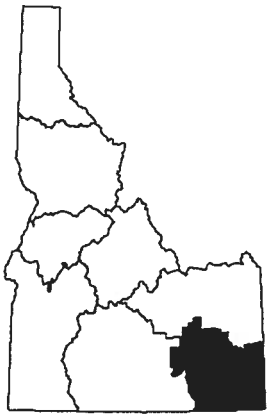
FISHERY MANAGEMENT INVESTIGATIONS

IDAHO DEPARTMENT OF FISH AND GAME
FISHERY MANAGEMENT ANNUAL REPORT

Cal Groen, Director

SOUTHEAST REGION
2009



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2009 Southeast Region Annual Fishery Management Report

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EXECUTIVE SUMMARY

A hatchery channel catfish (CC) *Ictalurus punctatus* evaluation was initiated on Alexander Reservoir in 2009. The goals of this evaluation were twofold. The first was to determine if channel catfish stocked into Alexander Reservoir are reproducing naturally. The second was to determine if the current rate of natural reproduction could sustain the fishery given the current angler exploitation rate. Preliminary results suggest no natural reproduction is occurring in Alexander Reservoir. Angler exploitation rate of channel catfish will not be known until sufficient tags have been recovered. Our final results and management recommendations will be reported in 2010 or 2011.

Coldwater fishery evaluations were completed on two SE Idaho reservoirs. Both of the reservoirs (Treasureton and Daniels) are currently managed under trophy trout regulations: 2 trout, none under 20" (508 mm), no bait and barbless hooks only. The primary goal of the surveys was to collect baseline data for biennial evaluation of the trophy trout regulation. A second goal was to evaluate the extent of the fish kill that occurred in Treasureton Reservoir during the winter of 2007-2008. Treasureton Reservoir has fully recovered. The results of the surveys indicate that Daniels Reservoir is currently performing below expectations. Low reservoir water levels going into the winter of 2007 is likely the mechanism suppressing the population of rainbow trout (RBT) *Oncorhynchus mykiss* in Daniels Reservoir.

Blackfoot Reservoir was extensively sampled in 2009. Eight gill nets and 29 trap nets were used to evaluate the fishery. The purpose of this investigation was to determine if smallmouth bass *Micropterus dolomieu* had invaded the reservoir, assess the status of the yellow perch *Perca flavescens* population, evaluate the diet of rainbow trout collected from the reservoir, and determine if predation by American White Pelicans (AWP) *Pelecanus erythrorhynchos* has impacted the Blackfoot Reservoir fishery. No smallmouth bass were sampled from the reservoir and the yellow perch population remains unchanged from previous sampling events. Aquatic insects comprised the bulk of the diet (61%) of rainbow trout sampled from the reservoir while fish comprised only 2%. The relative composition of the reservoir fishery remains similar to what has been observed over the past 4 decades suggesting that AWPs have had little if any impact on the fishery.

Traditional creel surveys are expensive and time consuming. In an attempt to gather creel survey information at a reduced overall cost we implemented and evaluated a "remote creel" methodology at Chesterfield Reservoir during 2009. Angler use was documented using digital photographs taken at the two primary parking areas. Vehicles observed in the photographs were counted and converted to total angling groups by dividing the total hourly count by the average length of time vehicles remained in the parking lot. The vehicle stay time was used as a surrogate for estimating angler fishing time. Angler fishing time (effort in hours) was also a question on voluntary report cards supplied at several locations around the reservoir. Angler catch and harvest rates were also obtained from the report cards. Total anglers and total effort (hours) were estimated by expanding the estimates of total vehicle visits by average group size and length of visit. A traditional creel survey conducted on Chesterfield Reservoir in 2006 cost about $31,076. The remote creel survey cost $6,080 – a considerable savings. The next step will be to conduct a remote creel and traditional creel survey side by side to validate the remote creel survey methodology. These results should be available in 2010.

We used Synpren liquid rotenone at a concentration of 2 ppm to renovate two southeast Idaho streams in 2009. Pruess Creek, a tributary of the Thomas Fork, was treated on 10-November to remove nonnative RBT and their hybrids. Fish Haven Creek (FHC), a tributary to Bear Lake, was chemically renovated to remove eastern brook trout (EBT) *Salvelinus fontinalis* and RBT and their hybrids. We were unable to assess the Preuss Creek project in 2009 due to extensive ice cover at the time of treatment but we will complete the evaluation and report our results in 2010. The FHC project appeared to be successful. After electrofishing approximately 13% of the total stream length available to fish, we were unable to detect any salmonids.

In 2009, Idaho Fish and Game personnel sampled various streams in the Bear River drainage as part of the Bonneville cutthroat trout *O. clarkii utah* (BCT) monitoring and broodstock programs. We sampled 3 of 16 BCT monitoring streams to measure population densities (BCT/100m^2) and percent composition of BCT in relationship to all salmonids present. Streams sampled consisted of Beaver Creek, Cub River and Maple Creek, although limited numbers of fish were marked in the Cub River mark-recapture efforts to facilitate calculations of BCT densities. Mean BCT densities in Beaver Creek were 1 BCT/100m^2 and BCT composed 29% of salmonids sampled, both decreasing from 2006 estimates. In Maple Creek, mean BCT densities were 15 BCT/100m^2 with BCT comprising 98% of salmonids sampled. Mean BCT population densities increased in 2009 but percent composition decreased when compared to 2006 estimates. In addition, we began sampling efforts to identify streams that contain BCT populations or streams that would benefit from supplementation through the BCT broodstock program. Currently, this program will focus on streams within the Thatcher management area of the Bear River drainage. We sampled 20 streams consisting of 33 sites to identify presence or absence of BCT and other fish species. There were 11 streams out of the 20 sampled that BCT currently occupy. The remaining streams appeared to be suitable for BCT supplementation after verification that water is present year round.

The adfluvial stock of Yellowstone cutthroat trout *O. clarkii bouvieri* (YCT) in the Blackfoot River continues to suffer from drought and predation by AWPs. The total run in 2009 was 865 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 50 adult pelicans was employed to reduce predation loss. Our hazing efforts appeared to be mildly effective although we were unable to draw any solid conclusions. Estimated density of YCT in the upper Blackfoot River (2009) was 295/km, which was well below the 2006 estimate of 400 YCT/km but slightly higher than the 287/km observed in 2008.

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LOWLAND LAKE AND RESERVOIR INVESTIGATIONS

Warmwater Fishery Investigations

Introduction and Methods

Alexander Reservoir, an impoundment of the Bear River near Soda Springs, covers 408 ha (1,007 acres) and has a volume of 7,104,960 m^3 (5,760 acre-feet) at the full pool elevation of 1,743 m. Reservoir discharge is managed by Utah Power and Light Company (PacifiCorp) for hydroelectric power generation. The lower 1.2 km of this 7.2 km reservoir is narrow, being approximately 200 m wide. From above this reach, the reservoir is generally 600 to 900 m wide (Figure 1). The upper two-thirds of the reservoir is shallow with a mud/sand substrate. A steep mountain rises from the south side of the reservoir between the dam and Second Bridge. The remaining area surrounding the reservoir is mostly gentle slopes managed for agriculture and recreation. During much of the year, especially during the irrigation season (usually May through September), the reservoir is noticeably turbid.

A number of fish species are found in Alexander Reservoir. Since 2004, the Department has stocked on average 15,587 CC annually at a mean cost of about $5,455 / year. The majority of angler effort is focused on the catfish fishery. The results of a short term creel survey of catfish anglers in 2004 showed they caught an average 0.4 catfish / hr at a mean length of 283 mm. RBT, smallmouth bass, and yellow perch provide additional angling opportunity although the latter two species were illegally introduced.

Channel Catfish were sampled during the summer of 2009 using baited hoop nets. Each hoop net was comprised of 7, 0.6 m diameter hoops covered with 19 mm bar mesh nylon netting material. Bait bags were placed inside each net and filled with commercial dry dog food prior to deployment. Two nets were fished in tandem and termed a set. Each set was fished about 48 hours and retrieved. All fish captured were measured to the nearest mm (Total Length) and released. In addition, all CC captured were fitted with a floy tag bearing a unique identification number.

The goals of this evaluation were twofold. The first was to determine if channel catfish stocked into Alexander Reservoir are reproducing naturally. The second was to determine if the current rate of natural reproduction could sustain the fishery given the current angler exploitation rate.

Results and Discussion

We had a total of 10 baited hoop net sets during the summer of 2009. These sets represented a total effort of about 480 net hours. A total of 100 CC were captured which resulted in a CPUE of 0.2 CC / net hour. Catch of CC ranged from a low of 1 to a high of 29

with a mean of 10 CC / set. Total lengths of CC captured ranged from a low of 210 mm to a high of 670 mm. The results of a length frequency histogram suggest that several year classes of CC are present in Alexander Reservoir but are likely the product of the Department's stocking program since no age-0 or age-1 fish were observed in the catch (Figure 2.).

This study is a two to three year evaluation. Final analysis will be completed in 2010 or 2011.

