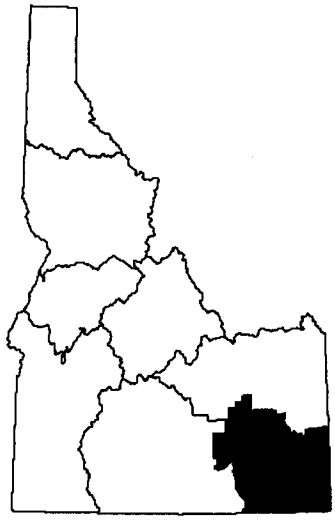
FISHERY MANAGEMENT INVESTIGATIONS

IDAHO DEPARTMENT OF FISH AND GAME

FISHERY MANAGEMENT ANNUAL REPORT

Cal Groen, Director



SOUTHEAST REGION

2006

Prepared By:
David Teuscher, Regional Fishery Biologist
Richard Scully, Regional Fishery Manager

February 2008
IDFG 08-103

TABLE OF CONTENTS

	Page
LOWLAND LAKE AND RESERVOIR INVESTIGATIONS	1
ABSTRACT	1
Chesterfield Creel Survey	1
INTRODUCTION	1
METHODS	2
RESULTS AND DISCUSSION	2
Chesterfield Bathymetric Map	4
METHODS AND RESULTS	4
Warmwater Fishery Evaluations	10
INTRODUCTION	10
METHODS	10
RESULTS AND DISCUSSION	11
RIVERS AND STREAMS INVESTIGATIONS	13
ABSTRACT	13
Population Monitoring Program for Bonneville Cutthroat	13
INTRODUCTION AND METHODS	13
RESULTS AND DISCUSSION	15
Yellowstone Cutthroat Trout Monitoring in the Blackfoot River System	18
INTRODUCTION AND METHODS	18
RESULTS AND DISCUSSION	19
MANAGEMENT RECOMMENDATION	22
LITERATURE CITED	23

TABLE OF CONTENTS (Continued)

Page

LIST OF TABLES

Table 1. Seasonal creel statistics for Chesterfield Reservoir from 2006..... 2

Table 2. Creel results from Chesterfield Reservoir..... 4

Table 3. Table of water storage values at different depths of Chesterfield Reservoir..... 9

Table 4. Species composition and harvest regulations for reservoirs included in the 2006 warmwater fishery evaluations..... 11

Table 5. Catch per hour of electrofishing effort in eight southeast Idaho reservoirs. Proportional stock density values for largemouth bass are shown in parenthesis.12

Table 6. Trends in proportional stock density for select largemouth bass populations in southeast Idaho..... 12

Table 7. Bonneville cutthroat trout densities (numbers/100 m2) in Preuss, Giraffe, and Dry creeks from 1981 through 2006. Only fish greater than 75 mm are shown. The 2004 and 2006 densities were estimated based on catch from a single pass. 16

Table 8. Trout density estimates (fish/100 m) for 13 creeks selected for long-term BCT monitoring program. Only fish over 75 mm total length are included in the abundance estimates..... 18

Table 9. Yellowstone cutthroat trout escapement estimates for the Blackfoot River. ... 19

Table 10. Yellowstone cutthroat trout abundance estimates by size class in the Blackfoot River 2006..... 20

TABLE OF CONTENTS (Continued)

Page

List of Figures

Figure 1. Length frequency histograms from harvested rainbow trout measured during the 2006 creel survey of Chesterfield Reservoir. The spring released catchable size trout first appeared in the creel during the fall. The spring and summer fishery appeared to be completely made up of carryover trout stocked in 2005..... 3

Figure 2. Comparison between harvested rainbow trout creeled in 1994 and 2006. Harvest rules were 6 trout in 1994 and 2 trout in 2006..... 5

Figure 3. Boat transect lines used to estimate water storage capacity of Chesterfield Reservoir..... 6

Figure 4. Bathymetric map of Chesterfield Reservoir. The Y and X axes are UTM coodinates (WGS 83)..... 7

Figure 5. Depth-volume plot for Chesterfield Reservoir. The zero Y-axis point represents the water surface at full pool elevation and storage capacity..... 8

Figure 6. Sampling locations for the BCT monitoring program..... 14

Figure 7. Bonneville cutthroat trout population trends in the Thomas Fork Tributaries.. 17

Figure 8. Length frequency distributions for Yellowstone cutthroat trout caught on the WMA of the Blackfoot River..... 21

SOUTHEAST REGION 2006 FISHERY MANAGEMENT ANNUAL REPORT

LOWLAND LAKE AND RESERVOIR INVESTIGATIONS

ABSTRACT

The southeast region fishery crew completed a year-long creel survey of Chesterfield Reservoir. The survey evaluated the impact of reducing the bag limit from 6 to 2 trout and estimated current fishing pressure. Anglers fished an estimated 71,000 hours and harvested about 15,000 rainbow trout *Oncorhynchus mykiss*. Peak angling pressure and harvest occurred during the December and January ice fishing season. Average catch rate was 0.5 fish/hr, which is similar to values reported during the 1990's prior to implementing the reduced harvest regulation. The mean size of fish harvested by anglers increased from 338 mm in 1994 to 431 mm in 2006 and may be a result of the 2 trout harvest rule.

A sonar survey was completed on Chesterfield Reservoir to estimate full-pool storage capacity and build a bathymetric map. A total of 22,233 depth estimates were recorded to complete the bathymetric map. Total volume of Chesterfield Reservoir was estimated to be 27,790,237 m^3 (22,530 acre-feet). The survey was completed to help evaluate the amount of water needed to support trout if a conservation pool can be obtained. The estimate is 90% of the storage value estimated by the Portneuf-Marsh Valley Irrigation Company in 1985.

Warmwater fishery evaluations were completed on eight reservoirs. The primary goals of these surveys were to collect relative abundance information for pan fish species and monitor largemouth bass *Micropterus salmoides* proportional stock densities (PSD). The surveys are part of a monitoring program completed every three years. Largemouth bass PSD estimates ranged from 13 to 78. Largemouth bass populations in southeast Idaho appear to follow a boom-bust cycle. The cycles occur in both general and conservative harvest regulation waters. The exception to the boom-bust cycle occurs in Glendale Reservoir, where the quality of the largemouth bass population has remained relatively constant over the past decade. The harvest regulation on Glendale Reservoir is two bass none under 406 mm.

Chesterfield Creel Survey

INTRODUCTION

Chesterfield Reservoir is the most popular trout fisheries in southeast Idaho. During the 1990s, the fishery was managed under general harvest rules that included a six trout limit with no size or bait restrictions. Those regulations maximized yield from the reservoir. In 1994, anglers fished an estimated 158,000 hours and harvested over 70,000 rainbow trout. Despite the popularity of the fishery, anglers began requesting more restrictive harvest regulations to allow more fish to grow to quality size. In response to angler requests and creel analysis that showed harvest would be significantly reduced under more conservative bag limits, the trout limit was reduced from 6 to 3 fish per day in 1998. The bag limit was reduced a second time to 2 trout in 2002. The 2006 creel survey was initiated to evaluate the impact of the rule changes and measure current angling effort on the reservoir.

Chesterfield Reservoir was drained during the years 2001-2004. In those years, drought conditions resulted in water demands that exceeded storage. Knowing that the reservoir would

be drained, stocking programs were terminated. During those years, the reservoir drained in July or August and would begin storing water on September 15th. Increased precipitation in 2005 refilled the reservoir and rainbow trout stocking program was reinstated with catchable and fingerling trout. Therefore, the creel results summarize a fishery created largely from a single year of adequate water storage and carryover rainbow trout survival.

