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Angler Survey of Experimental Recreational Bull Trout Fishery for Hungry Horse Reservoir and South Fork Flathead River, Montana for the 2007-2008 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 issued separate catch cards for HHR/SFF and LK. This allowed for better separation of data between the two drainages, and likely more accurate survey information. During the 2007-2008 season, a total of 2,336 anglers secured permits to fish for bull trout, increasing slightly from 2,209 in the 2006-2007 season. Of those, 1,519 (65%) anglers included validations for HHR/SFF. Angler survey results estimated 1,218 angler days pressure on HHR and 650 days on SFF. Bull trout catch estimates were 533 for HHR with an estimated harvest of 57 fish, well below the USFWS authorized take of 300 bull trout. In the SFF, an estimated 319 bull trout were caught and released. Estimated pressure and catch data for SFF decreased from numbers observed in previous seasons due to 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 proposed regulation change for the 2009-2010 season would end the season two weeks earlier.

INTRODUCTION

We conducted an angler mail survey for the recently created recreational bull trout fisheries on Hungry Horse Reservoir, South Fork Flathead River and Lake Koocanusa for the 2007 – 2008 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 Hungry Horse Reservoir (HHR), South Fork Flathead River (SFF) and Lake Koocanusa (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. Different than in previous years, In 2007 anglers were given the choice of two catch cards. Separate catch cards were issued for (1) Hungry Horse Reservoir/South Fork Flathead and (2) Lake Koocanusa. Anglers still had the option of obtaining both catch cards. 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 Hungry Horse Reservoir, South Fork Flathead River and Lake Koocanusa. 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) rather than rely solely on catch card returns. However, in contrast to previous years, the survey was sent only to anglers who did not return their catch cards by May 9, 2008. 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. Similar to the previous year, any angler who received a 2006 catch card but did not turn it in was required to present their 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 (Hensler and Benson 2006). We also reminded anglers through the media to return their cards. By August 11, 2008 we received 822 catch cards of the 1,519 cards issued (54.1% return).

Bull Trout Angler Mail Survey

We mailed the initial survey to 825 anglers with catch cards on May 9, 2008. The results of the initial mail survey achieved a 45.3% return rate (n=737 and 88 undeliverable) by June 20, 2008. On June 24, we conducted a second survey reminder mailing to non-respondents to increase our level of returns. By July 22, 2008 we had received a total of 445 responses (61.1% 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 2007 season increased slightly from 2006 with 2,336 cards being issued between the two drainages (HHR/SFF and LK). In contrast to previous years, anglers were given the choice of two separate catch cards, and thus had only three possible combinations of waters to select (Table 1).

Table 1. Bull trout waters selected by anglers from bull trout permit applications through the 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**	Number Selected **2007**	Percent of Total **2007**
All (HHR, SFF, LK)*	1,200	42	1,034	41	846	39	917	39
LK Only	1,040	37	911	36	768	35	817	35
HHR Only	125	4	103	4	76	3	-[a]	-
SFF Only	95	3	115	4	154	7	-[a]	-
HHR and SFF	215	8	194	8	170	7	602	26
LK and SFF	36	1	19	1	11	1	-[a]	-
HHR and LK	147	5	146	6	184	8	-[a]	-
Total Cards Issued	2,858	100	2,522	100	2,209	100	2,336	100
Total Validations that included HHR	1,687	59	1,477	59	1.276	58	1,519[b]	65[b]
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.

Validations have remained consistent over all years surveyed. Similar to previous seasons, most anglers (39%) selected all three waters to fish. When separated by drainage, 26% of anglers selected the combination of HHR and SFF, with LK receiving a slightly higher percentage (35%). When viewing total cards by water, 65% of anglers (1,519) included a validation for HHR and SFF (Table 1).

Angler Demographics

The majority (85%) of permitted bull trout anglers for HHR and SFF were Montana residents. Non-resident anglers for HHR/SFF were primarily from the states of Idaho (2.1%), Colorado (1.4%), and Washington (1.3%) with remaining anglers from 30 other states and 1 Canadian province.

