STATE: MONTANA

PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

PROJECT NO.: F-113-R-9

STUDY TITLE: SURVEY AND INVENTORY OF COLDWATER ECOSYSTEMS

JOB NO.: 3140

TITLE: NORTHWEST MONTANA COLDWATER ECOSYSTEM INVESTIGATIONS

PROJECT PERIOD: MARCH 1, 2010 THROUGH JUNE 30, 2011

Angler Survey of Experimental Recreational Bull Trout Fishery for Lake Koocanusa, Montana 2010 - 2011.

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July 2011

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SUMMARY

In 2004, the U.S. Fish and Wildlife Service authorized limited sport fishing for bull trout *Salvelinus confluentus* at Hungry Horse Reservoir, South Fork Flathead River and Lake Koocanusa as requested by Montana Fish, Wildlife & Parks after those fisheries were deemed to have reached recovery goals. A portion of the permit conditions called for a bull trout permit and catch card system, angler survey and development of educational information pertaining to these new fisheries.

This was the seventh year of the surveys. Out of 2,080 anglers who obtained permit/catch cards, 1,072 chose to be validated for Lake Koocanusa; 51.5 percent of all anglers validated for Lake Koocanusa. By July 6, 2011 we had received a total of 909 responses (84.8% return) for both mailings and returned catch cards. We issued fewer permits for both Koocanusa and South Fork Flathead compared to previous years and also noted a decrease in both the number and percent of anglers that said they actually fished at Koocanusa for the first time since 2006. But, the number of days anglers fished at Koocanusa (3.5) was second highest to last season (3.8); the two highest since 2004). This was likely because beginning in the 2009-2010 season, Montana Fish, Wildlife & Parks adopted a regulation that forced anglers to choose either Lake Koocanusa or Hungry Horse/South Fork Flathead and anglers chose the water they were more likely to fish for bull trout.

We estimated that 163 bull trout were harvested from Lake Koocanusa during the 2010 - 2011 season. This was lowest since the fishery began and continued to be much lower than the allowed harvest (1,140) from USFWS Sub-permit TE-077533. Anglers released more than 89 percent of the bull trout they caught at Lake Koocanusa. Once again, harvest increased in the last two months of the season, likely due to lake conditions and angler's desire to harvest healthier post-spawn bull trout. Anglers captured more bull trout during the four seasons since the two-line regulation was enacted by the Montana Legislature and made effective for the 2007-2008 season. Anglers that used two poles greater than 90 percent of the time caught 2.4 times as many bull trout at almost double the catch rate (0.51/day and 0.26/day, respectively) as those anglers that used two poles less than 90 percent of the time with about the same amount of effort.

The mean length of harvested bull trout exceeded the mean length of released bull trout for the 2010 - 2011 season. This was similar to other years and likely because anglers targeted "healthier bigger" bull trout. The mean length of both harvested and released bull trout was the lowest on record and the difference between mean lengths of harvested versus released bull trout (4.4") was the second highest on record since the 2004 season. There has been a downward trend for mean lengths of bull trout caught since 2007. This trend followed the decreasing trend for redd counts for the Wigwam River during the same time period. It appears as though larger fish are being cropped from the population and/or fewer large bull trout are available to be caught. Violations were similar to the previous year and no serious violations were noted for Lake Koocanusa.

INTRODUCTION

In 2011, Montana Fish, Wildlife & Parks (MFWP) personnel conducted the seventh annual angler mail survey for the recreational bull trout (***Salvelinus confluentus***) fishery on Lake Koocanusa initiated in 2004. Because bull trout were listed as a "threatened species" under the Endangered Species Act in 1998, this fishery was authorized under special permit by the U.S. Fish and Wildlife Service (USFWS).

BACKGROUND

Bull trout were listed as "threatened" under the Endangered Species Act in 1998. At the time of listing, sportfishing for bull trout had already been discontinued in Montana and was under review, except in Swan Lake which was considered to have a stable population.

The USFWS authorized an experimental sport fishery for bull trout at Lake Koocanusa because this fishery was deemed to have reached recovery levels. This activity was intended to benefit the species by researching the effects of restoring recreational fishing. In addition, allowing angling for bull trout likely increases public support for management of stable bull trout populations in the identified water bodies. We also believe this action will continue to garner additional support for restoration of bull trout habitats and other management activities that will improve bull trout populations throughout the state.

METHODS

Conditions of the USFWS special permit (TE-077533) for a new bull trout fisheries contained specific items agreed upon by both USFWS and MFWP (Hensler and Benson 2005). One condition called for the development and use of a harvest catch card. Also required was a formal survey of anglers participating in these experimental bull trout fisheries. Educational materials were also developed to explain catch card use, bull trout identification, seasons, limits, and regulations pertinent to each fishery and bull trout conservation measures.