METHODS

The creel survey period was April 24, 2006 to April 23, 2007. The survey was completed using a roving design. Angler counts were made from shore, ice, and by boat. Data entry and analysis were completed using Idaho Department of Fish and Game Department creel census system software version 1.7. The program generated a sampling calendar of randomly selected dates and times. In general, two weekdays and one weekend day were sampled per week. Angler interviews were collected by approaching anglers during their fishing activity (incomplete trip) or from anglers leaving the water (complete trip).

RESULTS AND DISCUSSION

A total of 395 interviews were made with an average of 2.2 anglers per interview. Ice anglers made up 41% of the interviews followed by boat (34%), bank (19%), and float tubes (5%).

Anglers fished an estimated 71,000 hours and caught 40,000 (± 5,000) rainbow trout. Anglers harvested 38% of their catch (15,000 ± 1,500). Mean total length of rainbow trout in the creel was 431 mm. The largest fish creeled was 555 mm long and weighed 2,010 grams. The relative weight of fish creeled was 98. During the 06-07 creel survey year, estimated yield was 19 kg/ha, and roughly 23 rainbow trout harvested per ha. Overall catch, harvest, and effort were greatest during the winter fishing season. Seasonal creel statistics are shown in Table 1.

Table 1. Seasonal creel statistics for Chesterfield Reservoir from 2006.

Season	Effort (hr)	Catch	Harvest
spring	20,282	10,380	4,162
summer	15,992	7,205	2,577
fall	11,410	8,908	3,049
winter	23,705	13,650	5,285
Totals	**71,389**	**40,143**	**15,073**

Carryover rainbow trout dominated the spring and summer fishery. Most of the trout harvested between April and August exceeded 350 mm (Figure 1). The paucity of small trout in the creel during the spring and summer periods may be explained by anglers selecting larger fish for harvest. The spring 2006 catchables were stocked at a mean length of 229 mm. Those catchables began showing up in creel checks during the fall and winter months (Figure 1). The delay of catchables recruiting to harvest may be because anglers tend for release smaller fish under a two-fish bag limit.

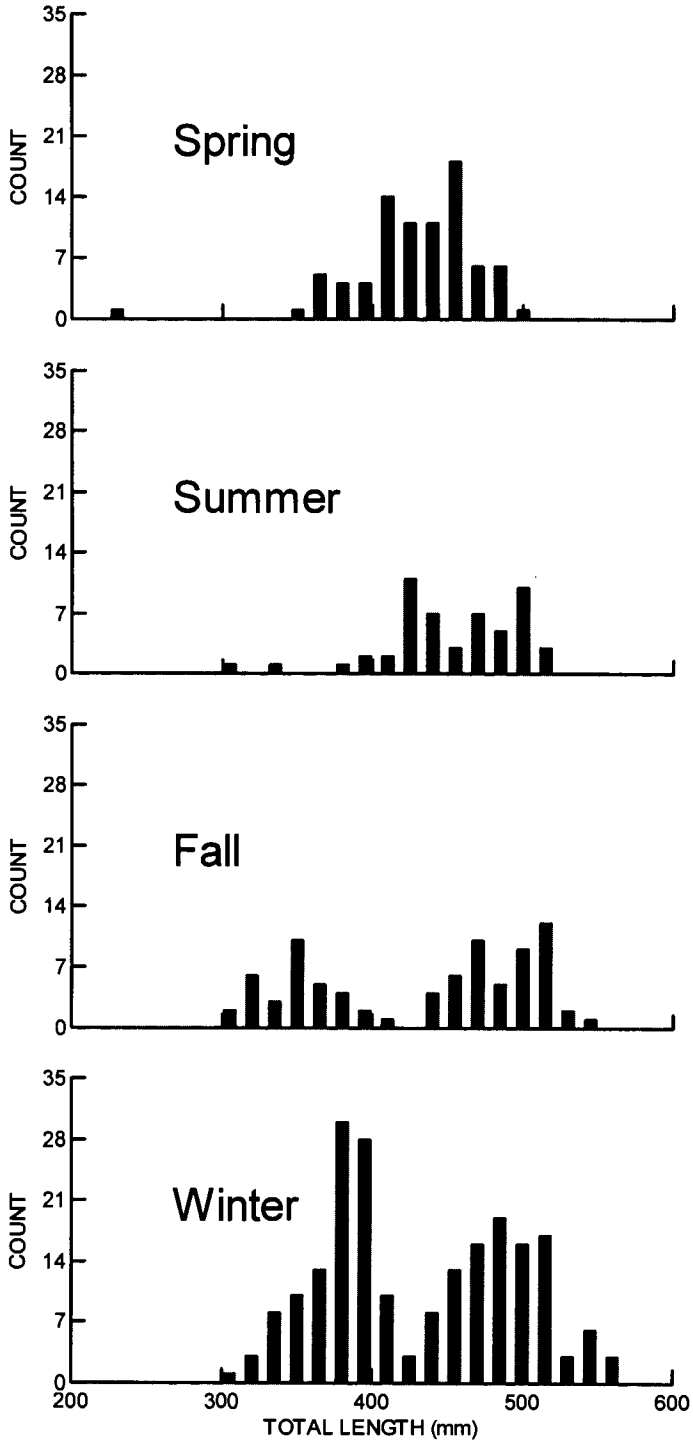


Figure 1. Length frequency histograms from harvested rainbow trout measured during the 2006 creel survey of Chesterfield Reservoir. The spring released catchable size trout first appeared in the creel during the fall. The spring and summer fishery appeared to be completely made up of carryover trout stocked in 2005.

The mean length of harvested trout from Chesterfield Reservoir is much larger than past creel surveys. In 1994, anglers harvested fish as small as 200 mm, with a mean length of 338 mm (Figure 2). Only 2% of the trout harvested in 1994 exceeded 500 mm total length. The mean length in 2006 was almost 100 mm larger at 431 mm and 11% of the trout exceeded 500 mm total length. The change in mean length is likely due to anglers selecting larger trout to harvest. Anglers harvested only 38% of the trout caught in 2006. Prior to the new regulation, anglers harvested about 65% of their catch. Catch and harvest trends from Chesterfield Creels are shown in Table 2.

Table 2. Creel results from Chesterfield Reservoir.

Year	Effort (1,000)	Catch (1,000)	Harvest (1,000)	Catch Rate
1993	29	14	9	0.5
1994	158	116	71	0.7
2006	73	40	15	0.5

Chesterfield Reservoir is one of the most productive trout fisheries in southeast Idaho. Estimated yield in 2006 was 19 kg/ha. Miranda (1999) reported the average yield of trout in 124 reservoir across the nation was 2.7 kg/ha. In 2005, Henry's Lake anglers fished an estimated 95,000 hours and harvested about 9,000 trout (Damon Keen, Idaho Department of Fish and Game, personal communication). Considering the size of each reservoir, harvest was 23 trout/ha in Chesterfield compared to only 4 trout/ha for Henrys Lake.

Chesterfield Bathymetric Map

Because Chesterfield Reservoir is such a productive trout fishery, the Department is interested in pursuing a conservation pool. The pool would allow for trout to carryover during the drought years. To better understand the current storage capacity of the reservoir, we constructed a bathymetric map in 2006. The reservoir was full and spilling during the survey.

METHODS AND RESULTS

An Eagle Sonar system (model 480 w/GPS) was used to complete the survey. The sonar system recorded depth and GPS coordinates every second. The survey was completed on June 3-5, 2006. A trespass permit was obtained from the Shoshone-Bannock Tribe to survey the reservation portion of the reservoir. Depth and GPS coordinate data were summarized using Surfer 8 software. A total of 22,233 depth estimates were recorded during the survey. Survey transects are shown in Figure 2. Total volume of Chesterfield Reservoir was estimated to be 27,790,237 m^3 (22,530 acre-feet). Figure 3 is a contour plot generated using Surfer 8 software. Table 3 shows storage capacity for selected depths.

