
Technical Report

Draft Englebright Lake Creel Survey

June 2006

Introduction

Water quality is an important factor in evaluating the feasibility of introducing Chinook salmon and steelhead to the upper Yuba River watershed. Water quality concerns primarily relate to mercury contamination resulting from hydraulic mining practices in the late 1800s, and the subsequent uptake and bioaccumulation of mercury in resident fish and invertebrate prey species. Spatial patterns of mercury bioaccumulation were investigated as part of a University of California, Davis, biological mercury study throughout the Yuba River watershed that was, in turn, part of a large, multi-disciplinary U.S. Geological Survey (USGS) project in the watershed. As part of these studies, Slotten et al. (2006) collected 155 fishes from Englebright Lake from July through September 2002. Reservoir fish sampling was focused on the primary species available for angling, including spotted bass (*Micropterus punctulatus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), rainbow trout (*Oncorhynchus mykiss*), and Sacramento Pikeminnow (*Ptychocheilus grandis*). In addition to muscle mercury analyses, additional parameters and analyses obtained from the reservoir fish samples included length and weight, age by scale analysis, carbon and nitrogen stable isotope ratios, and diet by stomach content analysis (Slotten et al. 2006).

To augment the studies by Slotten et. al. and others, we conducted creel surveys on Englebright Lake in 2003 and 2004 for the purpose of assessing, in general terms, the number, species, and size of fish caught and retained by anglers in Englebright Lake. This survey was intended to support the feasibility-level analyses regarding water quality conducted under the Upper Yuba River Studies Program, and does not constitute a rigorous assessment of the number of anglers and catch rates on the reservoir.

This technical memorandum describes the methods used to conduct the creel surveys and results of the surveys.

Survey Methods

Two types of surveys were used at Englebright Lake: (1) a voluntary survey in which a questionnaire was filled out by anglers and collected in drop boxes at the boat launches by marina personnel or mail; and (2) interviews of anglers conducted at the boat launches and the shoreline around the launch areas. The voluntary survey forms were available at the boat launches, from U.S. Army Corps of Engineers enforcement staff, and at Skipper's Cove Marina. The marina cooperated in the study by providing survey forms to patrons renting fishing and other boats and by collecting the completed forms. Posters were located at the fee kiosks at the boat launches and at the marina to promote participation in the angler survey. Examples of the voluntary survey form and the poster are included as Appendix A.

Based on information provided by Skipper's Cove Marina¹ and the U.S. Army Corps of Engineers², it was determined that there are generally more anglers on the lake on weekends, particularly during holidays such as Memorial Day and the Fourth of July, than during the week. To account for differential use (angling) rates on weekdays, weekends, and holidays, and

¹ Munro, Dave. Owner of Skippers Cover Marina. Conversation with Neil Nikirk, CH2M HILL, in 2003

² Groethe, Doug. U.S. Army Corps of Engineers. Conversation with Neil Nikirk, CH2M HILL, in 2003

to maximize the efficiency of the survey effort, a stratified random sampling scheme (Zar 1999) was developed to ensure that surveys occurred on all types of days in the approximate ratio of angling use. In general, surveys were conducted on at least one day of major holiday weekends, two weekend days and one weekday per month during the summer. As use declined in the late-summer and fall, survey days were reduced to one weekend and one weekday per month.

On scheduled survey dates, the study team arrived at Englebright Lake by approximately 9:00 a.m., and counted the number of vehicles and trailers in the boat launch parking areas to ascertain the approximate number of potential angling groups already present for the day. On most days, two surveyors were used to ensure coverage at both of the available launch ramps. Groups returning to the launch were interviewed to determine the number of anglers; the hours spent angling; the number, species, and size of fish caught and retained; and other demographic information. An example of the interview questionnaire is included as Appendix B. An attempt was made to interview every returning party. Whenever possible, fish that were retained were examined by surveyors to determine species and size, rather than relying on the anglers descriptions. Participation in the survey by returning anglers was voluntary, and those that declined to be interviewed were encouraged to fill out a survey form on their own. Interviews of bank anglers around the launch area were also conducted as these parties were leaving or at the end of the survey day. Typically, survey days ended between 2:00 and 4:00 p.m. or whenever the majority of day use had ended based on the number of launches/returns and the vehicles/trailers remaining in the parking areas. Vehicles and trailers in the boat launch parking areas were counted before leaving for the day.

