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Angler Survey of Experimental Recreational Bull Trout Fishery for Hungry Horse Reservoir and South Fork Flathead River, Montana for the 2008-2009 season

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SUMMARY

In 2004, Montana Fish, Wildlife and Parks (MFWP) applied to the U.S. Fish and Wildlife Service (USFWS) for authorization to allow a limited sport fishing season for bull trout (*Salvelinus confluentus*) under Section 10(a)(1)(A) of the Endangered Species Act for fisheries deemed to have reached recovery goals. The USFWS permitted fishing for bull trout on Hungry Horse Reservoir (HHR), South Fork Flathead River (SFF) and Lake Koocanusa (LK) per the regulations proposed by MFWP, which allowed angler harvest of up to 300 fish from HHR and catch and release but no possession from SFF. The permit also requires a bull trout permit and catch card system, angler survey and development of educational information pertaining to these new fisheries.

New for this season, anglers were required to choose between acquiring catch cards for either HHR/SFF or LK. This allowed for better separation of data between the two drainages, and likely more accurate survey information. In past surveys, it appeared as though anglers were acquiring both catch cards out of convenience rather than necessity, which increased survey needs and may have biased past data. During the 2008 season, a total of 1,513 anglers secured permits to fish for bull trout in HHR and SFF, decreasing slightly from 1,519 in the 2007-2008 season. Angler survey results estimated 1,211 angler days pressure on HHR and 1,061 days on SFF. Bull trout catch estimates were 621 for HHR with an estimated harvest of 74 fish, well below the USFWS authorized take of 300 bull trout. In the SFF, an estimated 406 bull trout were caught and released. Estimated pressure and catch data for SFF increased substantially from numbers observed in previous seasons despite the season being cut short as a result of elevated water temperatures. The current drought cycle observed in Montana in recent years has led to elevated water temperatures occurring earlier than in previous seasons. Because of this, a new regulation for 2009 ended the catch and release season for SFF July 31.

INTRODUCTION

We conducted an angler mail survey for the recently created recreational bull trout fisheries on HHR, SFF and LK for the 2008 – 2009 season. These fisheries are regulated by Montana Fish, Wildlife & Parks (MFWP) 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, sport fishing for bull trout was continued only in Swan Lake because of stable populations.

Under special permit, in 2004 the USFWS authorized sport fishing for bull trout on HHR, SFF and LK (Rumsey et al. 2005). This activity was intended to benefit the species by measuring the effects of restoring recreational fishing and by increasing public support for management of bull trout populations in the identified water bodies, which were deemed to have reached recovery goals. Public support is essential 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 the USFWS special permit (TE-077533) for new bull trout fisheries contained specific items agreed upon by both USFWS and MFWP. Part of the conditions 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.

Bull Trout Permit Application

The first step of developing a catch card harvest authorization involved creating an application for anglers who wanted to fish for bull trout. This form was made 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. In 2007 anglers were given the choice of two catch cards. Separate catch cards were issued for (1) HHR/SFF and (2) LK. However, anglers still had the option of obtaining both catch cards. New for the 2008 season, anglers were only allowed to obtain one catch card, and had to choose between the two drainages. All applications had to be submitted to the Region 1 FWP office in Kalispell. There was no charge for the bull trout catch card.

Bull Trout Catch Card

After processing a completed application, a permit and numbered catch card for either water body were issued to each individual. The catch cards provided general instructions for anglers fishing for bull trout on HHR, SFF and 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.

Upon landing a bull trout, an angler must either immediately release or legally harvest the fish. Immediately upon harvesting a bull trout from a permitted water, anglers must record the required information in ballpoint pen and notch out a triangle on the line for each fish.

Bull Trout Angler Mail Survey

As in previous seasons, we felt we could obtain more thorough and accurate estimates by conducting a survey of catch card holders (Hensler et al. 2005; Rumsey et al. 2005; Hensler and Benson 2006; Rosenthal and Hensler 2008) rather than rely solely on catch card returns. The survey was sent to all individuals who obtained a catch card, contrasting what was done in 2007 when the survey was sent only to anglers who did not return their catch cards by a certain date. 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.