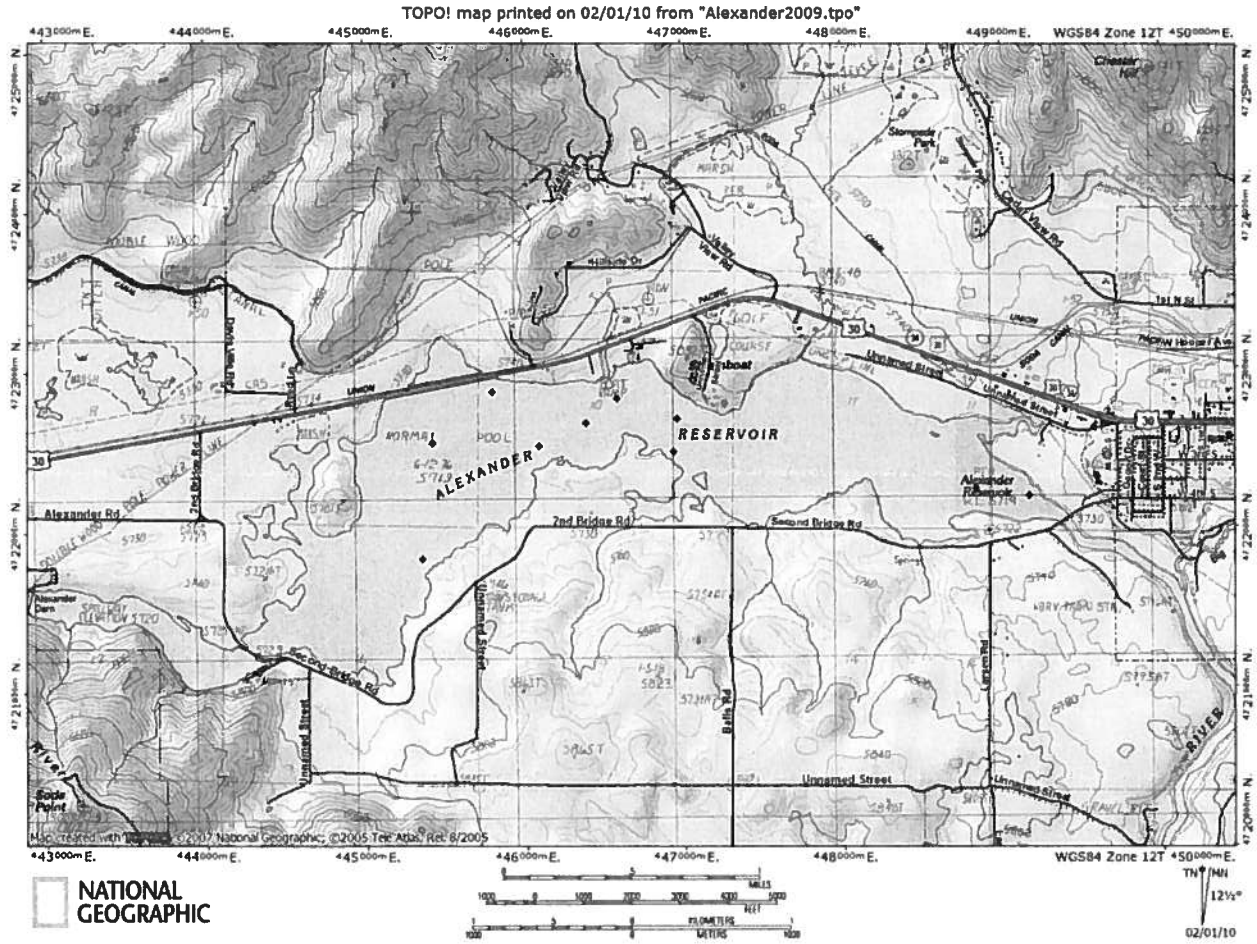

Figure 1. Map of Alexander Reservoir near Soda Springs, Idaho. Locations where channel catfish were sampled during the summer of 2009 are denoted by black diamonds.

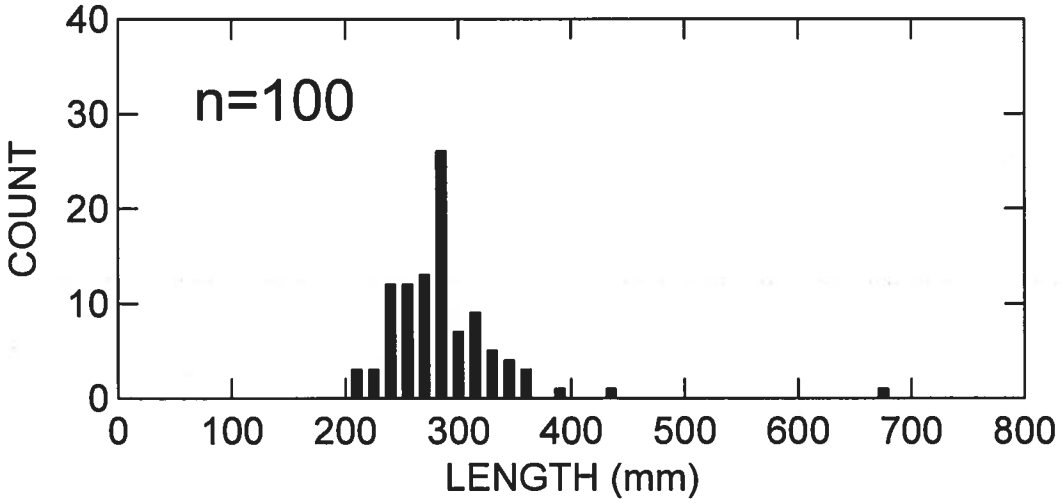

Figure 2. Length frequency of channel catfish collected from Alexander Reservoir during the summer of 2009.

Coldwater Fishery Investigations

Introduction and Methods

Daniels Reservoir is a 152 ha reservoir situated at an elevation of 1,573 m. Located in Oneida County, Daniels Reservoir is owned by the St John's Irrigation Company and was constructed 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 trophy trout regulation of two trout, none under 20" (508 mm), combined with a barbless hook no-bait restriction.

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, reservoir management changed to quality management with a two trout (none between 12" (305 mm) and 16 inches (406 mm)) limit. In 2008, management again changed to a two trout (none < 20" (508 mm)) harvest limit. Both Treasureton and Daniels reservoirs contain a monoculture of triploid RBT.

Electrofishing surveys were completed on both reservoirs in 2009. We used a boat mounted electrofishing unit to survey both bodies of water. Surveys were conducted from 2100 to 0400 hours at each location. Daniels Reservoir was sampled on July 1st and Treasureton Reservoir on July 6th. The goals of the surveys were to collect RBT from both bodies of water to assess the size structure of each population and to establish a baseline for biennial evaluation of the trophy trout regulation. One additional goal was to collect RBT from Treasureton Reservoir to determine if the fishery had recovered from a kill that occurred there during the winter of 2007-2008.

Results and Discussion

Rainbow trout size structure has been variable in both reservoirs over much of the past decade. In 2000, both reservoirs supported large populations of RBT over 400 mm in length regardless of which angling regulation was in play (Figure 3). It is likely that low reservoir levels going into the winter season drive the size structure growth rate of these populations more so than angling regulations. For example, Daniels has been under the same angling regulation for many years. During this time, the fishery has experienced both wet (late 1990s) and dry (mid 2000s) years. In wet years (1999 and 2000) the trophy component of the fishery has been maintained but in dry years (2005) catch of fish over 500 mm declines (Figure 3). Furthermore, when a wet year follows several dry years there appears to be a lag time of about one to two years before the fishery fully recovers. We experienced a wet year in 2009 but the benefits to the fishery will not likely be realized until the summer of 2010 or 2011.

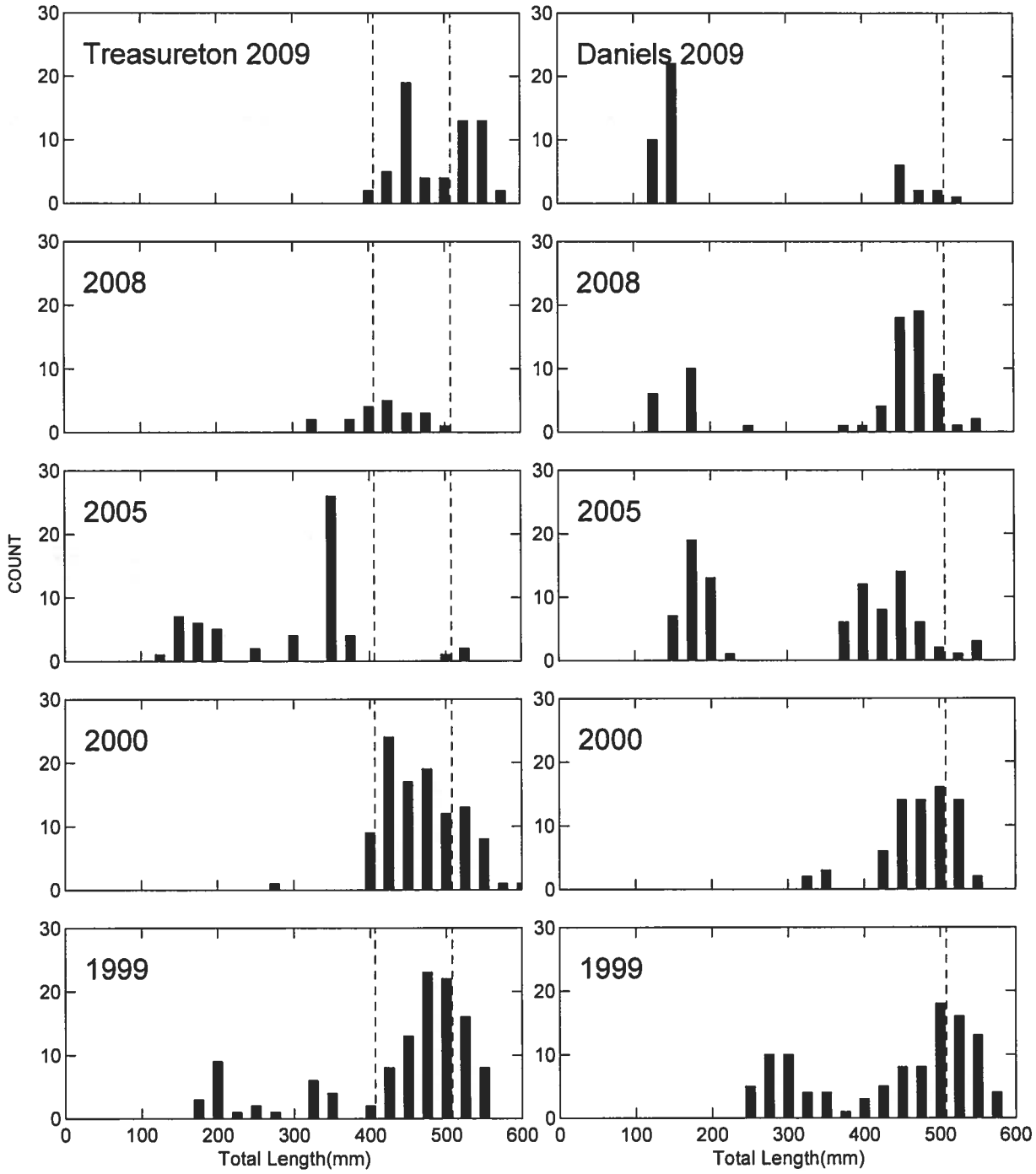

Figure 3. Length frequency distribution of rainbow trout collected from Treasureton and Daniels Reservoirs. Both reservoirs are managed under a trophy trout regulation (2 trout, none < 20", no bait, barbless hooks). The left dashed line in the Treasureton plots represents the 16" minimum length regulation that the reservoir was previously managed under and the right, the new trophy trout size limit of > 20". The vertical dashed line in the Daniels plots also represents the trophy trout minimum length limit of 20".

