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: (3110 Kootenai River Drainage Fisheries Management)

Abstract:

During the 2023 license year, 37 anglers obtained bull trout permits/catch cards for Lake Koocanusa. By August 2024, we received 25 catch cards and/or surveys (68% return) from anglers. For the 2024 license year, 54 anglers obtained bull trout permits/catch cards. By August 2025, we received 39 catch cards and/or surveys (72% return). The low number of catch cards issued and catch card/survey returns were likely a result of catch and release only regulations beginning with the 2020 season. Estimated catch of bull trout was 34 and 92 for the 2023 and 2024 fishing seasons respectively.

The bull trout population in Lake Koocanusa is closely monitored. Catch card data, redd counts, gillnet surveys, and tributary juvenile abundance estimates are reviewed annually and have led to an adaptive management approach where bull trout harvest limits are proactively adjusted based on gathered information. Montana Fish, Wildlife & Parks has managed the Lake Koocanusa bull trout fishery more conservatively than required by USFWS sub permit TE-077533.

Monitoring the bull trout population and fishery will continue. Adaptive harvest management has maintained a limited sport fishery for bull trout in Lake Koocanusa that will persist if monitoring and response efforts remain proactive. The success of this unique fishery enhances the understanding of bull trout while encouraging stakeholder engagement and informational contributions from anglers. The most recent shift to catch and release only regulations beginning in 2020 has limited the value of the catch card data through reduced angler interest, suggesting harvest opportunity is a strong motivator for participation.

Angler Survey of Experimental Recreational Bull Trout Fishery for Lake Koocanusa, Montana during the 2023 and 2024 Seasons.

Brian Stephens, Fisheries Management Biologist
Neil Benson, Fisheries Technician

Montana Fish, Wildlife & Parks
385 Fish Hatchery Road
Libby, Montana 59923

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SUMMARY

In 2004, the U.S. Fish and Wildlife Service authorized limited sport fishing for bull trout *Salvelinus confluentus* at Lake Koocanusa as requested by Montana Fish, Wildlife & Parks after that fishery was 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 this new fishery. Over the past 20 years, indices of Lake Koocanusa bull trout abundance have informed adaptive management of this unique fishery resulting in various adjustments of harvest limits.

During the 2023 license year, 37 anglers obtained bull trout permits/catch cards for Lake Koocanusa. By August 2024, we received 25 catch cards and/or surveys (68% return) from anglers. For the 2024 license year, 54 anglers obtained bull trout permits/catch cards. By August 2025, we received 39 catch cards and/or surveys (72% return). The low number of catch cards issued and catch card/survey returns were likely a result of catch and release only regulations beginning with the 2020 season. Estimated catch of bull trout was 34 and 92 for the 2023 and 2024 fishing seasons respectively.

The bull trout population in Lake Koocanusa is closely monitored. In addition to the catch card information, data from redd counts, gillnet surveys, and tributary juvenile bull trout abundance estimates are reviewed annually. The result has been an adaptive management approach where bull trout harvest limits are proactively adjusted based on gathered information. Through the years, Montana Fish, Wildlife & Parks has managed the Lake Koocanusa bull trout fishery more conservatively than required by the U.S. Fish and Wildlife Service in sub permit TE-077533.

Monitoring the bull trout fishery in Lake Koocanusa will continue. By combining indices of bull trout abundance with information regarding angler use, Montana Fish, Wildlife & Parks can continue to evaluate relationships between the fishery and the bull trout population. Adaptive harvest management has maintained a limited bull trout sport fishery that will persist as long as monitoring and response efforts remain proactive. The success of this unique fishery helps enhance the understanding of bull trout and encourages stakeholder engagement and informational contributions by the angling public. The most recent shift to catch and release only regulations beginning in 2020 has limited the value of the catch card data through reduced angler interest, suggesting harvest opportunity is a strong motivator for participation.

INTRODUCTION

From 2004 through 2024, Montana Fish, Wildlife & Parks (MFWP) personnel conducted annual angler mail surveys 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 (ESA) in 1998, this fishery was authorized beginning in 2004 under special permit by the U.S. Fish and Wildlife Service (USFWS).

The Lake Koocanusa bull trout population is quite complex in that most adults rear and mature in the Montana portion of the reservoir while much of the spawning and juvenile rearing occurs in the BC portion of the drainage. Environmental and anthropogenic factors impacting bull trout in such a large system are also complex and poorly understood. MFWP has 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. The result has been an adaptive approach where regulations can be modified between years based on the best available knowledge of the bull trout population (Stephens and Benson 2021).

Since the creation of Lake Koocanusa, the bull trout population in this portion of the Kootenai River drainage has become resilient. Likely existing at adult densities much higher than the free-flowing river, the population increased following ESA listing and elimination of targeted angling. Even after limited harvest was established in 2004, indices of bull trout abundance remain stable at levels not different from historic (Stephens and Benson 2021). This stability is a testament to the adaptive management approach where potential impacts of angling pressure are mitigated through harvest regulations, while still allowing a limited recreational fishery for bull trout.

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. In 2004, the U.S. Fish and Wildlife Service (USFWS) authorized limited sport fishing for bull trout at Lake Koocanusa as requested by Montana Fish, Wildlife and Parks (MFWP) after the fishery was deemed to have reached recovery goals. The resulting USFWS special permit (TE-077533; current permit ES077533) included conditions agreed upon by both USFWS and MFWP for authorized take of bull trout in Lake Koocanusa (Hensler and Benson 2005).

One key condition of the USFWS special permit called for development and use of a catch card and angler surveys. The first step in administering a catch card system involved an application process which was available through the Region 1 MFWP office and on MFWP web site. After a completed application was processed, a permit and numbered catch card were issued to each angler. Catch cards requested location, length, and date of each bull trout harvested be recorded. Additional supplemental information included total number of days fished, a catch and release log for bull trout, and catch information for rainbow trout.

Anglers were instructed to retain their catch cards until they received a mail survey after the bull trout season. Surveys were mailed to all current catch card holders, and in some years to anglers who had obtained catch cards in previous years. Information gathered from the catch cards and surveys was used to generate accurate estimates of bull trout catch and harvest from Lake Koocanusa.

