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Angler Survey of Experimental Recreational Bull Trout Fishery for Lake Koocanusa, Montana 2006-2007.

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SUMMARY

In 2004 the U.S. Fish and Wildlife Service authorized limited sport fishing for bull trout (*Salvelinus confluentus*) on Hungry Horse Reservoir, South Fork Flathead River and Lake Koocanusa as requested by Montana Fish, Wildlife and Parks. 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 third year of the surveys, over 1,800 anglers secured permits that included a validation to fish for bull trout at Lake Koocanusa, that is 82 percent of all the validations for the region.

We estimated that 180 bull trout were harvested from the reservoir during the 2006-2007season. This is lower than the previous season (371) and much lower than the allowed harvest (1,140) from USFWS Sub-permit TE-077533. We think that separating the catch cards by basin will give a better estimate in 2008. 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 relatively mild winter allowing boat access south of the Koocanusa Bridge. Lengths of harvested fish from the reservoir were very similar through all seasons.

On average, anglers harvested larger fish than they released through the year, although the mean length of released bull trout exceeded the mean length of harvested bull trout from October through February. This may be because anglers were targeting "healthier" juvenile and non-spawning bull trout. We proposed return of catch cards as prerequisite to secure a new catch card and have created two separate catch cards for the South Fork Flathead and Koocanusa to improve accuracy of surveys. Violations were mostly minor again.

INTRODUCTION

Montana Fish, Wildlife & Parks personnel conducted an 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 continued in Montana only in Swan Lake because of stable populations.

The USFWS authorized an experimental sport fishery for bull trout on Hungry Horse Reservoir, South Fork Flathead River and Lake Koocanusa once those fisheries were deemed to have reached recovery levels. This activity was intended to benefit the species by measuring the effects of restoring recreational fishing and by increasing public support for management of stable bull trout populations in the identified water bodies and support for restoration of bull trout habitat and for other management activities that will increase the distribution and abundance of bull trout populations throughout the state.

METHODS

Conditions of USFWS special permit (TE-077533) for 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 of developing a catch card harvest authorization involved creating an application for anglers who wanted to fish for bull trout. We made the form available through the Region One 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. All applications had to be submitted to the Region 1 FWP office in Kalispell to ensure consistent, high-quality information from participating anglers. 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 Hungry Horse Reservoir (HHR), South Fork Flathead River (SFF) and Lake Koocanusa (LK). The cards required entry of the catch zone, fish length, month and day of catch for each fish harvested in HHR and LK and for each fish caught and released in SFF.

Anglers are required upon landing a bull trout to immediately release the fish or harvest and record it if legal. Anglers were required to record the information in ballpoint pen and notch out a triangle on the line for each fish immediately upon harvesting a bull trout from the permitted water.

We sent or gave bull trout anglers a bull trout regulations and 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 2005 Montana Fishing Regulations booklet.

Catch cards alone provide information on bull trout harvest, catch date, size and location. However, in their present form they do not provide an estimate of pressure. There still is no fee for catch cards or a penalty for failure to return cards as specified (for 2008, we propose to require the return of the previous year's catch card as a prerequisite to receive the new catch card). Because catch card returns were not required and returns were very slow, we felt we could obtain more thorough, accurate and timely estimates by conducting a mail survey of all anglers with catch cards. The survey asked for additional information including whether the angler fished for bull trout or not and the number of days fished per validated water. The survey also requested specific catch card information pertaining to harvested or released fish by date, zone and size of fish. Surveys were initially mailed to anglers with current catch cards on March 8, 2007 with postage-paid return envelopes.

Harvest Parameters

We were most concerned with an estimate of caught and kept bull trout for Lake Koocanusa. We used the survey in combination with catch card returns to estimate the total number of bull trout kept. We estimated harvest by combining survey data and catch card information. All estimates and graphs were generated in Excel and Access. Level of significance was at 0.01 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 catch card or sign an affidavit attesting to information on a lost catch card before receiving a catch card for the current season. We also reminded anglers through the media to return their cards. By July 15, 2007 we received 1,156 catch cards or affidavits for the 1,809 cards issued (63.9% return).