The first step in developing a catch card harvest authorization involved creating an application for anglers interested in angling for bull trout. We made the form available through the Region 1 MFWP office and over MFWP's web site. The application required the angler's name, address, automated licensing system (ALS) number and permit area (waters) where they chose to fish. Applicants were asked to include the previous year's catch card with the survey for the 2010 - 2011 season. Anglers were not given duplicate catch cards during the season if the original was lost. To ensure consistent, high-quality information from participating anglers, we required that all applications be submitted to the Region One FWP office in Kalispell. There continued to be no charge for the permit/catch card.

After a completed application was processed, a permit and numbered catch card was issued to each angler. The catch cards provided general instructions for anglers fishing for bull trout on Lake Koocanusa and the request to keep the card until a survey was sent. The cards requested entry of the catch zone, fish length, month and day of catch for each fish harvested in Lake Koocanusa. Additionally, we requested supplemental information: total number of days fished for bull trout, total number of bull trout caught and released, and added a catch and release log that included zone, length, month, and day. We also asked what percent of the time each angler fished with two lines.

Upon landing a bull trout, anglers were required to immediately release the fish or harvest it. For each bull trout harvested from Lake Koocanusa anglers were required to record the information in ballpoint pen and notch out a triangle on the edge of the catch card; much like what is required for most big game licenses.

We offered to provide bull trout anglers with a copy of the current bull trout fishing regulations and an informational pamphlet with each catch card issued. Pamphlets specifically outlined seasons, limits, restrictions, catch card use, catch-and-release fishing techniques and bull trout identification for all waters open to bull trout fishing. Special license procedures, regulations and conservation measures for bull trout were also itemized in the 2010 and 2011 Montana Fishing Regulations booklets.

Completed catch cards helped to provide information on bull trout harvest, catch date, size and location for the 2010 - 2011 season. We still do not charge a fee for catch cards or assess a penalty for failure to return cards as specified. We requested the return of the previous year's catch card with the survey to improve the reliability of information.

To obtain the best and most thorough and accurate estimates of angling effort, harvest, and catch rates, MFWP conducted a mail survey of all anglers. The survey asked for the same information as requested on the catch cards. Surveys were initially mailed to anglers on March 14, 2011. A follow up mailing was conducted on April 22, 2011 to anglers who had not returned surveys. Anglers were also reminded to return their catch cards with the surveys.

For this report, we were most concerned with an estimate of bull trout catch and harvest for Lake Koocanusa. We used the survey in combination with catch card returns to estimate the total number of bull trout harvested. All estimates and graphs were generated in Microsoft Excel. Level of significance was at 0.05 unless otherwise noted.

FINDINGS

Bull Trout Catch Card Returns

Catch card instructions requested that anglers return the catch cards after their license expired with the survey. Anglers were no longer required to present the prior year's catch card or sign an affidavit attesting to information on a lost catch card before receiving a catch card for the current season. Some anglers did return catch cards but not surveys; some returned both; some returned only surveys. By July 1, 2011, we received 30 catch cards (4.8%) from anglers that did not return surveys.

Bull Trout Angler Mail Survey

On March 14, 2011, we mailed the initial survey to 1,072 Koocanusa anglers. The results of the initial mail survey achieved a 75.2% return rate (n=806 and 16 undeliverable) by April 10, 2011. We conducted a second mailing to non-respondents to increase our level of returns. By July 6, 2011 we had received a total of 909 responses (84.8%) for both mailings and returned catch cards and ended the survey due to declining returns. Returned surveys were processed by July 6, 2011. We will determine the need to use the second mailing in the future.

Angler Preferred Waters

Since 2009, anglers could get a catch card for Lake Koocanusa or South Fork Flathead (including Hungry Horse Reservoir) but not both. We received 2,080 bull trout permit applications on which anglers declared the waters they intended to fish for bull trout during the 2010 - 2011 season. The percentage of anglers that selected Lake Koocanusa (51.5%) was very similar to that of Hungry Horse/South Fork Flathead (48.5). Total catch cards issued Lake Koocanusa (1,072) was down from the previous year (1,181) and lower than any other season (Table 1). In fact, the number of cards issued for Lake Koocanusa has decreased every season since the system was first instituted in 2004. A similar trend existed for the South Fork Flathead. We presume the lower number of issued cards was because anglers were required to choose the water in which they were most likely to fish and possibly due to higher cost of recreational angling.

