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Angler Survey of Experimental Recreational Bull Trout Fishery for Lake Koocanusa, Montana 2008-2009.

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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. In the fifth year of the surveys, out of 2,404 who obtained permit/catch cards, 1,702 chose to be validated for Lake Koocanusa. Over 71 percent of anglers validated for Lake Koocanusa; 38 percent chose Lake Koocanusa only.

We estimated that 295 bull trout were harvested from Lake Koocanusa during the 2008-2009 season. This is greater than the previous season but still much lower than the allowed harvest (1,140) from USFWS Sub-permit TE-077533. Anglers released over 84 percent of the bull trout caught from 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. Lengths of harvested and released bull trout were very similar to other years. Anglers harvested and caught more bull trout for the two seasons since the new 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 2008-2009 season. This is similar to other years and likely because anglers targeted "healthier bigger" bull trout. Montana Fish, Wildlife & Parks adopted a new regulation that anglers must choose either Lake Koocanusa or Hungry Horse/South Fork Flathead for the 2009-2010 season to improve survey efficiency and accuracy. Violations were similar to the previous year and only one major violation was 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 2008-2009 fishing season was the second year in which we issued separate catch cards for Lake Koocanusa and Hungry Horse/South Fork Flathead. We did this to improve efficiency of analysis. In addition, applicants had to surrender the previous year's catch card or complete an affidavit containing information from the lost/misplaced catch card to secure a catch card for the 2008-2009 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. 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.

We required that upon landing a bull trout, anglers immediately release the fish or harvest and record. Anglers then recorded the information in ballpoint pen and notched out a triangle on the line for each bull trout harvested from the permitted water.

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 2008 and 2009 Montana Fishing Regulations booklets.

Completed catch cards provided information on bull trout harvest, catch date, size and location for the 2008 - 2009 season. We still do not charge a fee for catch cards or assess a penalty for failure to return cards as specified. We required the return of the previous year's catch card or affidavit as a prerequisite to receive the new catch card (2008 – 2009 will be the last season for this).

To obtain more 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 16, 2009. A follow up mailing was conducted on April 7, 2009 to anglers who had not returned surveys. Anglers were also reminded to return their catch cards.

For this report, we were concerned with an estimate of bull trout 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

Catch card instructions required anglers to return the catch cards after their license expired or when they were done fishing for bull trout. Once again, anglers were 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 (this was the last year for the requirement. By June 15, 2009 we received 1,077 catch cards or affidavits for the 1,702 cards issued for Lake Koocanusa (63.3% return).

Bull Trout Angler Mail Survey

On March 9, 2009, we mailed the initial survey to 1,702 Koocanusa anglers. The results of the initial mail survey achieved a 56.1% return rate (n=954 and 50 undeliverable) by April 1, 2009. On April 7, 2009 we conducted a second mailing to non-respondents to increase our level of returns. By June 1, 2009 we had received a total of 1,447 responses (85.0% return) for both mailings and returned catch cards and ended the survey period due to declining returns. Returned surveys were processed by June 10, 2009.

Angler Preferred Waters

We received 2,404 bull trout permit applications on which anglers declared the waters they intended to fish for bull trout during the 2008-2009 season. The anglers could get a catch card for Lake Koocanusa or South Fork Flathead (including Hungry Horse Reservoir) or both. Total numbers of catch cards issued were slightly greater than the previous two seasons (Table 1).

Table 1. Bull trout waters selected by anglers from bull trout permit applications through the 2008-2009 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
(HHR, SFF, LK)*	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
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
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
Total Validations 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.

For the first time, the greatest percentage of anglers (38%) selected Lake Koocanusa only. Another 33% of anglers selected both drainages. When viewing total cards by water, 71% of the anglers (1,702) applied for a catch card for Lake Koocanusa.

Angler Demographics

The vast majority of permitted bull trout anglers that fished at Lake Koocanusa were Montana residents (89%). This was similar to most other years. Anglers from 22 states and two provinces validated for Lake Koocanusa during the 2008-2009 season. Non-resident anglers were primarily from the states of Idaho (5%) and Washington (2%).

Fishing Pressure Estimates

For the 2008-2009 season, 1,447 (85.0%) of the 1,702 bull trout anglers that received a catch card for Lake Koocanusa either returned catch cards or responded to the mail survey. We found that 46.0 % of the respondents indicated that they did fish for bull trout. Both numbers of cardholders that fished for bull trout and the percent of total cardholders that fished for bull trout have increased for the Lake Koocanusa fishery since the 2006-2007 season (Figure 1).

