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Angler Survey of Experimental Recreational Bull Trout Fishery for Lake Koocanusa, Montana 2009-2010.

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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 sixth year of the surveys. Out of 2,224 anglers who obtained permit/catch cards, 1,181 chose to be validated for Lake Koocanusa; just over 53 percent of all anglers validated for Lake Koocanusa. We issued fewer permits for both Koocanusa and South Fork Flathead compared to previous years but also noted an increase in the percent of anglers that said they actually fished and number of days anglers fished at Koocanusa. This was likely because Montana Fish, Wildlife & Parks adopted a regulation that anglers had to choose either Lake Koocanusa or Hungry Horse/South Fork Flathead for the 2009-2010 and anglers chose the water they were more likely to fish for bull trout. By July 1, 2010 we had received a total of 961 responses (81.3% return) for both mailings and returned catch cards.

We estimated that 256 bull trout were harvested from Lake Koocanusa during the 2009-2010 season. This was less than the previous season and still much lower than the allowed harvest (1,140) from USFWS Sub-permit TE-077533. Anglers released more than 85 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 three seasons since the two-line regulation was enacted by the Montana Legislature and made effective for the 2007-2008 season.

The mean length of harvested bull trout exceeded the mean length of released bull trout for the 2009-2010 season. This was similar to other years and likely because anglers targeted "healthier bigger" bull trout. The mean length of released bull trout was the lowest on record and the difference between mean lengths of harvested versus released bull trout (4.7") was the greatest on record for the 2009 season. Violations were similar to the previous year and two serious violations were noted for Lake Koocanusa.

INTRODUCTION

In 2009, Montana Fish, Wildlife & Parks (MFWP) personnel conducted the fifth annual angler mail survey for the recreational bull trout *Salvelinus confluentus* fishery on Lake Koocanusa initiated in 2004. This fishery was authorized under special permit by the U.S. Fish and Wildlife Service (USFWS) due to listing of bull trout as a "threatened species" under the Endangered Species Act in 1998.

BACKGROUND

Bull trout were listed as "threatened" under the Endangered Species Act in 1998. At the time of listing, sportfishing for bull trout was discontinued in Montana, except in Swan Lake because of stable populations in that system.

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 garner additional support for restoration of bull trout habitats and other management activities that will increase the distribution and abundance of 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) that they chose to fish. The 2009-2010 fishing season was the first year in which we issued had to choose either Lake Koocanusa or Hungry Horse/South Fork Flathead. We did this to improve efficiency of analysis. In addition, applicants were asked to include the previous year's catch card with the survey for the 2009-2010 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 1 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. Anglers then were required to record the information in ballpoint pen and notch out a triangle on the line for each bull trout harvested from Lake Koocanusa.

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 2009 and 2010 Montana Fishing Regulations booklets.

Completed catch cards helped to provide information on bull trout harvest, catch date, size and location for the 2009 - 2010 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 18, 2010. A follow up mailing was conducted on April 18, 2010 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 and Access. Level of significance was at 0.05 unless otherwise noted.

FINDINGS

Bull Trout Catch Cards and Survey 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, 2010 we received 57 catch cards (4.8%) from anglers that did not return surveys of the 1,181 cards issued for Lake Koocanusa.

Bull Trout Angler Mail Survey

On March 18, 2010, we mailed the initial survey to 1,181 Koocanusa anglers. The results of the initial mail survey achieved a 68.8% return rate (n=811 and 76 undeliverable) by April 1, 2010. We conducted a second mailing to non-respondents to increase our level of returns. By July 1, 2010 we had received a total of 961 responses (81.3%) for both mailings and returned catch cards and ended the survey period due to declining returns. Returned surveys were processed by July 10, 2010.

Angler Preferred Waters

We received 2,224 bull trout permit applications on which anglers declared the waters they intended to fish for bull trout during the 2009-2010 season. The anglers could get a catch card for Lake Koocanusa or South Fork Flathead (including Hungry Horse Reservoir) but not both. Total catch cards issued Lake Koocanusa were lower than the all but one other season (Table 1). The greatest percentage of anglers (53.2%) selected Lake Koocanusa. When viewing total cards by water, the number of permits issued (1,181) was down substantially from the previous year (1,702); a decrease of 30.7 percent. A similar trend existed for the South Fork Flathead (30.8 percent decrease). 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.