RESULTS

Bull Trout Catch Cards

Catch card instructions required anglers to return them after their license expired or when they were done fishing for bull trout. We also reminded anglers through the media to return their cards. By August 3, 2009 we received 916 catch cards of the 1,513 cards issued (60.5% return).

Bull Trout Angler Mail Survey

We mailed the initial survey to all anglers with catch cards (1,513) on March 16, 2009. The results of the initial mail survey achieved a 41.9% return rate (n=630 and 67 undeliverable) by April 2009. On April 7, we conducted a second survey reminder mailing to non-respondents to increase our level of returns. By June 16, 2009 we received an additional 394 responses for a total of 1,024 (71.3% return) for both mailings and ended the survey period due to declining returns.

Angler Preferred Waters

The total number of catch cards issued for the 2008 season increased markedly from past years with 3,205 cards being issued between the two drainages (HHR/SFF and LK). Starting in 2007, anglers were given the choice of two separate catch cards, but were still allowed to obtain catch cards for both drainages (Table 1). However, in 2008 a new regulation required anglers to choose between the two drainages, and obtaining both catch cards was not allowed.

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

Waters Selected	Number Selected **2004**	% of Total **2004**	Number Selected **2005**	% of Total **2005**	Number Selected **2006**	% of Total **2006**	Number Selected **2007**	% of Total **2007**	Number Selected **2008**	% of Total **2008**
All (HHR, SFF, LK)*	1,200	42	1,034	41	846	39	917	39	-[c]	-
LK Only	1,040	37	911	36	768	35	817	35	1,702	53
HHR Only	125	4	103	4	76	3	-[a]	-	-[c]	-
SFF Only	95	3	115	4	154	7	-[a]	-	-[c]	-
HHR and SFF	215	8	194	8	170	7	602	26	1,503	47
LK and SFF	36	1	19	1	11	1	-[a]	-	-[c]	
HHR and LK	147	5	146	6	184	8	-[a]	-	-[c]	
Total Cards Issued	2,858	100	2,522	100	2,209	100	2,336	100	3,205	100
Total Validations that included HHR	1,687	59	1,477	59	1.276	58	1,519[b]	65[b]	-[c]	-
Total Validations that included SFF	1,546	54	1,362	54	1,181	53				

* HHR = Hungry Horse Reservoir, SFF = South Fork Flathead River, LK = Lake Koocanusa
[a] – Because of separate cards, anglers had only three possible combinations in 2007
[b] – Anglers were given one card for HHR and SFF in 2007 and 2008.
[c] – In 2008 anglers were able to obtain only one catch card. Anglers must choose between LK and HHR/SFF.

Although the total number of catch cards issued increased for the 2008 season, the proportion of validations by drainage has remained relatively consistent over all years surveyed. In past years, the majority of anglers chose to obtain catch cards for all three waters (LK, HHR, and SFF). Because this option was discontinued in 2008, we were able to better disseminate angler use by drainage. When separated by drainage, 47% of anglers selected the combination of HHR and SFF, with LK receiving a slightly higher percentage (53%) (Table 1).

Angler Demographics

Consistent with previous years, the majority (83%) of permitted bull trout anglers for HHR and SFF were Montana residents. Non-resident anglers for HHR/SFF were primarily from the states

of California (13%), Washington (10%), and Idaho (7%) with remaining anglers from 36 other states and 1 Canadian province.

Fishing Pressure Estimates

A combination of catch card data and survey results revealed that bull trout anglers fished 983 days on HHR and 861 days on SFF during the period surveyed (Table 2). To estimate total bull trout pressure, we used the number of anglers and angler days reported by survey respondents who fished for bull trout (Hensler et al. 2005; Rumsey et al. 2005; Hensler and Benson 2006; Rosenthal and Hensler 2008). For non-responding anglers we assumed the same proportion fished for bull trout with the same effort (Table 2). Estimated pressure for HHR remained consistent with the previous year while the estimated pressure for SFF increased to the highest level observed since the beginning of this regulated fishery. This increase in pressure for SFF is also compressed into a shorter time period due to a regulation change shortening the catch and release season by two weeks. This regulation change was in response to elevated water temperatures in late July as a result of drought.

Table 2. Bull trout season pressure estimates extrapolated from angler survey results for HHR and SFF through the 2008 season.