Between July and October 2003, surveys were conducted on twelve days. To cover the spring period, surveys were conducted on four days in April and May, 2004. Scheduled dates for the creel surveys are presented in Table 1.

TABLE 1
Dates for the creel survey conducted on Englebright Lake during 2003 and 2004

Date	Weekday	Weekend	Holiday	Notes
7/6/2003		X		
7/12/2003		X		
7/16/2003	X			
7/26/2003		X		
8/2/2003		X		
8/9/2003		X		
8/12/2003	X			
8/30/2003			X	Labor Day
9/9/2003	X			
9/28/2003		X		
10/18/2003		X		
10/24/2003	X			
4/22/2004	X			
4/24/2004		X		
5/29/2004			X	Memorial Day
5/31/2004			X	Memorial Day

Results

Number of Voluntary Survey Forms Returned

Voluntary survey forms could be left in the drop boxes at the boat launches, returned via mail, collected by marina staff, or collected by surveyors at the launches. During 2003 and 2004, 96 voluntary survey forms were returned. Some of the forms returned were incomplete, illegible, or contained contradictory information and could not be used. Of the 66 forms returned in 2003, 59 contained usable information. Of the 30 forms returned in 2004, 25 contained usable information.

Number of Interviews Conducted

On the twelve dates that surveys were conducted during 2003, 72 groups of anglers were interviewed, representing 119 individual anglers. During 2004, there were four survey dates and 28 angling groups were interviewed, representing 47 individual anglers. Table 2 presents the number of angling groups interviewed on each survey date.

TABLE 2
Number of angling groups interviewed on Survey dates for the creel survey conducted on Englebright Lake during 2003 and 2004

Survey Date	Number of Groups (Interviews)	Total Anglers	Total Hours Angling	Notes
7/6/2003	3	3	25	
7/12/2003	2	2	6	
7/16/2003	10	10	50	
7/26/2003	13	25	117	
8/2/2003	2	2	48	
8/9/2003	4	4	15	
8/12/2003	11	11	52	
8/30/2003	2	4	18	Labor Day
9/9/2003	5	25	149	
9/28/2003	11	18	50	
10/18/2003	7	11	29	
10/24/2003	2	4	16	
4/22/2004	12	22	145	
4/24/2004	8	14	67	
5/29/2004	6	9	79	Memorial Day
5/31/2004	2	2	12	Memorial Day

Species Retained

On the voluntary survey forms and during interviews, anglers were requested to provide the number, species, and approximate sizes (ranges) of fish that were caught and indicate whether the fish were retained for consumption or released. Anglers were also asked to provide an estimate of the number of hours spent angling. Very few anglers returned voluntary forms indicating that they were unsuccessful (no fish caught); the majority of forms were returned by successful anglers (those that caught at least one fish). No attempt was made to quantify angling success (catch/hour) because of this inherent bias in the survey methodology. Likewise, no attempt was made to summarize the species of fish "targeted" by anglers as the majority of groups marked several species as their target species on the voluntary forms and a common response during interviews to the target species question was "anything that bites" or similar noncommittal responses.