Fishing Pressure Estimates

A combination of catch card data and survey results revealed that bull trout anglers fished 916 days on HHR and 489 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). For non-responding anglers we assumed the same proportion fished for bull trout with the same effort (Table 2). The estimated pressure for HHR increased slightly from the previous year while the estimated pressure for SFF decreased. This decrease in pressure for SFF is likely due to the catch and release season being cut short two weeks due to elevated 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 2007 season.

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

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 zone "C", where the South Fork Flathead River enters the reservoir (Figure 1). Like 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.

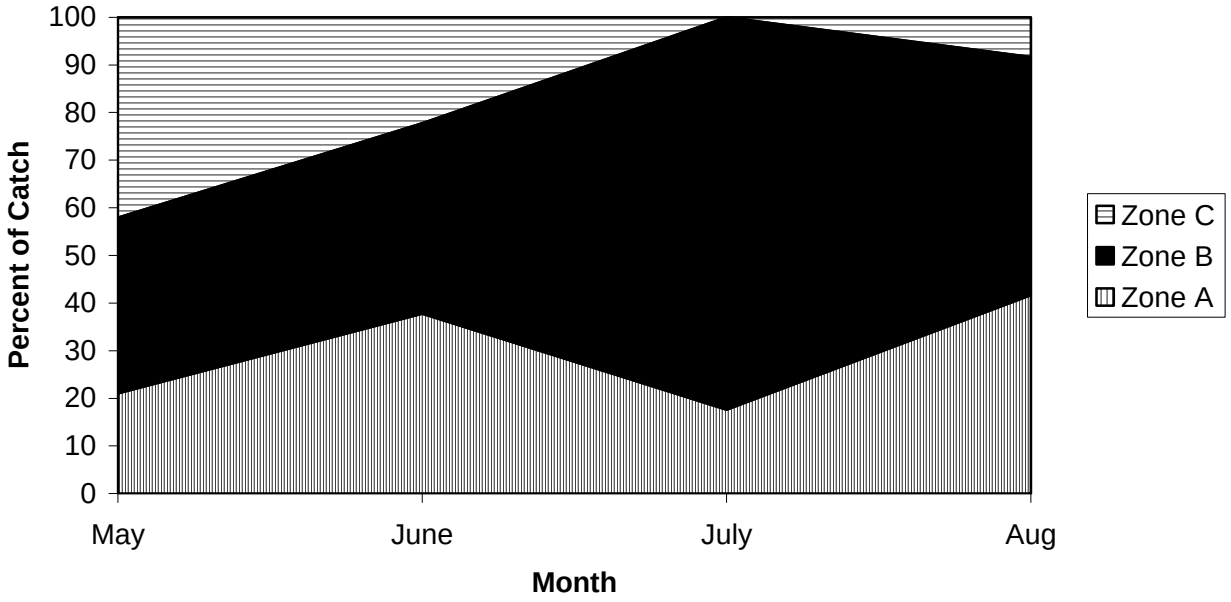

Figure 1. Hungry Horse Reservoir (HHR) bull trout reported catch by zone, from angler survey, 2007. Zone A equals the northern portion of HHR, Zone B is central and Zone C is the southern portion. Zones are mapped in the Bull Trout Pamphlet, (Rumsey et al. 2005).