Special terms and conditions for FWP's management of the Lake Koocanusa bull trout fishery are found in USFWS permit number TE077533 (current permit ES077533). FWP is authorized to allow individual anglers to intentionally pursue and capture bull trout from Lake Koocanusa with the appropriate permit and catch card. Depending on the status of the bull trout population, FWP may open or close the fishery and adjust harvest limit (maximum 2 per license year – 1 daily). Annual maximum authorized angler take is 1,140 bull trout from Lake Koocanusa, which includes incidental catch and release mortality calculated as 10 percent of the number of fish caught and released. Anglers may catch and release bull trout year-round, but harvest is restricted to June 1 – through February 28 in years where harvest is allowed.

The level of authorized take is reevaluated annually, and the recovery permit may be amended if bull trout abundance indices, as demonstrated by redd counts, fall below levels that the USFWS considers necessary to ensure local bull trout populations will not be unacceptably impacted. A review of the recovery permit for Lake Koocanusa is triggered when annual redd counts in the index areas of the Kootenai drainage drop below 667 redds in the Wigwam River or 67 redds in Grave Creek.

METHODS

Catch cards and/or surveys were issued to anglers for the Koocanusa bull trout fishery in all years from the 2004 through 2024 fishing seasons. Information obtained from catch card and survey returns was used to estimate fishing pressure, catch, and harvest metrics. To estimate fishing pressure, we used the reported effort from catch cards and surveys and assumed anglers not responding to the survey angled for bull trout with the same effort as respondents. Response rates averaged 71 percent for all years (range 38% - 85%). Analyses and figures were generated using Microsoft Excel at a significance level of 0.05 unless otherwise noted.

Beginning with the 2020 season for the most recent catch and release only years, only catch card holders received surveys. During 2012 through 2015 under no harvest regulations, mail surveys were sent to anglers that held bull trout catch cards in previous years to offset the low number of catch cards issued (Hensler and Benson 2014). This practice was not adopted starting in 2020 because prior efforts were costly and cumbersome, and because of data accuracy concerns associated with relying on long-term retrospective recollection of effort and catch.

RESULTS

Bull Trout Catch Card/Survey Returns

Catch card instructions requested that anglers return 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 37 catch cards for the 2023 season and by August 2024, we received 25 catch cards/surveys (66% return rate). We issued 54 catch cards for the 2024 season and received 39 catch cards/surveys (72% return rate) by August 2025. The low numbers of catch cards issued were likely a result of the catch and release only regulations beginning with the 2020 fishing season.

Angler Demographics

Most anglers that obtained a Lake Koocanusa bull trout catch card for the 2023 and 2024 seasons were Montana residents (96% and 100%). Only one angler from another state (Washington) was issued a catch card for Lake Koocanusa.

Fishing Pressure Estimates

After the 2023 season, only 12 of the 25 respondents (48.0%) indicated that they did fish for bull trout. For the 2024, 20 of the 39 respondents (51.3%) said they fished for bull trout. The percent of cardholders that fished began an upward trend likely associated with ability to harvest in 2016 (Figure 1) but declined drastically beginning in 2020 with the elimination of harvest. 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 2023 season, anglers reported fishing 49 days, and the estimate of total angling effort was 73 days. For the 2024 season, anglers reported fishing 31 days, and the estimate of total angling effort was 98 days (Table 1).

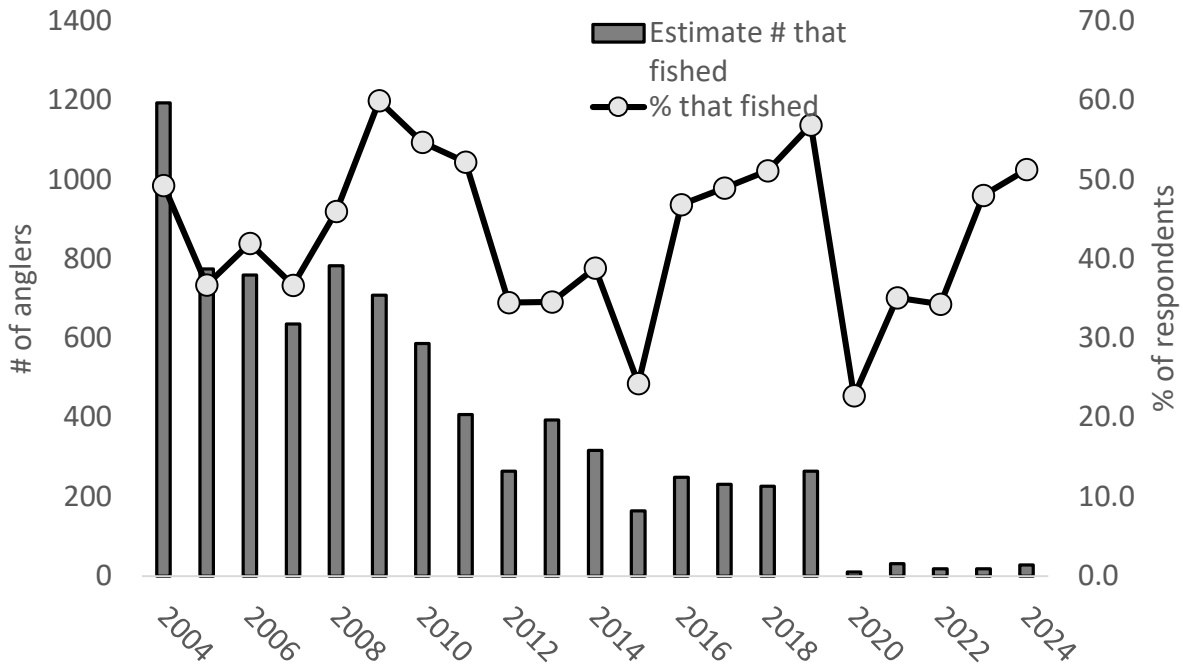

Figure 1. Estimated number of anglers and percent of respondents that fished for bull trout at Lake Koocanusa through the 2024 season.

Table 1. Bull trout season angling pressure estimates calculated from catch card and survey results for Lake Koocanusa through the 2024 season.

Fishing Pressure - Number of Angler Days							
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	2015	536	874	1,202
2005	774	3,285	4,874	2016	378	942	1,326
2006	590	2,639	3,390	2017	319	681	1,008
2007	569	2,963	3,595	2018	319	703	976
2008	609	3,917	4,607	2019	327	821	1,165
2009	691	3,686	4,537	2020	22	17	33
2010	497	3,154	3,720	2021	57	82	127
2011	598	1,933	2,521	2022	35	32	48
2012	603	1,456	1,850	2023	25	49	73
2013	449	1,673	2,370	2024	31	71	98
2014	574	1,099	1,842				

Harvest and Catch Estimates

Since there has been no harvest beginning with the 2020 fishing season, only catch estimates were calculated for the 2023 and 2024 fishing seasons. To estimate total bull trout catch at Lake Koocanusa, we calculated the mean catch rate (bull trout/angler) for anglers who returned catch cards or surveys. The estimated total catch for all catch card holders was 34 bull trout during the 2023 season and 92 bull trout during the 2024 season (Table 2).