The 2006 storage estimate is about 10% lower than a survey completed in 1985. The 1985 survey estimate was 30,467,001 m^3 (24,700 acre-feet). The difference between the two estimates is likely a combination of measuring equipment and(or) 23 years of sediment deposition.

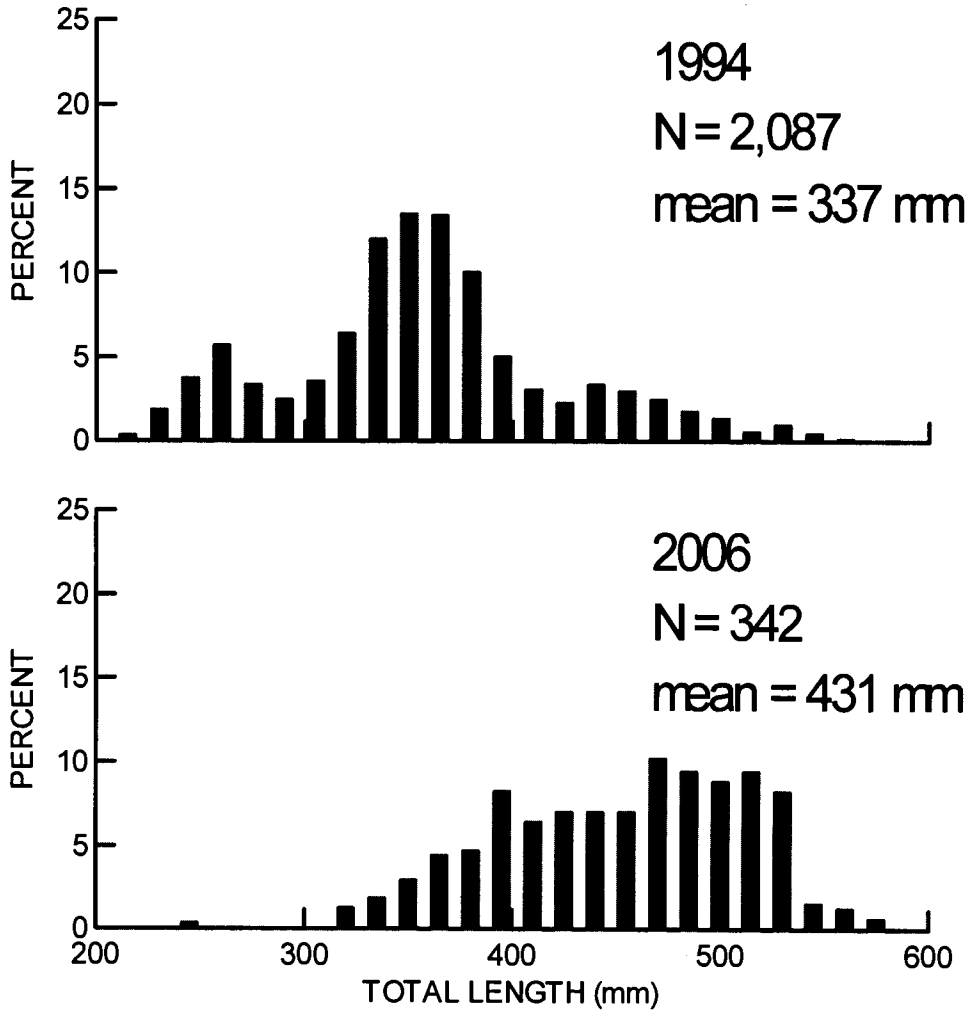


Figure 2. Comparison between harvested rainbow trout creeled in 1994 and 2006. Harvest rules were 6 trout in 1994 and 2 trout in 2006.

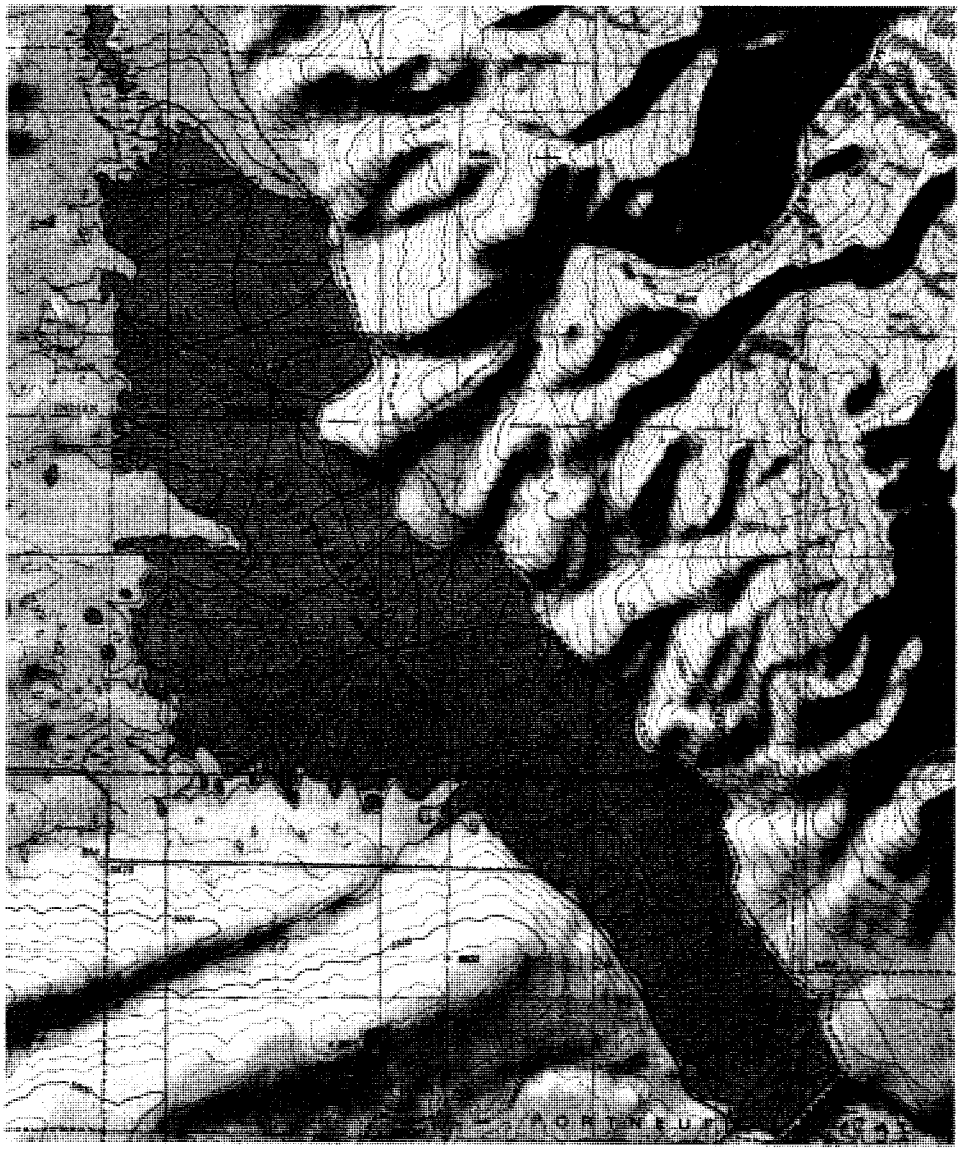


Figure 3. Boat transect lines used to estimate water storage capacity of Chesterfield Reservoir.

