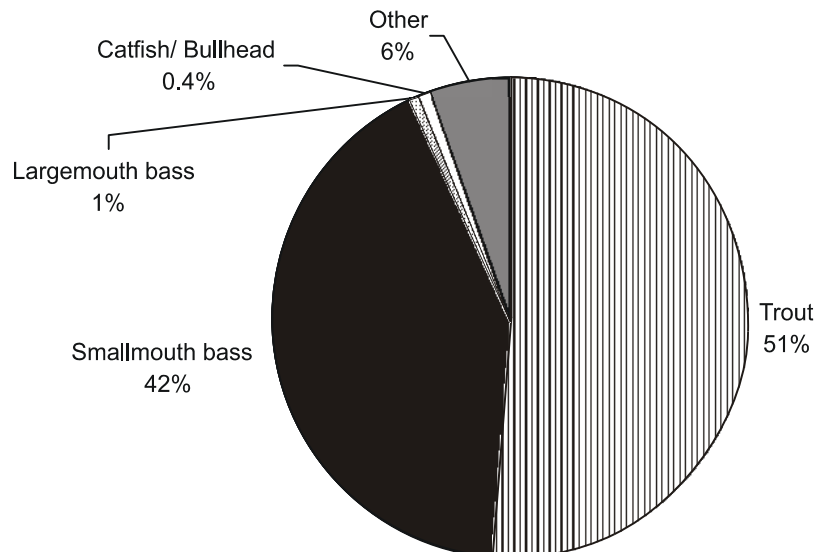


Figure 3-4. Total number of fish caught, by size range, at the reservoir sites, in the Upper North Fork Feather River Project survey area between April and October, 2000

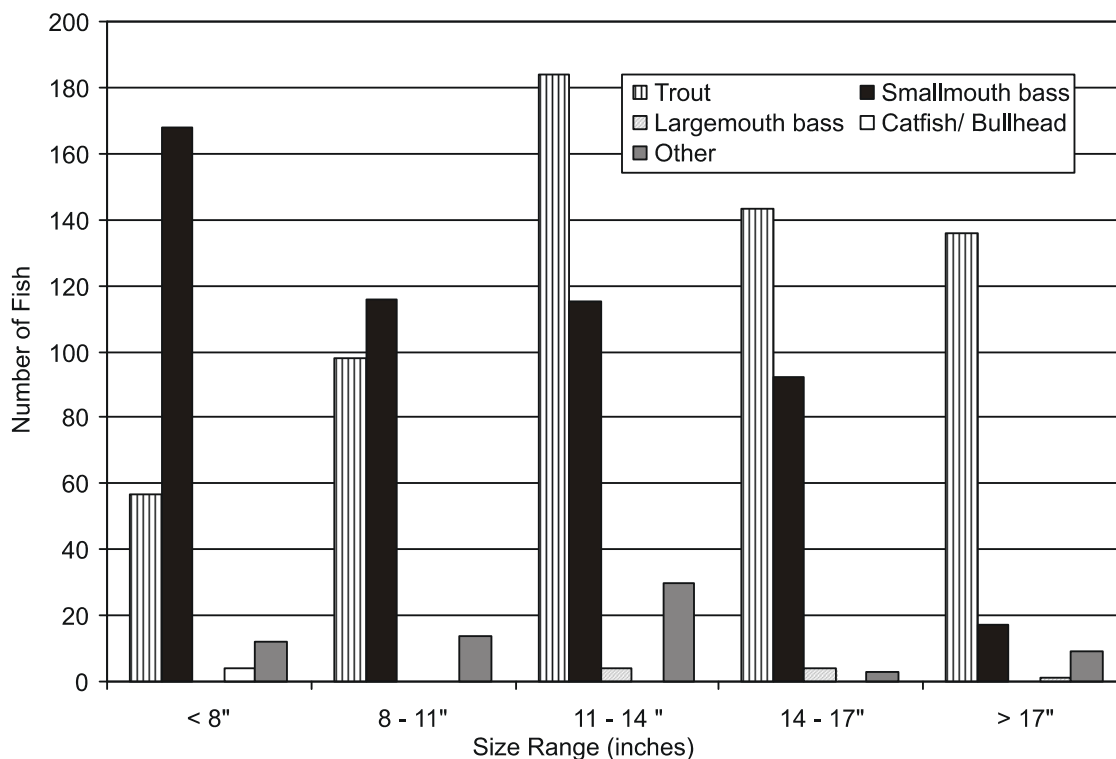


Figure 3-5. Percent composition of fish caught in Lake Almanor, in the Upper North Fork Feather River Project survey area between April and October, 2000