Bull Trout Angler Mail Survey

We mailed the initial survey to 2,209 anglers with catch cards on March 8, 2007. The results of the initial mail survey achieved a 64.5% return rate (n=1,299 and 176 undeliverable) by May 1, 2007. On May 8, we conducted a second survey reminder mailing to non-respondents to increase our level of returns. By June 16, 2007 we had received a total of 1,683 responses (83.5% return) for both mailings and ended the survey period due to declining returns. Returned surveys were processed by July 20, 2007.

Angler Preferred Waters

On the bull trout permit application, and subsequently on the catch card, 2,209 anglers declared the waters at which they intended to fish for bull trout during the 2006-2007 season. These anglers had seven possible combinations of waters to fish. Total validations were again down from the previous seasons (Table 1).

Table 1. Bull trout waters selected by anglers from bull trout permit applications through the 2006-2007 season.

Waters Selected	Number Selected 2004	Percent of total 2004	Number Selected 2005	Percent of Total 2005	Number Selected 2006	Percent of Total 2006
All Three (HHR, SFF, LK)*	1,200	42	1,034	41	846	39
LK Only	1,040	37	911	36	768	35
HHR Only	125	4	103	4	76	3
SFF Only	95	3	115	4	154	7
HHR and SFF	215	8	194	8	170	7
LK and SFF	36	1	19	1	11	1
HHR and LK	147	5	146	6	184	8
Total Cards Issued	2,858	100	2,522	100	2,209	100
Total Validations that included LK	2,423	85	2,110	84	1809	82

* HHR = Hungry Horse Reservoir, SFF = South Fork Flathead River, LK = Lake Koocanusa

As in the previous two seasons, the majority of anglers (39%) selected all three waters to fish. Another 35% of anglers selected Lake Koocanusa only, with the remaining five combinations of waters receiving less than 10 percent each. When viewing total cards by water, 82% of the anglers (1,809) included a validation for Lake Koocanusa.

Angler Demographics

The vast majority of permitted bull trout anglers on Lake Koocanusa were Montana residents (89%). This was down from 90 percent in 2004-2005. Anglers from 29 states and two provinces validated for Lake Koocanusa during the 2006-2007 season. Non-resident anglers were primarily from the states of Idaho (4%) and Washington (2%).

Fishing Pressure Estimates

To estimate total bull trout pressure, we used the number of anglers and angler days reported by 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 pressure estimates if nonfishing anglers are less likely to respond. We noted that fewer anglers are fishing more days (Table 2).

Table 2. Bull trout season pressure estimates extrapolated from angler survey results for Lake Koocanusa through the 2006-2007 seasons.

Number Angler-Days Fishing Pressure			
	2004 - 2005	2005 -2006	2006-2007
Result from survey	1,685	3,285	2,639
Estimated Total	3,483	4,874	3,390

Total Bull Trout Catch and Harvest Estimates

To derive a total harvest estimate for Lake Koocanusa, we had to derive the harvest rate (0.10) for Koocanusa anglers who returned surveys (n = 1,407). Using that harvest rate, we calculated the mean harvest rate from all anglers who validated for Koocanusa. We assumed that anglers that did not return surveys continued to fish and harvested bull trout at the same rate as the survey returns (Table 3). The harvest estimate for Lake Koocanusa bull trout during the 2006 - 2007 season (180) was lower than the previous year (371) and substantially lower than the 2004 - 2005 season (650). This is not surprising since total validations and angler-days was also down substantially from the previous year.

Table 3. Estimated bull trout harvest (known harvest) for Lake Koocanusa through the 2006-2007 season.

Estimated Harvest	Bull Trout Harvested	Lower Bound	Upper Bound
2004 –2005	650 (259)	560	740
2005 – 2006	371 (284)	341	401
2006 - 2007	180 (140)	163	198

We also derived the total catch similarly from the surveys. The catch rate for anglers that returned surveys was 0.65. The estimated total catch calculated from all catch card recipients was 1,170 (+/- 160). With that information we estimated 84.6 percent of bull trout caught were then released. The percent of released bull trout was slightly lower than the previous year (89.7).

From the survey and catch cards, we asked anglers to record lengths of bull trout caught, harvested and released by water and zone. The length frequency histograms for the two seasons at Lake Koocanusa (Figure 1) show the size of bull trout caught, released or harvested by anglers.