Treasureton Reservoir experienced a significant fish kill during the winter of 2007-2008. The result of the 2009 electrofishing survey indicates the fishery has recovered. Of the 62 RBT captured, 97% were over 400 mm and of these 45% were over 500 mm (Figure 3). The RBT measuring > 500 mm represents fish that survived the winter fish kill. Younger cohorts were not captured during the survey. The results from the Treasureton angler report cards corroborate our findings. The lack of juvenile cohorts in our sample and the fact that anglers did not catch any suggests that the stocking event that occurred in April 2009 failed. We plan to mitigate for this unexpected loss by stocking catchable RBT in May of 2010.

Blackfoot Reservoir

Introduction and Methods

Blackfoot Reservoir is located on the Blackfoot River in Caribou County north of Soda Springs, Idaho. Its primary uses are 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.

Historically, Blackfoot Reservoir was a premier fishery for large size (>500 mm) YCT. The fishery slowly deteriorated and eventually crashed in the early 1980s. In 1989, a comprehensive plan to reestablish a fishery for wild YCT 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 RBT and hatchery BCT originating from Bear Lake were stocked. Attempts were made for Bonneville cutthroat trout to establish their own wild spawning run into the Little Blackfoot River. Bonneville cutthroat trout stocking was discontinued in 1994. Rainbow trout stocking was increased as a replacement. We started by stocking catchables and fingerlings in the spring. However, after a few years of evaluation it was clear these fish were not recruiting to the fishery. In response to our findings, we switched to a fall release of triploid RBT catchables.

Currently, predation by the AWP is threatening a genetically unique population of YCT in the Blackfoot River system. The adult AWP population at Blackfoot Reservoir increased from a few hundred in 1993 to over 3,174 in 2009. This AWP population represents one of only two breeding colonies in Idaho. Conversely, the adult population of YCT declined from 4,747 in 2001 to about 865 in 2009. Both AWP and YCT are classified by IDFG as species of special concern. In addition to special concern status, recent genetic work showed that Blackfoot River YCT trout carry unique genetic markers not found in any other YCT population.

We have been collecting data over the past several years to help us understand the predator prey relationship between AWP and YCT in the Blackfoot River. However, little has been done to assess the effect of AWP on the general fishery (both game and non-game species) in Blackfoot Reservoir.

During the summer of 2009 we sampled Blackfoot Reservoir extensively with gill nets (floating and sinking) and trap nets. Gill nets measured 42 m x 2 m with six panels composed of

19, 25, 32, 38, 51, and 64 mm bar mesh. The combination of one floating and one sinking net, fished overnight equaled one unit of gill net effort. Trap nets had a frame size of 1 m x 2 m and a 15 m lead all comprised of 19 mm bar mesh netting that was coated with black net-set. The throat end of the net was constructed out of 5 hoops with crowfoot leads attached to the first and third hoops. One trap net fished over night equaled one unit of trap net effort. Over all, we applied 4 units of gillnet effort and 29 units of trap net effort (Figure 4).

All fish captured were identified, enumerated, measured to the nearest mm (Total Length; TL) and weighed to the nearest gram. Occasionally, catches were too large to measure and weigh every fish. In these cases, we sub-sampled a portion of the total catch. In addition, we visually examined stomach contents of 44 RBT captured to determine diet composition.

Four objectives were associated with this project. First, we wanted to determine if smallmouth bass were present in the reservoir. Second, we wanted to assess the status of the yellow perch population. Third, we wanted to assess the effects of predation by AWP on the reservoir fishery relative to species composition and relative abundance. Lastly, we wanted to determine if our hatchery RBT program was impacting YCT via direct predation.

Results and Discussion

Little has changed in the Blackfoot Reservoir fishery over the past 4 decades. Non-trout species continue to dominate the fishery and most years comprise over 95% of the catch (Table 1). We switched to fall stocking (after AWP have migrated) of RBT in 2004. This stocking effort did not show up in the 2005 sample however these fall plants are just now starting to recruit to the fishery (Table 1). The trout fishery in Blackfoot Reservoir has yet to recover to the levels experienced in the early 1960's. In 1963 and 1964 trout represented about 25% of the total catch. However in 2009, trout comprised only 9% of the catch (Table 1).

The RBT captured in 2009 (82) were of quality size. These fish had a mean length and weight of 412 mm and 722 g, respectively. Analysis of the length frequency histogram suggests that a couple of cohorts were present at the time we sampled but there was substantial overlap between the groups (Figure 5).

The diet of RBT sampled from Blackfoot Reservoir was dominated by aquatic insects. Aquatic insects comprised 61% of the total volume of prey items consumed by RBT (Figure 6). The next most abundant prey item fell into the "unknown" category and probably consisted of aquatic vegetation. Zooplankton was the next most abundant prey item consumed comprising 7% of the total volume of prey items. Fish and mollusks rounded out the diet at 2% each. Even though fish represented 2% of the total diet by volume, in reality that only represents one Utah chub. There were no other fish observed in the diet which suggests that RBT are having little to no direct impacts on the rest of the fishery (Figure 6).

Twenty-nine units of trap net effort were exerted on Blackfoot Reservoir during the summer of 2009. Similar to the gill net catch, non-trout species comprised the bulk of the trap net catch (99%). Utah chubs *Gila atraria* were the most numerous (73%) followed by Utah suckers (20%), carp *Cyprinus carpio* (4%), and yellow perch (2%). RBT comprised about 1% of the catch.

American white pelican appear to have had no measureable impact on the Blackfoot Reservoir fishery. Relative abundance of non-trout species collected in 2009 was similar to what was observed over the last 4 decades (Table 1). Trout relative abundance appears to be trending upward but is largely being driven by the Department's RBT stocking program. Yellowstone cutthroat trout relative abundance continues to be depressed at the same levels observed prior to the expansion of the AWP population (Table 1).

Figure 4. Locations where gillnets (●) and trap nets (■) were set at Blackfoot Reservoir during the summer of 2009.

Table 1. Summary of gillnet data from Blackfoot Reservoir from 1963 to 2009.

Year	Nets	Total catch	RBT	YCT	Total trout	% Trout	UC	US	CP	YP	Total non-trout	% Non-Trout
1963	2					31						69
1964						25						75
1967	4	348			13	4					335	96
1968		270	15	4	19	8	122	129			251	92
1971	20	782	9	16	25	3	456	283	18		757	97
1980	12	865	16	19	35	4	556	272	2		830	96
1991		273	1	7	8	3	216	49			265	97
1997		389	6	6	12	3	351	22	4		377	97
1999	6	1,528	22	1	23	2	1,291	200	7	7	1,505	98
2001	12	954	17	5	22	2	748	101	15	51	932	98
2003	6	454	26	1	27	6	304	123			454	94
2004	8	648	3	3	6	1	528	113	1		648	99
2005	8	476	10	2	12	3	311	148	2	3	476	97
2009	8	973	82	3	85	9	590	235	47	16	973	91

YCT = Yellowstone cutthroat trout, RBT = rainbow trout, UC = Utah chub, US = Utah sucker, YP = yellow perch, CP = common carp

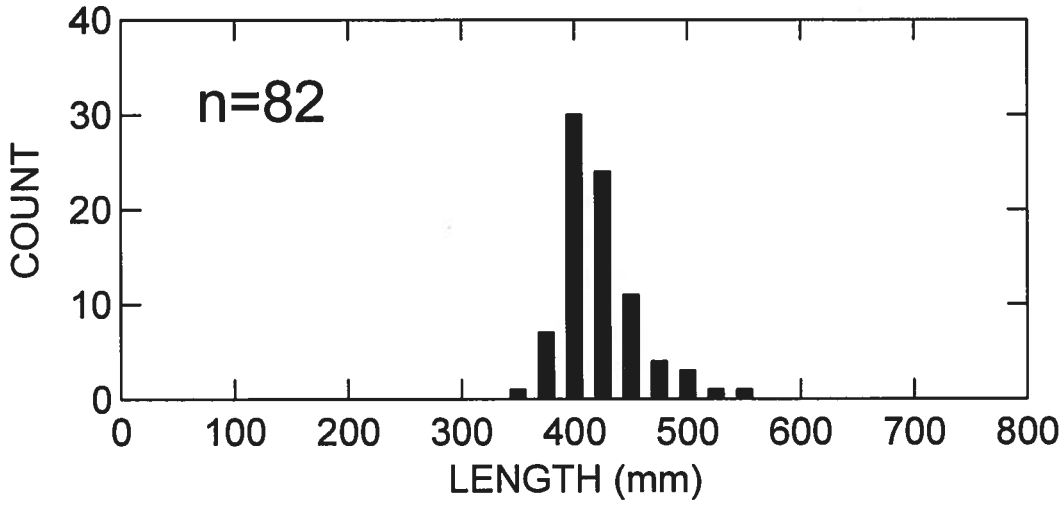

Figure 5. Length frequency of rainbow trout collected from Blackfoot Reservoir during the summer of 2009.