Angler Demographics

The vast majority of permitted bull trout anglers that fished at Lake Koocanusa were Montana residents (87%). This was similar to most other years. Anglers from fewer states (13 in 2009 compared to 22 in 2008) states were issued a catch card for Lake Koocanusa. Non-resident anglers were primarily from the states of Idaho (9.5%) and Washington (1.5%).

Table 1. Bull trout waters selected by anglers through the 2009-2010 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]
(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
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
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
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 2009-2010 season, 961 (81.3%) of the 1,181 bull trout anglers that received a catch card for Lake Koocanusa either returned catch cards or responded to the mail survey. We found that 60.0 % of the respondents indicated that they did fish for bull trout. Although numbers of cardholders that fished for bull trout decreased during the 2009-2010 season, the percent of total cardholders that fished for bull trout has increased for the Lake Koocanusa fishery since the 2006-2007 season (Figure 1). As was noted earlier, the requirement of either Lake Koocanusa or South Fork caused anglers to choose the water where they were more likely to fish.

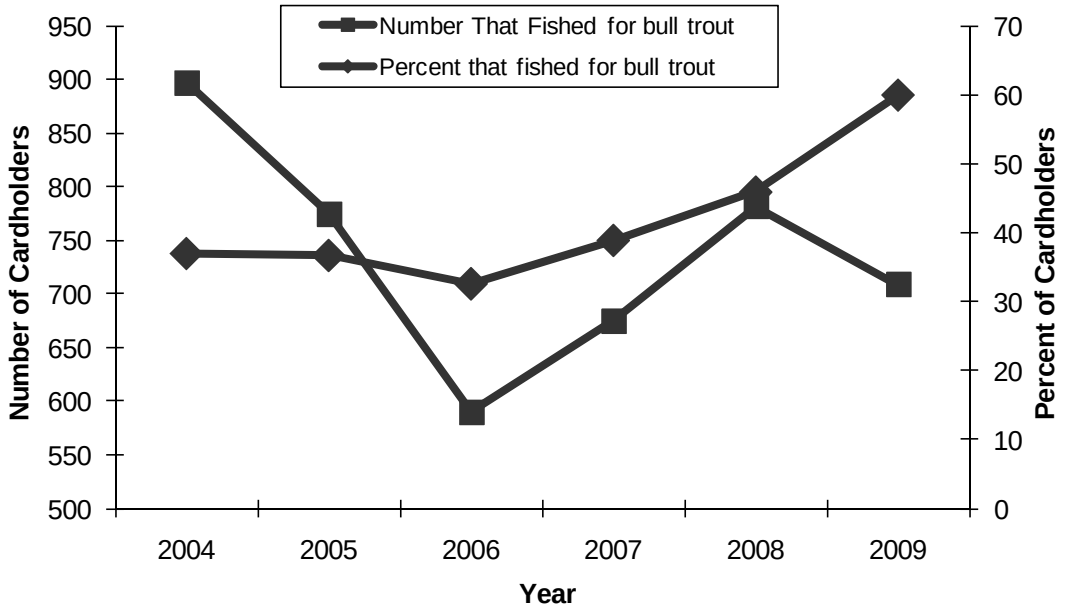

Figure 1. Estimated numbers of catch cardholders and percent of total catch cardholders that fished for bull trout at Lake Koocanusa, through the 2009-2010 season.

To estimate total number of angler-days of pressure on bull trout, we used the numbers of anglers and angler-days reported from catch cards and survey respondents who fished for bull trout. For anglers not responding to the survey we assumed the same proportion fished for bull trout with the same effort. This may overestimate angling pressure if non-fishing anglers were less likely to respond to surveys or return catch cards. Estimated days per angler (3.8) during the 2009-2010 season was highest on record (Table 2). This is not surprising because anglers that had to choose Lake Koocanusa appeared more likely to be more serious about fishing for bull trout.

Table 2. Bull trout season angling pressure estimates calculated from catch card and survey results for Lake Koocanusa through the 2009-2010 season.

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

Harvest and Catch Estimates

To estimate total harvest of bull trout for Lake Koocanusa for the 2001-2010 season, we calculated the mean harvest rate from survey and catch card returns (0.217; n=961) and expanded it to harvest for all anglers who acquired a catch card for Lake Koocanusa (Table 3). 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 the catch card and survey returns. The harvest estimate for Lake Koocanusa bull trout during the 2009-2010 season (256) was lower than the previous year (295) and substantially lower than the highest season (650 in 2004-2005). The request to return catch cards in combination with surveys continued to produce high quality results.