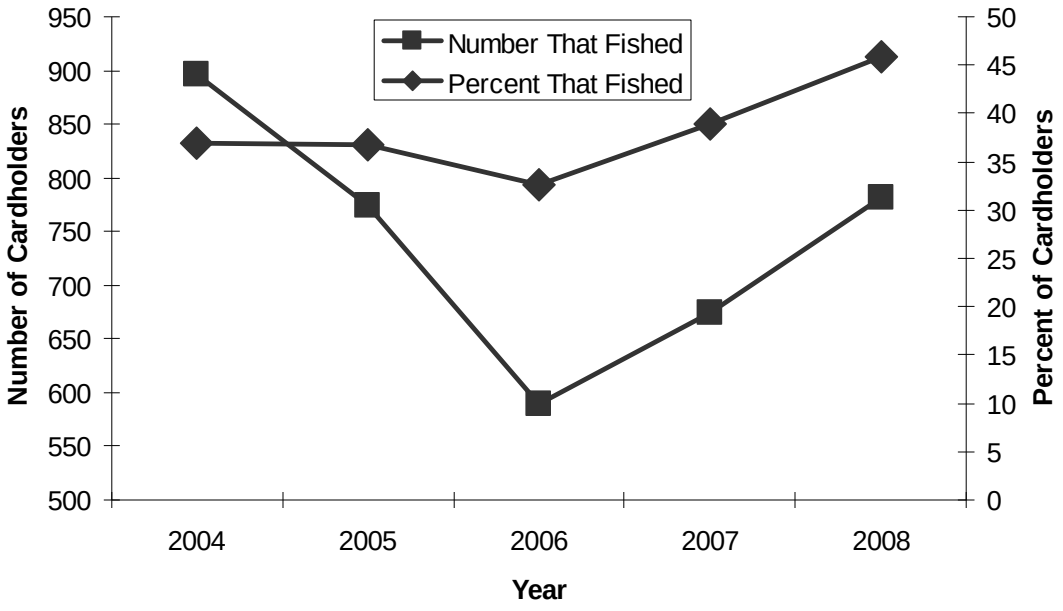

Figure 1. Estimated numbers of catch cardholders and percent of total catch cardholders that fished for bull trout at Lake Koocanusa, through the 2008-2009 season.

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 (2.7) during the 2008-2009 season was highest on record (Table 2). Since 2005, pressure has been between 1.4 and 2.7 days fished per card recipient.

Table 2. Bull trout season angling pressure estimates calculated from catch card and survey results for Lake Koocanusa through the 2007-2008 season.

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

Harvest and Catch Estimates

To estimate total harvest of bull trout for Lake Koocanusa for the 2008-2009 season, we calculated the mean harvest rate (0.173; n=1,447) 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 2008 - 2009 season (295) was higher than the previous year (267) but substantially lower than the highest season (650 in 2004-2005). The requirement 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 2007-2008 season.

Year	Bull Trout Harvested	Lower Bound	Upper Bound	Bull Trout Caught	Lower Bound	Upper Bound
2004 - 2005	650 (259)	259	652	Not accomplished		
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

To estimate total catch at Lake Koocanusa for the 2008-2009 season, we calculated the mean catch rate (0.941) for anglers who returned catch cards and surveys (n = 1,447). The estimated total catch calculated from all catch card recipients was 1,897 bull trout (Table 3). We combined catch information with the harvest information and we estimated that anglers released 84.4 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 estimate the potential impact of that change to bull trout catch and harvest. Of 430 respondents, 33.7 percent (145) said they fish with two lines all the time, 59.1 percent (254) responded that they fish with two lines at least some of the time.

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 2008-2009 season, the mean length of harvested bull trout (27.0"; range 16" - 36.5") was longer than the mean length of released bull trout (24.1"; range 10" - 40.5"). For the 2004-2005 season, the mean length of harvested bull trout (27.0"; range 13" to 37.5") was longer than the mean length of released bull trout (22.6"; range 10" – 37.5"). For the 2005-2006 season, the mean length of harvested bull trout (26.4"; range 10.5" to 37") was longer than the mean length of released bull trout (22.6"; range 9.0" – 36.0"). For the 2006-2007 season, the mean length of harvested bull trout (27.0"; range 16" - 36.5") was longer than the mean length of released bull trout (24.1"; range 10" - 40.5"). For the 2007-2008 season the mean length of harvested bull trout (27.3"; range 16" – 33") was longer than the mean length of released bull trout (23.6"; range 8" – 38"). All of the years showed similar mean lengths of harvested versus released bull trout. We will continue to monitor this through the succeeding seasons and compare to future gillnet information to determine if larger fish are being been cropped from the population.