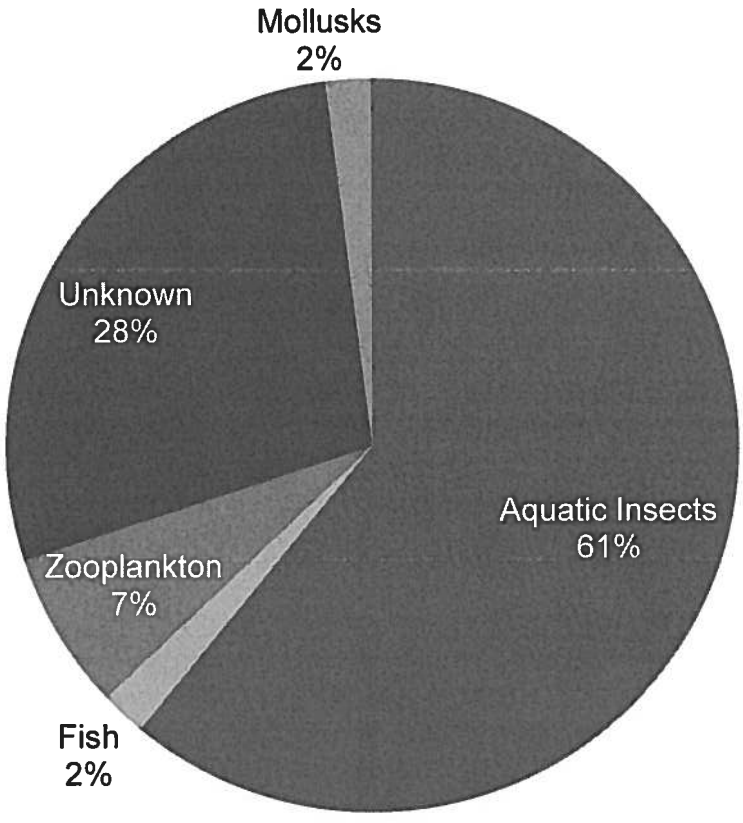

Figure 6. Percent composition by volume of consumed food items from 44 rainbow trout collected from Blackfoot Reservoir during September 2009.

Remote Creel Census of Chesterfield Reservoir

Introduction and Methods

Chesterfield Reservoir is one of 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 RBT. 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.

Chesterfield Reservoir was drained during the years of 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. However, increased precipitation in 2005 refilled the reservoir and rainbow trout stocking was reinstated with catchable and fingerling trout. Since 2005, the reservoir has maintained a minimum pool of water providing year-round fishing opportunity. To monitor initial success of the restocking program and evaluate the reduced harvest regulation imposed in 2002, a creel survey was completed for the period of April 24, 2006 through April, 24 2007. The creel information was very valuable in documenting changes in the fishery, but the level of effort and travel expenses make the surveys difficult to replicate.

During the past three decades, only three year-long creel surveys were completed on Chesterfield Reservoir. The paucity of creel data makes it difficult to access the efficiency of the stocking program for Chesterfield Reservoir. Moreover, maximizing the return of hatchery trout and providing the best angling opportunity at a regional scale could be improved with more frequent creel assessments. The objective of this project was to develop and evaluate a creel method that requires less personnel time and travel expense. The proposed creel method couples hourly photo images of angler use with a voluntary report card system to estimate catch rates and harvest. Because all of the data is collected without active creel clerks, we refer to the pilot effort as a "remote creel". The remote creel survey was completed on Chesterfield Reservoir and was compared to results from the 2006 standard creel survey.

The two primary components of the creel survey include total estimate of use and angler success. Angler use was documented using digital photographs taken at the two primary parking areas. The cameras were mounted to the top of a building located between the two parking areas. The cameras were set to take pictures during daylight hours. Vehicles observed in the photographs were counted and converted to total angling groups by dividing the total hourly count by the average length of time vehicles remained in the parking lot. The vehicle stay time was used as a surrogate for estimating angler fishing time. Angler fishing time (effort in hours) was also a question on the voluntary report cards. Total anglers and total effort (hours) were estimated by expanding the estimates of total vehicle visits by average group size and length of visit.

Angler success rates (catch and harvest) were estimated using voluntary reports cards. Report card boxes were set at the boat ramp and along the primary road entrance to Chesterfield Reservoir. The boxes included report cards and a secure compartment to store completed report cards. The report cards are shown in Figure 7. The cards asked anglers to record group size, angler hours, angling method, catch, and harvest statistics for their fishing trip. Creel data were summarized by season (spring, summer, fall, and winter). The seasons were defined as follows: winter as December, January, February and March; spring was April, May and June; summer was July, August and September; fall was October and November.

Results and Discussion

Table 2 summarizes remote creel data collected in 2009. Unfortunately, most of the winter fishing season (77%) was not sampled due to camera failure. Therefore, we dropped the winter season from further analysis. The only other camera failure occurred in the fall and was for only 5 of 61 sampling days. For the seasons with data, we estimated that a total of 9,890 anglers fished 51,810 hours. Those anglers reported catching 46,630 trout of which 14,460 were harvested.

The remote creel survey showed similar trends in angler effort compared to the standard creel completed in 2006. Effort declined between the spring and fall fishing periods for both survey methods (Figure 8). However, the decline shown in Figure 8 between the summer and fall period is explained by the fewer number of fishing days available during fall (Table 2). Using the remote creel data, average daily fishing pressure was 217 hours in the summer and 220 hours in the fall. Total fishing pressure for the spring-fall period was 51,810 hours in 2009 and 45,200 hours in 2006. It is important to note that the comparisons are made understanding that differences could be a result of a real difference between the two years or methodology difference.

The remote creel method saved significant personnel time and travel expense. The number of fields day required to complete the standard creel was 156 days that averaged 6 hours. Time spent changing batteries and servicing angler report card boxes was 18 trips that averaged 3 hours. Travel expenses were $8,836 for the standard creel and only $680 for the remote creel. Total cost estimates were $31,076 for the standard creel and $6,080 for the remote creel (Table 3). Another benefit of the remote creel method is the increase in instantaneous counts compared to a standard creel. The remote creel method yields over 4,000 instantaneous counts during a year. In 2006, we estimated total angling pressure from 156 instantaneous counts. The camera data may oversample use, but likely better represents extreme changes in use like those associated with holidays or fishing tournaments.

There are several limitations that need to be considered if using remote creel methods. First, the winter season was missed due to snow covering the lens or battery failure. Placement of a snow shield over the cameras may help reduce data losses during storms. Secondly, battery failure was a problem during the winter. However, a different brand of camera was purchased for 2010 and appears to be more reliable in cold weather (Moultrie I60). We anticipate having a complete creel survey for analysis in the 2010 report. Thirdly, the remote creel method relies on voluntary reporting of angler success. The 2009 remote creel results were based on anglers filing 82 reports. That value was down from 119 filed in 2008. Consideration should be given to incentivize voluntary reporting. Also, there may be a difference in angler responses from face-to-face creel interviews vs. written reporting.

Table 2. Remote camera creel results for Chesterfield Reservoir in 2009.

Category	Winter	Spring	Summer	Fall	Totals
Total days	121	91	92	61	365
Data days	28	91	92	56	267
Total cars counted	NA	7,100	7,700	2,560	17,360
Average trip time (hr)	4.80	5.16	5.4	5.08	5.21
Angler trips	NA	1,380	1,430	500	3,310
Average group size	2.4	3.5	2.6	2.9	2.9
Total anglers	NA	4,740	3,710	1,440	9,890
Hours Fished	NA	24,480	20,030	7,300	51,810
Catch Rates	1.3	0.9	0.9	0.9	1.1
Total Catch	NA	22,030	18,030	6,570	46,630
Harvest	NA	6,830	5,590	2,040	14,460

Table 3. Comparison of personnel and travel costs between the standard creel survey completed in 2006 and the remote creel survey completed in 2009.

Method		Effort	Unit Cost	Total Cost
Standard Creel	Field days (average 6 hrs)	156	$120.00	$18,720
	Travel expenses (miles)	118	$0.48	$8,836
	Data entry and analysis days (8 hrs)	22	$160.00	$3,520
	sub total			**$31,076**
Remote Creel	Cameras	2	$220.00	$440
	Field days (average 3hrs)	12	$60.00	$1,440
	Travel expenses (miles)	118	$0.48	$680
	Data entry and analysis days (8 hrs)	22	$160.00	$3,520
	sub total			**$6,080**

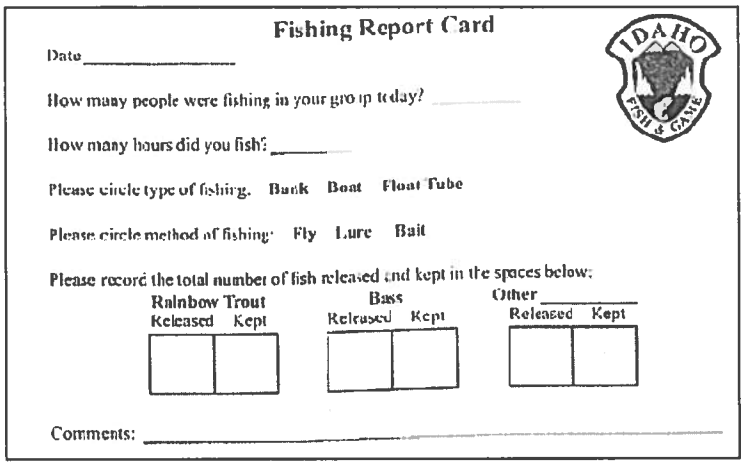

Figure 7. Angler Report Card.