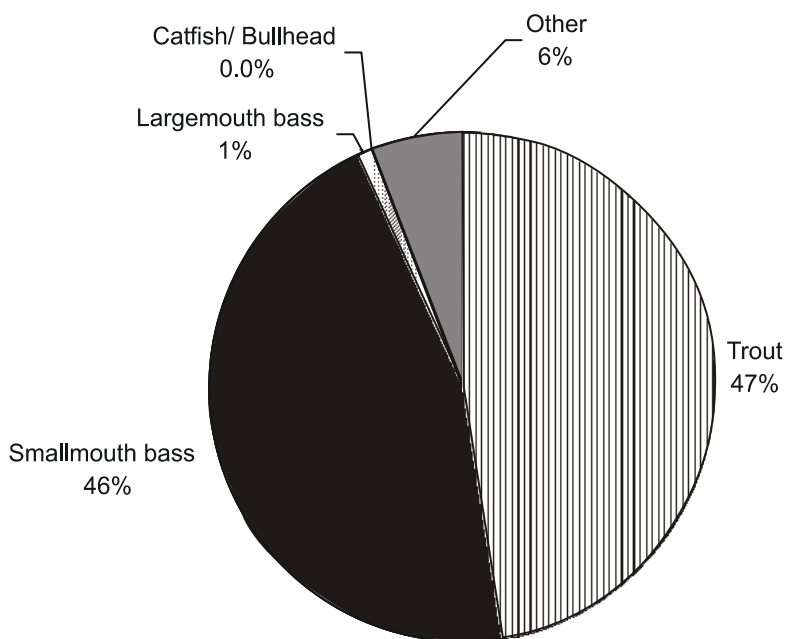


Figure 3-6. Number of fish caught, by size range, in Lake Almanor, in the Upper North Fork Feather River Project survey area between April and October, 2000.