Angler Demographics

The vast majority of permitted bull trout anglers that fished at Lake Koocanusa were Montana residents (85%). This was slightly lower but similar to most other years. Anglers from 13 states and provinces (13 in 2009, 22 in 2008) were issued a catch card for Lake Koocanusa. Non-resident anglers were primarily from the states of Idaho (8.2%) and Washington (2.7%).

Table 1. Bull trout waters selected by anglers through the 2010 - 2011 season.

Waters Selected	Number Selected 2004	Percent of total 2004	Number Selected 2005	Percent of total 2005	Number Selected 2006	Percent of total 2006	Number Selected 2007	Percent of total 2007	Number Selected 2008	Percent of Total 2008	Number Selected 2009[3]	Percent of Total 2009[3]	Number Selected 2010	Percent of Total 2010
(HHR, SFF, LK)[1]	1,200	42	1,034	41	846	39	917	39	801	33	--	--	--	--
LK Only	1,040	37	911	36	768	35	817	35	901	38	1,181	53.2	1,072	51.5
HHR Only	125	4	103	4	76	3	---[2]	---	---	--	--	--	--	--
SFF Only	95	3	115	4	154	7	---[2]	---	---	--	--	--	--	--
HHR and SFF	215	8	194	8	170	7	602	26	702	29	1,043	46.8	1,008	48.5
LK and SFF	36	1	19	1	11	1	---[2]	---	---	--	--	--	--	--
HHR and LK	147	5	146	6	184	8	---[2]	---	---	--	--	--	--	--
Total Cards Issued	2,858	100	2,522	100	2,209	100	2,336	100	2,404	100	2,224	100	2,080	100
Total cards that included LK	2,423	85	2,110	84	1,809	82	1,734	74	1,702	71	--	--	--	--

[1] HHR = Hungry Horse Reservoir, SFF = South Fork Flathead River, LK = Lake Koocanusa.
[2] SFF and HHR were combined for 2007.
[3] Anglers were required to choose either LK or SFF/HHR beginning 2009.

Fishing Pressure Estimates

For the 2010 - 2011 season, 909 (84.8%) of the 1,072 bull trout anglers that received a catch card for Lake Koocanusa either returned catch cards or responded to the mail survey. We found that 54.7 % of the respondents indicated that they did fish for bull trout. This was the first season since 2006-2007 that both the number and percentage of anglers that fished for bull trout decreased (Figure 1).

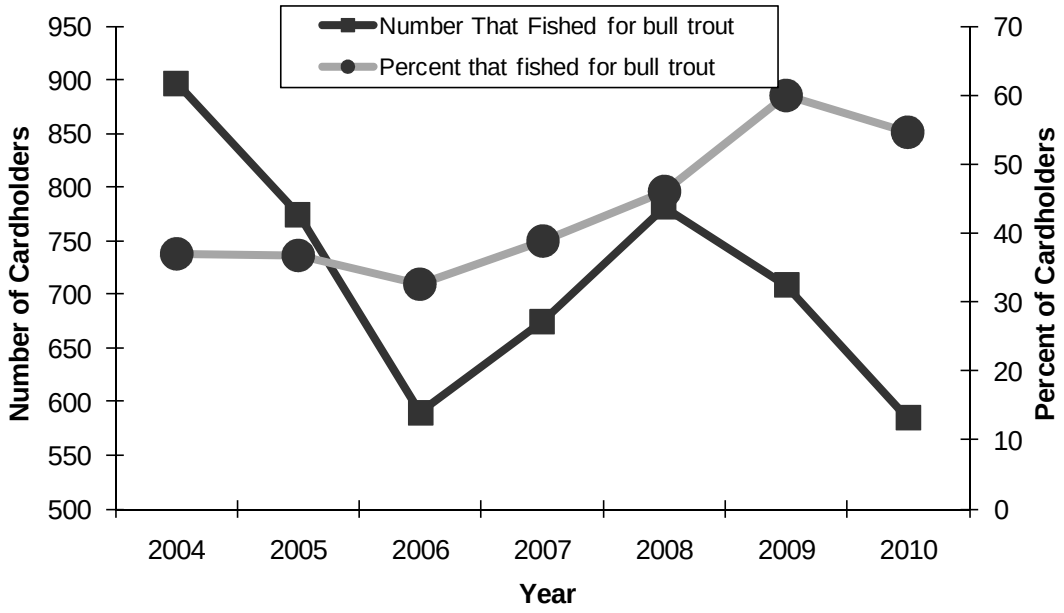

Figure 1. Estimated numbers of catch cardholders and percent of total catch cardholders that fished for bull trout at Lake Koocanusa, through the 2010 - 2011 season.