Angler-Days of Fishing Pressure										
	2004		2005		2006		2007		2008	
	HHR	SFF	HHR	SFF	HHR	SFF	HHR	SFF	HHR	SFF
From Survey	935	411	679	426	694	603	916	489	983	861
Estimated Total	1,650	725	1,314	793	940	897	1,218	650	1,211	1,060

Bull Trout Catch and Harvest Estimates

Bull trout anglers again reported catch and harvest by zone for HHR and SFF (Figures 1 and 2). Early in the season in HHR, the majority of bull trout again were caught in the southern and middle zones (B and C) (Figure 1). Similar to previous seasons, we expected a higher catch proportion to occur here due to staging and progressive spawning movements up river. Bull trout catch in mid-reservoir (Zone B) and in the north end (Zone A) increased as angling for staging adult bull trout decreased.

For the South Fork Flathead River, only catch and release fishing is allowed for bull trout (Figure 2). Catch by zone continues to be similar through all years in that during May and June, catch was mostly in zone "A", the lowest portion and most accessible portion of the river. During July and August, catch progressed somewhat up river into more remote areas of wilderness where access is limited.

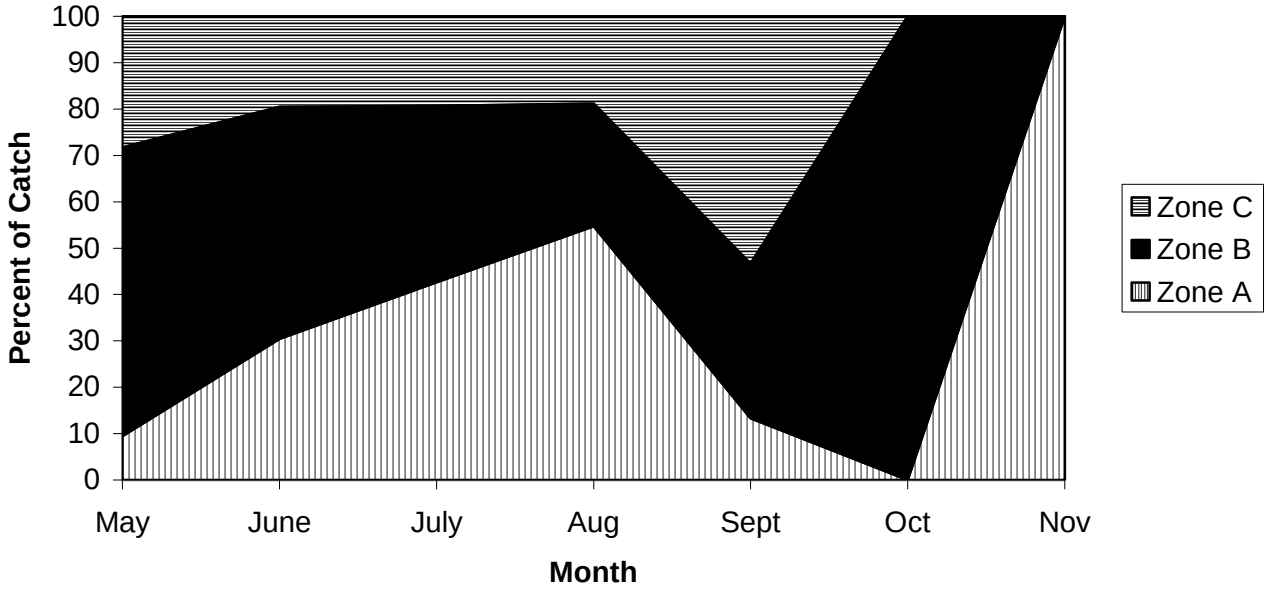

Figure 1. Hungry Horse Reservoir (HHR) bull trout reported catch by zone, from angler survey, 2008. Zone A equals the northern portion of HHR, Zone B is central and Zone C is the southern portion. Zones are mapped in the Bull Trout Pamphlet, (Rumsey et al. 2005).