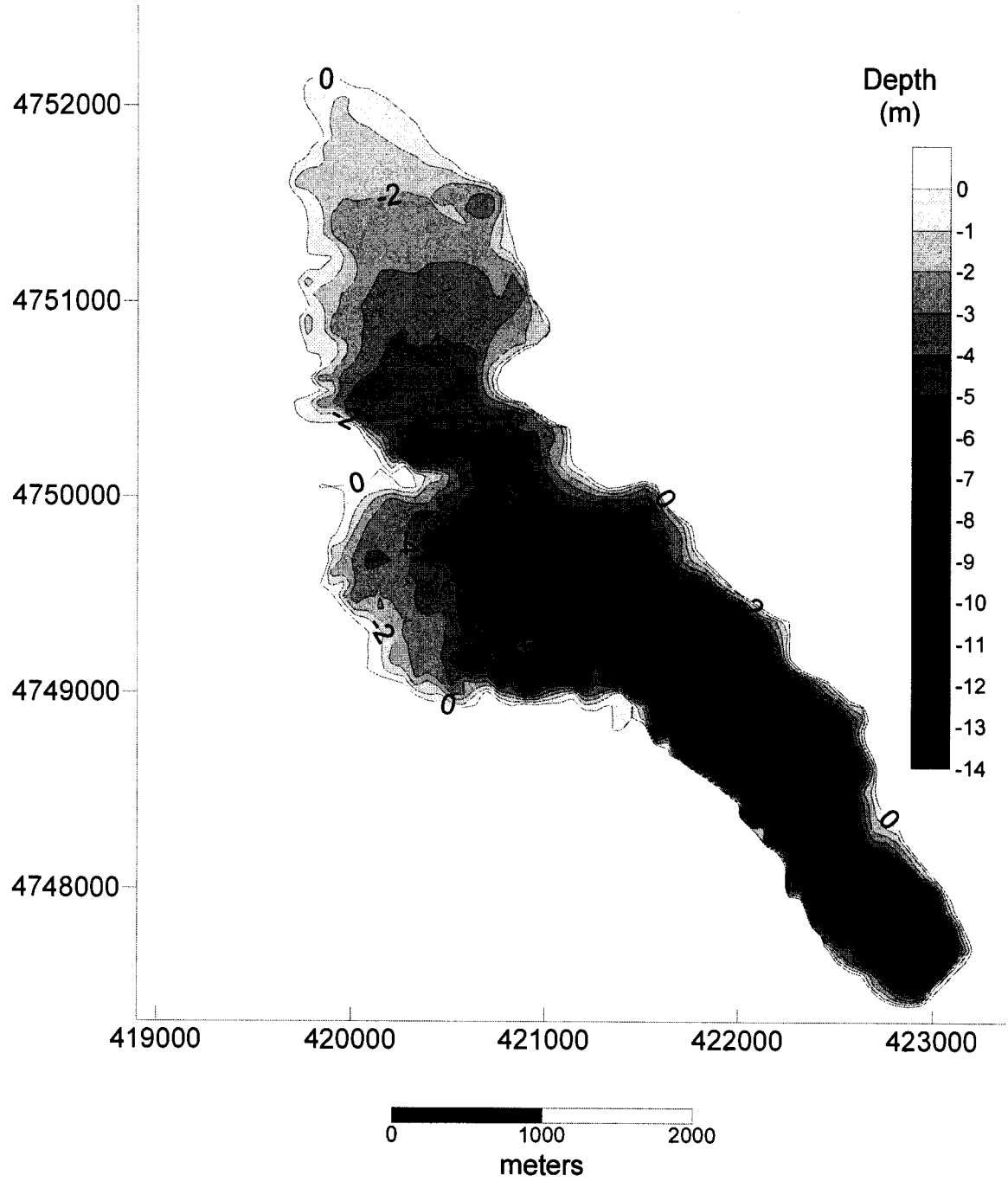


Figure 4. Bathymetric map of Chesterfield Reservoir. The Y and X axes are UTM coodinates (WGS 83).

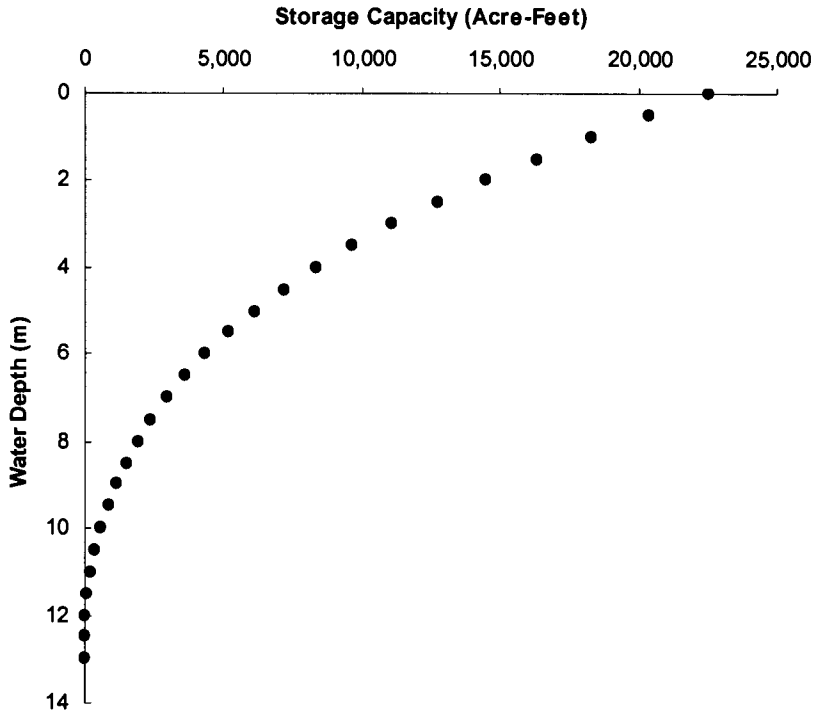


Figure 5. Depth-volume plot for Chesterfield Reservoir. The zero Y-axis point represents the water surface at full pool elevation and storage capacity.

Table 3. Table of water storage values at different depths of Chesterfield Reservoir.

Depth (m)	m^3	Acre-Feet	% Full
full pool 0	27,790,238	22,530	100%
0.5	25,116,810	20,363	90%
1	22,565,324	18,294	81%
1.5	20,138,173	16,326	72%
2	17,844,714	14,467	64%
2.5	15,702,180	12,730	57%
3	13,726,634	11,128	49%
3.5	11,930,746	9,672	43%
4	10,315,971	8,363	37%
4.5	8,853,916	7,178	32%
5	7,546,290	6,118	27%
5.5	6,389,402	5,180	23%
6	5,356,213	4,342	19%
6.5	4,447,883	3,606	16%
7	3,655,205	2,963	13%
7.5	2,962,798	2,402	11%
8	2,372,255	1,923	9%
8.5	1,855,767	1,504	7%
9	1,407,878	1,141	5%
9.5	1,022,737	829	4%
10	707,784	574	3%
10.5	451,607	366	2%
11	249,441	202	1%
11.5	112,994	92	0%
12	40,679	33	0%
12.5	11,186	9	0%
13	213	0	0%

Warmwater Fishery Evaluations

INTRODUCTION

In the early 1990s a comprehensive research study was initiated to better understand the biology of largemouth bass (LMB) in Idaho (Dillon 1991). A conclusion of that work indicated that water temperature was a key factor controlling LMB productivity. Several other studies described growth potential of LMB across their natural range (McCauley and Kilgour 1990; Beamesderfer and North 1995). Those studies coupled with Dillon (1991) identify the maximum growth potential for LMB in the predominately cold water lakes and reservoirs in Idaho. However, many other factors can contribute to the population structure and success of a LMB fishery. Most importantly are harvest, lake productivity, and interaction among fish species (i.e., competition and predation). Monitoring of those variables is necessary to maintain or improve LMB fisheries in southeast Idaho.