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

Year	Bull Trout Harvested	Lower Bound	Upper Bound	Bull Trout Caught	Lower Bound	Upper Bound
2004 - 2005	650 (259)	259	652	Not surveyed		
2005 - 2006	371 (284)	284	373	3,595 (2,174)	2,174	3,605
2006 - 2007	180 (140)	140	181	1349 (909)	909	1,353
2007 - 2008	267 (220)	220	268	1,484 (997)	997	1,488
2008 - 2009	295 (249)	249	296	1,897 (1,358)	1,358	1,900
2009 - 2010	256(206)	206	255	1,810 (1,247)	1,247	1,815

To estimate total catch at Lake Koocanusa for the 2009-2010 season, we calculated the mean catch rate (1.32) for anglers who returned catch cards and surveys (n = 961). The estimated total catch calculated from all catch card recipients was 1,810 bull trout (Table 3). We combined catch information with the harvest information and we estimated that anglers released 85.8 percent of the bull trout they caught. The percent of released bull trout was slightly higher than the previous year.

The 2007 Montana Legislature authorized the use of two lines in lakes and reservoirs. On the survey and catch cards, 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 2009-2010 season, 38.0 percent of anglers said they fished with two lines all the time, 64.0 percent responded that they fished with two lines at least some of the time. Both were increases over the previous year (Table 4). Additionally, the known number of bull trout caught was greater in the years following the regulation change. Though the regulation was put into effect (July) in 2007, most of the spawning adults had migrated out of Koocanusa to the B.C. portion of the reservoir so as expected, anglers caught fewer bull trout.

Table 4. Percent of anglers that used two lines to fish for bull trout in Lake Koocanusa through the 2009-2010 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

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

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 size of bull trout harvested and released by anglers for the past five seasons, respectively.

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 2009-2010 season, the mean length of harvested bull trout (26.6”; range 13.0”- 40.0”) was longer than the mean length of released bull trout (21.9”; range 6.0”- 37.0”). For the 2009-2001 season, the mean length of released bull trout was the lowest on record and the difference between mean lengths of harvested versus released bull trout (4.7”) was the greatest on record.

All of the years continue to show similar mean lengths of harvested versus released bull trout. There has been a downward trend for mean length of all fish caught since 2005. We will continue to monitor this trend through the succeeding seasons and compare to gillnet information and redd counts to determine if larger fish are being cropped from the population.

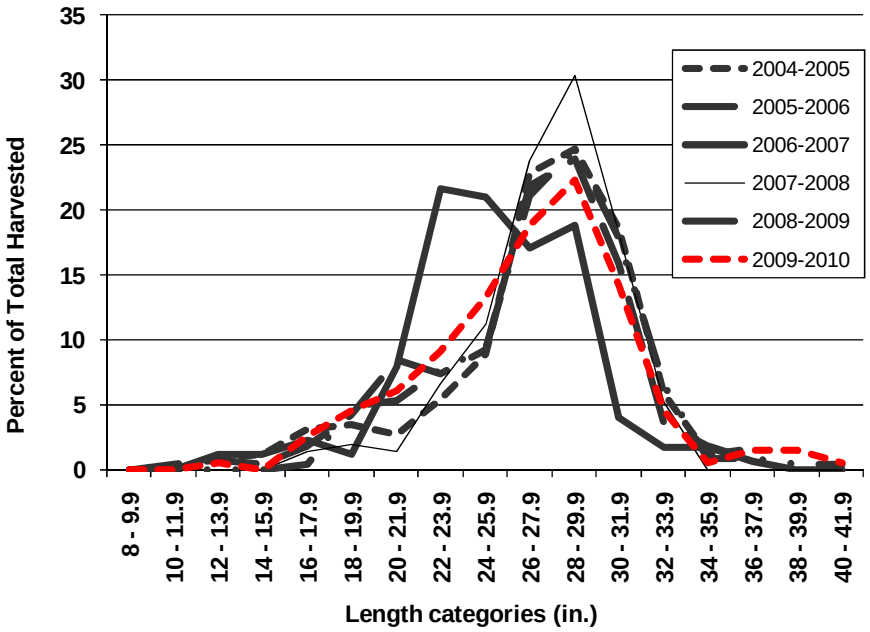

Figure 2. Lengths of bull trout harvested through the 2009-2010 season from Lake Koocanusa, Montana.