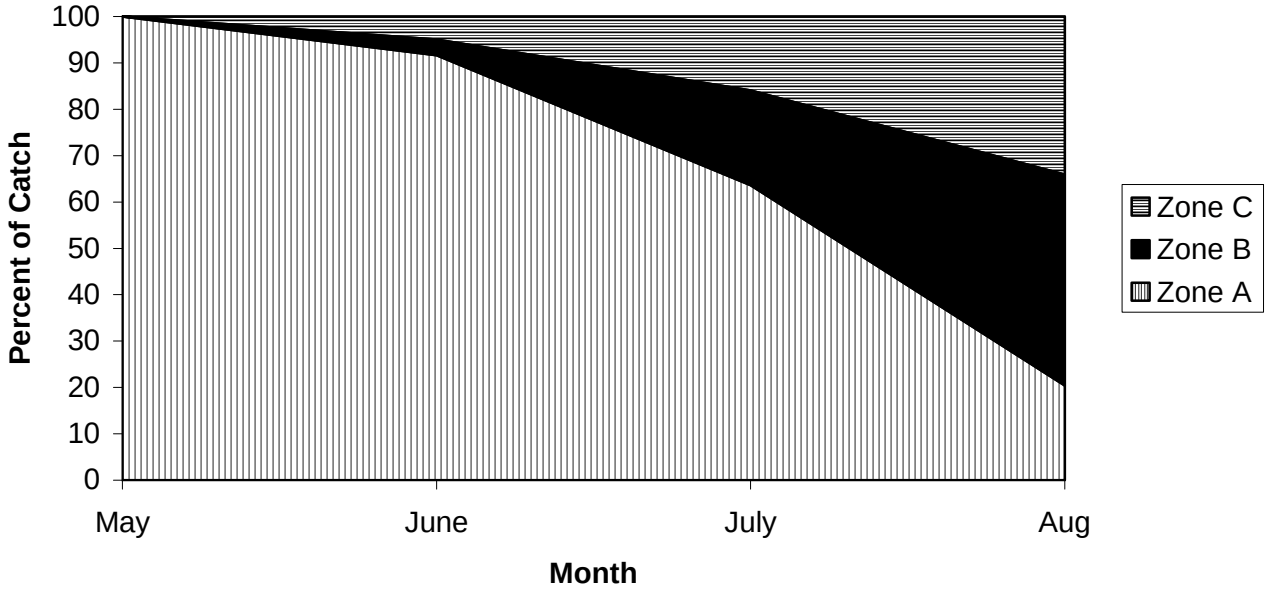

Figure 2. South Fork Flathead (SFF) bull trout reported caught and released by zone, from angler survey, 2008. Zone A equals the northern portion of SFF, Zone B is central and Zone C is the southern portion. Zones are mapped in the Bull Trout Pamphlet, (Rumsey et al. 2005).

Total catch and harvest estimates for each water were derived for non-respondent anglers. Catch from estimated pressure was added to catch reported from the angler survey (and catch cards) assuming equal catch rates (Hensler et al. 2005; Rumsey et al. 2005; Hensler and Benson 2006; Rosenthal and Hensler 2008) (Table 3). For HHR in 2008, an estimated total of 621 bull trout were caught and 74 harvested, with 88% released. The total catch and harvest estimates from 2006 and 2007 are likely more accurate than 2005 because we were able to better separate validations those years. However, they still should be viewed with some caution because they include validations for all three systems, and non-responding anglers may not have fished at HHR. In contrast, estimates from 2008 more accurately represent true catch and harvest rates because anglers were forced to choose between the two drainages (HHR/SFF and LK). In the SFF, 330 bull trout were caught and released by surveyed individuals. An estimated total of 406 bull trout were caught and released over the 2008 season (Figure 3).

Table 3. Estimated bull trout catch and harvest for Hungry Horse Reservoir through the 2008 season. The lower bound for these estimates represents the known catch and harvest from surveyed individuals.