Table 2. Estimated bull trout harvest (reported harvest) and estimated catch (reported catch) for Lake Koocanusa through the 2024 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)	608	747	100
2013	No harvest			965 (728)	728	981	100
2014	No harvest			1,250 (746)	746	1,283	100
2015	No Harvest			973 (548)	548	1.019	100
2016	78 (55)	55	79	885 (575)	575	890	91.2
2017	68 (46)	46	69	607 (364)	364	611	87.4
2018	84 (31)	31	85	997 (336)	336	1003	91.6
2019	145 (58)	145	146	1030 (355)	355	1035	83.7
2020	No Harvest			26 (3)	3	29	100
2021	No Harvest			198 (45)	45	203	100
2022	No Harvest			97 (22)	22	103	100
2023	No Harvest			34 (11)	11	37	100
2024	No Harvest			92 (34)	34	96	100

DISCUSSION

Angler Interest and Participation

During the first few years of the fishery, anglers expressed high levels of interest in the Koocanusa bull trout fishery based on the large number of catch cards issued. Through time, the number of catch cards issued decreased, even prior to the first change to the harvest limit in 2011 (Figure 2). Under catch and release only scenarios (2012-2015 and 2020-2024) the mean number of catch cards issued annually was 67 (range 37 – 114) indicating low angler interest and participation likely due to the inability to harvest a bull trout.

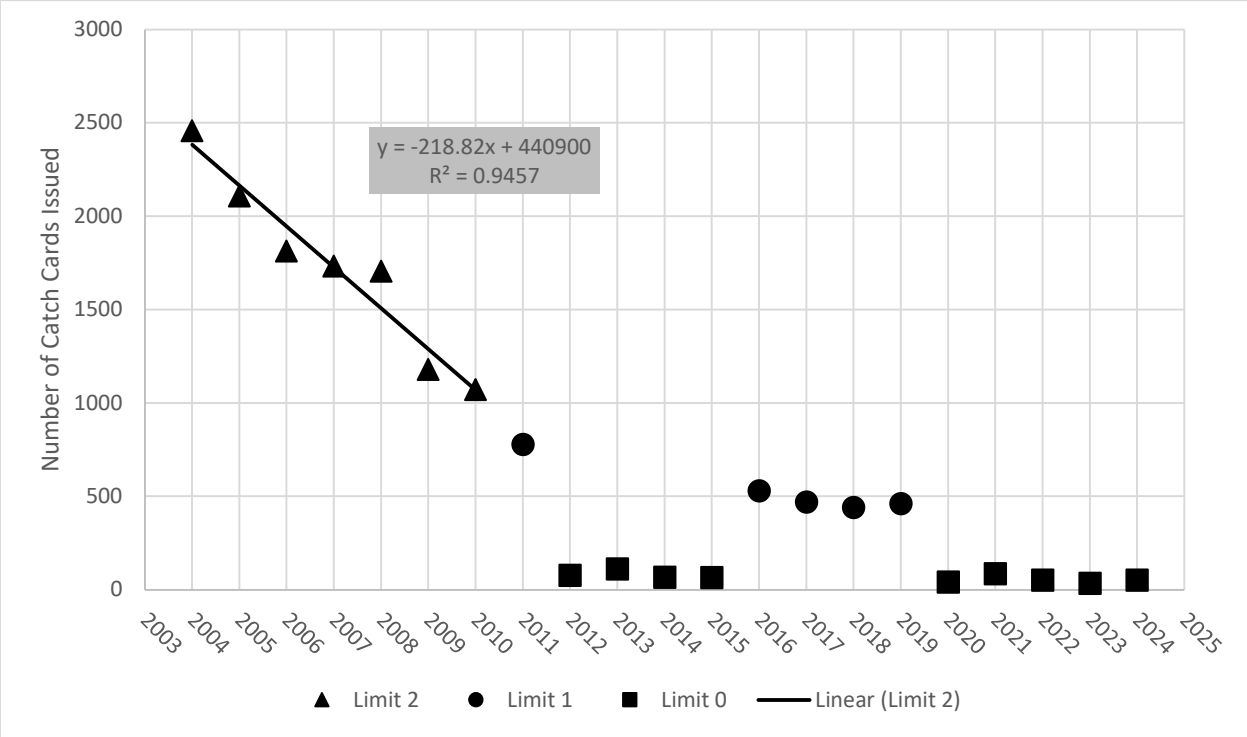

Figure 2. Number of Koocanusa bull trout catch cards issued by year and harvest limit regulation.

Angler Effort

Similar to interest expressed as the number of catch cards issued, angler effort also decreased through time (Figure 3). Estimated total number of angler days declined from over 4,000 during the first two years to around 1,000 during the most recent seasons where harvest was permitted (2016-2019). Since harvest opportunity was eliminated beginning in 2020, estimated total angler days has averaged only 76 days/season (range 33-127).