Anglers caught and released bull trout from all of the size classes but were more likely to keep larger fish. In the previous two seasons, the majority of the bull trout kept were between 26 and 30 inches. These fish were typically between 6 and 12 pounds. In the 2006-2007 season, the majority of the bull trout kept were between 24 and 28 inches, although the mean lengths of harvested fish remained similar. We will monitor this change through the next season and compare to future gillnet information to determine if this is a function of larger fish having been cropped from the population.

We then separated length of released versus harvested bull trout by month (Figure 2). For the first year, we found that anglers generally kept smaller bull trout and released larger fish. 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”) which was similar to previous years though the mean length of released fish was substantially longer than previous years. Additionally, this was the first year that anglers generally released larger fish than they kept during October through February. Anglers suggested that they were targeting the “healthier” (juvenile and non-spawning) bull trout to eat.

Finally, we separated harvest by month (Figure 3). The results were very similar for all three 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 from spawning to the reservoir. The highest percent of harvest was in February by boat anglers during the mild winters all three years.

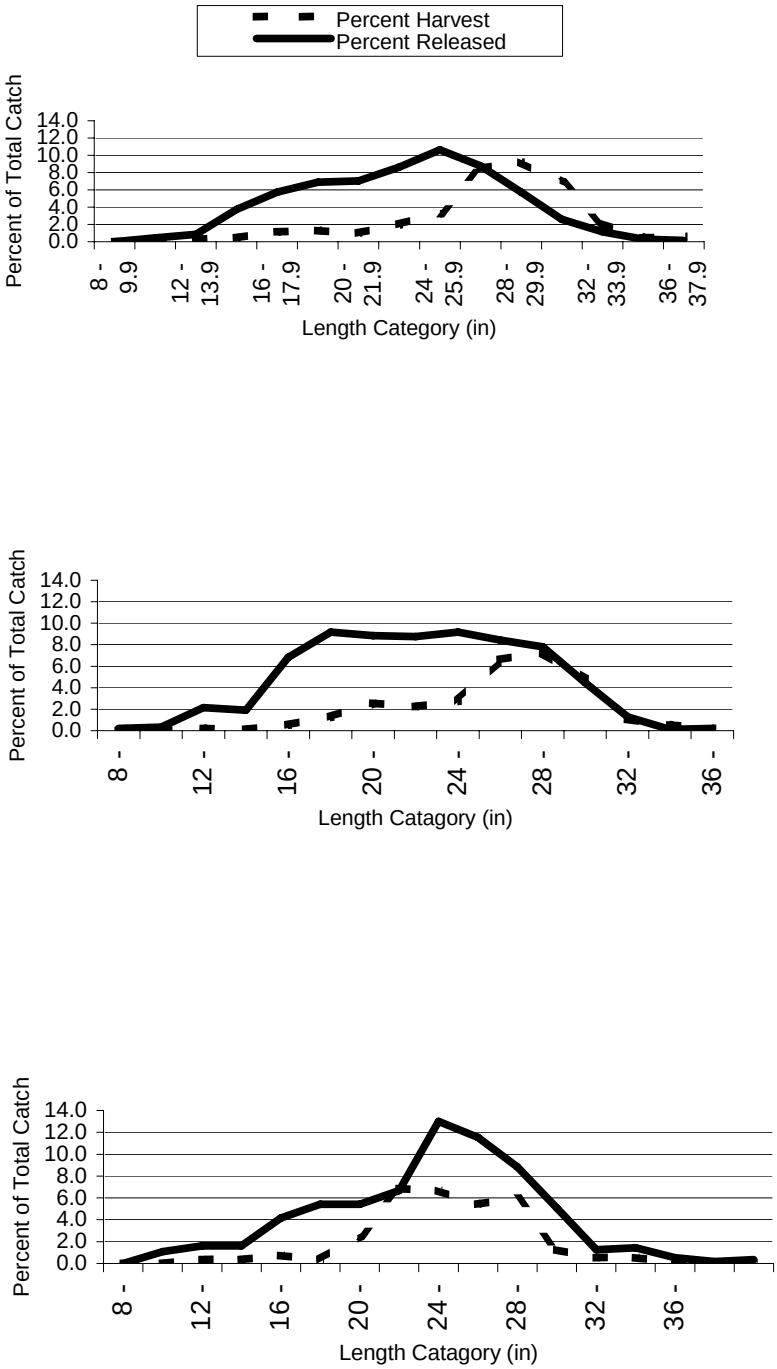

Figure 1. Length of bull trout harvested and released for the 2004-2005 (top), 2005-2006 (middle) and 2006-2007 (bottom) seasons in Lake Koocanusa