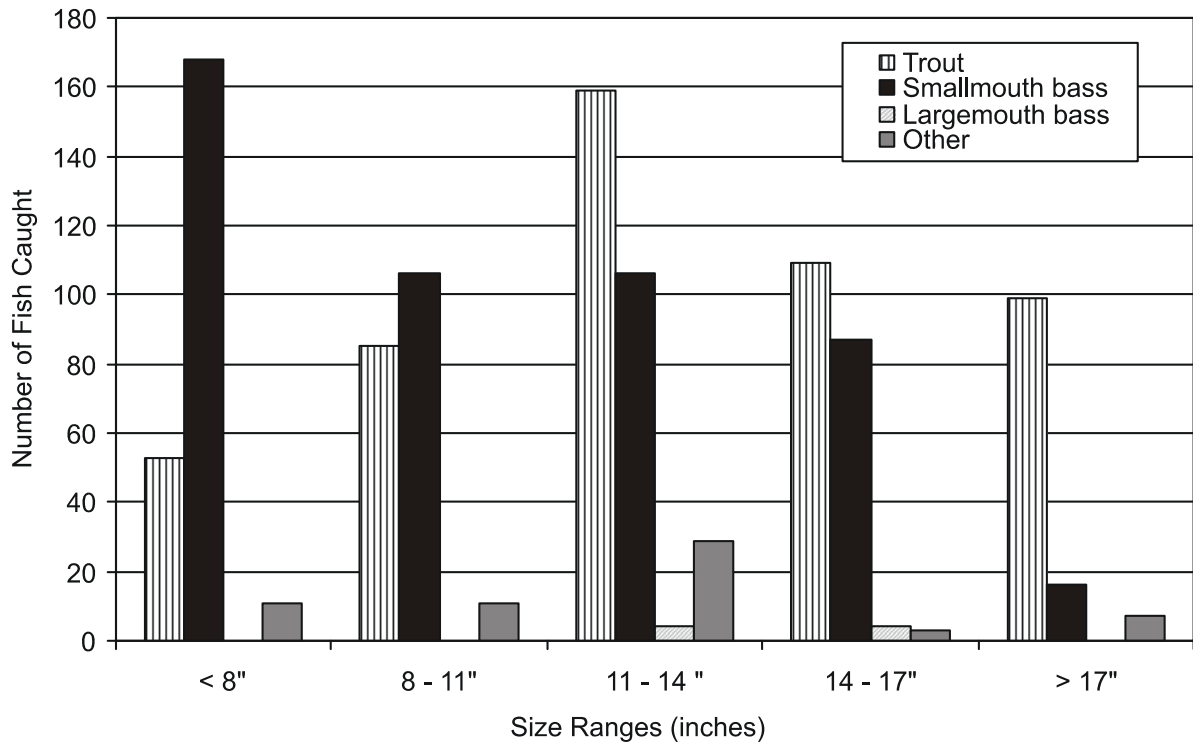


Figure 3-7. Percent composition of fish caught in Butt Valley Reservoir, in the Upper North Fork Feather River Project survey area between April and October, 2000

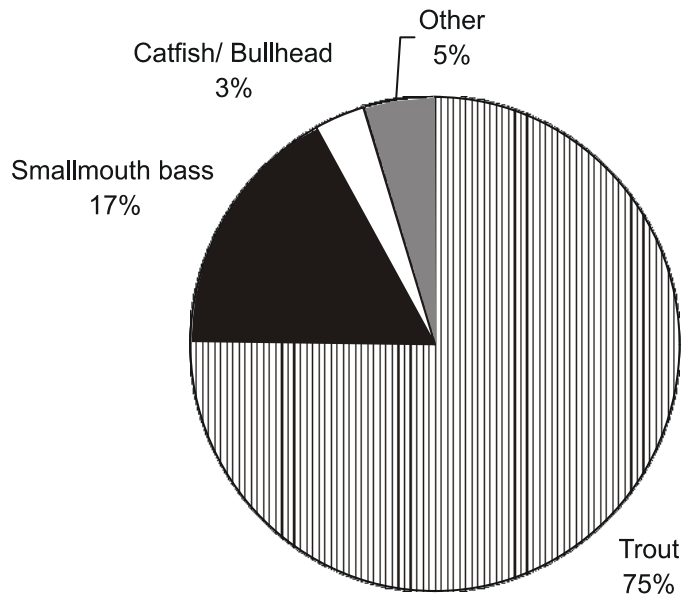


Figure 3-8. Number of fish caught, by size range, at Butt Valley Reservoir, in the Upper North Fork Feather River Project survey area between April and October, 2000