To estimate total number of angler-days of pressure on bull trout, we used the number of days anglers reported from catch cards and survey respondents who fished for bull trout. We assumed anglers not responding to the survey fished for bull trout with the same effort. Though the estimated total angler-days was down considerably from the last two years, estimated days per angler (3.5) during the 2010 - 2011 season was second highest on record (Table 2). It again showed that anglers who chose Lake Koocanusa were more serious about fishing for bull trout and therefore more likely to spend more days fishing.

Table 2. Bull trout season angling pressure estimates calculated from catch card and survey results for Lake Koocanusa through the 2010 - 2011 season.

Number Angler-Days Fishing Pressure							
	2004 - 2005	2005 -2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
Number of Respondents	897	774	590	569	609	691	497
Angler-Days from survey	1,685	3,285	2,639	2,963	3,917	3,686	3,154
Estimated Angler-Days	3,483	4,874	3,390	3,595	4,607	4,537	3,720
Estimated days per angler	1.4	2.3	1.9	2.1	2.7	3.8	3.5

Harvest and Catch Estimates

To estimate total harvest of bull trout for Lake Koocanusa for the 2010 - 2011 season, we calculated the mean harvest rate from survey and catch card returns (0.152; n=909) and expanded it to harvest for all anglers who acquired a catch card for Lake Koocanusa. We assumed that anglers who did not return catch cards or surveys continued to fish for and harvest bull trout at the same rate as those that returned their catch card and/or survey. The request to return catch cards in combination with surveys continued to produce high quality results. The harvest estimate for Lake Koocanusa bull trout during the 2010 - 2011 season (163) was substantially lower than the previous year (256) and the lowest since the season opened in 2004 (Table 3).

Table 3. Estimated bull trout harvest (known harvest) and catch (known catch) for Lake Koocanusa through the 2009-2010 season.

Season	Bull Trout Harvested	Lower Bound	Upper Bound	Bull Trout Caught	Lower Bound	Upper Bound	Percent Released
2004 - 2005	650 (259)	259	652	2,399(698)	*	*	72.1
2005 - 2006	371 (216)	216	373	3,595 (2,171)	2,171	3,611	89.7
2006 - 2007	180 (140)	140	181	1349 (909)	909	1,353	86.6
2007 - 2008	267 (220)	220	268	1,484 (997)	997	1,488	82.0
2008 - 2009	295 (249)	249	296	1,897 (1,358)	1,358	1,900	84.4
2009 - 2010	256(206)	206	257	1,810 (1,247)	1,247	1,815	85.8
2010 - 2011	163(138)	138	164	1,568(1,328)	1,328	1,573	89.6

*Point estimate expanded from caught vs. released bull trout from catch cards with no variance calculated

To estimate total catch at Lake Koocanusa for the 2010 - 2011 season, we calculated the mean catch rate (1.31) for anglers who returned catch cards and surveys (n = 909). The estimated total catch calculated from all catch card recipients was 1,568 bull trout (Table 3). We combined

catch information with the harvest information and we estimated that anglers released 89.6 percent of the bull trout they caught; highest since the 2005-2006 season.

We asked anglers to estimate the percent of time they fished with two lines to assess the potential impact of that change to bull trout catch and harvest. During the 2010 - 2011 season, 41.2 percent of anglers said they fished with two lines all the time, 65.8 percent responded that they fished with two lines at least some of the time; both were increases over the previous years (Table 4).

Table 4. Percent of anglers that used two lines to fish for bull trout in Lake Koocanusa through the 2010 - 2011 season.

Year	Total Number of Respondents	Percent That Fished with Two Lines at Least Some of The Time	Percent That Fished with Two Lines all of the Time	Known bull trout caught by all methods
2006	One line	0	0	909
2007	None*	--	--	997
2008	430	59.1	33.7	1,358
2009	511	64.0	38.0	1,247
2010	469	65.8	41.2	1,328

*The regulation was put into effect after the start of the 2007 season

We analyzed catch and harvest for anglers using two lines for 2010 - 2011. The respondents that acknowledged the number of lines they used accounted for 3,026 angler-days, 126 bull trout harvested and 1,076 bull trout released. Anglers that used two poles 90 percent of the time or more accounted for 59.5 percent (75) of the harvest but 71.7 percent (771) of the released bull trout in similar number of angler-days (1661 and 1365 for two line vs. one line, respectively). In other words, anglers that used two poles greater than 90 percent of the time caught 2.4 times as many bull trout at almost double the catch rate (0.51/day and 0.26/day, respectively) as those anglers that used two poles less than 90 percent of the time with about the same amount of effort. Those anglers that fished with two poles >90% of the time weren't any more likely to harvest two bull trout in a season than those that used two poles <90% of the time (14 and 11, respectively).