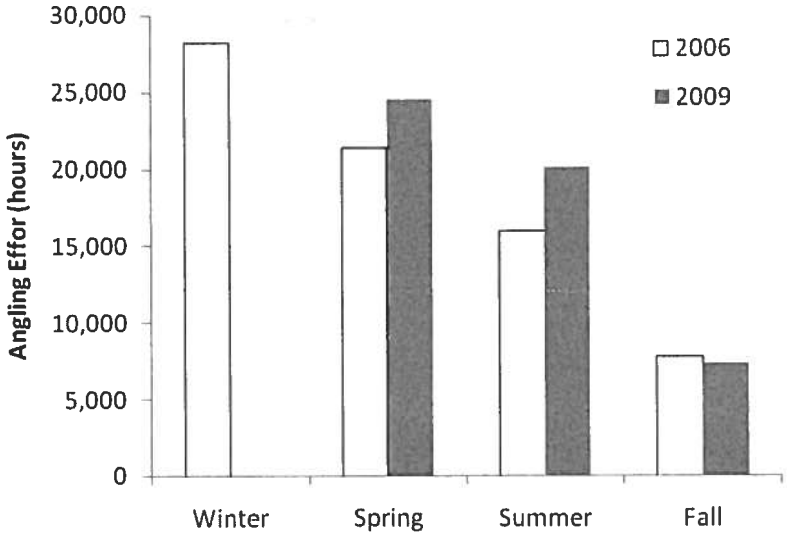

Figure 8. Comparison of angler effort on Chesterfield Reservoir between the standard creel survey completed in 2006 and the remote creel survey from 2009. Winter fishing estimates were not available for 2009.

Chesterfield Reservoir is ideal for completing a remote creel survey. The reservoir has limited parking that is easily covered with two remote cameras. Additionally, there is essentially no other recreation that occurs on Chesterfield Reservoir other than angling. Correction would be necessary if other water sports were involved. Larger reservoirs (i.e., American Falls) would require numerous cameras at several boat ramps and corrections for non-angling vehicle use. However, many of the small reservoirs in southeast Idaho are suitable for remote creel surveys. Some examples included, Daniels, Treasureton, Weston, Johnson, Lamont, Glendale, Montpelier, Condie, Deep Creek, Foster, Hawkins, Oneida, and Winder. The regional fishing and access program has initiated remote creel surveys on Glendale and Daniels reservoirs. River fisheries with point access locations like Black Canyon of the Bear River or the Portneuf River should also be ideal sites to complete remote angler use surveys. In summary, combining voluntary reporting with remote cameras is an efficient method for collecting angler use and success information. Expansion and improvement of the technique is warranted.

2009 Southeast Region Annual Fishery Management Report

RIVERS AND STREAMS INVESTIGATIONS

Stream Renovations

Introduction and Methods

Non-native EBT and RBT exist in many eastern Idaho streams. EBT and RBT have negative impacts on native fish communities via direct or indirect competition for limited resources and in the case of RBT, can hybridize with native BCT. Fish Haven Creek (FHC) and Preuss Creek (PC) were renovated with rotenone in 2009 to remove EBT and RBT and create additional space for native BCT. Preuss Creek was treated on 10-November with Synpren liquid rotenone at a concentration of 2 ppm for about six hours. However, due to the presence of ice in the creek at the time of treatment, we were unable to complete the fishery survey needed to evaluate the project. We will complete the evaluation in 2010 and submit a completion report at that time.

Fish Haven Creek was chemically renovated on September 16th. A total of six drip stations were deployed (Figure 9). Each station was charged with Synpren liquid rotenone at a concentration of 2 ppm and operated for approximately four hours (Table 4). The upper two stations (1 and 2) were started at about 05:15 hrs. The remaining stations (3, 4, 5 and 6) were activated between 08:00 and 09:00 hours (Table 4). Drip stations were spaced about 1 ½ hours apart based on stream flow travel time. We treated three spring complexes with backpack sprayers charged with liquid rotenone at a ratio of 1 part liquid rotenone to 10 parts water.

We evaluated the chemical renovation of FHC on October 14th. Beginning near the mouth of the creek, we conducted fishery surveys using a Smith-Root backpack electrofishing unit. We progressed upstream stopping to conduct a survey at each 1 km interval. Transect length at each sample location was approximately 100 m. A total of eight locations were sampled for EBT and RBT (Figure 10). In addition, we also sampled areas between transects that appeared to have good salmonid habitat.

Results and Discussion

Overall the application of Synpren liquid rotenone to FHC went smoothly with one exception. Three of the drip cans (3, 4, 5; Table 4) developed clogging issues and required constant oversight. These cans had been charged with rotenone from a bulk barrel that had been opened 3 to 4 years ago and had experienced several freeze-thaw cycles. The rotenone from this barrel was still effective but the chemical carrier it was mixed with had degraded to the consistency of syrup. We recommend that all future renovation projects be completed with rotenone from unopened barrels or previously opened barrels that have not been exposed to a freeze-thaw event.

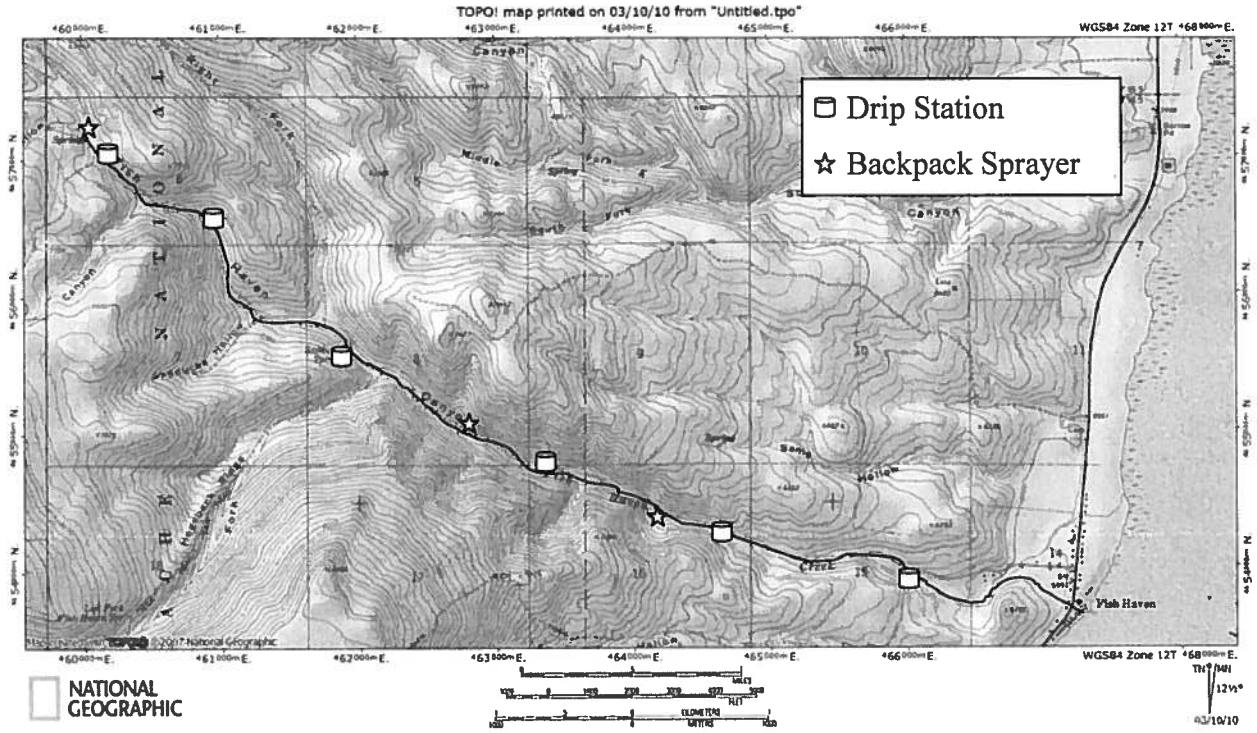

Figure 9. Locations where Synpren liquid rotenone was applied to Fish Haven Creek on September 16, 2009.