Year	Bull Trout Caught	Upper Bound (95% CI)	Lower Bound (Known)	Bull Trout Harvested	Upper Bound (95% CI)	Lower Bound (Known)
2004 – 2005	355	--	201	48	--	27
2005 – 2006	2154	2167	778	58	59	44
2006 – 2007	623	627	460	56	57	43
2007 – 2008	533	535	402	57	57	44
2008 – 2009	621	624	502	74	75	60

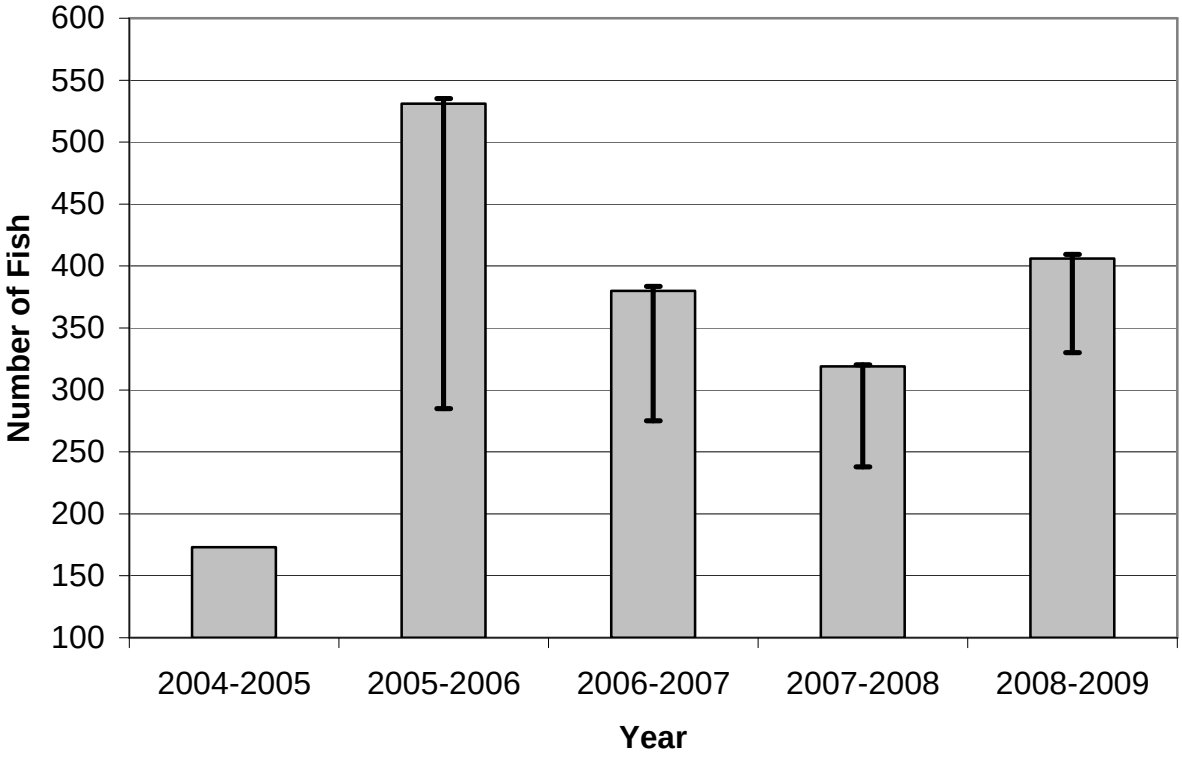

Figure 3. Estimated numbers of bull trout caught and released in the South Fork Flathead River through the 2008-2009 season. Error bars represent the 95% confidence intervals (upper bound) and the known bull trout catch from surveyed individuals (lower bound).

Included in the catch and harvest data, anglers also recorded lengths of bull trout caught, harvested and released by water. Length frequency distributions for HHR (Figure 4) and SFF (Figure 5) depict the size of bull trout caught, released or harvested by anglers. The distribution of bull trout harvested and released for HHR was similar to the previous season. Anglers continue to select for the larger fish (>18") for harvest. Consistent with the previous seasons, the distribution of bull trout caught and released from SFF has shifted back to smaller sizes from those observed in 2005.