Based on the responses on the voluntary survey forms received, most anglers were able to identify their catch to species. Anglers reported catching eleven different species. Both brown trout and rainbow trout were caught according to the survey forms, although many anglers referred to their catch as simply "trout." Based on the fish examined during interviews, "trout" were most likely rainbow trout as no brown trout were observed. Similarly, largemouth,

smallmouth, and spotted bass were generally referred to as “bass.” Rainbow trout was the most common species caught in Englebright Lake, representing 56 percent of the catch, followed by bass (28%) and bluegill (11%). Very few individuals of the other species were caught by anglers. Table 3 presents the number and species of fish caught by anglers. Generally, only larger fish were retained due to angling restrictions (minimum size limits) on both trout and bass. Smaller bluegill and crappie were retained by some anglers. Rainbow trout represented 86 percent of the catch that was retained, followed by bass (8%), bluegill (3%) and crappie and kokanee (1% each). The number of fish retained by anglers, and percentage of the total catch retained by species is presented in Table 4.

TABLE 3
Number of fish caught by anglers as reported during interviews and on voluntary survey forms

Species	Total Number Caught	Percentage of Total Catch
Bass ^a	219	28
Bluegill	85	11
Brown Trout	9	1
Carp	5	1
Channel Catfish	2	0
Crappie	3	0
Kokanee	7	1
Pikeminnow	14	2
Rainbow Trout ^b	440	56
Sucker	1	0
Yellow Perch	7	1
Total	792	

^a Includes spotted bass

^b Includes fish identified on forms as “trout”

TABLE 4
Number of fish retained by anglers as reported during interviews and on voluntary survey forms

Species	Total Number Retained	< 6" Retained	6" to 12" Retained	12" to 15" Retained	>15" Retained	Percentage of total catch ^c
Bass ^a	28	0	25	3	0	8
Bluegill	10	8	0	2	0	3
Brown Trout	4	0	2	2	0	1
Carp	1	0	0	0	1	0
Channel Catfish	0	0	0	0	0	0
Crappie	2	1	1	0	0	1
Kokanee	5	0	0	4	1	1
Pikeminnow	1	0	0	0	1	0
Rainbow Trout ^b	304	0	192	97	15	86
Sucker	0	0	0	0	0	0
Yellow Perch	0	0	0	0	0	0
Total	355	9	220	108	18	

^a Includes spotted bass

^b Includes fish identified on forms as "trout"

^c Based on total number of retained fish

References

Slotten, D.G., S.M. Ayers, and C.N. Alpers. 2006 (in prep). Mercury Concentrations in Fishes from Englebright Lake, Yuba and Nevada Counties, California, 2002. U.S. Geological Survey Data Series Report.

Zar, J.H. 1999. Biostatistical Analysis. 4th Edition. Prentice-Hall, Inc. Englewood Cliffs, New Jersey. 736 p.

Voluntary Survey Form and Poster

Lake Englebright Angler Survey

TODAY'S DATE: _____ YOUR HOME ZIP CODE: _____

How many people in your group were fishing today? _____

How many hours did each person spend fishing today?

Person 1 _____ Person 2 _____ Person 3 _____
 Person 4 _____ Person 5 _____ Person 6 _____

What were you fishing for today? (check all that apply)

- Trout
 Bass
 Catfish
 Crappie
 Kokanee
 Bluegill
 Other _____ (please specify)

How many fish did you catch today and how big were they? (Species and length):

Species	<6 inches		6 to 12 inches		12 to 15 inches		>15 inches	
	Number Released	Number Kept						
Rainbow Trout								
Brown Trout								
Bass								
Bluegill								
Crappie								
Kokanee								
Channel Catfish								
OTHER (please identify)								

How often do you fish Lake Englebright each year? (check one)

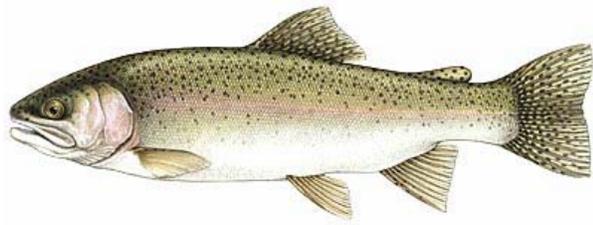
- Often (≥ 10 days/yr)
 Moderate (5-10 days/yr)
 Infrequent (2-4 days/yr)
 First Time