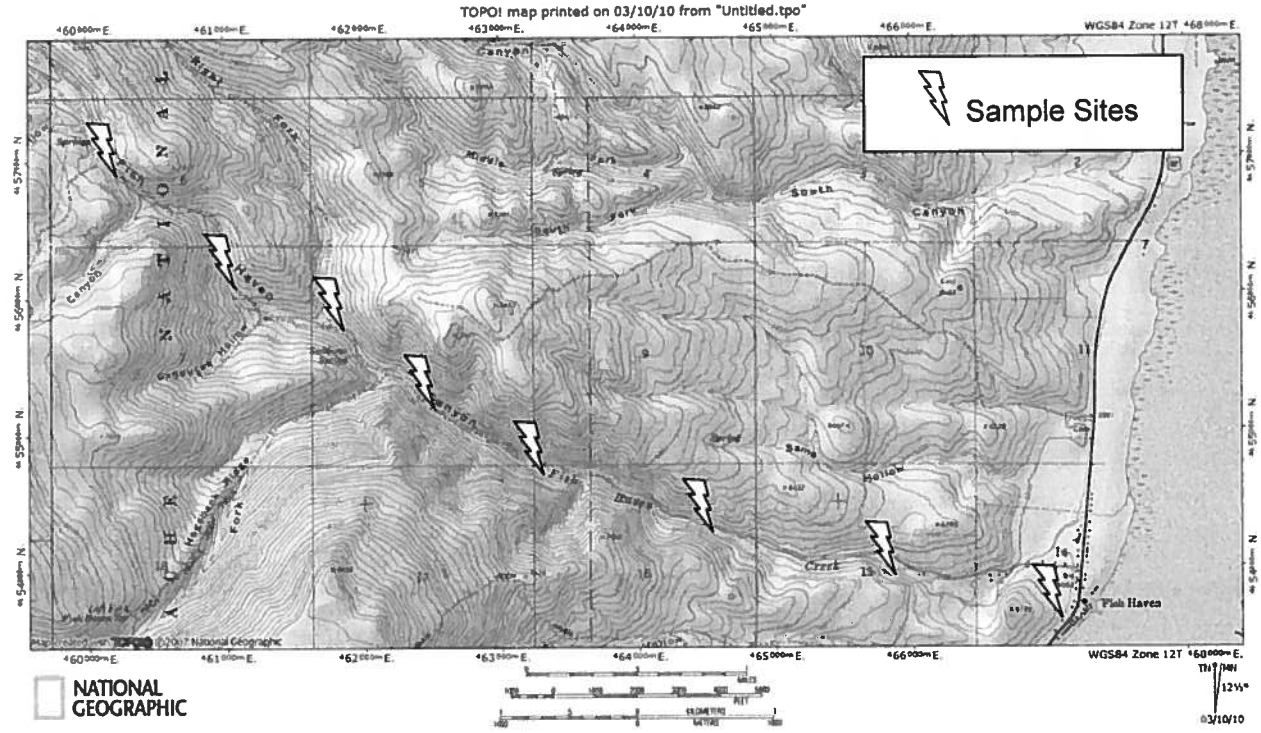

Figure 10. Post treatment Locations on Fish Haven Creek that were sampled for eastern brook trout and rainbow trout on October 14, 2009.

Table 4. Various elements of the Fish Haven Creek chemical renovation project that occurred on September 16, 2009.

Drip Station	Discharge (cfs)	Rotenone Applied (ml)	Rotenone Concentration (ppm)	Start Time	End Time	Treatment Duration (hrs)
1	1.239	1011	2	0515	0810	2.95
2	1.239	1011	2	0510	0820	3.10
3	9.878	8061	2	0845	1500	6.55
4	13.363	10,904	2	0830	1425	5.95
5	13.525	11,037	2	0815	1402	5.87
6	13.002	10,610	2	0800	1200	4.00
Sprayer		2,250				
Total		44,884				

Weather conditions were ideal for the application of rotenone. Winds were light and variable and clear skies persisted throughout the treatment period. The high temperature for the day was approximately 22.0°C. Fish Haven Creek water temperature was 7.0°C when treatment ended.

We think the chemical renovation of FHC was successful. After sampling approximately 1,000 m of stream (13% of the total stream length) we were unable to detect any salmonids. We will return to FHC in 1 to 2 years to reevaluate the project.

Monitoring Program for Bonneville Cutthroat Trout

Introduction and Methods

BCT are one of three native cutthroat trout sub species in Idaho. In Idaho, BCT only 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, Giraffe, and Dry Creeks), which were to be sampled every other year. In 2006, as part of the BCT management plan (Teuscher and Capurso 2007), additional streams were added to the BCT monitoring program to implement a broader representation of BCT populations from across their historical range in Idaho. The additional monitoring sites include Eight-mile, Bailey, Georgetown, Beaver, Whiskey, Montpelier, Maple, Cottonwood, Snow slide, First, Second, and Third creeks, and the Cub River. In 2008, only nine of the 16 BCT monitoring locations were sampled. Therefore, during the summer of 2009, department personnel sampled three of the streams that were missed during 2008 (Figure 11).

In order to calculate mean density of BCT in monitoring streams, we sampled at least two sites within each stream using multiple pass removal techniques sampled with backpack electro-fishing equipment. At each site, a segment of stream (usually 100 m) was sampled, which included block nets at the downstream and upstream boundaries. Stream measurements included length (m) and average width (m), so the area (m^2) of the stream sampled could be calculated. The number of fish sampled in each pass was entered into Microfish 3.0 software (Microfish Software, Durham, NC, USA), which calculated a population estimate with ± 95% confidence intervals. This estimate was divided by the area (m^2) sampled and then by 100 to obtain the number of BCT/100m^2. The percent composition of BCT in relationship to other salmonids was calculated by dividing the number of BCT by the total number of all salmonids sampled. Mean density and percent composition for an entire stream was calculated by averaging these values from each site within a particular stream.

As part of the BCT broodstock program for the Thatcher Management Unit (TMU), we attempted to sample streams with limited records of BCT presence. The TMU consists of the Bear River and tributaries between Alexander and Oneida Reservoirs. Historical sampling efforts have identified only a few streams within the TMU where BCT populations persist. Therefore, we wanted to identify additional BCT populations and the potential for BCT broodstock supplementation in streams with limited or no BCT presence. We used single-pass backpack electro-fishing efforts to sample fish within at least one 100 m stretch from each stream. We collected and recorded a number of physical characteristics related to the stream and fish sampled. First, we recorded total length (mm) and weight (g) on all salmonids and recorded the presence of other fish species. Second, we collected genetic samples from BCT to be analyzed for genetic purity which will be used in determining sources for the broodstock program. Finally, we made note of stream habitat characteristics and recorded water temperature.

Results and Discussion

Mean BCT densities were 8 BCT/100 m^2 (range 1 – 20) for all streams sampled in 2009. The highest mean BCT density was observed in Maple Creek (15 BCT/100 m^2), which was an increase from what we observed in 2006 (Table 5). The percent composition of BCT in relationship to other salmonids sampled in each stream remained high for Maple Creek, averaging 98% of the population. In contrast, percent composition of BCT observed in Beaver Creek was 29%, much lower than Maple Creek and lower than the observed 45% in 2006 (Table 5). Mean BCT densities in Beaver Creek were observed to be lower in 2009 (1 BCT/100 m^2), compared to mean density in 2006 (6 BCT/100 m^2).

There are a number of variables that may be influencing population trends in BCT monitoring streams and one of these appears to be water cycles. Rainfall totals were above average in the mid 1980s and 1990s and BCT densities peaked in streams that were monitored during that time period. Given the sensitive status of BCT and recent petitions to list the species under the Endangered Species Act, it is important to identify and correlate variation in BCT densities that appear to be associated with environmental variables, such as annual precipitation.

We sampled 20 streams consisting of 33 sites to identify presence or absence of BCT and other fish species as part of the BCT broodstock program (Table 6). We identified 11 streams out of 20 that BCT currently occupy and could potentially be used for the broodstock program (Table 6). The nine remaining streams appeared to be suitable for BCT supplementation if stream flows are sufficient year round (Table 6). In addition, we visually classified BCT in Stockton Creek, which if genetics affirm these samples as pure BCT, this will be the only population identified in the Swan Valley drainage.

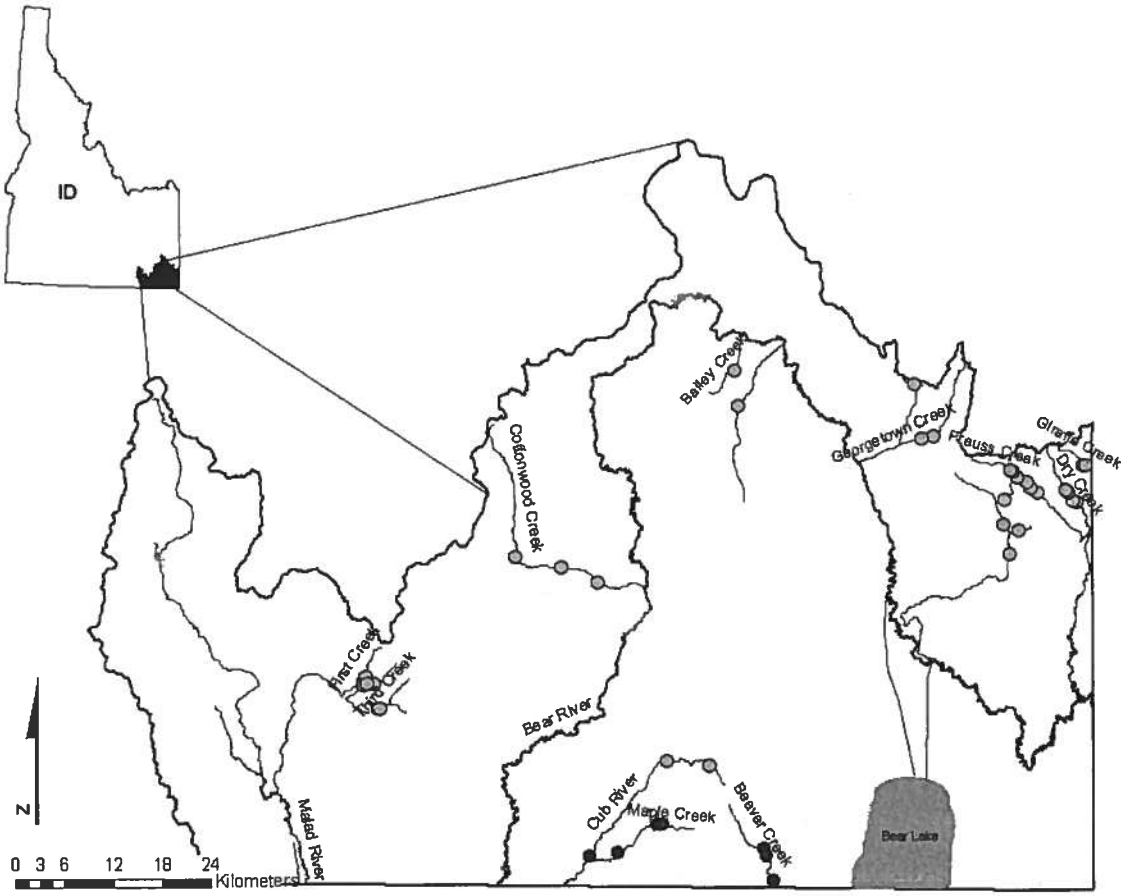

Figure 11. Monitoring streams and sampling sites (circles) for Bonneville cutthroat trout within the Bear River drainage. Black circles represent sites sampled in 2009.