We also asked anglers to record lengths of bull trout harvested and released by water and zone. The following figures (Figures 2 and 3) show the length categories of bull trout harvested and released by anglers since 2004. As was typical for all years, anglers caught and released bull trout from all of the size classes but were more likely to keep larger fish. For the 2010 - 2011 season, the mean length of harvested bull trout (25.8"; range 15.0"- 34.0") was longer than the mean length of released bull trout (21.3"; range 8.0"- 40.0"). For the 2009-2001 season, the mean lengths of harvested and released bull trout was the lowest on record and the difference between mean lengths of harvested versus released bull trout (4.4") was the second highest on record (4.7 during the 2009 – 2010 season).

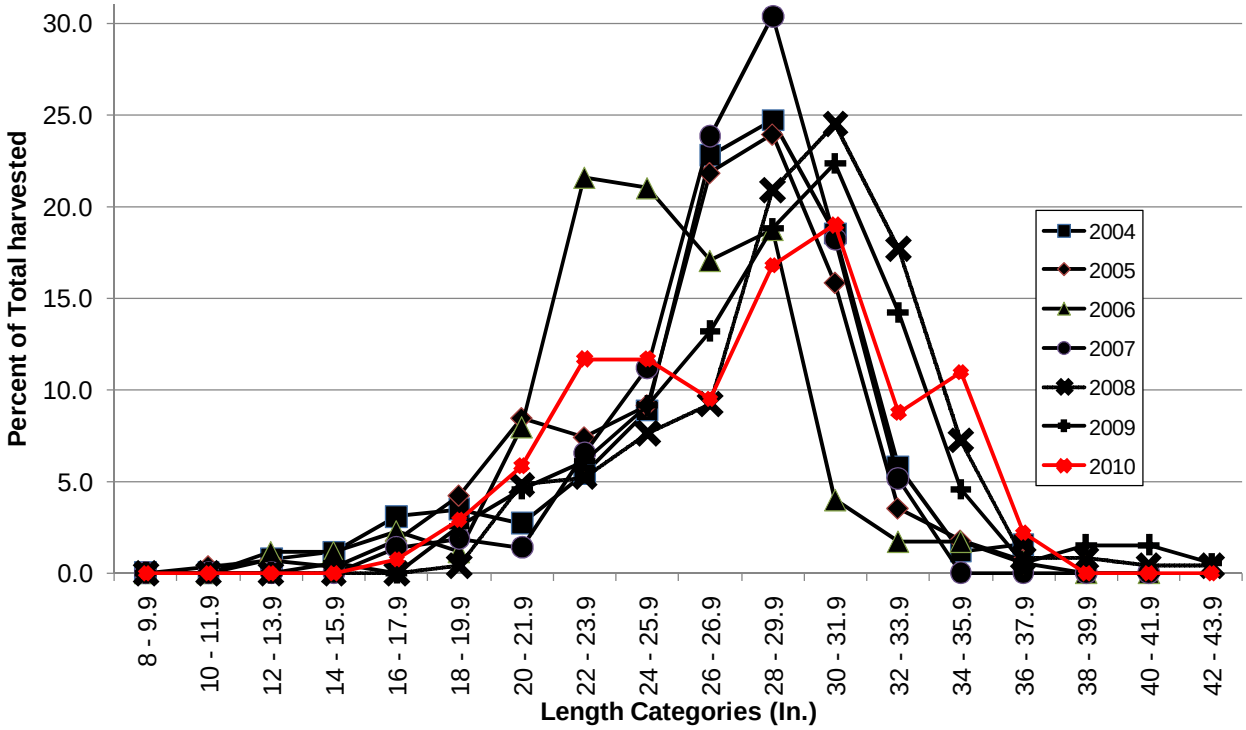

Figure 2. Lengths of bull trout harvested through the 2010 - 2011 season from Lake Koocanusa, Montana.