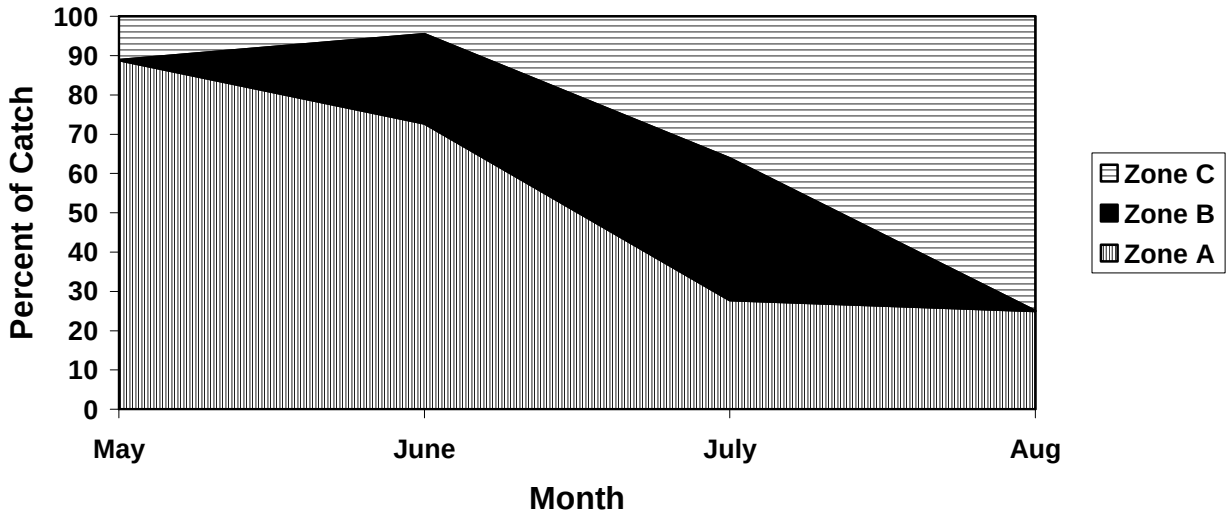

Figure 2. South Fork Flathead (SFF) bull trout reported caught and released by zone, from angler survey, 2007. Zone A equals the northern portion of SFF, Zone B is central and Zone C is the southern portion. Zones are mapped in the Bull Trout Pamphlet, (Rumsey et al. 2005).

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) (Table 3). For HHR in 2007, an estimated total of 533 bull trout were caught and 57 harvested, with 89% 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 the SFF, 238 bull trout were caught and released by surveyed individuals. An estimated total of 319 bull trout were caught and released over the 2007 season (Figure 3).

Table 3. Estimated bull trout catch and harvest for Hungry Horse Reservoir through the 2007 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

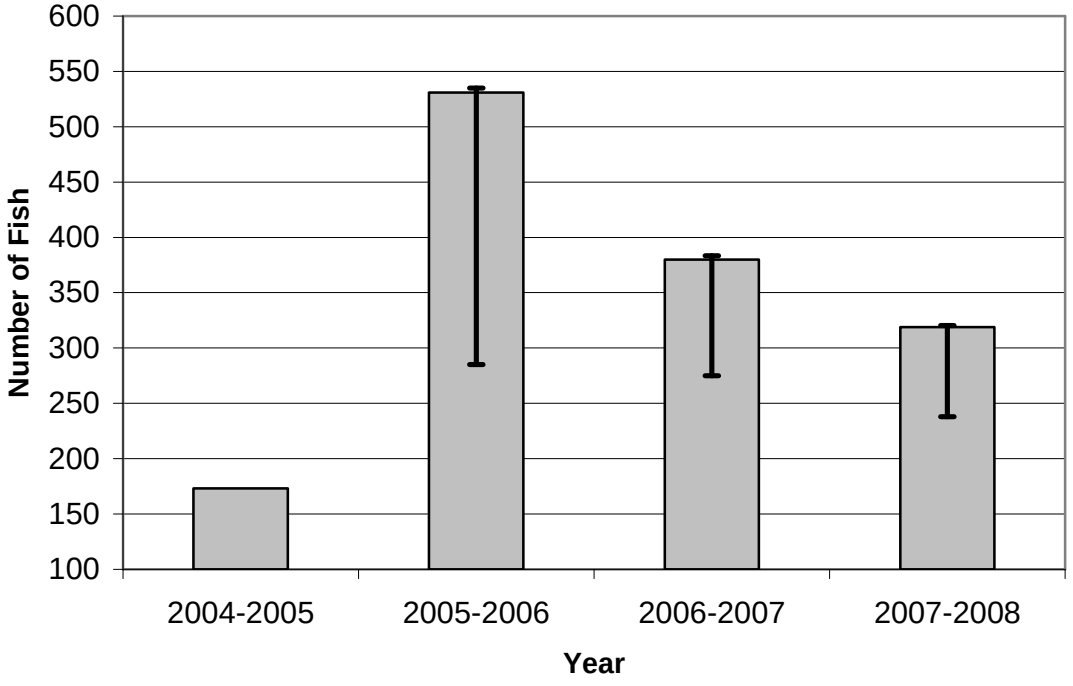

Figure 3. Estimated numbers of bull trout caught and released in the South Fork Flathead River through the 2007-2008 season. Error bars represent the 95% confidence intervals (upper bound) and the known bull trout catch from surveyed individuals (lower bound).