Table 5. Bonneville cutthroat trout density estimates (fish/100m^2; ± 95% C.I.) and percent composition of all salmonids for 3 of 16 streams selected for long-term BCT monitoring program. Only streams sampled in both 2006 and 2009 are reported here. Only fish over 75 mm total length are included in the estimates.

		UTM Coordinates (12T; NAD 83)		2006		2009	
Stream	Site	Easting	Northing	Fish/100m^2	% Comp.	Fish/100m^2	% Comp.
Beaver Creek	1	456693	4650690	10 (± 0)	73	2 (± 1)	53
	2	455793	4653834	1 (± 0)	22	1 (± 0)	25
	3	455428	4654607	7 (± 0)	41	1 (± 0)	10
Cub River	1[a,b]	433955	4653741	N/A	N/A	N/A	N/A
Maple Creek	1[a]	437452	4654095	N/A	N/A	20 (± 1)	97
	2	442172	4657624	12 (± 1)	100	10 (± 3)	98
	3	442902	4657587	6 (± 1)	100	15 (± 1)	98

[a] No data in 2006. New site lower in system.
[b] No data in 2009. Mark-recapture sampling effort failed.

Table 6. List of 20 streams sampled by IDFG personnel during the summer of 2009 to determine the presence of Bonneville cutthroat trout (BCT) and the potential for either using the population as part of a BCT brood stock or if broodstock supplementation should be considered. A variable amount of sites were sampled within each stream along with the length of stream sampled. The total of BCT sampled within the stream was counted in addition to recording the presence or absence of other salmonids and other fish species.

Stream	Sites	Length Sampled (m)	# BCT Sampled	Other Salmonids	Other Species	Potential Broodstock Source	Potential Broodstock Supplementation
Cottonwood Creek	3	250	56	Yes	Yes	X	
Mill Canyon Creek	1	100	25	Yes	No	X	
Shingle Creek	1	75	13	Yes	Yes	X	
R.F. Cottonwood Ck.	1	100	11	Yes	No	X	
North Hoopes Creek	1	100	8	No	Yes	X[a]	
Stockton Creek	3	300	8	Yes	Yes	X[a,b]	
South Hoopes Creek	1	100	6	No	Yes	X_a	
Walker Gulch Creek	1	100	5	No	No	X[a]	
Blue Creek	1	100	3	Yes	Yes	X	
Hoopes Creek	1	100	2	No	Yes	X[a]	
Bullwhacker Creek	1	100	2	No	No		X[c]
Cottonwood Creek	1	100	0	No	No		X[c]
Densmore Creek	2	300	0	No	Yes		X[c,d]
Caribou Creek	1	100	0	No	No		X[c]
Kackley Springs	1	100	0	Yes	No		X
King Creek	2	500	0	Yes	No		X[c,d]
Swan Lake Creek	2	200	0	No	No		X[c]
Burton Creek	4	400	0	No	Yes		X[c]
Alder Creek	3	300	0	No	No		X[c]
Smith Creek	2	200	0	No	Yes		

[a] Additional sample sites needed to determine a more accurate BCT density.
[b] Genetic samples need to be completed to determine BCT purity.
[c] Need to verify that water connectivity is consistent year round.
[d] Small densities of RBT present.

Yellowstone Cutthroat Trout Monitoring in the Blackfoot River System

Introduction and Methods

There are two long term monitoring programs in place for YCT in the upper Blackfoot River. They are adult spawning counts and population estimates within the Blackfoot Wildlife Management Area (BWMA) located about 51 km above the reservoir. The spawning counts have been completed every year since 2001. The population surveys are completed less frequently. In addition, we also estimated the population of YCT in the section of river currently owned by Monsanto.

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 April 21st to June 17th. Prior to observing fish at the trap, field crews checked the live box several times a week. On several occasions YCT were angled below the trap, processed and released above the trap. Once fish began entering the trap, it was checked at least once a day. Fish species and total lengths (mm) and weights (g) were recorded. Yellowstone 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. All salmonids handled at the trap were fitted with an aluminum jaw tag bearing a unique identification number. These fish were tagged so they could be included in a pelican predation study that is currently underway.

In 1994, the IDFG, with assistance from the Conservation Fund, purchased the 700 ha ranch and began managing the property as the BWMA. The BWMA 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 an historical YCT spawning and rearing stream. Since purchasing the BWMA, IDFG has completed periodic population estimates to monitor native YCT abundance.

We estimated YCT abundance within 8.7 km of the BWMA reach of the Blackfoot River in 2009. The estimate was completed using mark-recapture methods. Fish were sampled with drift boat-mounted electrofishing gear. Fish were marked on 9-July and recaptured 15-July. Data were analyzed using Fish Analysis + software package (Montana Fish Wildlife and Parks 2004). All YCT caught were measured for total length (mm) and weighed to the nearest gram.

In 2009, Monsanto enrolled their river property in the Department's access program. The parcel of land is located approximately 16 km downstream of BWMA and is in the vicinity of Fox Hills. This was the first time in many years this property has been accessible to the general

angling public. In an effort to gain an understanding of what success anglers might enjoy while fishing the property, we estimated the population using the same mark-recapture methods mentioned above. Yellowstone cutthroat trout were marked on July 21st and recaptured on July 27th. The length of river sampled was approximately 6 km.

Results and Discussion

In 2009, a total of 865 adult YCT were collected at the migration trap. The escapement count was similar to what observed in 2002 and was the highest observed in the past six years. About 14% of the YCT observed in the trap had fresh bird scars (open wounds) and another 9% had old bird scars (wounds that were healed or nearly so). Fish that exhibited old bird scars probably acquired them while in the reservoir or during a previous spawning run. Scarring rates have varied from no visible scars on 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 clarity, and hazing efforts exerted on the birds to reduce predation impacts. The hazing efforts were described by Teuscher and Scully (2008). Escapement and bird scar trends are shown in Table 7.

A total of 598 YCT were sampled on the BWMA during the mark and recapture electrofishing surveys. The total YCT population estimate for the BWMA was 2,567 ± 573 which translated to approximately 295 YCT/km. The estimate from 2006 was 3500 ± 700 YCT (400 YCT/km). Mean length of YCT in 2009 was 276 mm which was significantly lower than observed in 2008 (319 mm) but the same as in 2006 (272 mm) ($F = 37.143$; $df = 2$; $P = 0.000$). Abundance estimates by size class are reported in Table 8.

Prior to 2009, a downward trend in abundance of YCT was observed on the BWMA. The population estimate derived in 2005 was 4,092 YCT (the highest of the current decade). However, over the next two sampling events, abundance declined to a low of 2500 YCT in 2008. The population estimate obtained in 2009 showed small rebound in the abundance of YCT on the BWMA but biomass did not (Figures 12 and 13).

In past surveys of the BWMA 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, 2006 and 2009 surveys show similar ratios of juvenile cohorts (Figure 14).

A total of 154 YCT were sampled from the Monsanto reach of the Blackfoot River in 2009. We estimated the population to be 406 (±121) YCT which converted to about 68 fish/km (Table 9). Total biomass was estimated to be 95 kg or about 16 kg/km. Yellowstone cutthroat trout captured during the survey had a mean length and weight of 296 mm and 334 g, respectively.

Length frequency distribution of YCT collected from the Monsanto property was approximately normal. At least 5 distinct age classes were represented in the sample with 2 and 3 year old fish comprising the bulk of the catch (Figure 15).

The results of these surveys suggest angling should be good over the next few years in the upper Blackfoot River. Catch rates will likely be higher on the BWMA than on the Monsanto property however, both areas will provide excellent angling opportunities.

Table 7. Yellowstone cutthroat trout escapement estimates for the Blackfoot River 2001-2009.

Year	Weir Type	YCT Count	Mean Length(mm)	% Bird Scars	Mean May River Discharge (cfs)	Adult Pelican Count
2001	Floating	4,747	486	No data	74	No data
2002	Floating	902	494	0	132	1,352
2003	Electric	427	495	No data	151	1,674
2004	Electric	125	478	70	127	1,748
2005	Electric	16	Na	6	388	2,800
2006	Electric	19	Na	38	453	2,548
2007	Electric	98	445	15	115	3,416
2008	Electric	548	485	10	409	2,390
2009	Electric	865	484	14	568	3,174

Table 8. 2009 Yellowstone cutthroat trout abundance and biomass estimates by size class collected from the Wildlife Management Area of the Blackfoot River, Idaho.