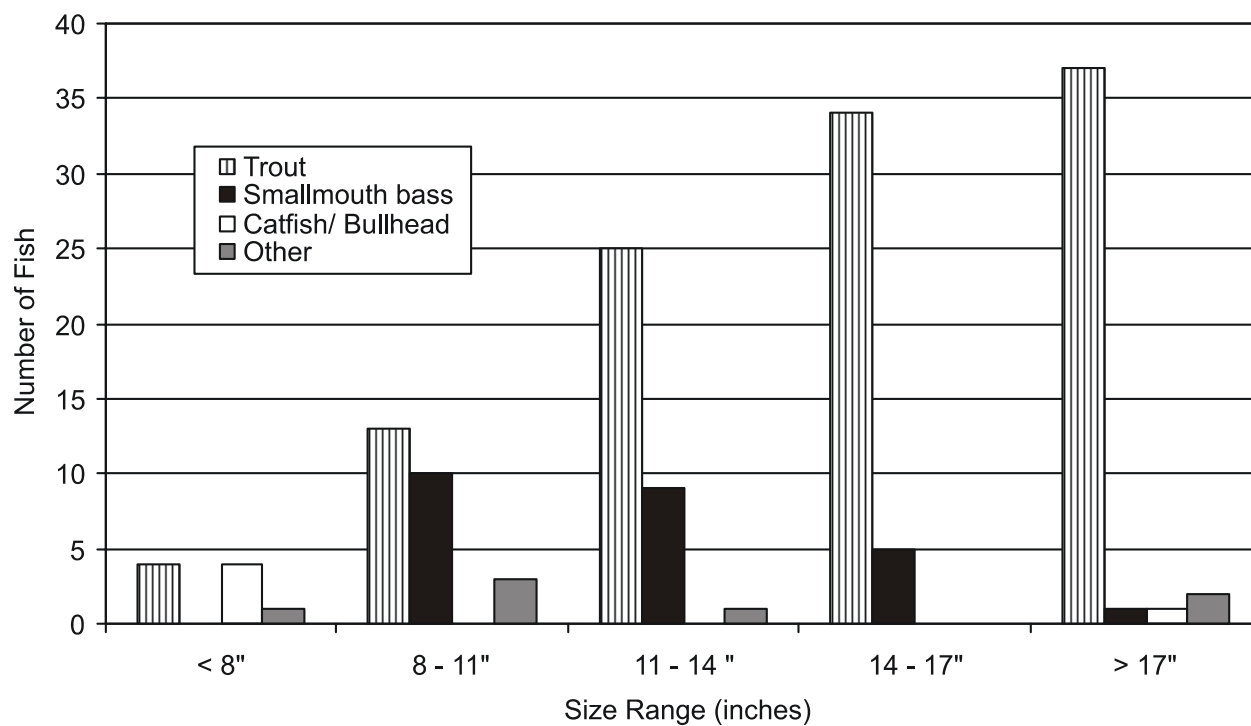


Table 3-7. Total number of fish, by size range caught in all river areas, in the Upper North Fork Feather River Project survey area, between April and October, 2000.

	Size Ranges					
Species	<8"	8-11"	11-14"	14-17"	>17"	TOTAL
Belden Forebay						
Rainbow Trout	12	10	30	18	6	76
Brown Trout	0	1	0	0	0	1
Other	0	4	4	0	0	8
TOTAL	12	15	34	18	6	85
Belden Reach						
Rainbow Trout	55	43	18	2	4	122
Brown Trout	0	0	0	0	0	0
Other	0	0	0	0	0	0
TOTAL	55	43	18	2	4	122
Lower Butt Creek						
Rainbow Trout	2	28	20	2	3	55
Brown Trout	0	0	0	1	0	1
Other	0	0	0	0	0	0
TOTAL	2	28	20	3	3	56
Upper Butt Creek						
Rainbow Trout	35	15	31	70	72	223
Brown Trout	0	1	1	2	5	9
Other	0	2	0	0	5	7
TOTAL	35	18	32	72	82	239
All River Areas						
Rainbow Trout	121	132	123	104	99	579
Brown Trout	0	2	1	3	6	12
Other	0	6	4	0	5	15
TOTAL	121	140	128	107	110	606

Figure 3-9. Species composition of fish caught at all the river sites in the Upper North Fork Feather River Project area between April and October, 2000

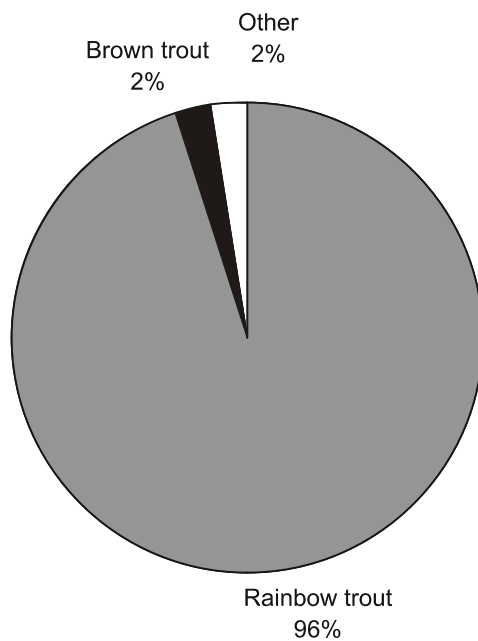


Figure 3-10. Total number of fish caught, by size range, at all the river sites in the Upper North Fork Feather River Project area between April and October, 2000