Since 1990, several changes have been implemented in southeast Idaho's largemouth bass fisheries. Some of those changes include: 1) restricting harvest, 2) introducing tiger muskellunge *Esox lucius x E. masquinongy*, yellow perch *Perca flavescens*, and crappie *Pomoxis sp.*, and 3) increases in the number of competitive angling tournaments. To evaluate the impact of those changes, the Department monitors the LMB populations at approximately 3 year intervals.

Electrofishing surveys were completed on 8 southeast Idaho reservoirs. All of the reservoirs are small (< 200 ha), shallow, and productive. Table 4 shows reservoir name, elevation, surface area, species composition, and current LMB harvest regulations.

METHODS

LMB and potential prey species abundance were evaluated using shoreline electrofishing. Target species for electrofishing included LMB, bluegill *Lepomis macrochirus*, crappie, and yellow perch. Sampling goals were to collect enough LMB to estimate proportional stock densities (PSD).

Catch per unit effort (CPUE) was used to compare the relative abundance of LMB among the different reservoirs. The CPUE data were collected using night-time shoreline electrofishing with boat-mounted equipment. All electrofishing was completed between 2100 and 0400 hours. Netting effort varied depending on catch rates. The first priority was to obtain a random sample of all species. A second goal was to obtain a sample of 10 LMB from all distinguishable cohorts. In some waters, Bluegill (BG) or yellow perch densities were too high to continually net those species and achieve the sample goal for LMB. In such cases, selective netting for LMB was implemented. Size selective netting periods for LMB were not included in CPUE or PSD analysis. Fish were weighed to the nearest 10 g and measured for total length (mm).

Table 4. Species composition and harvest regulations for reservoirs included in the 2006 warmwater fishery evaluations.

Water	Elevation (m)	Surface Area (ha)	Species Composition	Harvest Regulations
Johnson	1,485	20	LMB,BG,YP,RBT	6 none under 12"
Lamont	1,485	37	LMB,BG,YP,TM,RBT	6 none under 12"
Glendale	1,509	93	LMB,BG,CR,YP,RBT	2 none under 16"
Twin Lakes	1,452	180	LMB,BG,YP,RBT	6 any size
Condie	1,500	47	LMB,BG,YP,TM	2 none under 20"
Devils	1,570	142	LMB, KOK,RBT	6 none under 12"
Winder	1,492	38	LMB,BG,YP,RBT	6 none under 12"
Foster	1,480	145	LMB,BG,CR,RBT	6 none under 12"

BG = bluegill, YP = yellow perch, TM = tiger muskellunge, KOK = kokanee, CR = crappie, RBT = rainbow trout.

RESULTS AND DISCUSSION

Catch rates of warmwater species varied markedly among reservoirs. Bluegill were most abundant in Johnson Reservoir followed by Twin Lakes and Condie reservoirs. Largemouth bass were most abundant in Condie Reservoir followed by Foster and Lamont reservoirs. Crappie were only observed in Glendale and Foster reservoirs (Table 5).

Proportional stock densities for LMB were greatest in Winder and Glendale reservoirs. PSDs were lowest in reservoirs that were recently drained (Foster and Johnson reservoirs) or had newly stocked LMB populations (Devils Creek Reservoir). PSD trends for most of the southeast reservoir fisheries are highly variable (Table 6). Protective harvest regulations may moderate the fluctuations in PSDs, but do not appear to guarantee quality fishing. For example, Condie Reservoir is managed using the trophy bass rule of no harvest of LMB under 508 mm. Despite the conservative harvest rule, the PSD in 2002 was only 14. Glendale Reservoir is the only fishery that maintains PSD values above 50 (Table 6). Glendale Reservoir has a two-bass none under 406 mm minimum size rule, which may contribute to the PSD results.

Table 5. Catch per hour of electrofishing effort in eight southeast Idaho reservoirs. Proportional stock density values for largemouth bass are shown in parenthesis.

Reservoir	BG	CR	LMB	YP	Grand Total
Condie	30.0	0.0	70.5 (20)	21.6	122.1
Devils	0.0	0.0	18.8 (7)	0.0	18.8
Foster	13.4	6.2	46.6 (7)	4.1	70.3
Glendale	7.4	17.0	18.5 (56)	6.7	49.6
Johnson	108.0	0.0	9.0 (0)	1.5	118.5
Lamont	28.8	0.0	48.0 (11)	1.2	78.0
Twin Lakes	54.5	0.0	23.7 (48)	2.4	80.5
Winder	12.1	0.0	23.7 (80)	9.2	45.0

BG = bluegill, YP = yellow perch, TM = tiger muskellunge, KOK = kokanee, CR = crappie, RBT = rainbow trout.

Table 6. Trends in proportional stock density for select largemouth bass populations in southeast Idaho.

Year	Condie	Glendale	Lamont	Twin Lakes	Winder
1986			13		
1987					
1988	30	9		25	10
1989					
1990					
1991					
1992			3		
1993	21	6	1		25
1994	58				
1995	76	86	1		
1996					
1997	73	94			
1998					
1999	43	83		0	
2000					
2001					
2002	97	56	8	0	0
2003	14				
2004					
2005					
2006	20	56	13	48	78

RIVERS AND STREAMS INVESTIGATIONS

ABSTRACT

A long-term monitoring program for Bonneville cutthroat trout *Oncorhynchus clarkii utah* (BCT) was initiated in 2006. The streams chosen for the monitoring program were selected so that all of the management units identified in the state management plan were represented. The Thomas Fork tributary monitoring program has been included in the comprehensive monitoring program. BCT abundance in the Thomas Fork tributaries were similar to 2004 with the exception that BCT returned to Dry Creek.

The adfluvial stock of Yellowstone cutthroat trout *O.c. bouvieri* (YCT) in the Blackfoot River continues to suffer from drought and predation by American white pelicans. The total run in 2006 was less than 20 fish. No bird lines were set to reduce pelican predation at the mouth of the river because the water levels in the reservoir were rising during the cutthroat trout migration. Hazing combined with limited shooting of 13 adult pelicans was investigated as a technique to reduce predation loss. The lethal methods did not reduce the concentration of birds feeding at the mouth of the reservoir. Converse to the adfluvial escapement trend, the resident YCT population upriver appears to be relatively strong. Densities in 2006 were 400 YCT/km, which is down slightly from the 2005 estimate of 455 YCT/km.

Population Monitoring Program for Bonneville Cutthroat Trout

INTRODUCTION AND METHODS

Bonneville cutthroat trout are one of three native cutthroat trout sub species in Idaho. BCT occur in the Bear River Drainage. In the early 1980s, distribution and abundance data for this native trout were lacking. To better understand population trends and the potential impacts of land use practices on the sub-species, a long-term monitoring program was initiated for three tributary streams of the Thomas Fork Bear River (Preuss Creek, Giraffe Creek, and Dry Creek). In addition to those streams, a broader monitoring program is being developed that includes populations from across BCT range in Idaho. The additional monitoring sites include Eightmile, Bailey, Georgetown, Beaver, Whiskey, Montpelier, Maple, and Cottonwood, Snow slide, First, Second, and Third creeks, and the Cub River.