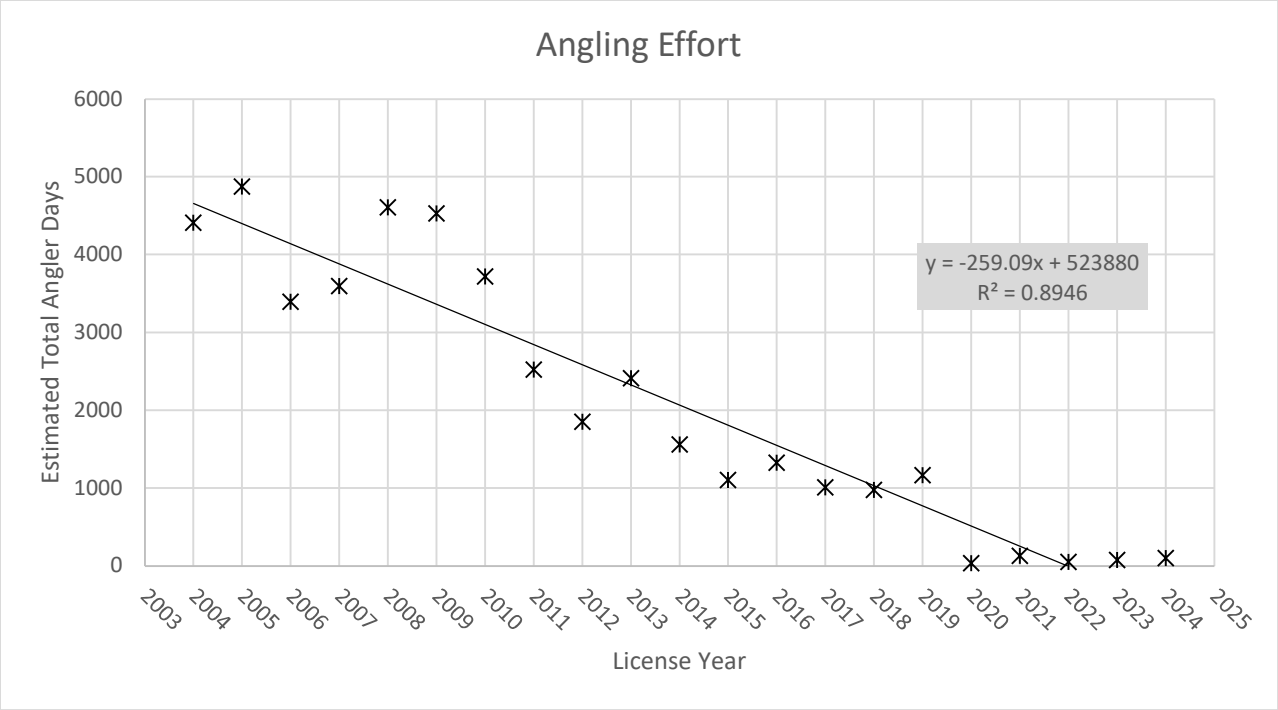

Figure 3. Estimated effort (total number of angler days) by license year.

Bull Trout Catch

The estimated total number of bull trout caught in Koocanusa declined through time ($p < 0.001$; Figure 4). This could be the result of several factors including the initial novelty of the fishery and changes to harvest regulations. Under the most recent catch and release regulations (2020-2024), mean annual estimated total bull trout catch was 90 (range 26-198). A significant positive relationship exists between angler effort and the number of bull trout caught ($p < 0.001$; Figure 5).

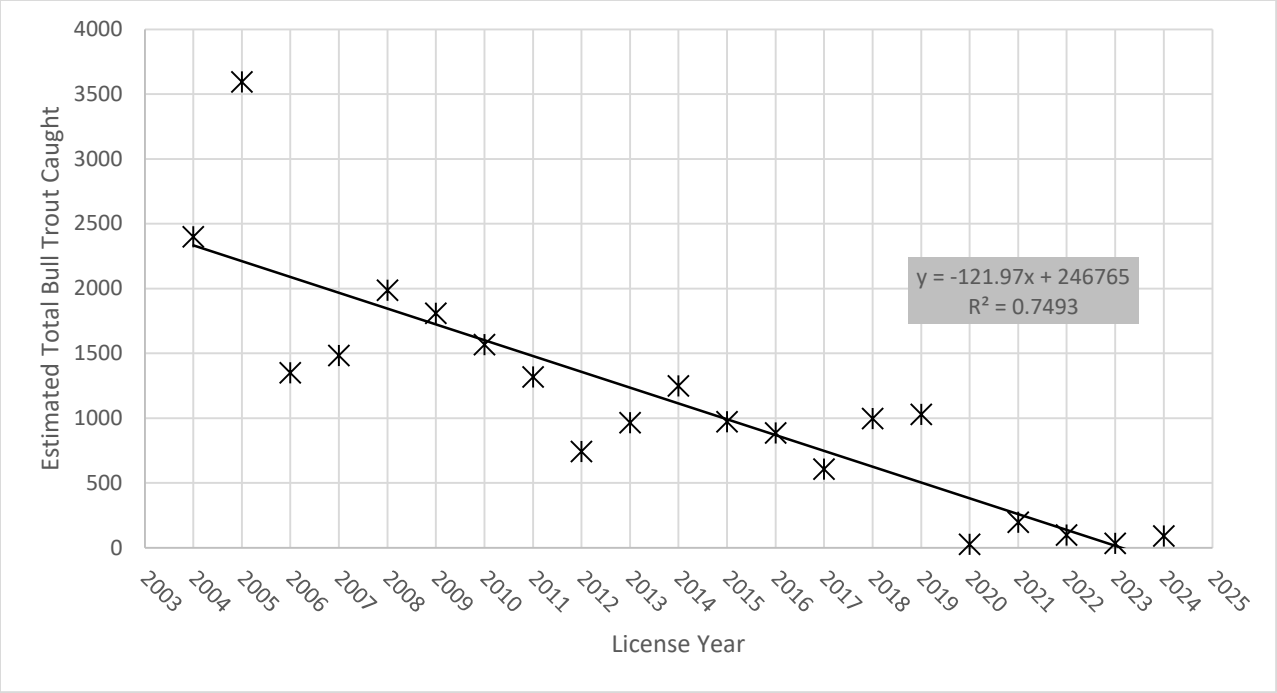

Figure 4. Estimated total bull trout catch by license year.