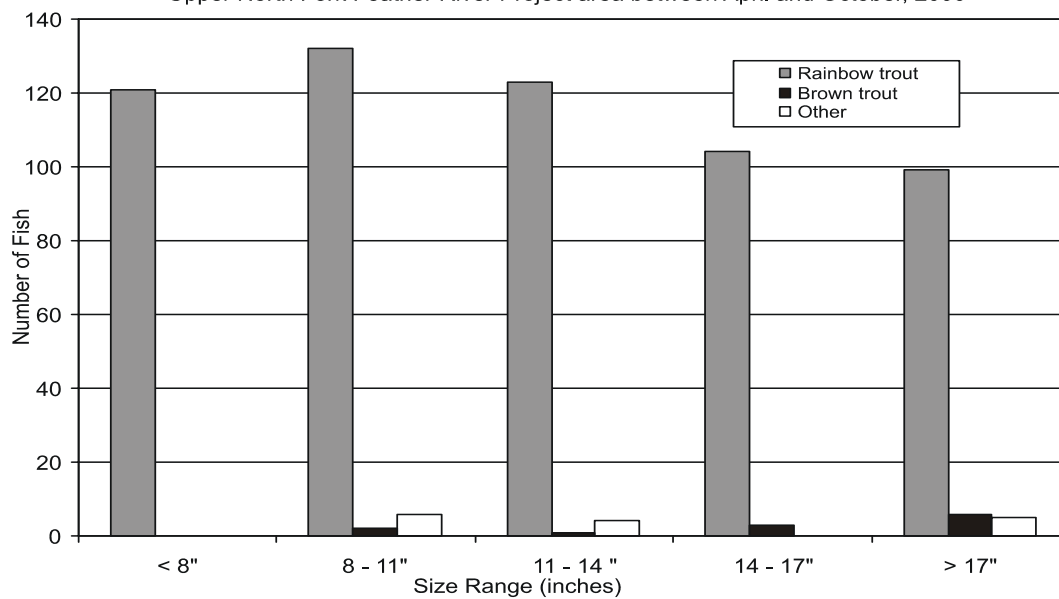


Figure 3-11. Number of fish, by size range, caught at Belden Forebay, in the Upper North Fork Feather River Project area between April and October, 2000

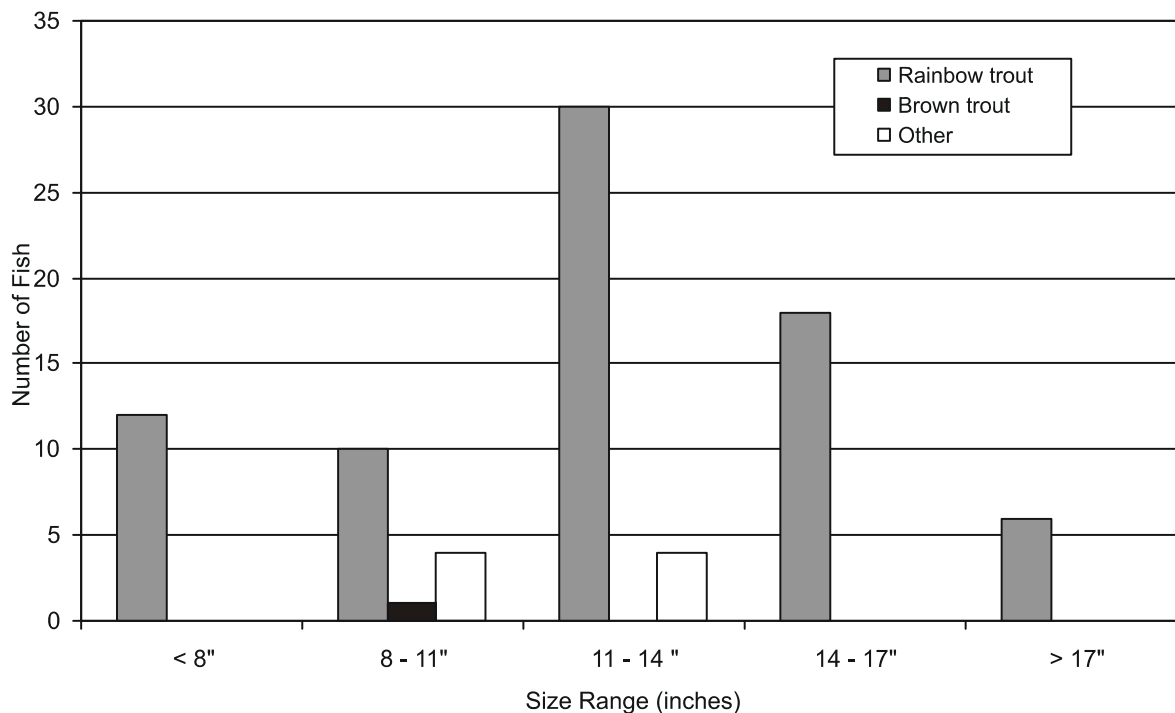


Figure 3-12. Number of fish, by size range, caught in the Belden Reach, in the Upper North Fork Feather River Project area between April and October, 2000