Department personnel have monitored age-1 and older cutthroat trout densities in the Thomas Fork tributaries since 1981. Annual monitoring was completed during the mid 1980s, but was reduced to alternate year sampling in 1991. In general, cutthroat trout densities were estimated using multiple pass removal techniques sampled with backpack electrofishing equipment. In these streams, fish catch from the first pass explained 96% of the variation in total fish densities (Teuscher and Scully 2003). Therefore, to optimize use of personnel time, sampling effort was reduced to single pass runs. Sample sites were approximately 100 m long. Measurements of length, width, and depth were made for each site. Because population data from the other 10 tributaries are limited, density estimates were made using multiple pass depletion methods. Figure 6 shows the 2006 sample locations.

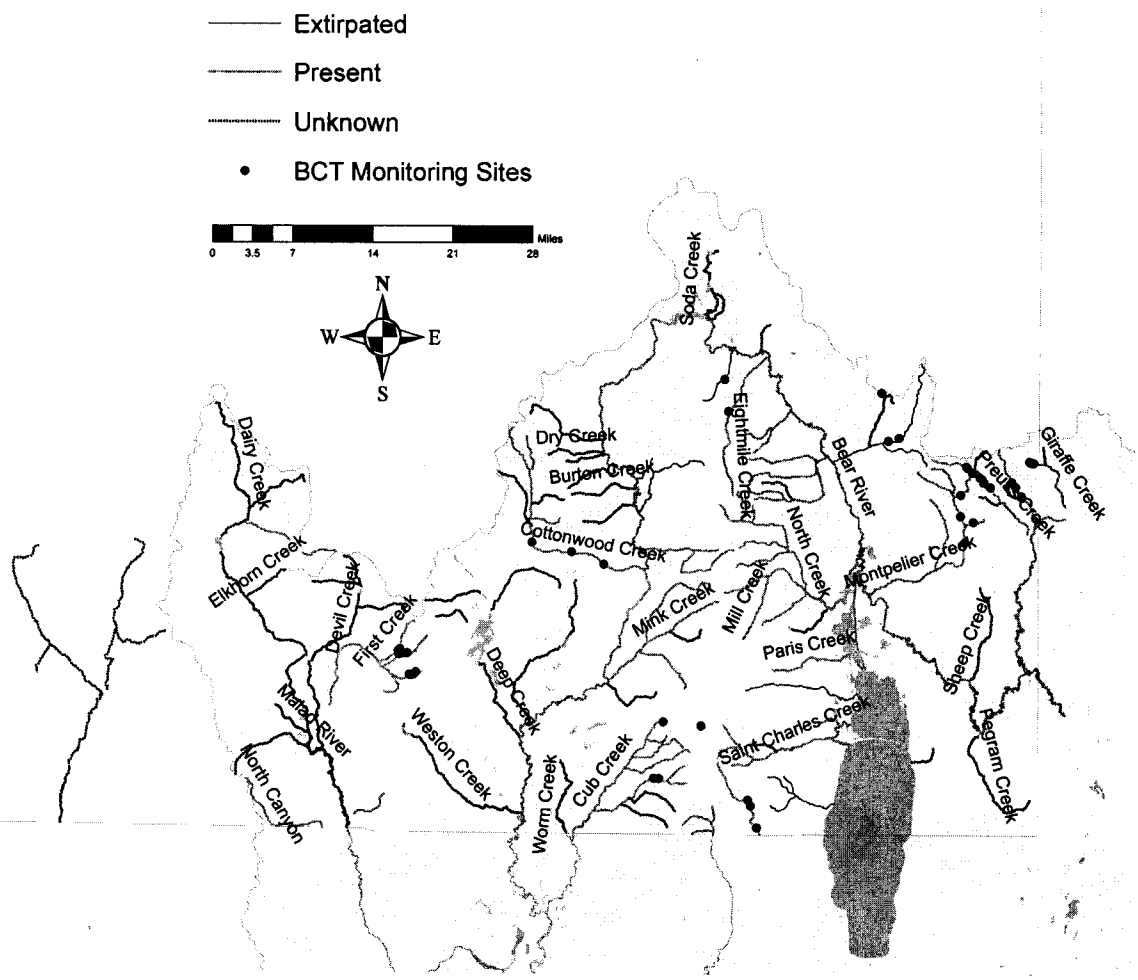


Figure 6. Sampling locations for the Bonneville cutthroat trout monitoring program.

RESULTS AND DISCUSSION

BCT densities were less than 10 fish/100 m^2 for all three tributaries. In Dry Creek, the mean density was 3 BCT/100 m^2, which is an increase from the previous two sample periods (Figure 6). This modest recovery is likely as a result of high spring runoff that occurred in 2005. In Preuss and Giraffe Creeks, the 2006 density estimates were similar to 2004 but well below peaks observed in the mid 1990s and mid 1980s (Table 7).

Population trends in the Thomas Fork tributaries appear to follow variations in water cycles. Rainfall totals were above average in the mid 1980s and 1990s and fish densities peaked during those periods. Given the sensitive status of BCT and recent petitions to list the species under the Endangered Species Act, it is very important to included variation that appears to be associated with changes in annual precipitation. For example, population status reviews completed in 1986 or 2000 would yield very different conclusions than if a status review was based on densities observed in 1991 (Figure 7).

Fish abundance estimates for streams included in the BCT monitoring program are reported in Table 8. The information is intended for use in a population monitoring program for BCT. This is the first year of the monitoring program. The monitoring program was initiated as prescribed in the BCT management plan (Teuscher and Capurso 2007).

Table 7. Bonneville cutthroat trout densities (numbers/100 m^2) in Preuss, Giraffe, and Dry creeks from 1981 through 2006. Only fish greater than 75 mm are shown. The 2004 and 2006 densities were estimated based on catch from a single pass.

Year	min	max	mean	SE
Preuss Creek				
1981	6.2	16.3	11.3	5.1
1985	20.5	31.6	26.1	5.5
1986	15.0	17.5	16.3	1.3
1987	9.7	21.0	15.2	3.3
1988	22.0	22.0	22.0	
1989	1.0	2.6	1.9	0.5
1990	3.1	3.5	3.3	0.2
1991	0.3	3.6	2.3	0.8
1993	0.3	6.3	3.4	1.5
1995	1.7	5.9	3.2	0.9
1997	4.9	14.0	8.8	2.2
1998	3.2	3.2	3.2	
2000	5.6	10.7	7.9	1.5
2002	1.6	4.6	3.1	0.6
2004	0.9	21.4	9.1	3.3
2006	0.0	14.1	6.0	2.4
Giraffe Creek				
1981	0.2	4.2	2.2	2.0
1986	19.1	21.4	20.3	1.2
1987	32.7	41.5	37.1	4.4
1989	19.0	33.9	26.5	7.5
1990	5.5	14.1	9.8	4.3
1993	0.0	0.5	0.3	0.3
1995	0.0	5.0	3.4	1.2
1998	5.9	17.3	11.0	2.4
2000	3.1	38.6	16.9	8.2
2002	0.0	3.7	1.8	1.0
2004	2.4	5.4	4.0	0.8
2006	0.0	11.3	4.2	2.7
Dry Creek				
1987	14.4	14.4	14.4	
1990	4.3	4.3	4.3	
1993	0.0	0.0	0.0	
1998	11.2	24.8	16.8	4.1
2000	22.6	27.2	24.9	2.3

Preuss Creek				
Year	min	max	mean	SE
2002	0.3	0.9	0.6	0.3
2004	0.0	0.0	0.0	
2006	0.0	5.2	3.1	1.2