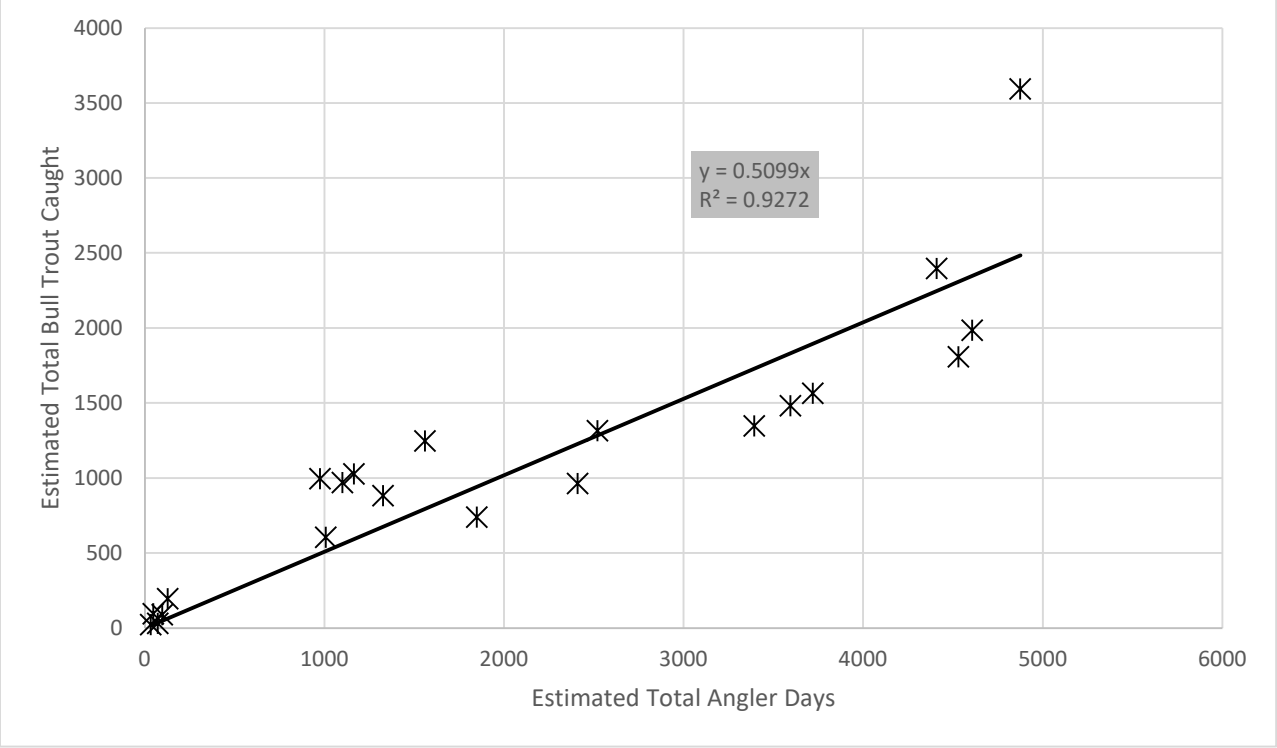

Figure 5. Relationship between angler effort and number of bull trout caught during the 2004 through 2024 seasons.

Bull Trout Harvest and Take

Estimated bull trout harvest and total take also declined with time (Figure 6). Estimated total take includes harvest and incidental catch and release mortality represented as 10-percent of released bull trout. Like interest, effort, and catch, novelty of the fishery likely contributed to initial higher levels of harvest and total take that diminished through the years. Season harvest limit clearly influenced indices of take. Under catch and release only regulations, incidental catch and release mortality represents the total estimated take of bull trout. From 2020 through 2024, estimated annual take averaged 9 bull trout (range 3-20).

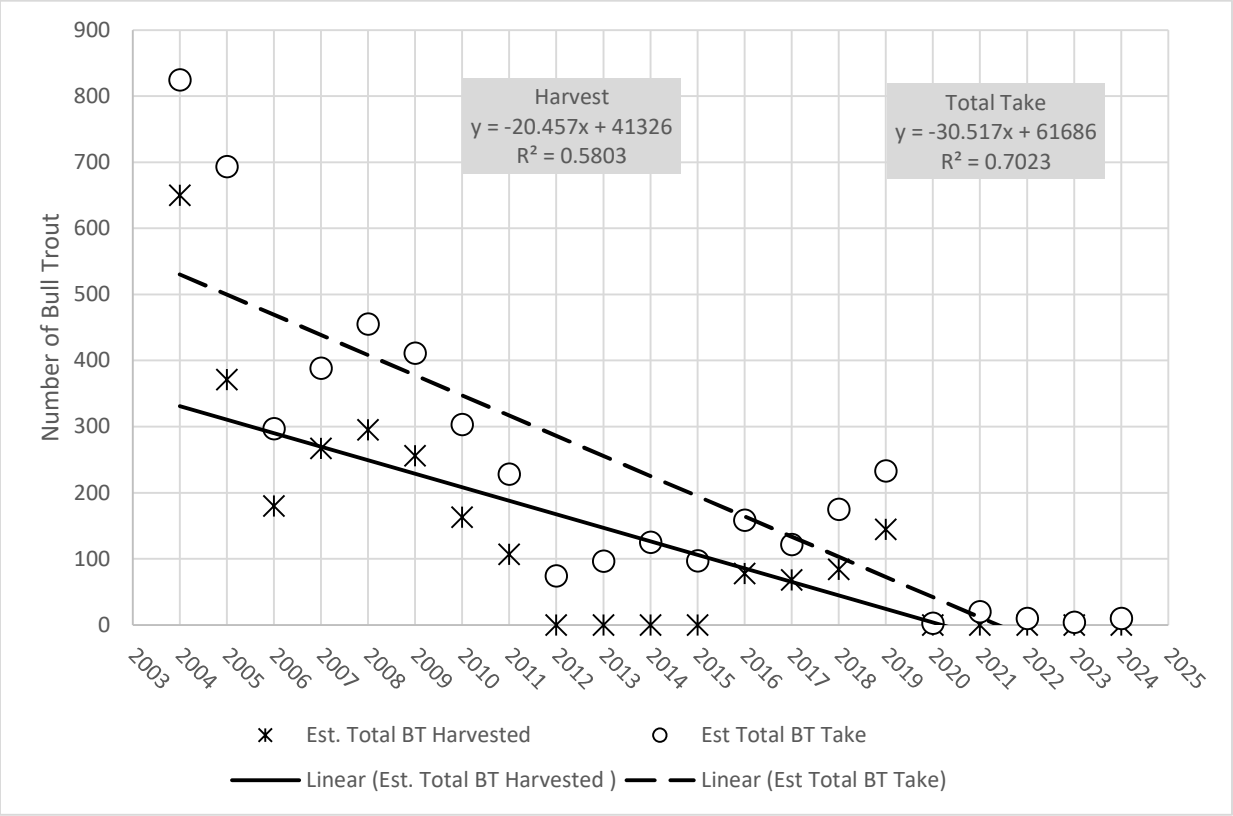

Figure 6. Estimated total bull trout harvest and estimated total bull trout take by license year.

Bull Trout Redd Counts

The Koocanusa bull trout population is closely monitored. A primary metric of bull trout abundance is annual fall redd counts. Bull trout redds are counted in index reaches of the Wigwam River and its tributaries annually by BC personnel, and in index reaches of Grave Creek and its tributaries by MFWP personnel (Dunnigan et al. 2019). Provisions of the USFWS sub permit TE-077533 authorized in 2004 for Koocanusa provided for angler take not to exceed 1,140 bull trout per year and that redd counts not drop below 667 for the Wigwam River or below 67 in Grave Creek.

