MONTANA FISH, WILDLIFE & PARKS

Fisheries Division
Federal Aid Job Progress Report

Montana Statewide Fisheries Management

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Project Title: Montana Statewide Fisheries Management

Job Title: (3140 Kootenai River Drainage Fisheries Management)

Abstract:

This was the sixteenth year of the surveys. In 2019, 464 anglers obtained bull trout permits/catch cards. By August 1, 2020, we received 327 catch cards/surveys (70%) from anglers. Nearly 92 percent of the anglers that said they fished at least one day were from Montana, as were 92 percent of all catch card holders.

We estimated that 1030 bull trout were caught at Lake Koocanusa during the 2019 season. The estimated total harvest calculated from surveyed anglers was 145 bull trout. Even after harvest was re-instated in 2016, anglers continued to harvest at a very low rate and much below the USFWS sub permit allowable harvest of 1,140 bull trout.

For the 2019 season, the mean length of bull trout caught (23.8”; range 12”- 33”) was similar to other years. The mean length of bull trout harvested (26.6”; range 17”- 33”) was similar to other years and indicated anglers targeted larger bull trout for harvest.

A 26-year dataset suggests a trend relationship exists between the number of bull trout redds and angling regulations at Koocanusa. In addition, recent BC regulations include more restrictive limits (Bull trout release from Nov 1 through March 31 in Koocanusa and Kootenay River; No bull trout <75 cm). With that in mind, MFWP returned to a one bull trout harvest per year starting the 2016 season. However, in response to declining red numbers in the Wigwam River and Grave Creek in 2019, MFWP has established only catch and release fishing for bull trout during the 2020 season.

We found 22 technical violations in 2019-2020; 16 catch cards were not notched for harvested bull trout and 6 catch cards were not signed. Though not egregious, the 16 catch cards not notched is troubling. We will remind anglers in the future to accurately complete their catch cards and appropriately notch the catch card upon harvest of a bull trout.

Over the years, we developed a management strategy for the Lake Koocanusa bull trout recreational fishery that is more conservative than the limits of the Authority statutes set by USFWS sub permit TE-07753 for this population. As a result, regulations have been modified from two bull trout per year to catch and release and back to one bull trout per year beginning in 2016. However, the 2019 redd count for Grave Creek was below the threshold established in the USFWS sub permit TE-07753, and regulations were modified to catch and release for the 2020 season.

Angler Survey of Experimental Recreational Bull Trout Fishery for Lake Koocanusa, Montana through the 2019 Season.

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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, an angler survey, and development of educational information pertaining to these new fisheries.

This was the sixteenth year of the catch card surveys. During the 2019 license year, 464 anglers obtained bull trout permits/catch cards for Lake Koocanusa. By August 2020, we received 327 catch cards and/or surveys (70% return) from anglers. Nearly 92 percent of angler respondents that said they fished for bull trout were Montana residents, as were 92 percent of all catch card holders.

We estimated that 1030 bull trout were caught at Lake Koocanusa during the 2019 season. The estimated total harvest calculated from all surveyed anglers was 145 bull trout (85.9% release rate). Even after harvest was re-instated in 2016, anglers harvested at a very low rate, much below the USFWS sub permit allowable harvest of 1,140 bull trout.

For the 2019 season, the mean reported length of bull trout caught (23.8”; range 12”- 33”) was similar to other years. The mean length of bull trout harvested (26.6”; range 17”- 33”) was similar to other years as well and indicated anglers targeted larger bull trout for harvest.

A 26-year dataset suggests a trend relationship exists between the number of bull trout redds and angling regulations at Koocanusa. In addition, bull trout angling in the British Columbia portion of the Lake Koocanusa/Kootenay River/Elk River system historically had relatively liberal harvest limits. Therefore, even though harvest and redd count numbers did not approach permit thresholds, MFWP adjusted regulations after 2011 to one per year harvest and after 2012 to catch and release. Recent BC regulations include more restrictive limits and with that in mind, MFWP requested a one bull trout harvest per year starting in the 2016 season

We found 22 technical violations; 16 catch cards were not notched for harvested bull trout and 6 catch cards were not signed. Though not egregious, the 16 catch cards not notched is troubling. We will remind anglers in the future to remember to accurately complete their catch cards and appropriately notch the catch card upon harvest of a bull trout.