We also analyzed harvest by month for bull trout taken from Lake Koocanusa (Figure 4). The results were similar for all four years. 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 highest percent of harvest was in February for all years. Anglers suggested that they 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. It is possible that the higher spike in November of 2008 could have been related to increased number of anglers that used two lines while angling for bull trout and large rainbow trout.

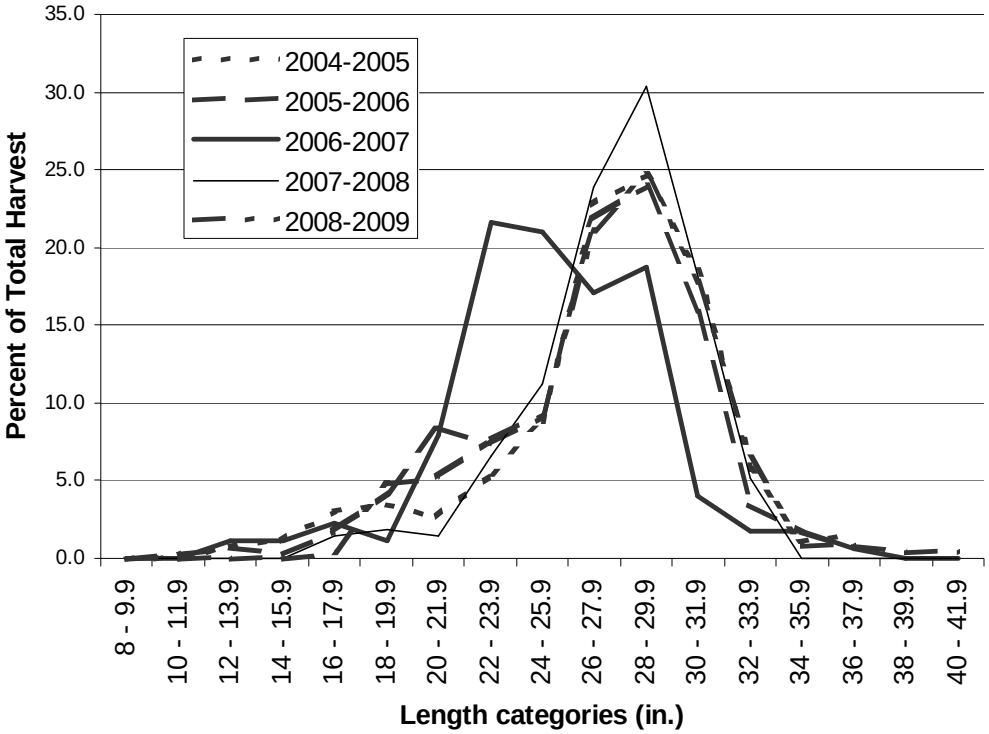

Figure 2. Lengths of bull trout harvested through the 2008-2009 season from Lake Koocanusa, Montana.