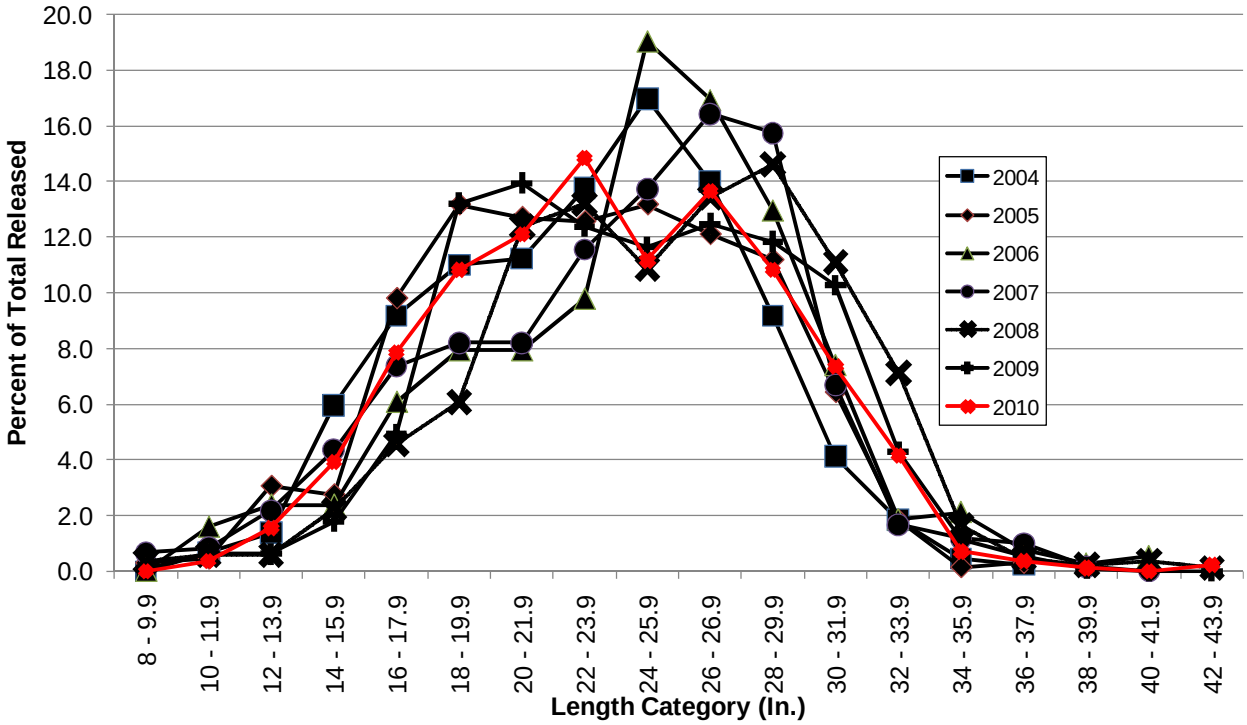

Figure 3. Lengths of bull trout caught and released through the 2010 - 2011 season from Lake Koocanusa, Montana.

There has been a downward trend for mean length of all fish caught since 2007. This trend followed the decreasing trend for redd counts for the Wigwam River during the same time period (Figure 4) it appears as though larger fish are being cropped from the population and/or fewer large bull trout are available to be caught.