Over the years, MFWP has developed a management strategy for the Lake Koocanusa bull trout recreational fishery that is more conservative than the limits of the Authority statutes set by USFWS sub permit TE-07753 for this population. As a result, angling regulations have been modified through the years to address potential declines in the bull trout population, from two bull trout per year, to catch and release, and back to one bull trout per year beginning in 2016 based on the information gathered. However, 2019 bull trout redd count surveys indicated a decline in both the Wigwam River and Grave Creek. Furthermore, the redd count for Grave

Creek was below the threshold established in the USFWS sub permit TE-07753, and regulations were modified to catch and release for the 2020 season.

INTRODUCTION

In 2020, Montana Fish, Wildlife & Parks (MFWP) personnel conducted the sixteenth annual angler mail survey for the recreational bull trout (***Salvelinus confluentus***) fishery on Lake Koocanusa. Because bull trout were listed as a "threatened species" under the Endangered Species Act in 1998, this fishery was authorized in 2004 under special permit by the U.S. Fish and Wildlife Service (USFWS).

In 2012, Montana Fish Wildlife & Parks decreased bull trout harvest from one per angler per year to catch and release for several reasons: 1) decreasing mean lengths of bull trout caught and harvested; 2) an unstable trend of redd numbers in the Wigwam River (the major spawning tributary in the BC portion Lake Koocanusa bull trout) and Grave Creek (the major spawning tributary in the US portion of Lake Koocanusa); 3) unknown amount of angler harvest in the mainstem and tributaries of the BC portion of Lake Koocanusa. We believed this was the prudent course of action even though the USFWS sub permit TE-077533 allowed for harvest of 1,140 bull trout. In 2015 MFWP determined that because redd numbers had stabilized then increased and BC further restricted angling regulations for bull trout, a limited (one bull trout/angler/year) harvest would be re-instituted for Lake Koocanusa during the 2016 season. Declining redd numbers in the Wigwam River and Grave Creek in 2019 prompted a return to catch and release angling only for the 2020 season.

BACKGROUND

Bull trout were listed as "threatened" under the Endangered Species Act in 1998. At the time of listing, sport fishing for bull trout had already been discontinued in Montana and was under review, except in Swan Lake which was considered to have a stable population.

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 and limited harvest for bull trout likely increases public support for management of stable bull trout populations in the identified water bodies. We also believe the action will continue to garner additional support for restoration of bull trout habitats and other management activities that will improve bull trout populations throughout the state.

METHODS

Conditions of the USFWS special permit (TE-077533) for a new bull trout fishery contained items agreed upon by both USFWS and MFWP (Hensler and Benson 2005). One condition called for the development and use of a catch card. Also required was a formal survey of anglers participating in these experimental bull trout fisheries. Educational materials were 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 authorization involved creating an application for anglers interested in fishing for bull trout. We made the form available through the Region 1 MFWP office and on MFWP's web site. The application required the angler's name, address, automated licensing system (ALS) number, and permit area (waters) where they chose to fish. Anglers were not given duplicate catch cards during the season if the original was lost. To ensure consistent, high-quality information to and from participating anglers, we required that all applications be submitted to the Region One MFWP office in Kalispell. There has been no charge for the permit/catch card.

After a completed application was processed, a permit and numbered catch card were issued to each angler. The catch cards provided general instructions for anglers fishing for bull trout on Lake Koocanusa and requested that anglers keep the card until a survey was sent. The cards indicated entry of the catch zone, fish length, and date of catch for each fish harvested from Lake Koocanusa. Additionally, we requested supplemental information: total number of days fished for bull trout, total number of bull trout caught and released, and a catch and release log that included zone, length, month, and day.

We provided bull trout anglers 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 Montana Fishing Regulations booklets. As was previously described, anglers were allowed to harvest one bull trout during the 2019 season. Upon landing a bull trout, anglers were required to dispatch and harvest the fish or immediately release the fish.