Redd counts in both Grave Creek and the Wigwam River have exhibited various trends through time and by harvest management strategy (Figures 7 and 8). Prior to reestablishing bull trout harvest in Lake Koocanusa, redd counts displayed a significant increasing trend. Over the first several years of harvest (2 bull trout/year) redd numbers declined, prompting harvest management to become an adaptive response that set the annual individual angler harvest at one or zero depending on the most recent redd trend information.

While the USFWS sub permit TE-077533 only identified bull trout redd count thresholds for the Grave Creek and Wigwam River drainages, BC personnel identified other spawning tributaries in the upper Kootenai River drainage. Bull trout redds have been inventoried annually in reference reaches of the Skookumchuk and White Rivers since 1997 and 2001 respectively. Blackfoot Creek was added in 2002 and inventoried during most years, although the reference reach varied following an extreme debris torrent reported in 2009. Wildhorse Creek has been surveyed since 2016 and has accounted for an average of 136 redds annually. Mean total redds counted for the Lake Koocanusa bull trout population have averaged over 2,000 per year since the fishery was established in 2004, indicating robustness and resiliency across time and adaptive management strategies (Figure 9).

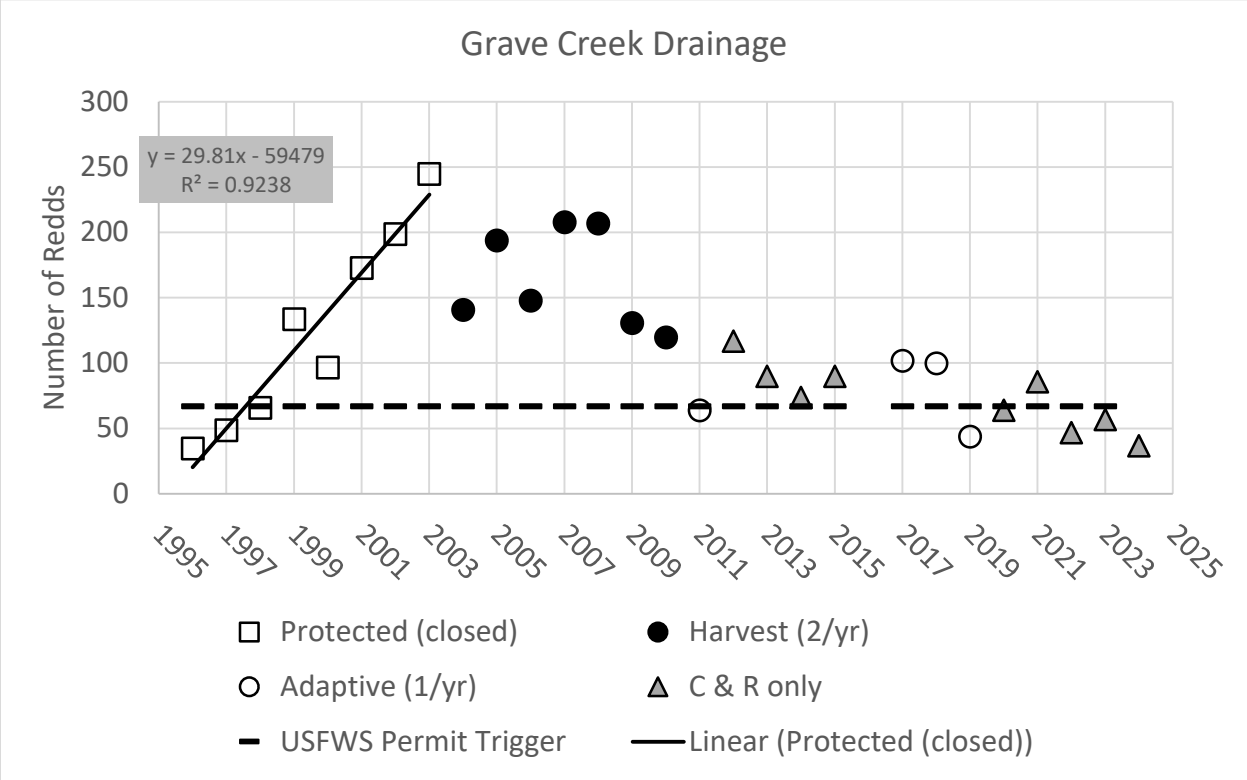

Figure 7. Number of bull trout redds observed in Grave Creek drainage by year and harvest management regulation.

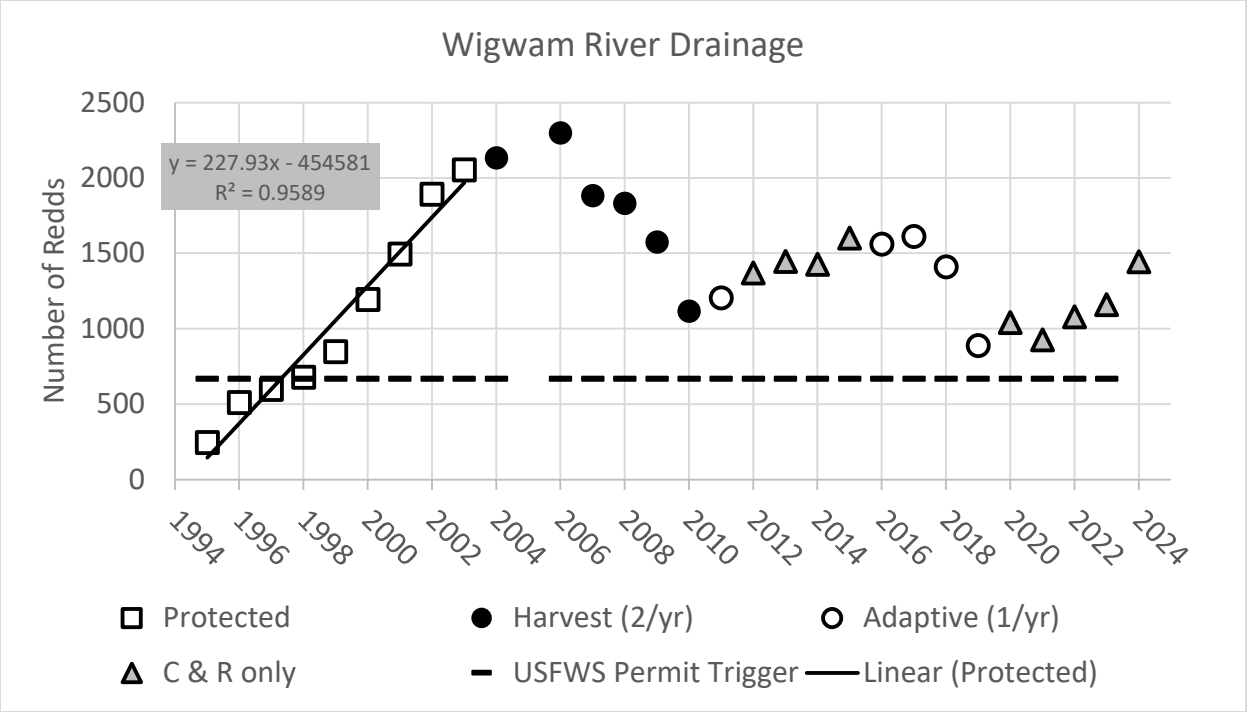

Figure 8. Number of bull trout redds observed in the Wigwam River drainage by year and harvest management regulation.