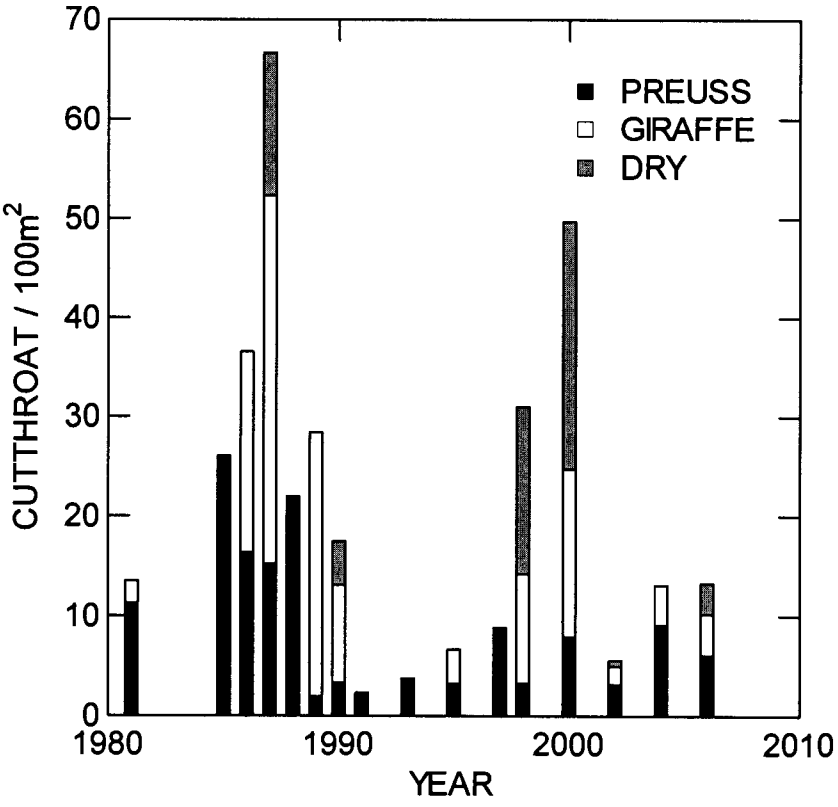


Figure 7. Bonneville cutthroat trout population trends in the Thomas Fork tributaries.

Table 8. Trout density estimates (fish/100 m) for 13 creeks selected for long-term Bonneville cutthroat trout monitoring program. Only fish over 75 mm total length are included in the abundance estimates.

Water	Date	UTM Coordinates (WGS 83) E	N	BCT	Density (fish/100m) Brook	Brown	RBT
Eightmile Cr	8/22/2006	452586	4709013	1	26		
Bailey Cr	8/22/2006	452073	4713444		39		
Beaver Cr	8/24/2006	456673	4650693	36	13		
Beaver Cr	8/24/2006	455800	4653789	2	7		
Beaver Cr	8/24/2006	455406	4654625	22	32		
Cottonwood Cr	7/20/2006	435085	4687405	39			
Cottonwood Cr	7/20/2006	430529	4689173	8			
Cottonwood Cr	7/20/2006	424942	4690515	6			
Cub River	8/17/2006	443508	4665374	46			
Cub River	8/17/2006	448837	4664810		7		
Montpelier Cr	8/1/2006	485856	4690688	1		2	6
Montpelier Cr	8/1/2006	485237	4694406	7	25		
Maple Cr	8/18/2006	442902	4657587	19			
Maple Cr	8/18/2006	442172	4657624	44			
Snow slide Cr	8/1/2006	487040	4693580	5	3		
Whiskey Cr	8/1/2006	485263	4697376		22		
Georgetown Cr	8/23/2006	474176	4711643		17		
Georgetown Cr	8/23/2006	476614	4705326		14		12
Georgetown Cr	8/23/2006	475098	4704903		7		8
First Cr	9/7/2006	406079	4675314	5			
First Cr	9/7/2006	406354	4675522	9	1		
First Cr	9/7/2006	406450	4675879	3	6		
Second Cr	9/6/2006	406172	4674818				
Second Cr	9/6/2006	406959	4674979	5			
Second Cr	9/6/2006	407366	4674961				
Second Cr	9/6/2006	406539	4674973				
Third Cr	9/7/2006	407810	4671898				
Third Cr	9/7/2006	408137	4671960	2			

Yellowstone Cutthroat Trout Monitoring in the Blackfoot River System

INTRODUCTION AND METHODS

There are two monitoring programs in place for YCT in the upper Blackfoot River. They are adult spawning counts and population estimates within the Blackfoot River Wildlife Management Area located about 51 km above the reservoir. The spawning counts have been completed every year since 2001. The population surveys are completed less frequently.

An electric fish migration barrier was installed in the Blackfoot River in 2003. The barrier includes a trap box designed using Smith Root Inc. specification. The barrier components include four flush mounted electrodes embedded in Insulcrete, four BP-X.X.-POW pulsators,

and a computer control and monitoring system. The computer system can be operated remotely, records electrode outputs, and has an alarm system that triggers during power outages. Detailed descriptions of these components and their function can be obtained at www.smith-root.com.

The electric barrier was operated from 28 April to 25 May 2006. Prior to observing fish at the trap, field crews checked the live box several times a week. Once fish began entering the trap, it was checked at least once a day. Fish species and lengths were recorded. Cutthroat trout were visually checked for bird scars. Bird scar monitoring began in 2004. Scar rates were associated with increases in pelicans feeding in the Blackfoot River downriver of the trap.

In 1994, the Department, with assistance from the Conservation Fund, purchased the 700-ha ranch and began managing the property as the Blackfoot Wildlife Management Area (WMA). The WMA straddles the upper Blackfoot River, with an upper boundary at the confluence of Lanes, Diamond, and Spring creeks and a lower boundary at the head of a canyon commonly known as the upper narrows. Approximately, 9 km of river meander through the property along with 1.6 km of Angus Creek, which is a historical YCT spawning and rearing stream. Since purchasing the WMA lands, the Department has completed periodic population estimates to monitor native YCT abundance.

In 2006, we estimated YCT abundance within 8.7 km of the WMA reach of the Blackfoot River. The estimate was completed using mark-recapture methods. Fish were sampled with drift boat-mounted electrofishing gear. Fish were marked on 10 July and recaptured 17 July, 2006. Data were analyzed using Fish Analysis + (Montana Fish Wildlife and Parks 2004). All trout caught were measured for total length (mm) and weighed to the nearest gram.

RESULTS AND DISCUSSION

In 2006, a total of 19 adult YCT were collected at the migration trap. The escapement count was similar to the record low of 16 YCT reported in 2005. About 37% of the YCT observed in the trap were scarred by birds. Scarring rates have varied from no visible scars in fish collected in 2002 to a high of 70% scarred in 2004. Scarring rates may be related to the predation rate by pelicans, but no information is available to determine the relationship. Variation in scarring rates is likely impacted by the overall number of pelicans feeding on the river below the migration trap, water levels, and hazing efforts exerted on the birds to reduce predation impacts. The hazing efforts were described by Teuscher and Scully (in press). Escapement and bird scar trends are shown in Table 9.

Table 9. Yellowstone cutthroat trout escapement estimates for the Blackfoot River.

Year	Weir Type	Count	Mean Length	% Bird Scars
2001	Floating	4,747	486	No data
2002	Floating	902	494	0
2003	Electric	427	495	No data
2004	Electric	125	478	70
2005	Electric	16	Na	6
2006	Electric	19	Na	38

Unlike the adfluvial population, the estimate of YCT abundance in the WMA reach of the Blackfoot River remains high. A total of 732 cutthroat trout were sampled during the mark and recapture electrofishing surveys. The total trout population estimate for the WMA was 3,500 ± 700 (400/km). The estimate from 2005 was 455 ± 110 YCT/km. Mean length of YCT was 280 mm (Figure 8). About 9% of the cutthroat trout captured during the survey exceeded 400 mm total length. Based on size at age estimate reported by Thurow (1981), the two dominate cutthroat trout cohorts in the WMA sample were age-2 and age-3 fish that range between 175 and 300 mm total length. Abundance estimates by size class are reported in Table 10.