Completed catch cards helped to provide information on bull trout harvest, catch date, size, and location through the 2019 season. We do not charge a fee for catch cards or assess a penalty for failure to return cards as specified. We requested that anglers retain their catch card until surveyed and return the completed catch card with the survey to improve the reliability of information. A total of 464 catch cards were distributed to anglers for the 2019 season and surveys were mailed to catch card holders in early March 2020. By August, we concluded the survey due to declining returns.

We used the survey in combination with catch card returns to estimate the total number of bull trout harvested and released. All estimates and graphs were generated in Microsoft Excel. We conducted statistical analyses using Excel at a level of significance of 0.05 unless otherwise noted.

RESULTS

Bull Trout Catch Card/Survey Returns

Catch card instructions requested that anglers return the catch cards after their license expired with the mail survey. Some anglers returned catch cards but not surveys; some returned both; some returned only surveys. We issued 464 catch cards for the 2019 season and by August 2020, we received 327 catch cards/catch card surveys (70% return rate).

Angler Demographics

The vast majority of anglers that obtained a Lake Koocanusa bull trout catch card for the 2019 season were Montana residents (92%). Anglers from 12 other states and provinces were issued a catch card for Lake Koocanusa. Non-resident anglers were from the states of California, Florida, Iowa, Idaho, Indiana, Nevada, New York, Ohio, Texas, Utah, Washington, Wisconsin, and the Canadian province of Alberta.

Fishing Pressure Estimates

After the 2019 season, 186 of the respondents (56.9%) indicated that they did fish for bull trout. The percent of cardholders that fished began an upward trend likely associated with ability to harvest in 2016 (Figure 1). To estimate total number of angler-days of pressure on bull trout, we used the number of days reported from catch cards and surveys. We assumed anglers not responding to the survey angled for bull trout with the same effort as respondents. During the 2019 season, anglers reported fishing 821 days, and the estimate of total angling effort was 1165 days (Table 1).

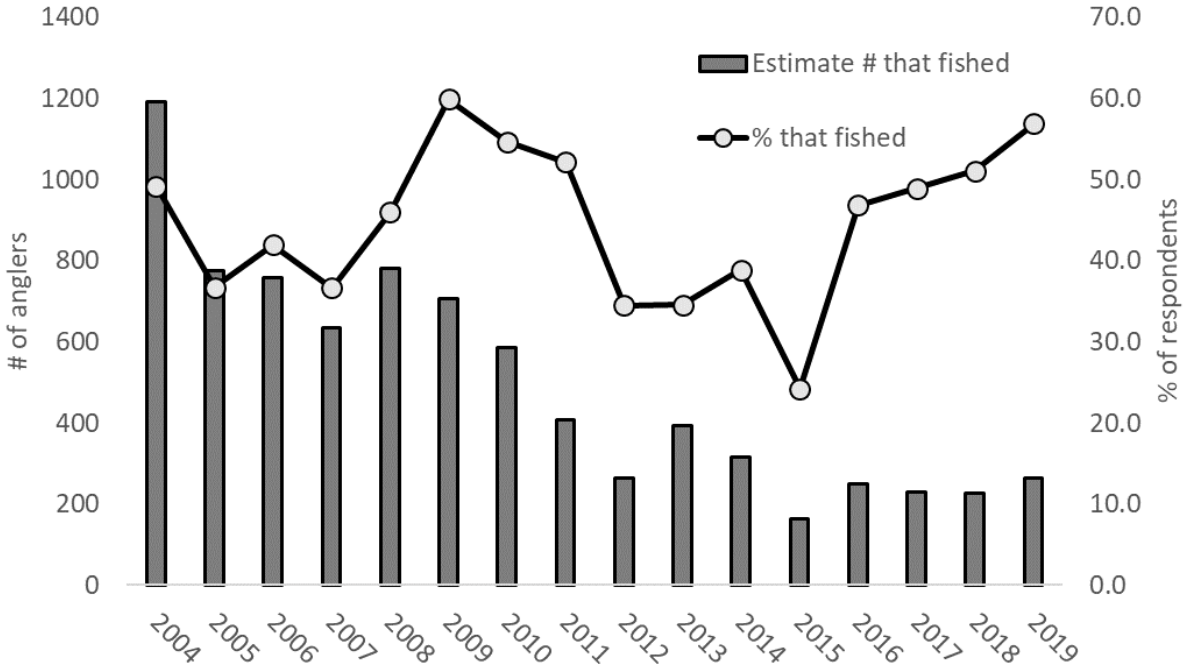

Figure 1. Estimated number of anglers and percent of respondents that fished for bull trout at Lake Koocanusa, Montana through the 2019 season.