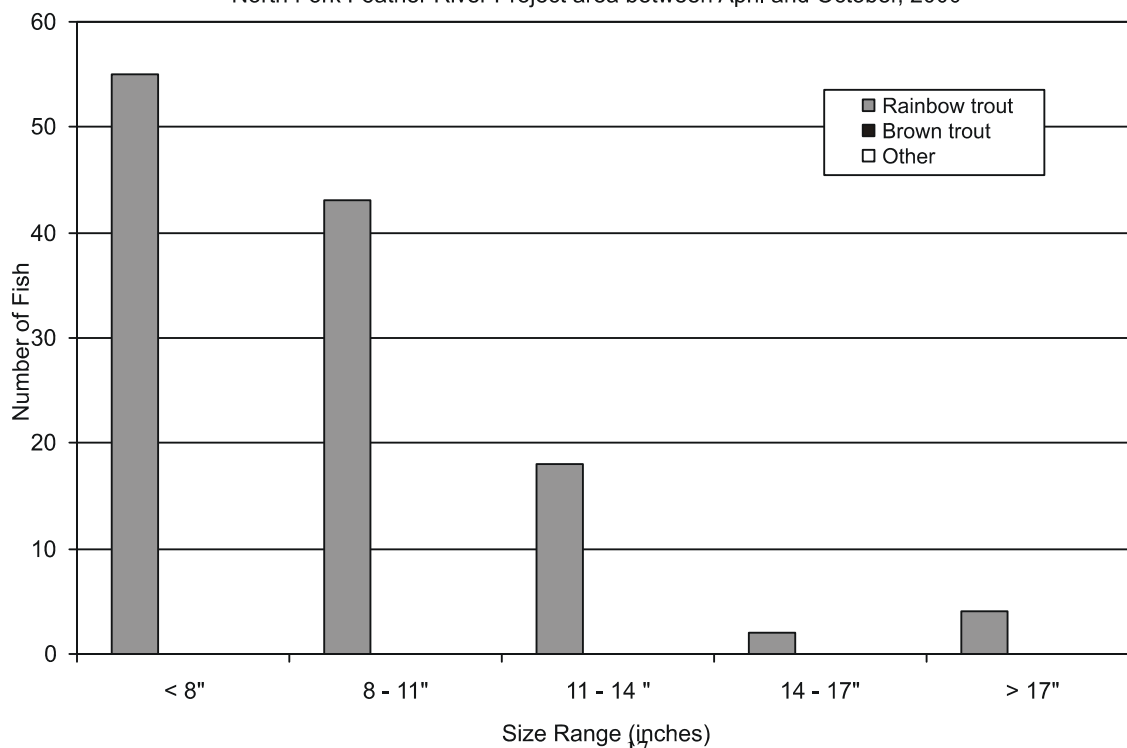


Figure 3-13. Number of fish, by size range, caught in the Lower Butt Creek Reach, in the Upper North Fork Feather River Project area between April and October, 2000