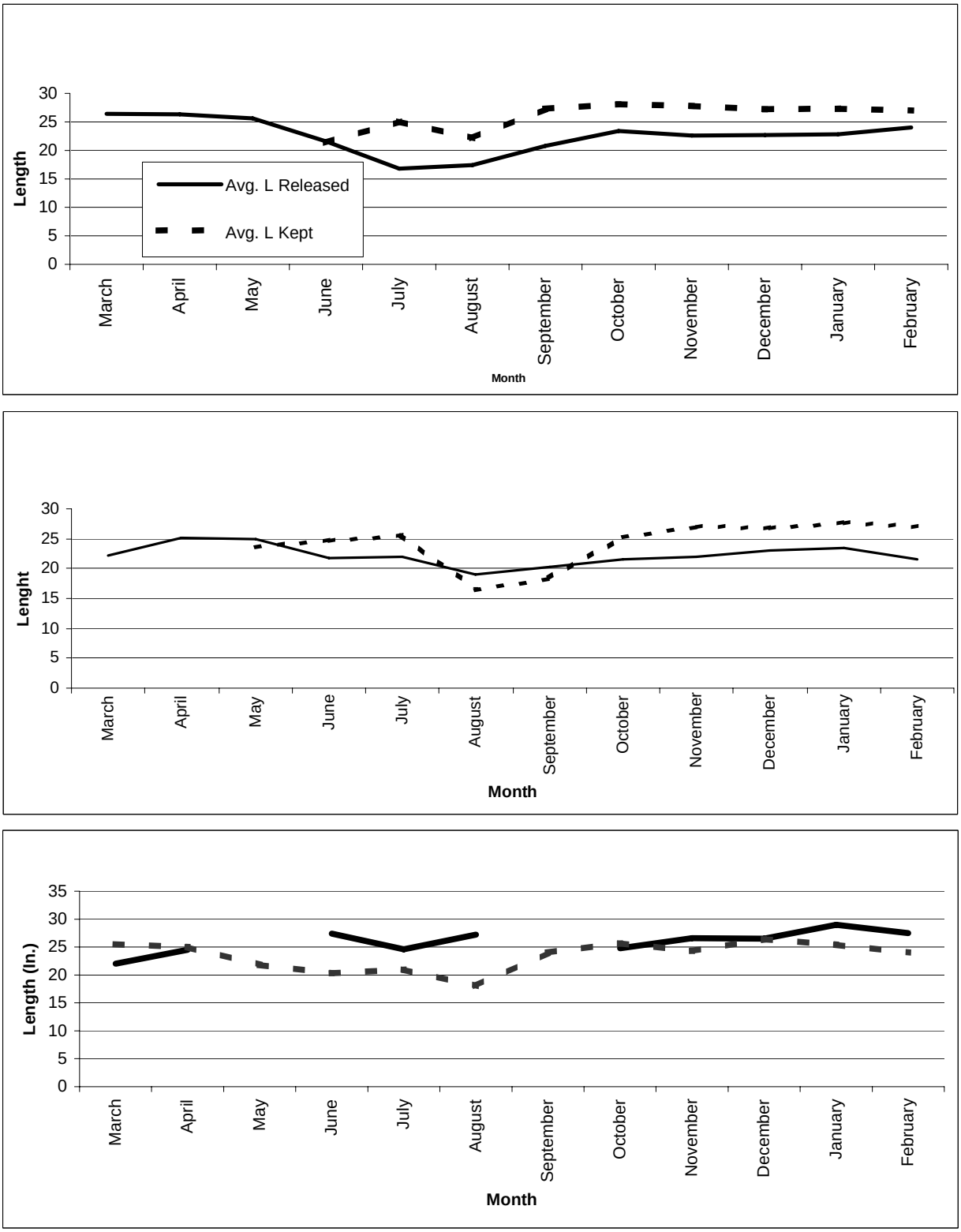

Figure 2. Monthly mean length of bull trout harvested and released from Lake Koocanusa 2004-2005 (top), 2005-2006 (middle) and 2006-2007 (bottom) seasons.