Table 1. Bull trout season angling pressure estimates calculated from catch card and survey results for Lake Koocanusa through the 2019 season.

Number Angler-Days Fishing Pressure							
Season	Number of Respondents	Angler-Days from survey	Estimated Angler-Days	Season	Number of Respondents	Angler-Days from survey	Estimated Angler-Days
2004	897	1,685	3,483	2012	603	1,456	1,850
2005	774	3,285	4,874	2013	449	1,673	2,370
2006	590	2,639	3,390	2014	574	1,099	1,842
2007	569	2,963	3,595	2015	536	874	1,202
2008	609	3,917	4,607	2016	378	942	1,326
2009	691	3,686	4,537	2017	319	681	1,008
2010	497	3,154	3,720	2018	319	703	976
2011	598	1,933	2,521	2019	327	821	1,165

Harvest and Catch Estimates

To estimate total harvest at Lake Koocanusa for the 2019 season, we calculated the mean harvest rate (0.31 bull trout/angler) for anglers who returned catch cards and surveys. The

estimated total harvest calculated from all surveyed anglers was 145 bull trout (Table 2). To estimate total catch at Lake Koocanusa for the 2019 season, we calculated the mean catch rate (1.91) for anglers who returned catch cards and surveys. The estimated total catch calculated from all surveyed anglers was 1030 bull trout (Table 3). After harvest was re-instated in 2016, anglers continued to harvest bull trout at a very low rate and much below the USFWS sub permit TE-077533 allowed for harvest of 1,140 bull trout.

Table 2. Estimated bull trout harvest (known harvest) and estimated catch (known catch) for Lake Koocanusa through the 2019 season.

Season	Bull Trout Harvested	Lower Bound	Upper Bound	Bull Trout Caught	Lower Bound	Upper Bound	Percent Released
2004	650 (259)	259	652	2,399 (698)	*	*	72.1
2005	371 (216)	216	373	3,595 (2,171)	2,171	3,611	89.7
2006	180 (140)	140	181	1349 (909)	909	1,353	86.6
2007	267 (220)	220	268	1,484 (997)	997	1,488	82
2008	295 (249)	249	296	1,897 (1,358)	1,358	1,900	84.4
2009	256 (206)	206	257	1,810 (1,247)	1,247	1,815	85.8
2010	163 (138)	138	164	1,568 (1,328)	1,328	1,573	89.6
2011	107 (82)	82	108	1,318 (925)	925	1,323	91.9
2012	No harvest			742 (608)	738	747	100
2013	No harvest			965 (728)	951	981	100
2014	No harvest			1,250 (746)	1,219	1,283	100
2015	No Harvest			973 (548)	927	1.019	100
2016	78 (55)	55	79	885 (575)	879	890	91.2
2017	68 (46)	46	69	607 (364)	603	611	87.4
2018	84 (31)	31	85	997 (336)	992	1003	91.6
2019	145 (58)	143	146	1030 (355)	1024	1035	83.7

*Point estimate expanded from caught vs. released bull trout from catch cards with no variance calculated

We analyzed catch rates for anglers for all years. During the 2019 season, anglers reported relatively low numbers of bull trout caught and harvested comparable to other recent years (Table 3). The lower number of bull trout caught during 2017 to 2019 may be a response to decreasing numbers of anglers fishing for bull trout (Figure 1) as regulations limited harvest to one bull trout per year.

Table 3. Estimated annual bull trout caught and angler days per bull trout for anglers fishing in Lake Koocanusa through the 2019 season.