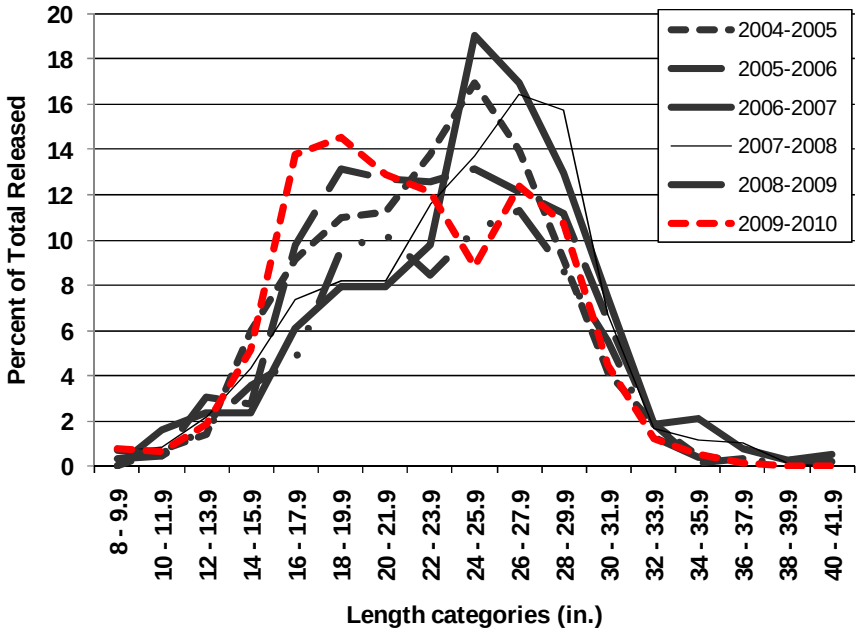

Figure 3. Lengths of bull trout caught and released through the 2009-2010 season from Lake Koocanusa, Montana.

We also analyzed harvest by month for bull trout taken from Lake Koocanusa (Figure 4). 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, though the harvest in June (opening of the harvest season) is trending lower each year. Harvest on adult bull trout increased substantially as they returned to the reservoir from spawning streams. The highest percent of harvest was in February for all years and in the 2009-2010 season, anglers kept the highest percentage of bull trout (48.0) for any year . Anglers were targeting the "healthier" bull trout (those that had recovered from spawning) to eat and consequently waited until the end of the season to harvest a bull trout.