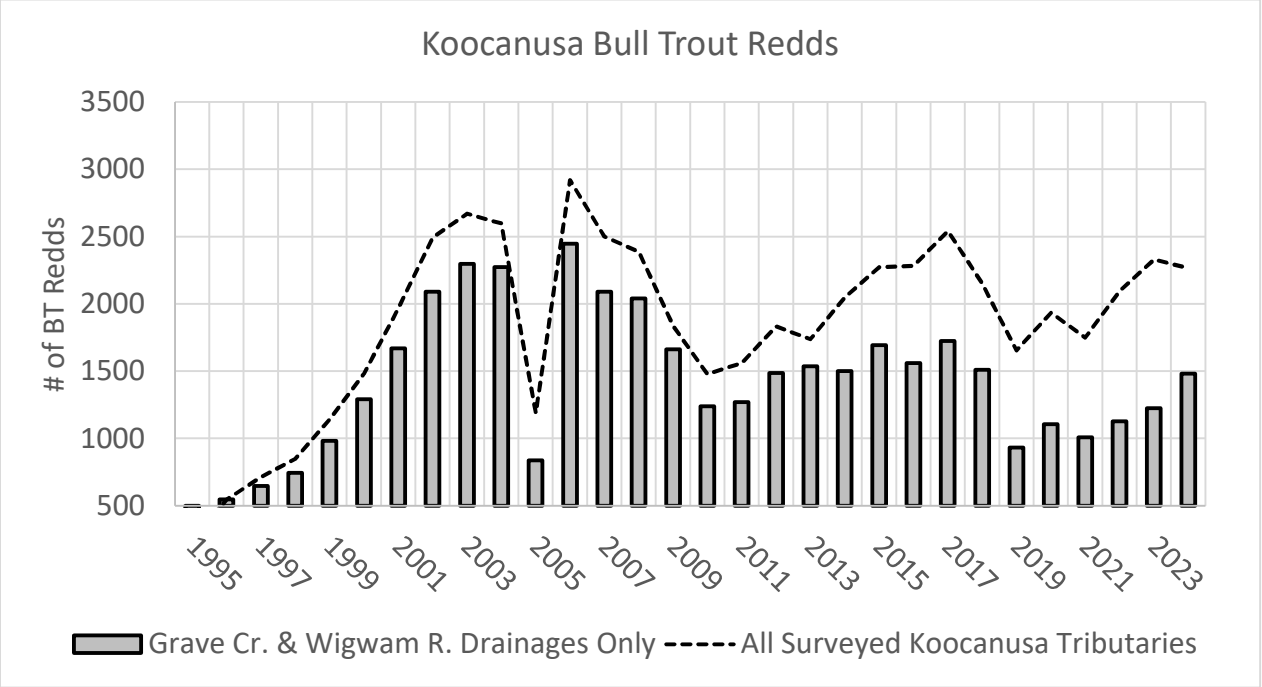

Figure 9. Annual bull trout redd counts for the Grave Creek and Wigwam River drainages, and for all surveyed Lake Koocanusa bull trout spawning streams. In 2005, a landslide in the Wigwam River likely prevented many bull trout from reaching the redd count reference reach.

Juvenile Bull Trout Estimates

Population estimates of juvenile bull trout abundance in Grave Creek have been conducted annually since 1997. Population estimates were generated using multiple depletion electrofishing techniques in an approximately 185-meter long reference reach. While estimates vary between years, no trend is apparent through time (Figure 10). Juvenile bull trout abundance in Grave Creek has averaged 11 bull trout per $100m^2$ across all years and ranged from 6 to 18 bull trout per $100m^2$.

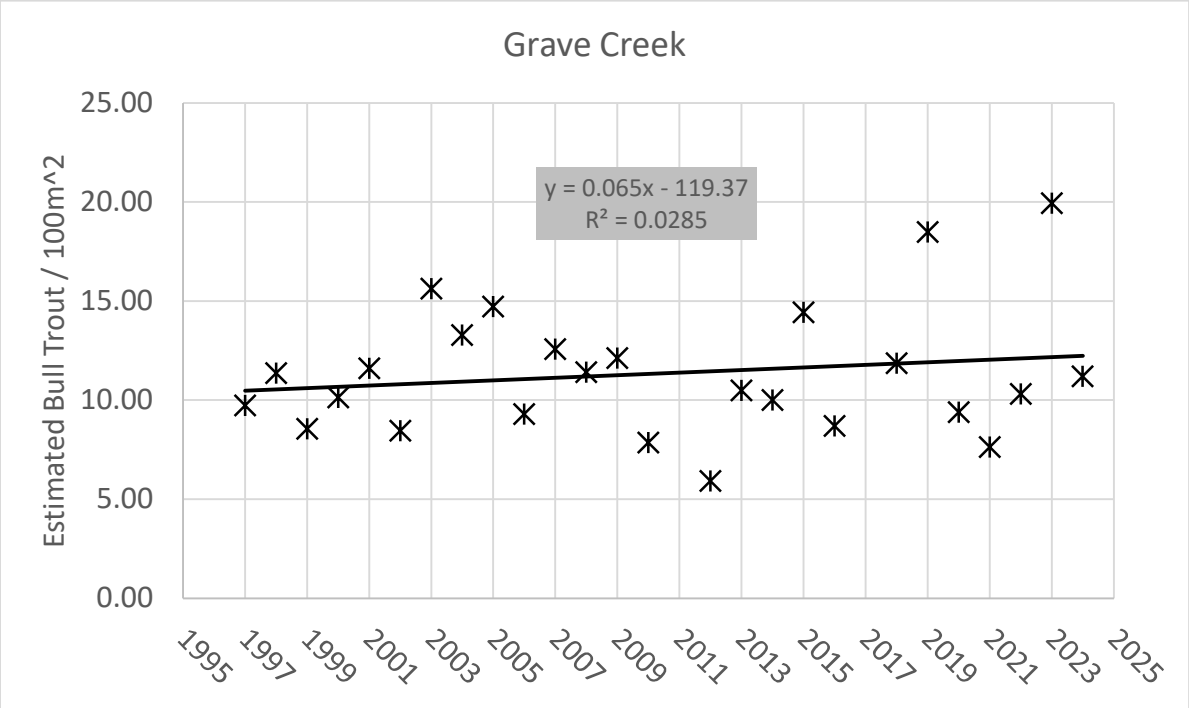

Figure 10. Estimated juvenile bull trout abundance in Grave Creek by year.