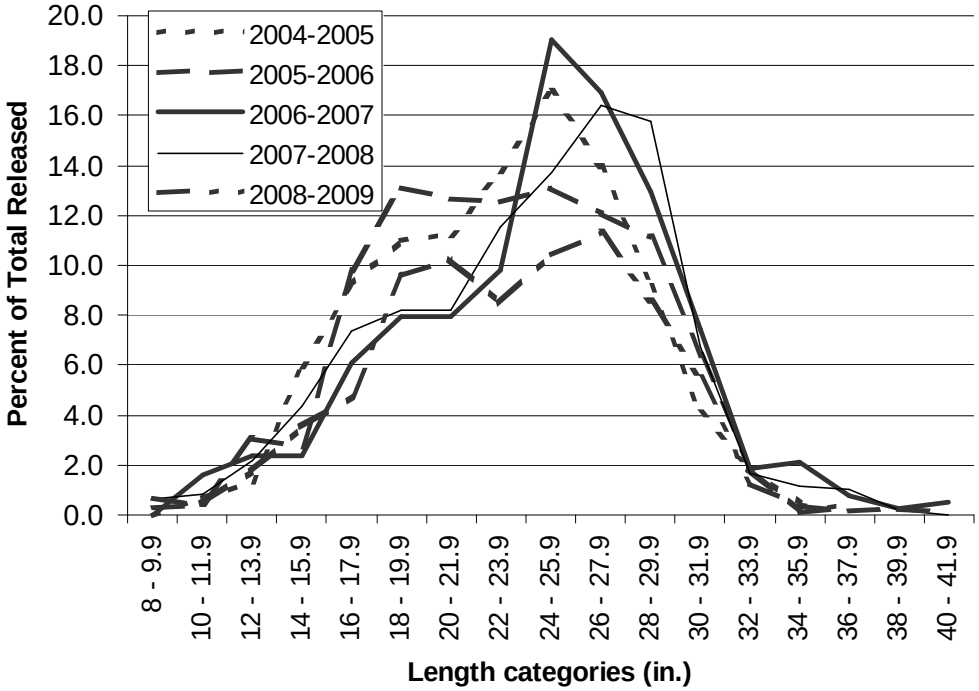

Figure 3. Lengths of bull trout caught and released through the 2008-2009 season from Lake Koocanusa, Montana.

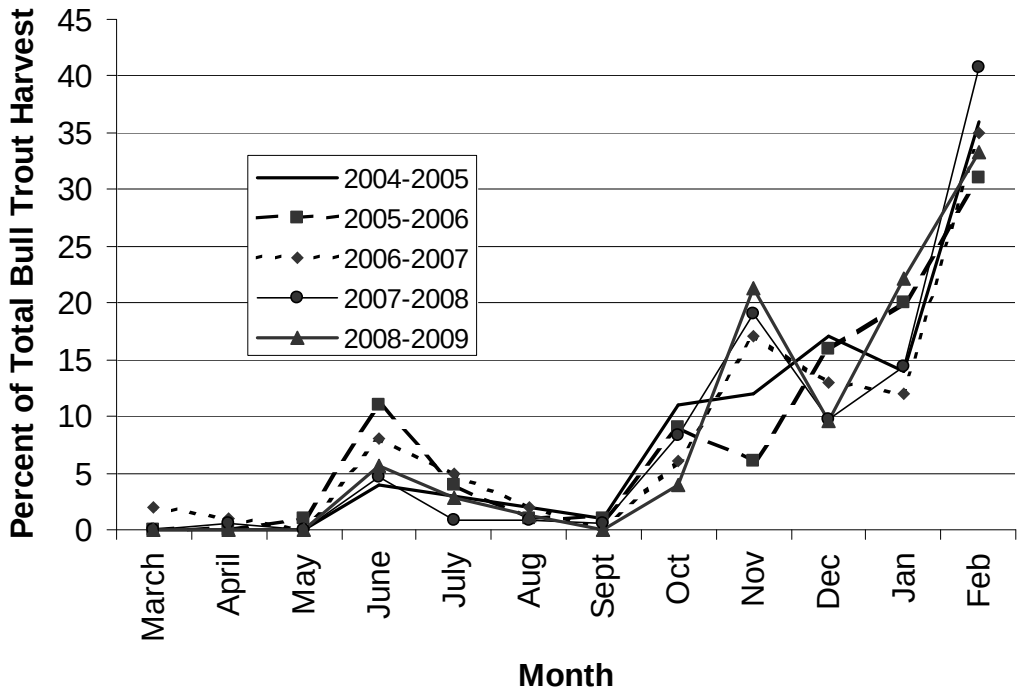

Figure 4. Percent of total harvest of bull trout by month from Lake Koocanusa through the 2008-2009 season.

Bull trout anglers again reported harvest by zone. During the 2008-2009 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. Harvest was greater in the northern zone during January and February likely because persistent ice formed north of the Koocanusa Bridge and allowed for a relatively safe ice fishery. During the 2004-2005 season, anglers caught the majority of bull trout in the southern zone of Koocanusa and the highest over-all bull trout harvest also occurred during the December to February period (177) followed next by the September to November period (59). We know that mild weather in January and February allowed increased ice-free opportunity to angle and a substantial number of bull trout were harvested during that time. During the 2005-2006 season, angling pressure shifted to the northern end of the reservoir for all months and harvest was greatest between December and February. During the 2006-2007 season, zonal harvest continued to follow a similar pattern, although harvest was greater in the southern and mid zones of Lake Koocanusa during February likely because persistent but treacherous ice formed north of the Koocanusa Bridge. During the 2007-2008 season, zonal harvest continued to follow a similar pattern to the previous two years.