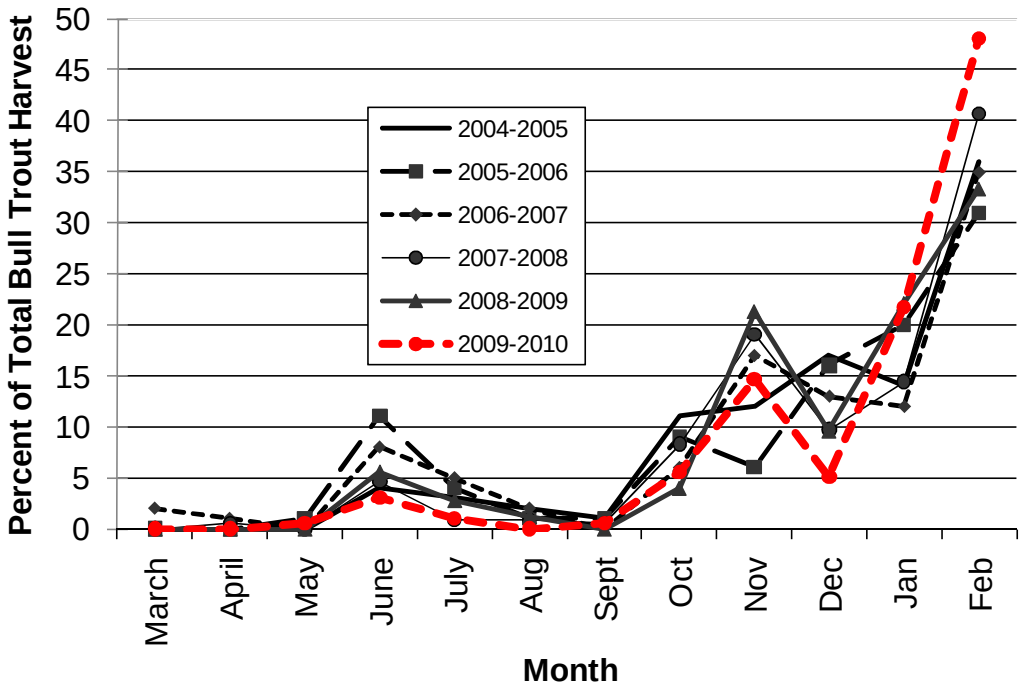

Figure 4. Percent of total harvest of bull trout by month from Lake Koocanusa through the 2009-2010 season.

Bull trout anglers also reported harvest by zone. During the 2009-2010 season, zonal harvest continued to follow a similar pattern to the previous years (Figure 5). 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 February but in the south during January likely because there was no persistent ice formed north of the Koocanusa Bridge in January that allowed for a relatively safe ice fishery. We believe that erratic weather in January and February affected increased ice-free opportunity to angle and distribution of harvested bull trout shifted to later in the season and south where the reservoir is mostly ice-free.

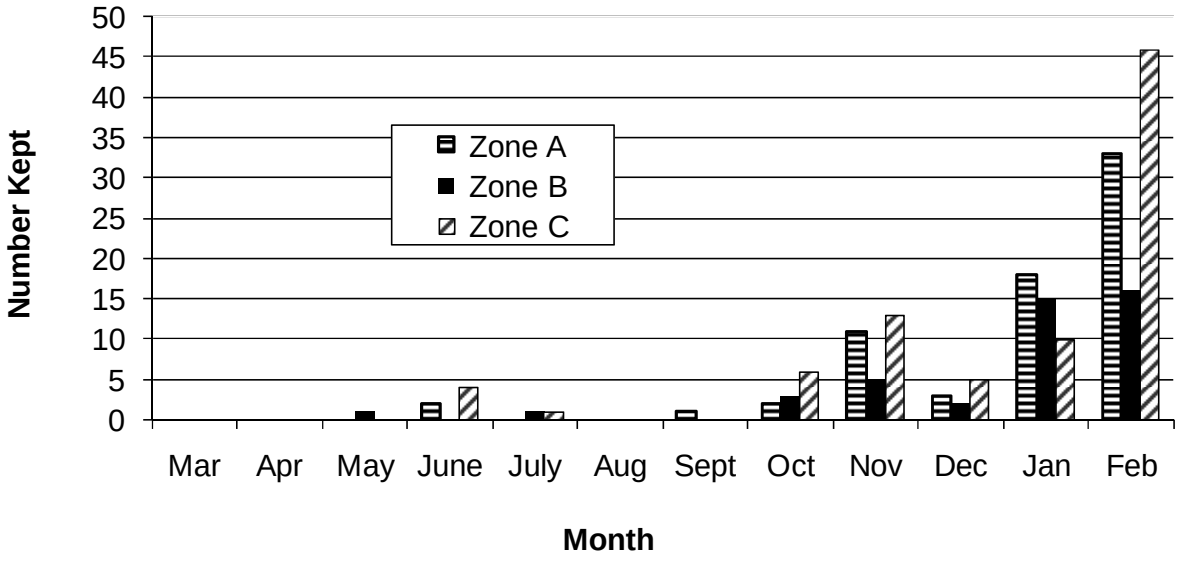

Figure 5. Bull trout harvest by zone (Zone A = Libby Dam to Tenmile Creek; Zone B = Tenmile Creek to Koocanusa Bridge; Zone C = Koocanusa Bridge to Canadian Border) from Lake Koocanusa during the 2009-2010 season.

Catch Card Violations

By July 15, 2010 we received 607 catch cards for the 1,181 cards issued for the Koocanusa bull trout fishery. We found technical violations on 54 cards (8.9%). This is a slight increase over the previous year and shows that most anglers understand the procedure for 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 two violations for Koocanusa anglers that were considered serious; one for keeping two bull trout on one day and one for harvesting during the closure. All violations were submitted to Region 1 Enforcement Division for follow-up.

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