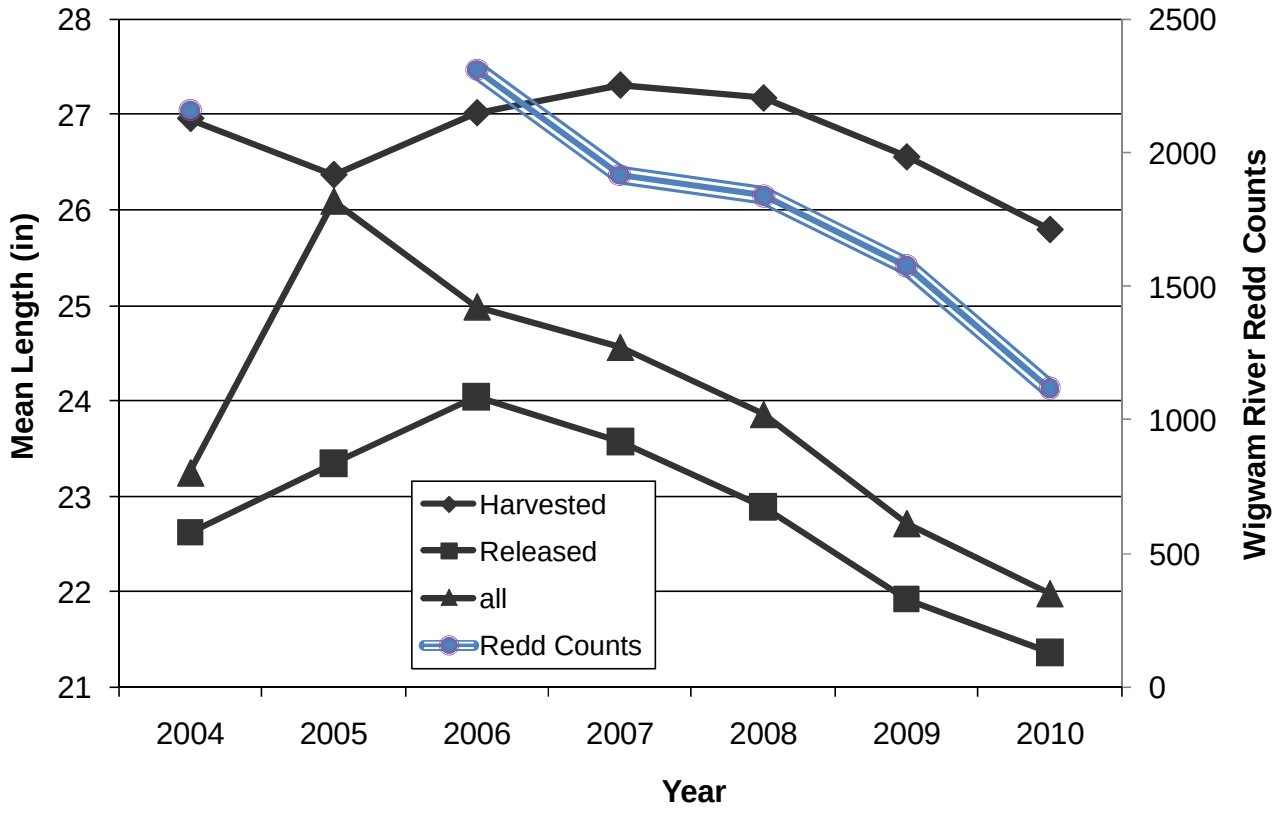

Figure 4. Mean lengths of bull trout caught and released through the 2010 - 2011 season from Lake Koocanusa, Montana and redd counts from Wigwam River B.C. Note: The 2005 released bull trout represented only 10 percent of the total catch so the mean for all fish was skewed toward the harvested mean

We also analyzed harvest by month for bull trout taken from Lake Koocanusa (Figure 5). The results were similar for all six seasons. We found that, as expected, catch rate was low during summer months and through spawning in September. Harvest on adult bull trout increased substantially as they returned to the reservoir from spawning streams. The percent of harvest in February for the 2010 - 2011 season was the lowest on record.

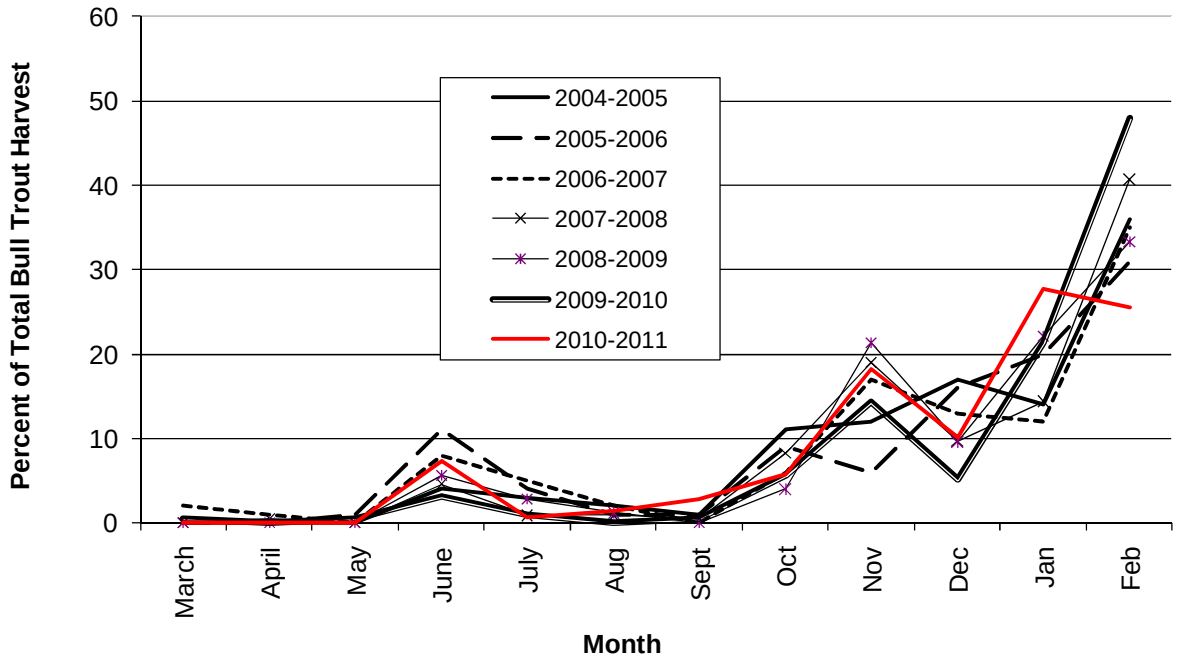

Figure 5. Percent of total harvest of bull trout by month from Lake Koocanusa through the 2010 - 2011 season.