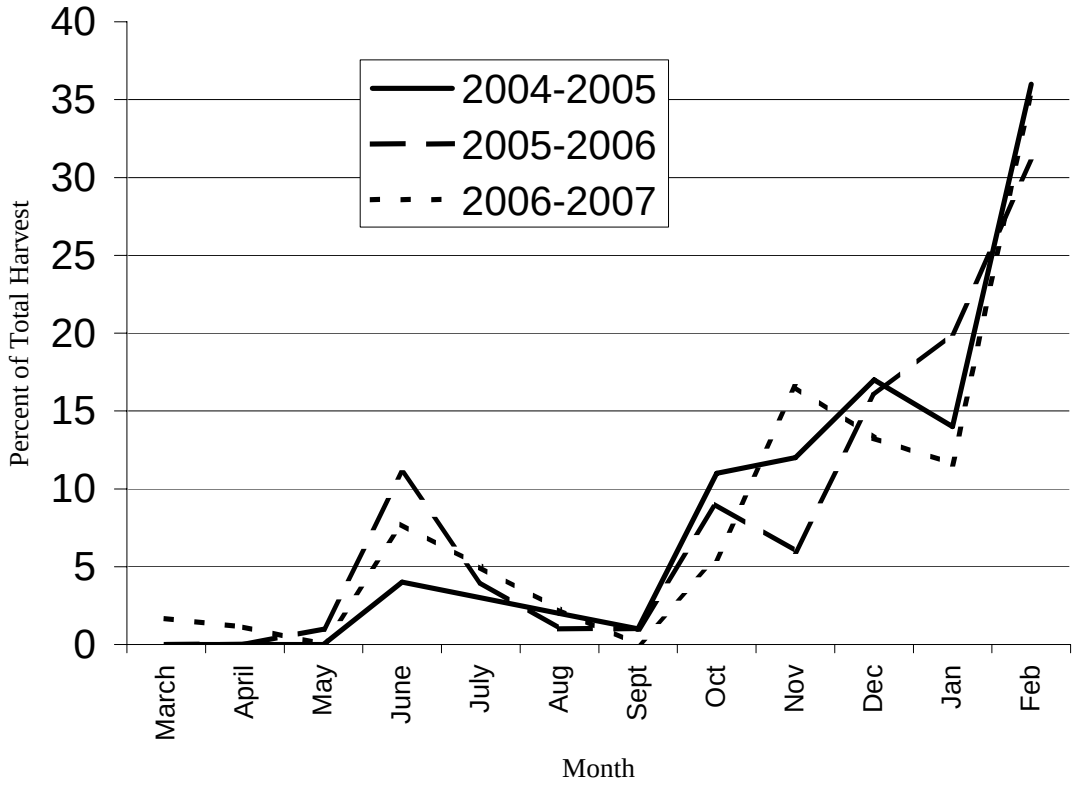

Figure 3. Percent of harvested bull trout by month from Lake Koocanusa bull trout angler creel survey and catch card data through the 2006-2007 season.

Bull trout anglers again reported harvest by zone (Figure 4). In the 2004-2005 season, anglers caught the majority of bull trout in the southern zone "A" 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). Again, 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. In 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. For the 2006-2007 season, zonal harvest continued to follow a similar pattern, although harvest was greater in zones A (Libby Dam to Tenmile) and B (Tenmile to Koocanusa bridge) during February likely because persistent but treacherous ice formed north of the Koocanusa Bridge.