From the catch and harvest data, anglers 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 caught and released for Hungry Horse Reservoir was similar to the previous season. Consistent with the previous season, the distribution of bull trout caught and released from South Fork Flathead has shifted back to smaller sizes from those observed in 2005.

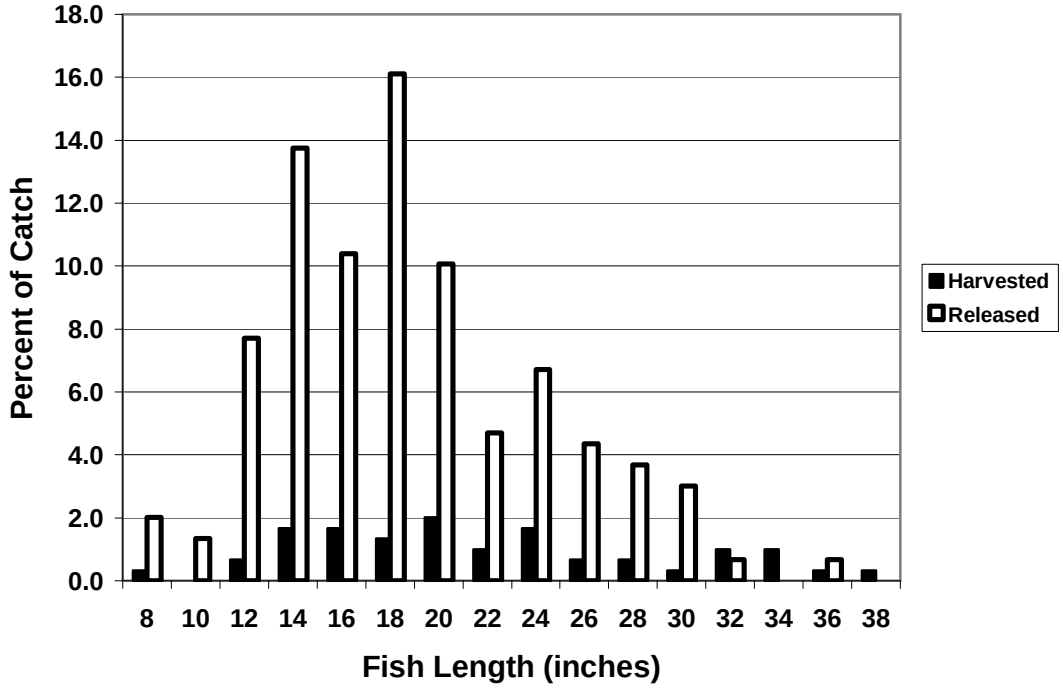

Figure 4. Length frequency histogram of bull trout harvested and released by percent for Hungry Horse Reservoir, 2007.