When do you usually fish Englebright? (check all that apply)

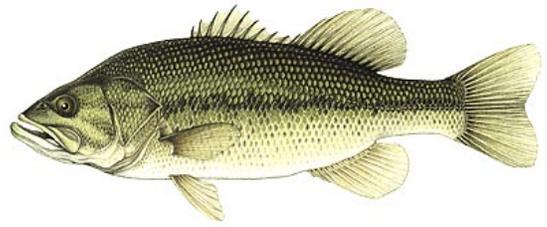
- Spring
 Summer
 Fall
 Weekdays
 Weekends
 Holidays

What species of fish do you usually catch in Lake Englebright? (check all that apply)

- Trout
 Bass
 Catfish
 Crappie
 Kokanee
 Bluegill
 Other _____ (please specify)



TROUT



BASS

HAVE YOU FILLED OUT YOUR ANGLER SURVEY FORM TODAY?

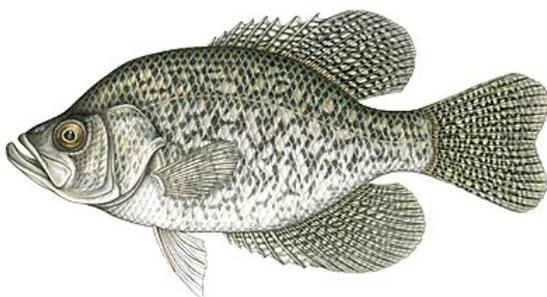
Information is needed on the number of anglers and the types of fish being caught in Englebright Lake. Skipper's Cove Marina supports this data collection effort and encourages ALL anglers to participate in the survey by filling out a survey form each day they go fishing in Englebright Lake.

Survey forms are available in the Marina store, from Park Rangers, and at the Fee Booths, and take only a few minutes to complete. Completed forms can be placed in drop boxes located at the boat ramps or can be given to the Marina store clerk or Park Rangers.

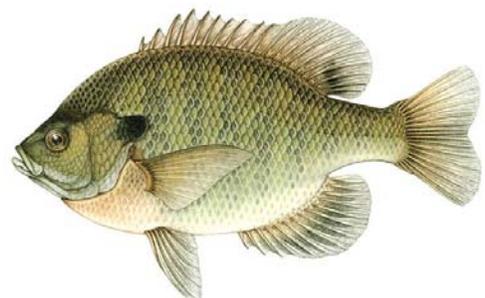
You may be asked to be interviewed at the marina or boat ramp and have your fish measured by survey personnel. Your cooperation in the interview process is encouraged and appreciated.

Thank you for your participation in the Englebright Lake Angler Survey.

HAVE YOU FILLED OUT YOUR ANGLER SURVEY FORM TODAY?



CRAPPIE



BLUEGILL

APPENDIX B

Interview Questionnaire

LAKE ENGLEBRIGHT ANGLER SURVEY

DATE: _____ TIME: _____ LOCATION: _____

ANGLER'S ZIP CODE: _____

NUMBER OF HOURS SPENT FISHING: _____ BOAT or BANK

TARGET SPECIES: Trout Bass Catfish Crappie
 Kokanee Bluegill Other _____ (specify)

NUMBER OF FISH RETAINED:

SPECIES	TOTAL LENGTH (mm)								

NUMBER OF FISH RELEASED (Species and length):

SPECIES	<6 inches	6-12 inches	12-15 inches	>15 inches	Unknown

HOW OFTEN DO YOU FISH ENGLEBRIGHT LAKE?

Often (≥ 10 days/yr) Moderate (5-10 days/yr) Infrequent (2-4 days/yr) First Time

WHEN DO YOU USUALLY FISH ENGLEBRIGHT LAKE? Spring Summer

Fall

Weekdays Weekends Holidays

SPECIES USUALLY CAUGHT: Trout Bass Catfish Crappie
 Kokanee Bluegill Other _____ (specify)

NOTES