Season	Estimated Bull Trout Caught (reported caught)	Angler days per bull trout caught
2004	2,399 (698)	
2005	3,595 (2,171)	1.4
2006	1,349 (909)	2.5
2007	1,484 (997)	2.4
2008	1,897 (1,358)	2.4
2009	1,810 (1,247)	2.5
2010	1,568 (1,328)	2.1
2011	1,318 (925)	2.1
2012	742 (608)	2.4
2013	965 (728)	2.3
2014	1,250 (746)	1.5
2015	973 (548)	1.6
2016	885 (575)	1.6
2017	607 (364)	1.9
2018	997 (336)	2.1
2019	1030 (355)	2.3

Catch Versus Harvest Length Estimates

We asked anglers to estimate and record lengths of bull trout they caught and released. For the 2019 season, mean length of harvested bull trout (26.6”; range 17”-33”) was significantly larger (p-value < 0.001) than mean length of released bull trout (22.8”; range 12”-33”). While anglers caught and released bull trout of all size classes, harvest was targeted at larger bull trout (Figure 2). These patterns are consistent with data from previous years.

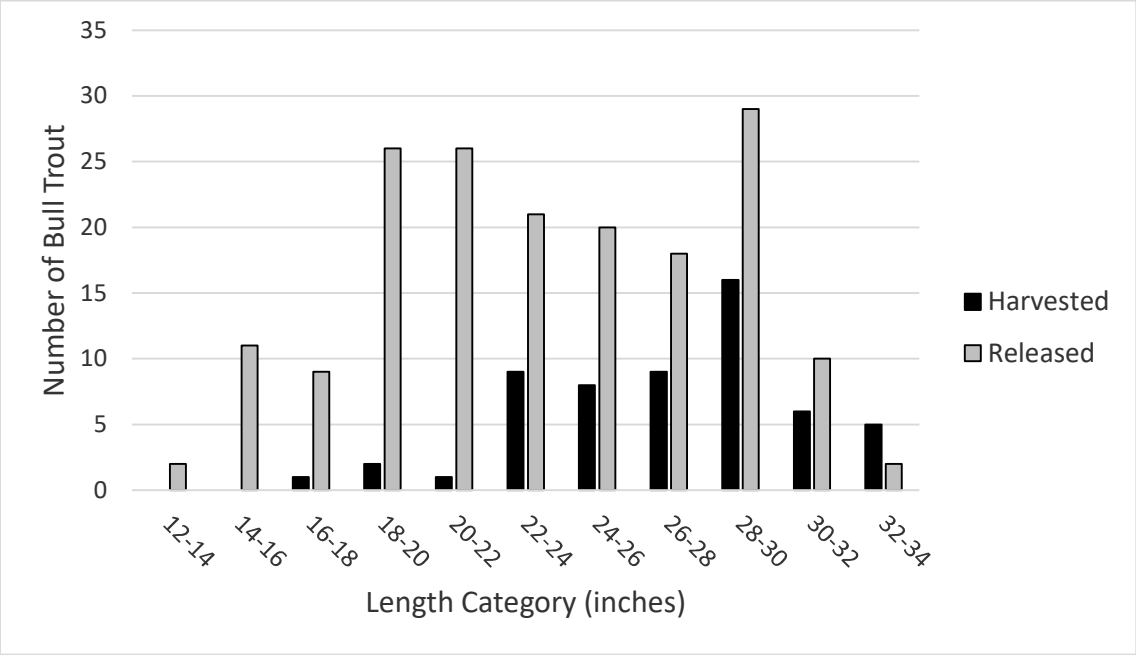

Figure 2. Length categories of bull trout harvested and released during the 2019 season from Lake Koocanusa, Montana.

Bull Trout Redd Counts

Provisions of the USFWS sub permit TE-07735 authorized in 2004 for Koocanusa provided for angler take not to exceed 1,140 bull trout per year and stipulated that redd counts not drop below 667 for Wigwam River in British Columbia or 67 in Grave Creek. Since the experimental fishery began, estimated yearly harvest rates never approached permitted yearly harvest (Table 2) and even relatively liberal estimates for catch and release mortality (10.0%) only two years (2004,2005) resulted in the fishery exceeding 50 percent of the 1,140-fish take limit.

The Koocanusa bull trout population is closely monitored; one of the ways to monitor bull trout abundance trends is through annual fall redd counts. Bull trout redds are counted in index reaches of Wigwam River and its tributaries (Figure 3) annually by BC personnel, and in index reaches of Grave Creek and its tributaries (Figure 4) by MFWP personnel.