Bull trout anglers also reported harvest by zone. During the 2010 - 2011 season, zonal harvest continued to follow a similar pattern to the previous years (Figure 6). The increased harvest in November likely coincides with increased fall fishing for trophy rainbow trout, hunting season nearing its end and the return of spawning adult bull trout and their partial recovery to better fitness. Harvest was greater in the northern zone during January but in the south during February likely because there fewer days of quality ice formed north of the Koocanusa Bridge after January that allowed for a relatively safe ice fishery. This is the first year on record that harvest decreased in the north end of the reservoir between January and February. Part of the reason is the kokanee ice fishery never started so those additional anglers that could catch bull trout weren't fishing. In addition, the condition of large bull trout caught was generally poor and more were released than other years.

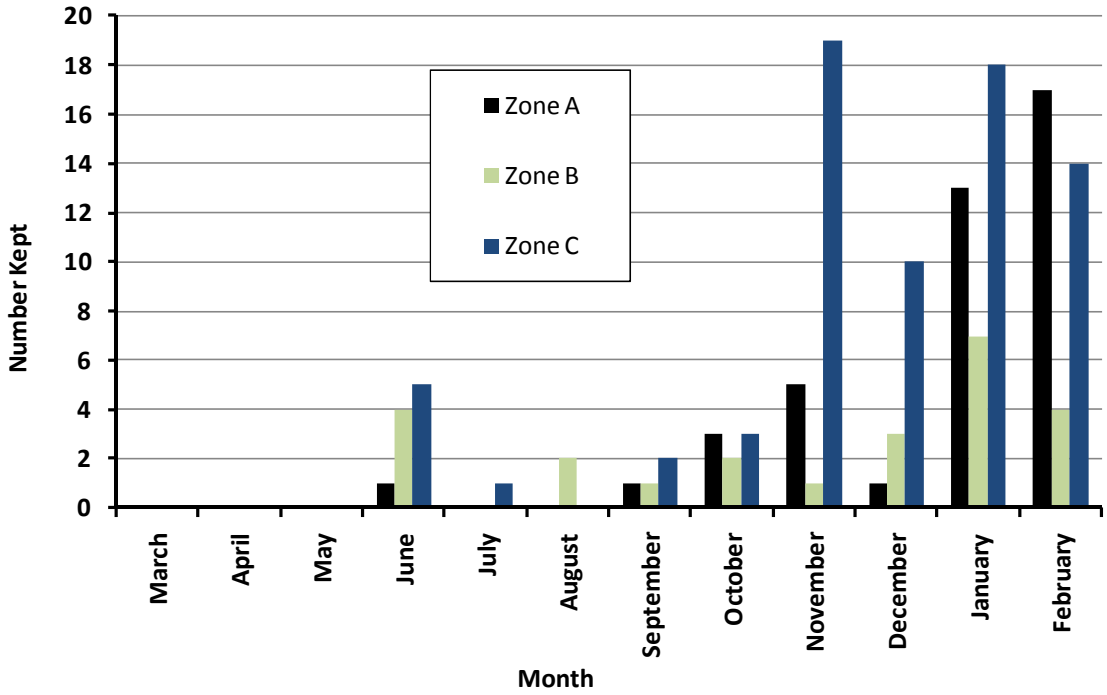

Figure 6. Bull trout harvest by zone (Zone A = Libby Dam to Tenmile Creek; Zone B = Tenmile Creek to Koocanusa Bridge; Zone C = Koocanusa Bridge to Canadian Border) from Lake Koocanusa during the 2010 - 2011 season.

Catch Card Violations

By July 6, 2011 we received 616 catch cards for the 1,072 cards issued for the Koocanusa bull trout fishery. We found technical violations on 83 cards (13.5%). This is an increase over the previous year but for the most part showed that most anglers understood the procedure for correctly filling out the catch card. The vast majority of the violations continue to be combinations of not notching card for fish kept and not signing the catch card. There were no violations for Koocanusa anglers that were considered serious. All violations were submitted to Region One enforcement division for follow-up.

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