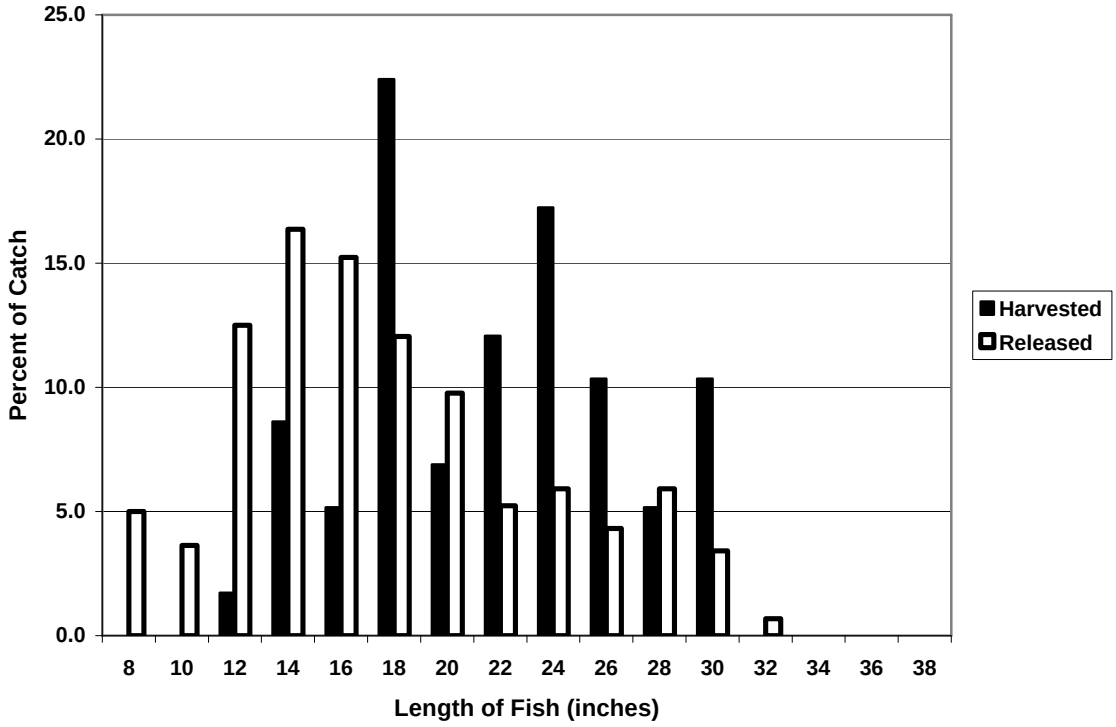

Figure 4. Length frequency histogram of bull trout harvested and released by percent for Hungry Horse Reservoir, 2007.