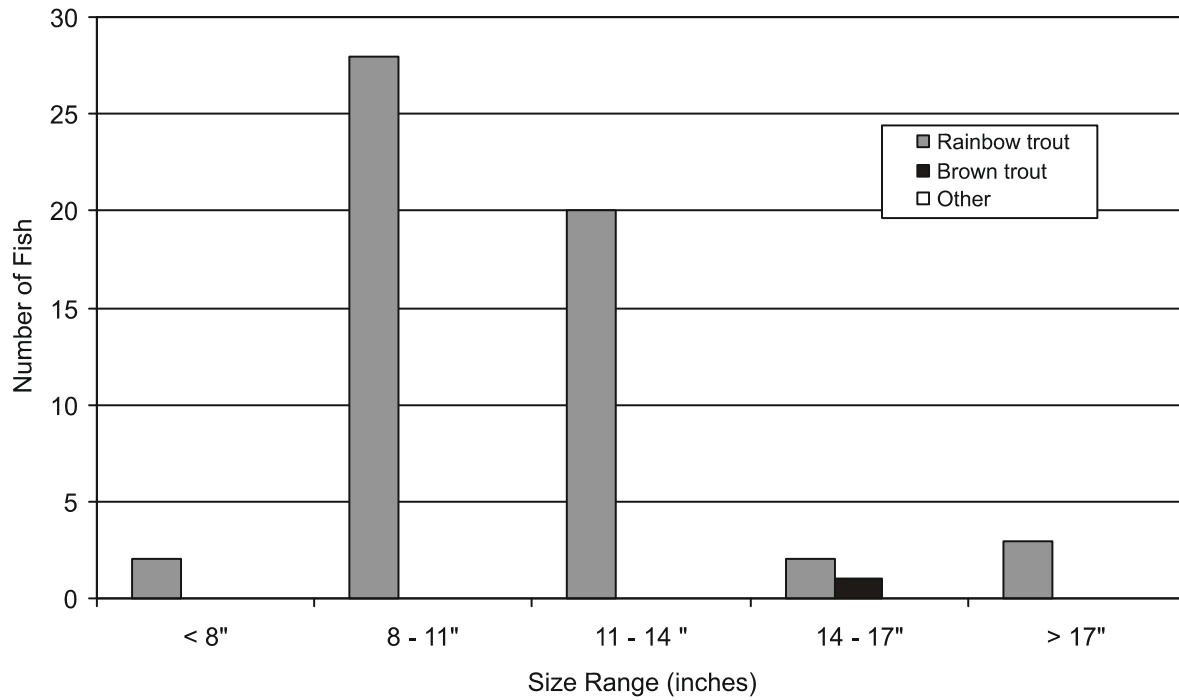
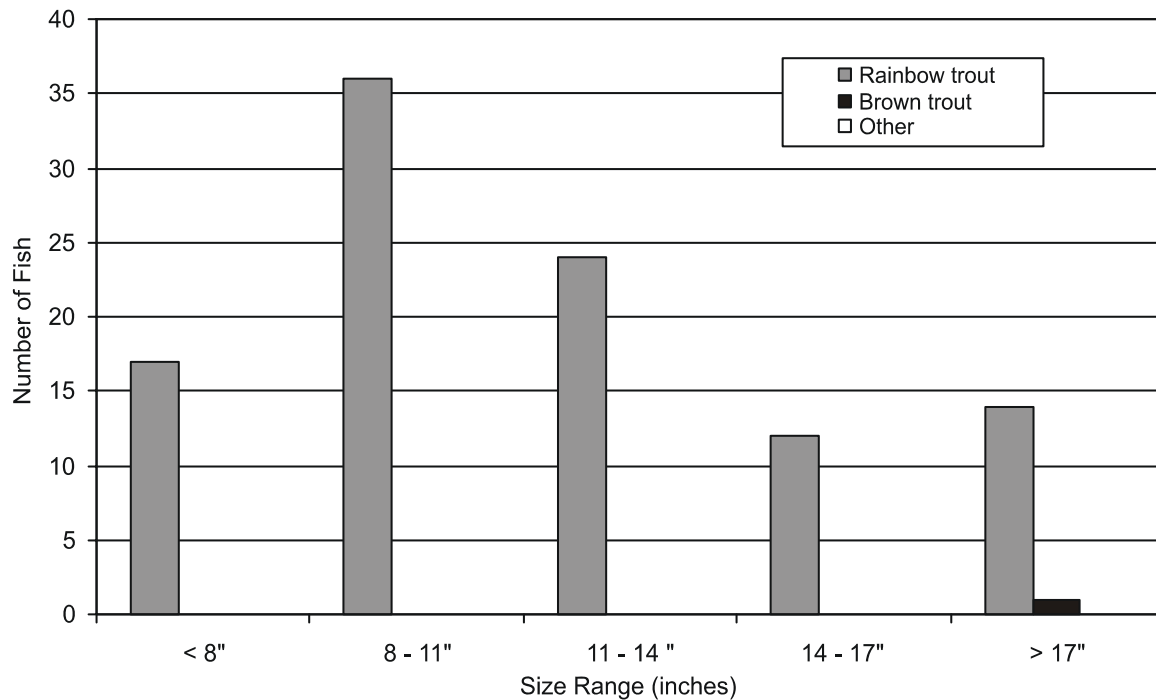


Figure 3-14. Number of fish, by size range, caught in the Seneca Reach, in the Upper North Fork Feather River Project area between April and October, 2000



3.4 Angler Satisfaction

There was a difference in the satisfaction of anglers between the reservoir sites and the river sites. Overall, anglers showed a greater satisfaction with their fishing experiences at the river sites.