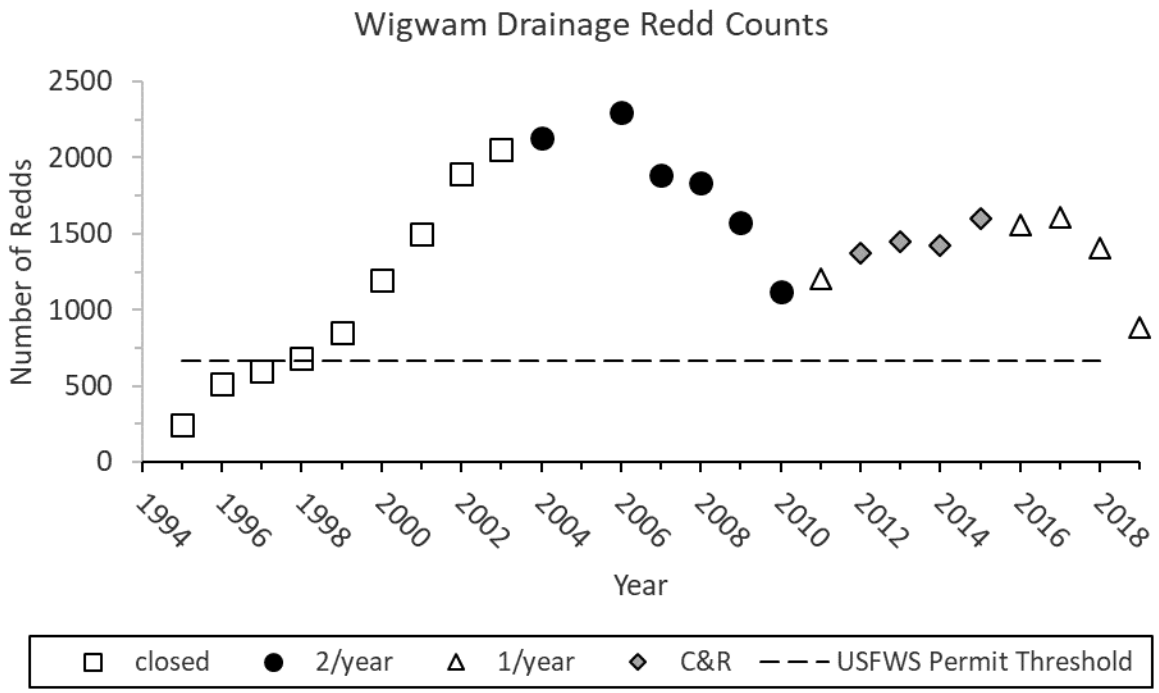

Figure 3. Bull trout redd counts for the Wigwam River drainage, British Columbia, Canada by Koocanusa bull trout regulation.