Table 10. Yellowstone cutthroat trout abundance estimates by size class in the Blackfoot River 2006.

Size Class (mm)	Fish Marked	Fish Captured	Fish Recaped	Pop Est	Pop Est SD	Total Biomass (kg)	Relative Wt Avg
75 - 149	4	4	0	159	25.5	8.9	226.0
150 - 224	81	114	5	1,501	279.3	143.3	110.1
225 - 299	134	182	20	1,285	204.0	228.8	91.9
300 - 374	83	106	19	462	58.5	177.7	87.2
375 - 449	29	35	10	105	18.9	72.5	85.6
450 - 599	8	9	3	21	6.1	25.9	84.7
Totals:	339	450	57	3,534	352.3	657.1	95.9

In past surveys of the WMA reach, juveniles (< 300 mm) dominated catch. Thurow (1981) reported that about 80% of the fish caught during population surveys were less than 300 mm total length. Results from 1995, 2005, and 2006 surveys show similar ratios of juvenile cohorts (Figure 7). The frequency distribution from 2002 varied from the other years in that large fish dominated the catch. The paucity of small fish may have been related to drought conditions for several years preceding the 2002 survey.

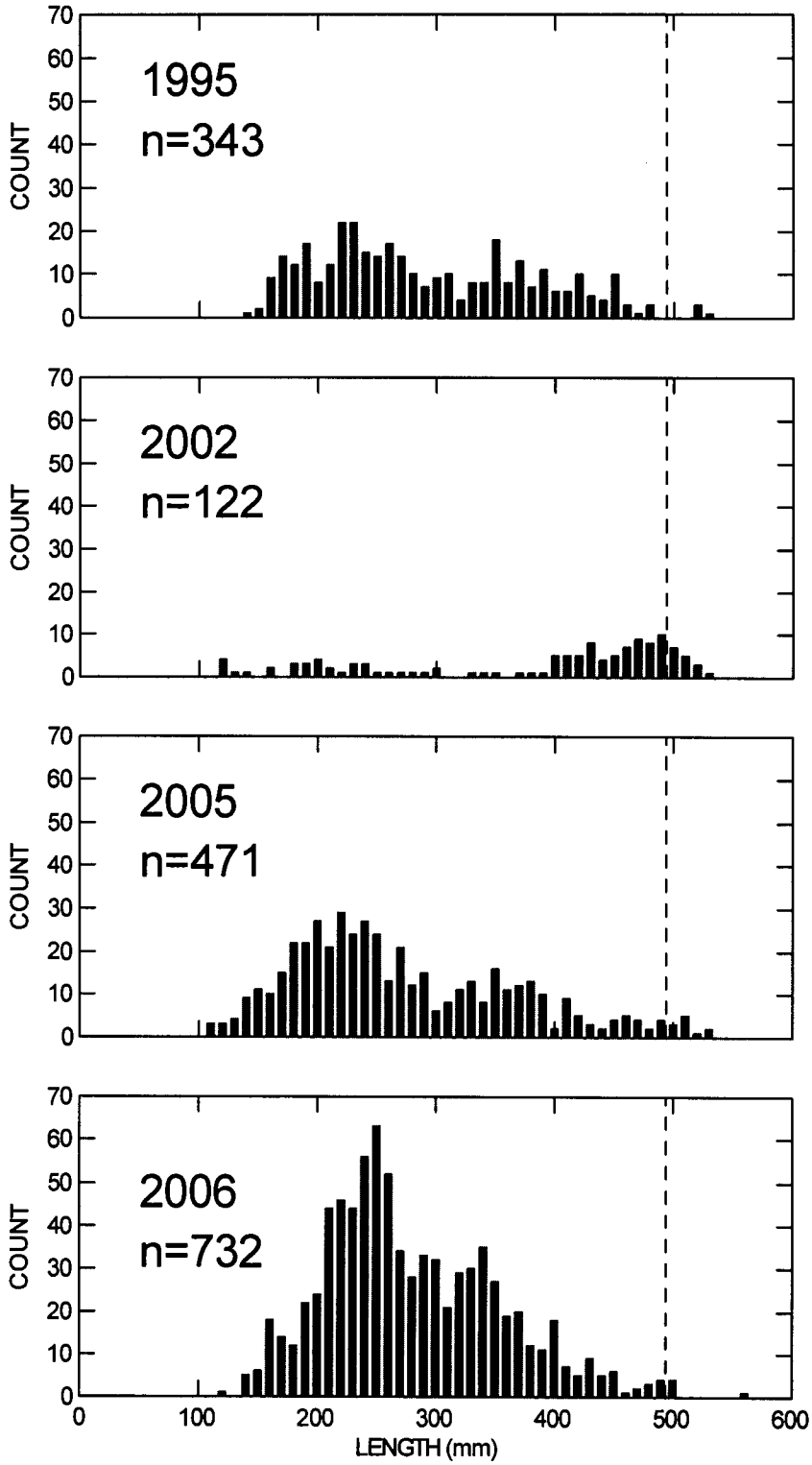


Figure 8. Length frequency distributions for Yellowstone cutthroat trout caught on the Blackfoot River Wildlife Management Area.

MANAGEMENT RECOMMENDATIONS

1. Pursue a minimum conservation pool for Chesterfield Reservoir. The fishery provides some of the best trout fishing in southeast Idaho when water is maintained through the summer.

2. Continue monitoring stream populations as prescribed in the Idaho Bonneville cutthroat trout management plan.

3. Pursue management goals for American white pelicans and Yellowstone cutthroat trout that balance conservation and recreation needs for both.

LITERATURE CITED

Miranda. L. E. 1999. A typology of fisheries in large reservoirs of the United States. North American Journal of Fisheries Management 19:536-550.

Beamesderfer, R. C. P. and J. A. North. 1995. Growth, natural mortality, and predicted response to fishing for largemouth bass and smallmouth bass populations in North America. North American Journal of Fisheries Management 15:688-704.

Dillon. J. C. 1991. Lake and Reservoir Investigations. Largemouth Bass Forage Investigations. Idaho Department of Fish and Game, Job Performance Report. Project F-73-R-13, Boise.

McCauley, R. W. and D. M. Kilgour. 1990. Effect of air temperature on growth of largemouth bass in North America. Transactions of the American Fisheries Society 119:276-281.

Teuscher, D. and J. Capurso. 2007. Management plan for conservation of Bonneville cutthroat trout in Idaho. Idaho Department of Fish and Game and USDA Forest Service. IDFG 07-48, Boise.

Teuscher, D. and R. Scully. 2003. Regional Fishery Management Investigations. Idaho Department of Fish and Game, 2002 Job Performance Report, Project F-71-R-27, Boise.

Teuscher, D. and R. Scully. In press. Regional Fishery Management Investigations. Idaho Department of Fish and Game, 2005 Job Performance Report, Project F-71-R-30, Boise.

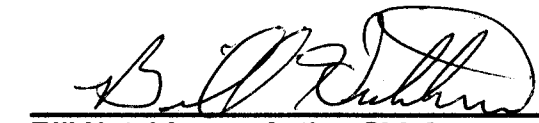
Thurow, R. 1981. Blackfoot River and fisheries investigations. Idaho Department of Fish and Game, Job Completion Report. F-73-R-3, Boise.

SUBMITTED BY:

David Teuscher
Regional Fishery Biologist

Richard Scully
Regional Fishery Manager

APPROVED BY:



Bill Hutchinson, Acting Chief
Fisheries Bureau

William D. Horton
State Fishery Manager