Reservoir Areas

The level of angler satisfaction, based on numerical ratings, is shown in Table 3-8. The angler survey form used a 5 point scale to measure angler satisfaction (from less satisfied (-2), to neutral (0), to more satisfied (+2)). Overall, 60% of the anglers that responded were more than satisfied (+1 to +2) with their overall fishing experience in the reservoir areas, 20% were neutral (0) with their overall fishing experience, and 20% were less than satisfied with their overall fishing experience (-1 to -2).

Of the 54 anglers that commented on their reservoir fishing experience, 41 described some part of their experience as bad, while only 13 described their experience as essentially good. Eight (8) comments suggested more fish stocking. Several people reported finding parasites on both trout and salmon in Lake Almanor.

Table 3-8. Levels of satisfaction of anglers at all reservoir sites in the Upper North Fork Feather River Project survey area, between April and October, 2000.

Level of satisfaction		Satisfaction with:					
		Number of fish		Size of fish		Overall experience	
		Number of anglers	% of anglers	Number of anglers	% of anglers	Number of anglers	% of anglers
less satisfied	-2	58	23%	38	18%	35	15%
	-1	17	7%	20	9%	11	5%
	0	76	30%	50	24%	46	20%
	1	42	17%	47	22%	63	28%
more satisfied	2	57	23%	56	27%	72	32%
	Totals	250	100%	211	100%	227	100%

River Areas

The level of satisfaction, based on numerical ratings, is shown in Table 3-9. Overall, 76% of the anglers that responded were more than satisfied (+1 to +2) with their overall fishing experience in the river areas, 15% were neutral (0) with their overall fishing experience, and only 9% were less than satisfied with their overall fishing experience (-1 to -2).

Of the 21 anglers that commented on their river fishing experience, 14 described having a bad experience, while only 7 said that they had a good experience. Three (3) suggested more fish stocking. One person suggested planting breeding stock at end of the season, in order to establish higher populations of wild fish in future years.

Table 3-9. Levels of satisfaction of anglers at the river sites in the Upper North Fork Feather River Project survey area, between April and October, 2000.

		Satisfaction with:					
		Number of fish		Size of fish		Overall experience	
Level of satisfaction		Number of anglers	% of anglers	Number of anglers	% of anglers	Number of anglers	% of anglers
less satisfied	-2	17	14%	9	8%	5	4%
	-1	12	10%	13	12%	6	5%
	0	29	24%	24	22%	18	15%
	1	27	23%	29	27%	42	36%
more satisfied	2	34	29%	32	30%	47	40%
	Totals	119	100%	107	100%	118	100%

4. CONCLUSIONS

4.1 Summary of Angler Response

The response for mail-in survey forms was similar between the reservoir sites (20 to 27%) and the river sites (23 to 26%).

Interviews were a better method than mail-in surveys for collecting angler use information, because all of the needed information was collected in an interview. However, the time that is required to conduct one interview could be used to place many mail-in survey forms on vehicles, though one must take into account the high possibility of receiving incomplete information from the survey forms that are returned.

4.2 Summary of Angler Effort

Most angler effort (time and number of anglers) was concentrated in the reservoir areas, especially Lake Almanor (69% of all angler effort).

The average CPUE at the river sites (0.56 fish/hour) was more than two times greater than the average CPUE at the reservoir sites (0.26 fish/hour). Lower Butt Creek had the greatest river site CPUE (1.5 fish/hour), and upper Butt Creek had the lowest CPUE (0.41 fish/hour). Catch per unit of effort was virtually the same at both Lake Almanor (0.25 fish/hour) and Butt Valley Reservoir (0.27 fish/hour).

4.3 Fish Species and Composition

From the information collected from anglers at the reservoir sites, Lake Almanor is a trout and smallmouth bass fishery, while Butt Valley Reservoir is predominantly a trout fishery.

From the information collected from anglers at the river sites, the rivers are almost exclusively a rainbow trout fishery.

4.4 Angler Satisfaction

Angler satisfaction with their total fishing experience at the river sites (76%) was greater than at the reservoir sites (60%). Anglers were also more satisfied with both the number and size of fish from the river sites (52 and 57%, respectively) than were the reservoir anglers (40 and 49%, respectively).