Koocanusa Spring Gillnet Catch

MFWP has used experimental gillnets to monitor fish population trends in Lake Koocanusa since 1975. Two sections, Rexford and Canada, are currently sampled in the spring with 14 sinking gillnets in each section although historical effort and sections included additional sites (Dunnigan et al 2019). Fish species abundance is expressed as fish/net and used to assess changes through time.

Koocanusa spring bull trout catch in the gillnets has increased through time (Figure 11). Prior to ESA listing and protection in Montana, catch was stable at relatively low levels. Once fishing for bull trout was eliminated beginning in 1994, bull trout catch per gillnet in Lake Koocanusa displayed a significant increasing trend ($R^2 = 0.535$). Following the reestablishment of a limited fishery that has been adaptively managed, mean bull trout catch in spring gillnets has varied annually displaying no trend, indicating the contemporary stability of the population.

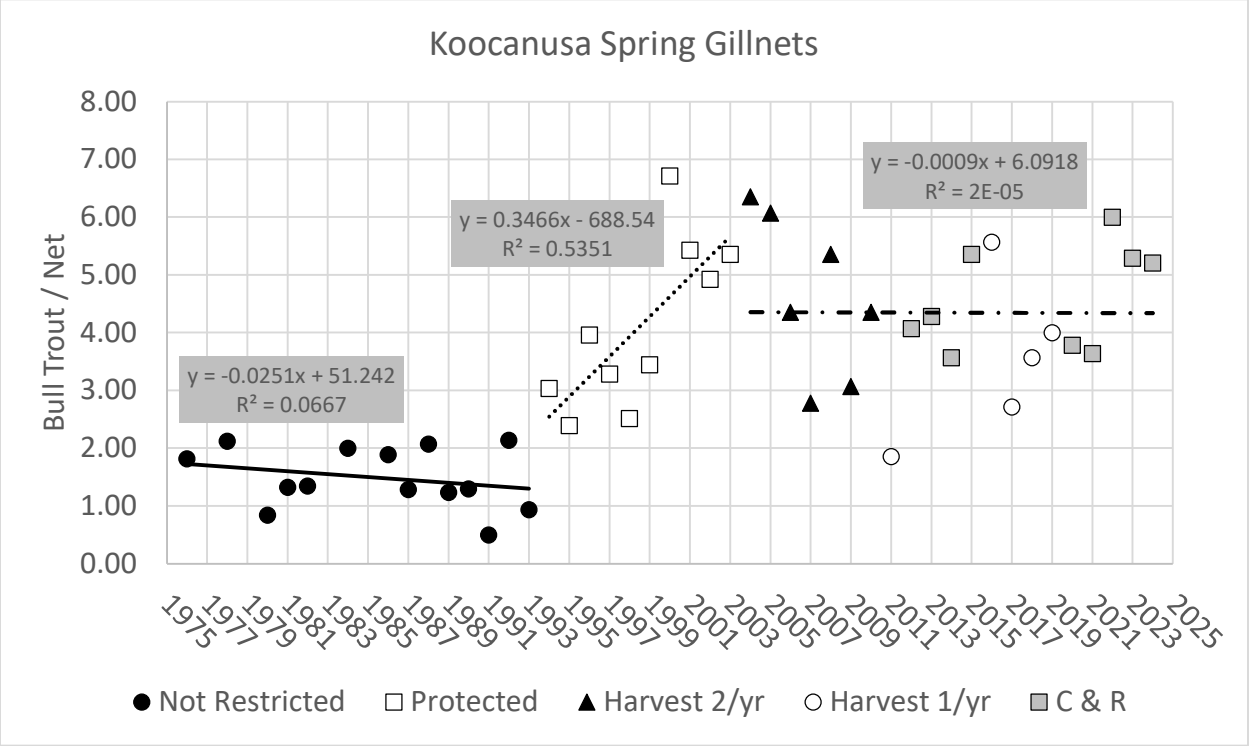

Figure 11. Mean bull trout catch per spring gillnet in Lake Koocanusa by year and harvest management regulation.

CONCLUSIONS

Reduced harvest opportunity for bull trout in Lake Koocanusa has likely influenced angler interest and participation in the catch card program (Stephens and Benson 2021). Particularly under catch and release only regulations, the number of catch cards issued has averaged well under 100 per season. Only limited information can be gleaned from such small samples. Catch card data represents only a minute fraction of the total potential angling impact to bull trout on Lake Koocanusa, as bull trout are susceptible to angling gear and tactics used in a popular sympatric fishery for trophy rainbow trout. While catch and release only regulations reduce bull trout take by eliminating harvest, recent reported and estimated catch of bull trout does not likely represent the potential angling influences associated with the entire fishery.

Monitoring of the Lake Koocanusa bull trout population has been extensive and will continue. Redd counts in the Grave Creek and Wigwam River drainages have been foundation metrics for assessing bull trout abundance trends in Lake Koocanusa. While these indexes of abundance have fluctuated through time, indications are that the Lake Koocanusa bull trout population remains quite robust compared to the rest of the species' range. Ongoing complimentary monitoring of juvenile bull trout recruitment in Grave Creek and adult and sub-adult presence in Lake Koocanusa also suggest stability of this resilient population.

The adaptive harvest management approach employed over the last several years has shown that a limited bull trout fishery can persist on Lake Koocanusa as long as monitoring and response efforts remain proactive. The success of this unique fishery not only enhances the understanding of bull trout, but it also encourages significant opportunities for stakeholder engagement and informational contributions by the angling public. The most recent shift to catch and release only regulations beginning in 2020 has limited the value of the catch card data through reduced angler interest, suggesting harvest opportunity is a strong motivator for participation.

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