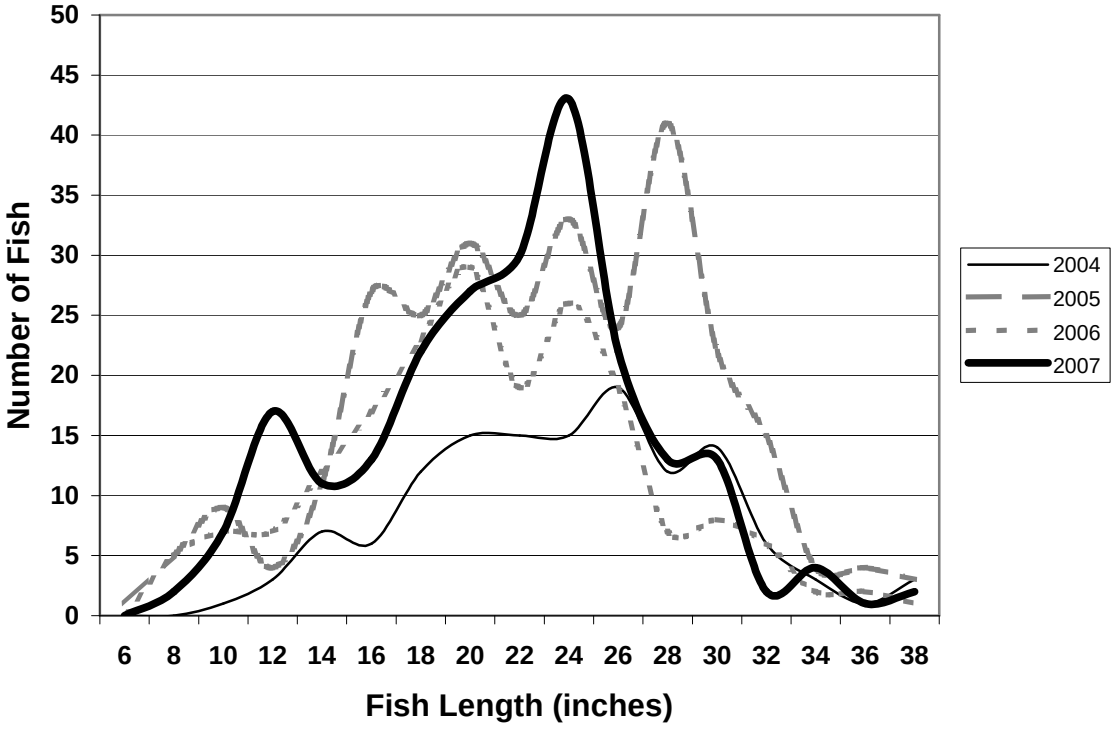

Figure 5. Length frequency distributions of bull trout caught and released in the South Fork Flathead River, 2004-2007.

Catch Card Violations

A total of 822 catch cards were returned to MFWP by August 11, 2008. Of those, we found technical violations on 29 cards (3.5 %). This is a considerable decrease from the previous survey (19.2%). The majority of violations continue to be combinations of failure to notch the card for fish kept, and not signing the catch card. There were only two serious violations that included keeping two fish in one day and for fishing out of season. 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 2007-2008 season. Catch cards and angler surveys estimated HHR bull trout harvest at only 57 fish, which was well within USFWS permitted limits. This level of harvest has remained consistent through the four years of the fishery, suggesting that anglers are being conservative with regard to the species' status. HHR gill net monitoring and SFF bull trout redd counts will continue to be conducted to evaluate population trends.

Combining the results of the catch card and survey data provided the most accurate data in terms of return percentage. While returns on catch cards alone (54%) and surveys (61%) were relatively low, combining the two resulted in a return of 75% (1142 respondents). Combining the two data sets added in complexity of data analysis, but the increase in return percentage warrants similar methods in future years.

Issuing different catch cards for the two drainages allowed for better interpretation of the data. However, because anglers were still given the choice of obtaining catch cards for both drainages, estimated angler days and associated catch could be potentially skewed. Anglers may actually fish only one drainage but acquired the other catch card out of convenience. 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.

Water temperatures played an integral part in determining the 2007-2008 fishing pressure and catch estimates. Portions of Montana have been affected by continued drought conditions marked by lower than average precipitation and above average temperatures. Northwest Montana is no exception, and by the beginning of July, water temperatures in the neighboring North Fork Flathead River began to approach 60 degrees. Water temperatures were measured at 65 degrees in the South Fork Flathead by mid July. Because of concern that bull trout would be more vulnerable to angling as they congregated near creek mouths, and that elevated water temperatures would increase angling related mortality, the catch and release season in SFF was cut short by two weeks in 2007. Thus, angling pressure and associated catch estimates were lower than in previous seasons. Faced with a continuing trend of hotter, dryer summers, MFWP has proposed shortening the catch and release season for SFF in 2009. The proposed season would end August 1.

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