Size Class (mm)	Fish Marked	Fish Captured	Fish Recaped	Pop Est	Pop Est SD	Biomass (kg)	Relative Wt Avg
75 - 149	7	15	0	231	38.8	7.1	134.2
150 - 224	87	117	7	1,296	261.0	100.0	97.6
225 - 299	68	67	6	543	99.5	91.2	90.8
300 - 374	54	72	19	274	40.1	106.7	86.0
375 - 449	38	27	6	143	23.3	93.4	83.6
450-599	25	21	6	79	21.1	88.7	78.8
Totals:	279	319	44	2,567	286.5	487.1	92.4

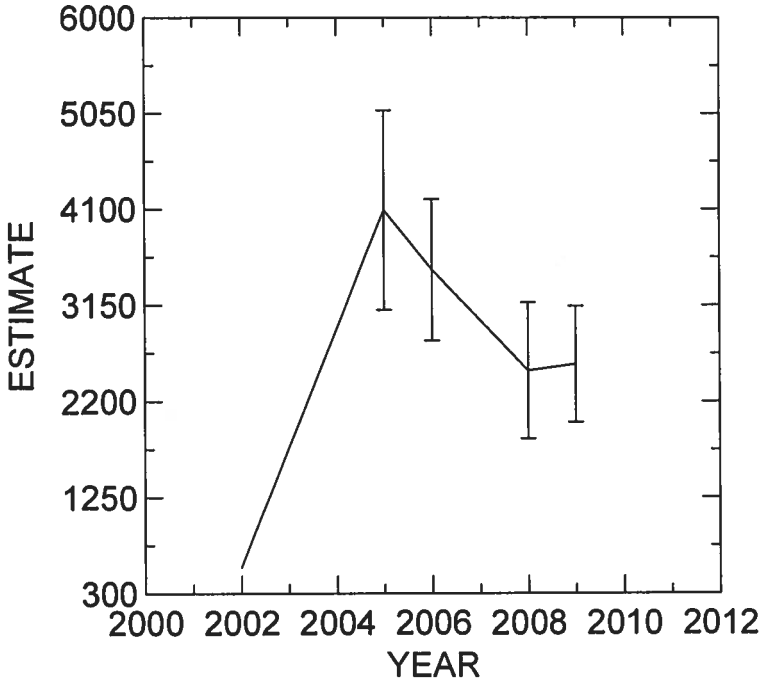

Figure 12. Abundance and 95% CI of Yellowstone cutthroat trout collected from the Blackfoot River within the boundaries of the Blackfoot Wildlife Management Area, Idaho.

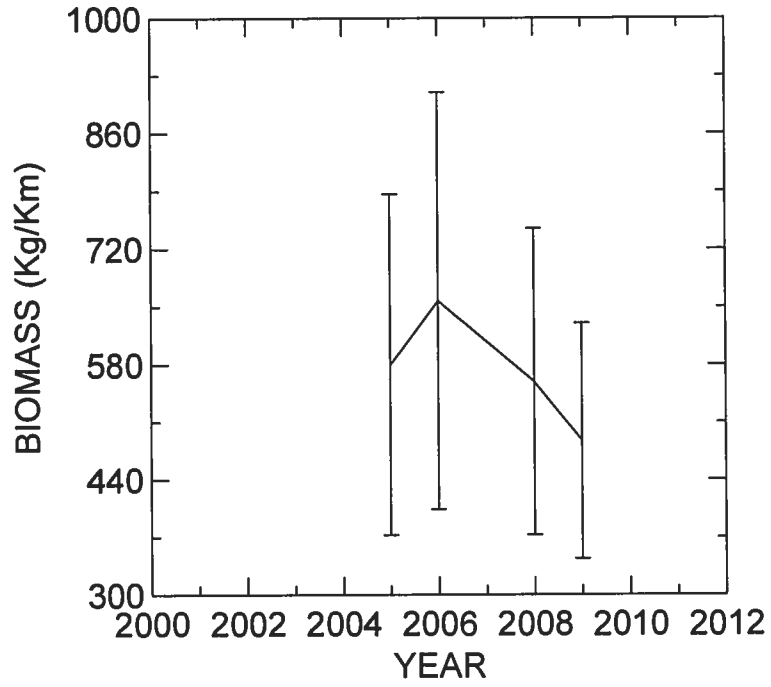

Figure 13. Biomass and 95% CI of Yellowstone cutthroat trout collected from the Blackfoot River within the boundaries of the Blackfoot Wildlife Management Area, Idaho.

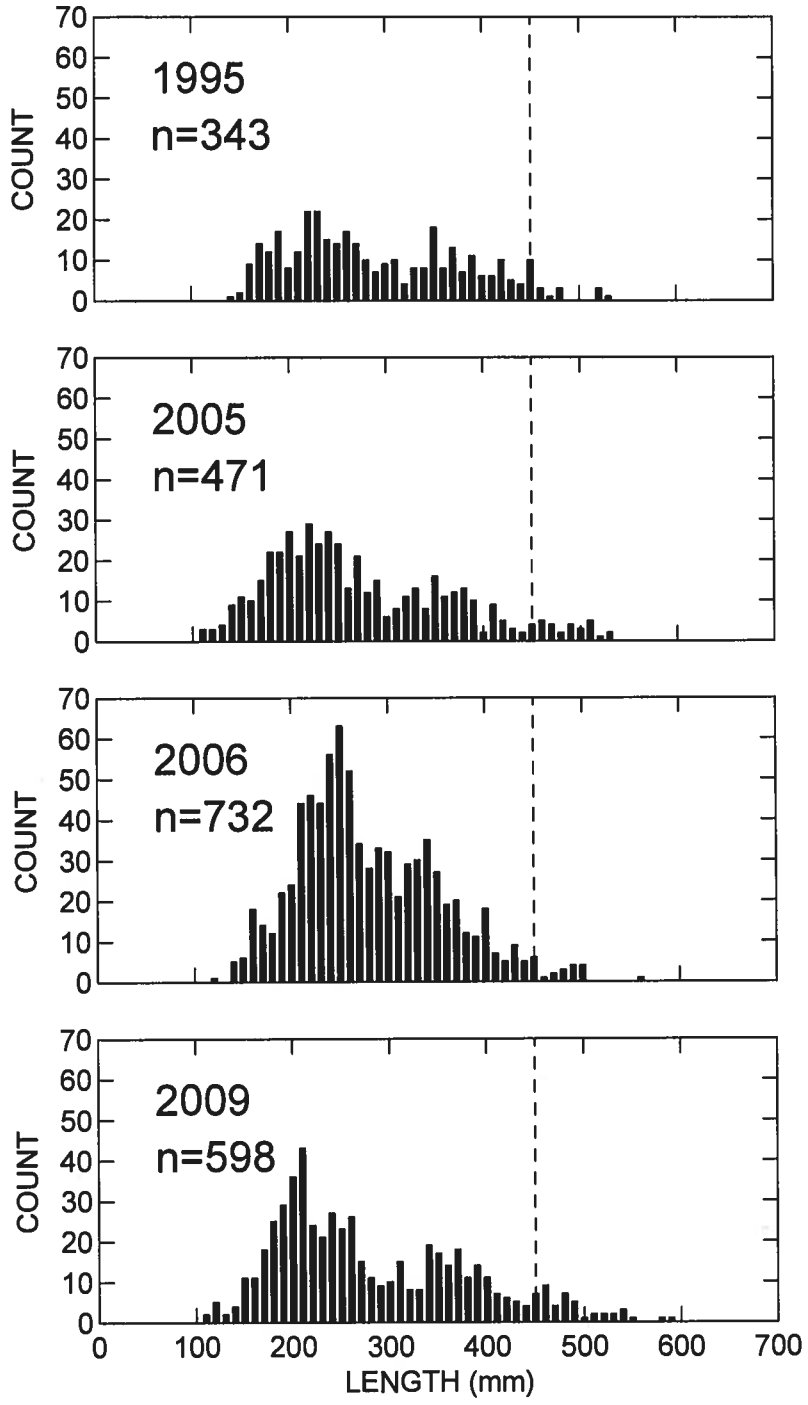

Figure 14. Length frequency distributions of Yellowstone cutthroat trout caught from the Blackfoot Wildlife Management Area of the Blackfoot River, Idaho. The majority of fish located to the right of the vertical dashed lines are likely post spawn adfluvial fish returning to Blackfoot Reservoir.

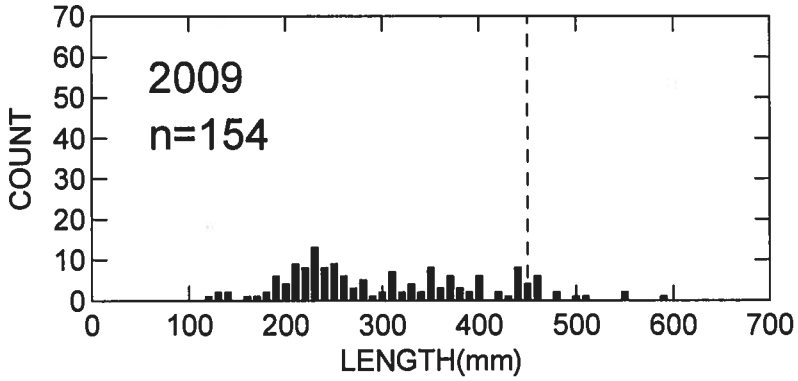

Figure 15. Length frequency distribution of Yellowstone cutthroat trout collected in July 2009 from the Monsanto property (Fox Ranch) of the Blackfoot River, Idaho.

Table 9. 2009 Yellowstone cutthroat trout abundance and biomass estimates by size class collected from the Monsanto property (Fox Ranch) of the Blackfoot River, Idaho.

Size Class (mm)	Fish Marked	Fish Captured	Fish Recaptured	Pop Est	Pop Est SD	Biomass (kg)	Relative Wt Avg
75 - 149	3	2	0	59	117.4	1.1	88.5
150 - 224	18	18	1	139	46.7	10.6	85.3
225 - 299	23	19	6	98	27.4	14.8	86.0
300 - 374	17	16	5	53	10.9	19.5	82.9
375 - 599	20	18	6	58	17.9	48.7	79.5
Totals:	81	73	18	406	60.6	94.7	83.7

MANAGEMENT RECOMMENDATIONS

1. Continue monitoring stream populations as prescribed in the Idaho Bonneville cutthroat trout management plan.
2. Continue to evaluate the remote creel survey methodology.
3. Obtain angler exploitation rates of channel catfish from Alexander Reservoir.
4. Complete first year evaluation of streams renovated with rotenone in 2009.
5. Move forward with St. Charles Creek renovation.

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