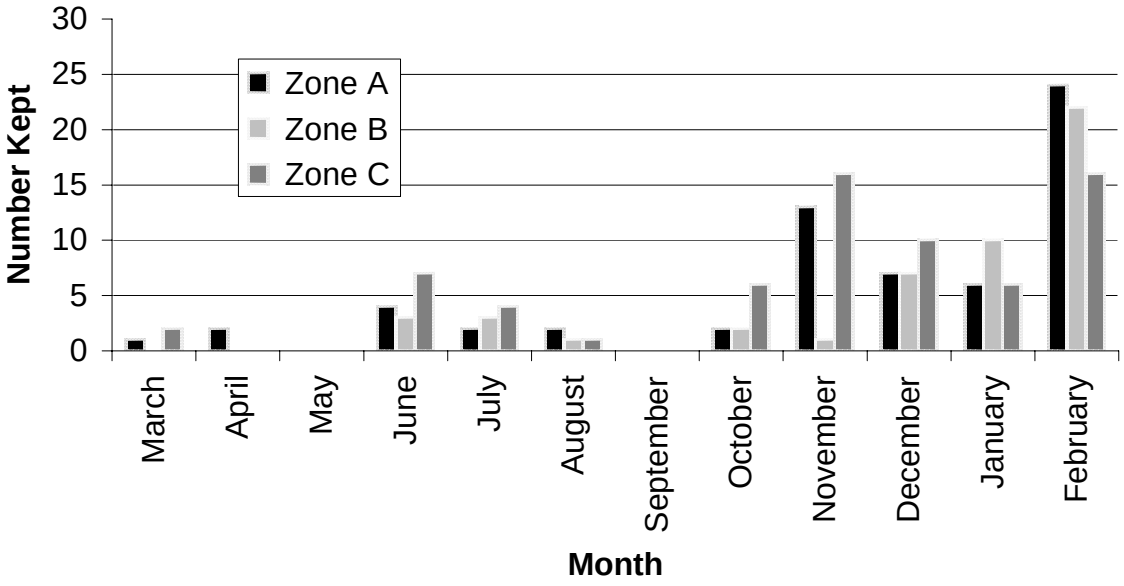

Figure 4. Bull trout harvest by zone (Zone A = Libby Dam to Tenmile Creek; Zone B = Tenmile Creek to Koocanusa Bridge; Zone C = Koocanusa Bridge to Canadian Border) from angler survey and catch cards for Lake Koocanusa, 2006 - 2007.

Catch Card Violations

A total of 1,156 catch cards were returned to MFWP by July 15, 2007. Of those, we found technical violations on 215 cards (18.6 %) decreased only slightly from 2006 (19.2%). The vast majority of the violations continue to be combinations of not notching card for fish kept and not signing the catch card (97.7%). There were fewer serious violations (5) that included keeping two fish in one day and for harvest out of season. All violations were submitted to Region 1 Enforcement Division for follow-up and this year, letters were submitted to those that did not notch their cards and those that did not sign the catch card.

DISCUSSION

Overall, we observed considerable similarities among the seasons. 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 significantly different among any season.

The continued high release rate (84.6%) also reflects the conservative harvest rate of anglers. The harvest estimate for Lake Koocanusa during the 2006 - 2007 season (180 +/- 17) was less than the estimate for 2005-2006 and much lower than the allowed harvest of 1,140 noted in the USFWS Sub-permit TE-077533 (Rumsey et al. 2005). The distribution of harvest was greater in the middle and southern parts of the reservoir in 2006-2007, especially during the early migration in February due to persistent ice north of the Koocanusa Bridge. The current trend of relatively low harvest suggests a relatively conservative harvest by anglers and a management strategy that currently works well for this fishery. It will be important to monitor the new two-pole regulation enacted by the Montana Legislature and effective for the next season.

Once again, we experienced some problems with the voluntary return of catch cards and the lack of permit fee to cover permit administration and evaluation. This will partially be alleviated in future years as the returned catch card is now required for receiving a current card. A modest fee for the permit would tend to eliminate anglers not serious about the fishery. In addition, some confusion in surveying in the future will be alleviated because we separated the Koocanusa and South Fork/Hungry Horse Reservoir fisheries into two separate permits for the 2007-2008 season.

We found a lower but similar percent of returned catch cards contained technical violations from the previous season, though only 5 of the 1,156 of the returned cards violations were considered serious. Most violations should be correctable. We need to remain diligent in our efforts to maintain quality reporting by the anglers during future seasons. As noted above the format for the catch cards will be slightly different than in previous seasons to help anglers report their harvest or catch/release.

LITERATURE CITED

Hensler, M. and N. Benson. 2005. Angler Survey of Experimental Recreational Bull Trout Fishery In Lake Koocanusa, Montana 2004**.** Montana Fish, Wildlife & Parks. Kalispell, MT.

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