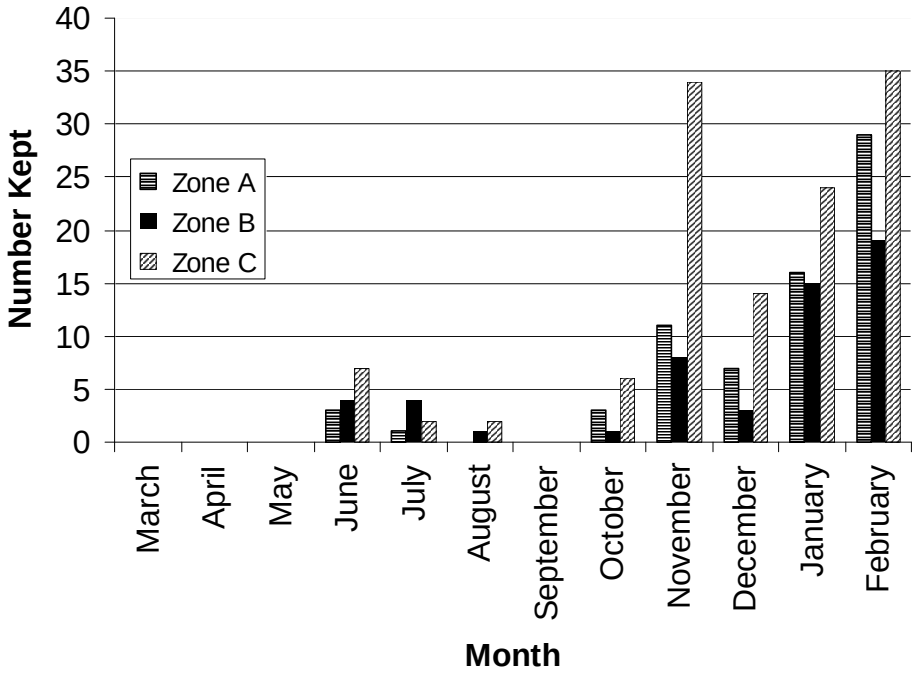

Figure 5. Bull trout harvest by zone (Zone A = Libby Dam to Tenmile Creek; Zone B = Tenmile Creek to Koocanusa Bridge; Zone C = Koocanusa Bridge to Canadian Border) from Lake Koocanusa during the 2008-2009 season.

Catch Card Violations

By June 15, 2009 we received 1,077 catch cards or affidavits for the 1,702 cards issued for the Koocanusa bull trout fishery. We found technical violations on 92 cards (8.5%). This is an increase of about two percent from 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 was one serious violation for Koocanusa anglers; that was for keeping two bull trout on one day. All violations were submitted to Region 1 Enforcement Division for follow-up and again, letters were submitted to those with technical violations.

DISCUSSION

Once again we observed considerable similarities among the years. We again received numerous comments from anglers who appreciated this opportunity to fish for bull trout. The catch rates and size distribution of fish caught were not substantially different between the last two years.

The continued high release rate (84.4%) also reflects the conservative harvest rate of anglers. The harvest estimate for Lake Koocanusa during the 2008 - 2009 season (295) was greater than the estimate for 2007 - 2008 but still much lower than the allowed harvest of 1,140 noted in the USFWS Sub-permit TE-077533 (Rumsey et al. 2005). The distribution of bull trout harvest was focused on the middle and northern parts of the reservoir again in 2008 – 2009 because persistent ice supported a relatively safe ice fishery. The current trend of relatively low harvest suggests a conservative attitude by anglers and a management strategy that currently works well for this fishery.

Of 430 anglers that responded about use of two lines in Koocanusa, 33.7 percent (145) said they fished with two lines all the time, 59.1 percent (254) responded that they fished with two lines at least some of the time. Anglers harvested and caught more bull trout for the two seasons since the Montana Legislature enacted the new two-line regulation and made effective for the 2007-2008 season.

The Montana Fish, Wildlife & Parks Commission adopted a new regulation that anglers must choose to fish for bull trout at either Lake Koocanusa or Hungry Horse Reservoir/South Fork Flathead River for the 2009-2010 season and beyond. This will continue to refine our ability to complete quality surveying. A modest fee for the permit would tend to eliminate anglers not serious about the fishery and help with the cost of administration of this program.

We found a much lower percent of returned catch cards contained technical violations from the previous seasons. Additionally, only 1 of the 92 violations was considered serious. Most violations should be correctable and it appears that anglers are better understanding the process now. As noted above, the format for the catch cards should be changed slightly from previous years to help anglers report better quality harvest or catch/release information.

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