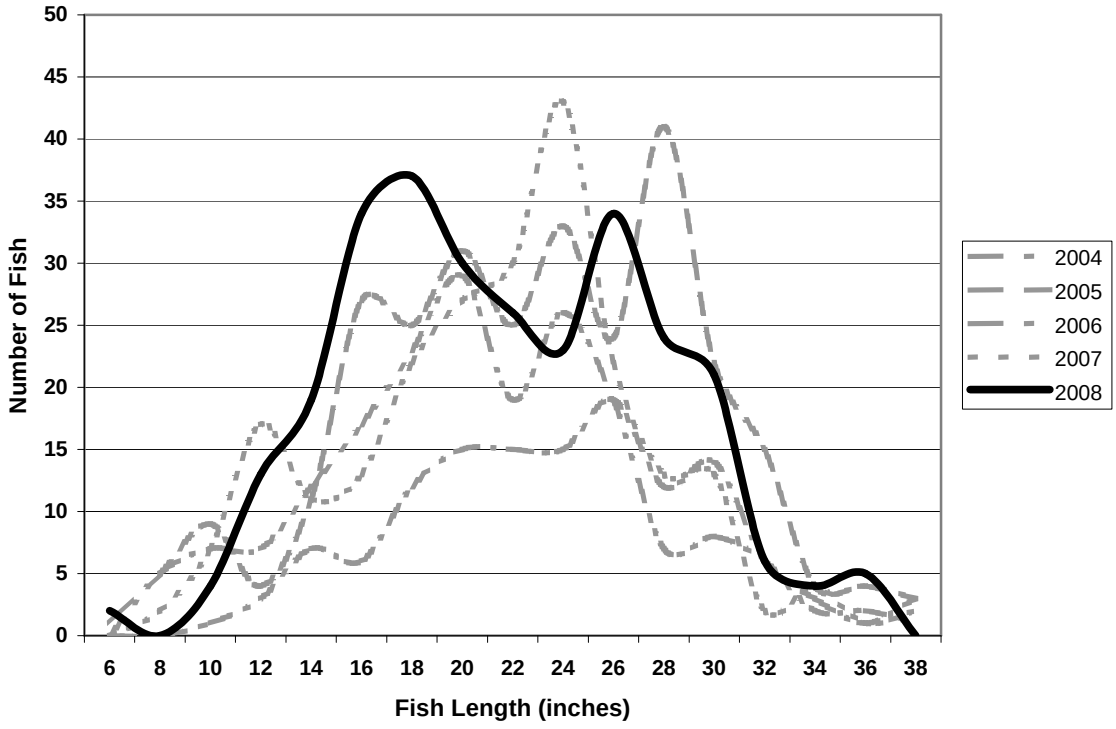

Figure 5. Length frequency distributions of bull trout caught and released in the South Fork Flathead River, 2004-2008.

Catch Card Violations

A total of 916 catch cards were returned to MFWP by August 3, 2009. Of those, we found technical violations on 36 cards (3.9%). This is consistent with what was observed in 2007 (3.5%), and a considerable decrease from the 2006 survey (19.2%). The majority of violations continue to be combinations of failure to notch the card for fish kept (17), and not signing the catch card (19). Violations for not signing the catch card have decreased substantially since the Region 1 front desk staff have asked anglers to sign them upon reception. Unsigned cards were typically those that were mailed to individuals. There was only one serious violation in which an angler reported keeping two fish in one day. However, after talking with the angler it was discovered that the fish were released, and no charges were filed. All violations were submitted to Region 1 Enforcement Division for follow-up, and letters were submitted to those that did not notch their cards and those that did not sign the catch card.

DISCUSSION

Provisions of the USFWS special permit authorized an angler take of up to 300 bull trout from HHR and catch and release only in the SFF for the 2008-2009 season. Although the number of anglers participating in the fishery increased markedly this year, catch cards and angler surveys estimated HHR bull trout harvest at only 74 fish, which was well within USFWS permitted limits. This low level of harvest has remained consistent through the five years of the fishery, suggesting that anglers are being conservative with regard to the species' status. HHR gill net monitoring, as well as SFF bull trout redd counts and juvenile population estimates will continue to be conducted to evaluate population trends. This year (2009) represents a year in which basin-wide redd counts will be conducted, thus increasing our confidence in estimating adult bull trout density.

Estimated fishing pressure and estimated catch of bull trout for the catch and release season in SFF increased markedly in 2008. This finding was of particular interest because a new regulation also shortened the season two weeks due to elevated water temperatures in July and August observed over the past several years. The concern is that bull trout would be more vulnerable to angling as they congregate near creek mouths for thermal refuge, and that elevated water temperatures would increase angling related mortality. The increase in angler use will continue to be monitored in future surveys.

Combining the results of the catch card and survey data provided the most accurate data in terms of return percentage. While return on catch cards alone (60%) was relatively low, addition of the survey data resulted in a return of 81% (1228 respondents). The return rate of surveys alone was relatively high (71%). However, when comparing the data, it was recognized that many times the information contained in the survey did not match up with the catch card. Therefore, in these cases, catch card data was preferred over the survey, as anglers are required to fill out the catch card while fishing, leading to more accurate data. Additionally, this method was used in previous reports, and provides for a consistent data set for evaluating long-term trends. Combining the two

data sets added in complexity of data analysis, but the increase in return percentage and consistency of data warrants similar methods in future years.

Beginning this year, anglers were only allowed one catch card, therefore having to choose between LK and HHR/SFF. Issuing different catch cards for the two drainages allowed for better interpretation of the data in 2007. However, because at that time anglers were still given the choice of obtaining catch cards for both drainages, estimated angler days and associated catch could have been potentially skewed. Anglers may have only fished one drainage but acquired the other catch card out of convenience. Because this was not an option for the 2008 season, this data should more accurately depict actual angler use.

Reporting estimated catch and harvest on a catch card system requires angler cooperation for reliability. The ability to charge for a bull trout permit and mandatory turn-in of catch cards would increase efficiency and accuracy of the estimate. Mandatory turn-in would also eliminate the need for expensive and time-consuming angler surveys requiring final data extrapolation. We hope to be able to improve on the catch card system in the future.

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