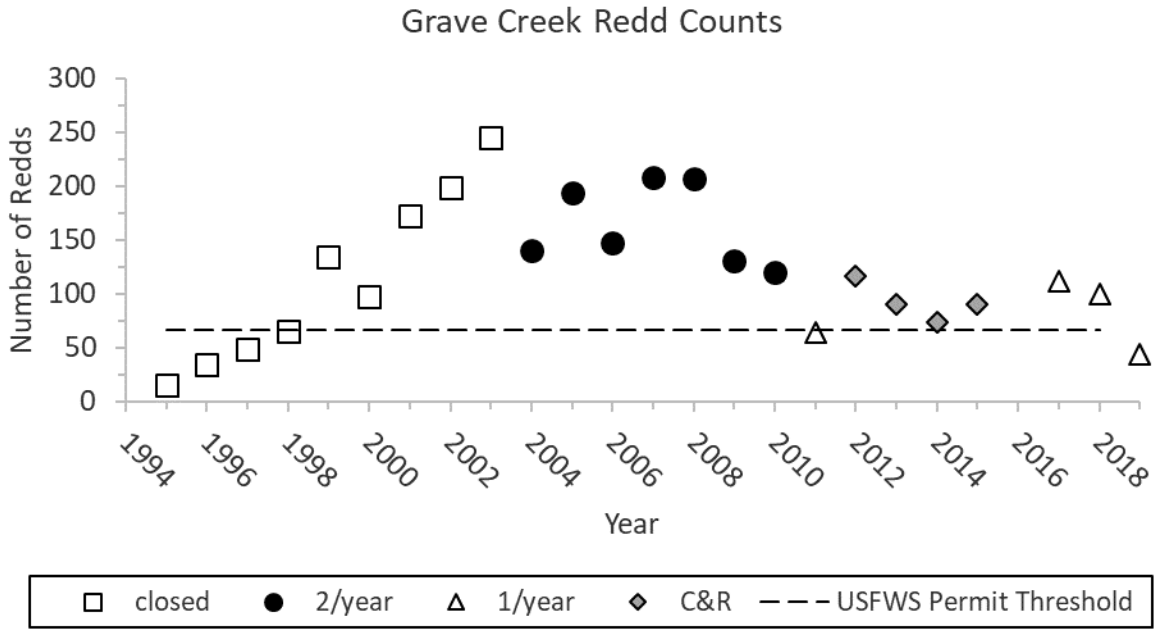

Figure 4. Bull trout redd counts for Grave Creek, Montana by Koocanusa bull trout regulation.

These redd surveys have been conducted annually since 1995 except for Grave Creek in 2016 when high water made redd counts impossible. The 26-year dataset suggests a trend

relationship exists between the number of bull trout redds and angling regulations at Koocanusa. In addition, bull trout angling in the British Columbia portion of the Lake Koocanusa/Kootenay River/Elk River system had relatively liberal harvest limits (1 >30 cm [12”] per day in Koocanusa and Kootenay River, 1>75 cm (29.5”) per day Elk River. Therefore, even though the harvest and redd count numbers did not approach permit thresholds, MFWP adjusted regulations after 2011 to one per year harvest and after 2012 to catch and release. Recent BC regulations include more restrictive limits (Bull trout release from Nov 1 through March 31 in Koocanusa and Kootenay River; No bull trout <75 cm) and with that in mind, MFWP requested a one bull trout harvest per year starting in the 2016 season.

The 2019 data indicated a substantial decline in bull trout redds in both the Grave Creek and the Wigwam River drainages (Figures 3 and 4). Both 2019 counts represent the lowest observed since the bull trout catch card program was initiated, and the Grave Creek redd count (44) was well below the USFWS threshold value of 67 for maintaining harvest. In response MFWP staff recommended, and the MFWP Commission approved closing Lake Koocanusa to bull trout harvest during the 2020 fishing season. Anglers will still need to acquire a Lake Koocanusa catch card to legally target bull trout on a catch-and-release basis.

Catch Card Violations

We found 22 technical violations during the 2019 Koocanusa bull trout season; 16 catch cards were not notched for harvested bull trout and 6 catch cards were not signed. Though not egregious, the 16 catch cards not notched is troubling. We will remind anglers in the future to remember to accurately complete their catch cards and appropriately notch the catch card upon harvest of a bull trout.

CONCLUSION

The Lake Koocanusa bull trout fishery is quite complex in that most of the adult population rears and matures in the Montana portion of the reservoir although major adult runs, spawning, and juvenile rearing occur in the BC portion of the drainage. Environmental and anthropogenic pressures are also complex and largely not known or measured. Over the years, MFWP developed a management strategy for the Lake Koocanusa bull trout recreational fishery that evolved to be more conservative than the limits of the authority statutes set by USFWS sub permit TE-07753 for this population. As a result, regulations have been modified ranging from harvest of two bull trout per year to catch and release based on gathered information.

It is problematic to identify and measure all possible variables (environmental/anthropogenic) affecting the bull trout population in Lake Koocanusa. Adding to the complication, one-half of the reservoir is across an international border with additional environmental variables and different management schemes for bull trout. Through the years, MFWP has adjusted Lake Koocanusa fishing regulations to maintain angling opportunities while conservatively protecting

the bull trout population. The declining trend in bull trout redd counts, and the contemporary record low count in Grave Creek warrants a shift to catch and release only for the 2020 fishing season. We will still require a catch card and survey catch card holders. Continued monitoring of the fishery and the bull trout population will determine the future trajectory of this unique and valuable fishery.

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