Montana Fish, Wildlife & Parks

**Fisheries Division**

Federal Aid Job Progress Report

**Montana Statewide Fisheries Management**

**Federal Aid Project Number: F-113**

July 1, 2023– June 30, 2025

Project Title: Montana Statewide Fisheries Management

Job Title: Bitterroot Drainage Fisheries Management

Purpose: This report summarizes fish sampling and fisheries related surveys conducted in waters of the Bitterroot basin during the 2023 and 2024 field seasons. Sampling was carried out as part of the fisheries management duties of the Bitterroot fisheries responsibility area located in administrative Region 2.

# Bitterroot Basin

# Fisheries Sampling

# 2023 & 2024

**Prepared by:**

**Jason Lindstrom – Fisheries Biologist**

**Montana Fish, Wildlife and Parks**

**January 2025**

## Acknowledgments

Thank you to MFWP technician Leslie Nyce who assisted with the sampling and data analysis that is summarized in this report. Also, thank you to numerous Bitterroot National Forest employees who provided valuable field assistance.

The work summarized in this report was funded with Montana hunter and angler license dollars and Federal Wallop-Breaux/Sport Fish Restoration Act funds.

# TABLE OF CONTENTS

# PURPOSE

This report summarizes fish sampling and fisheries related surveys conducted in the Bitterroot River and other waters of the Bitterroot River drainage during the field seasons of 2023 and 2024. Sampling was carried out as part of the fisheries management duties of the Bitterroot fisheries responsibility area located in administrative region 2.

# BACKGROUND

The Bitterroot River is a large Western Montana freestone stream originating at the confluence of its East and West Forks near Conner. From this location, the river flows in a northerly direction for over 80 miles through irrigated crop and pastureland before joining the Clark Fork River near the city of Missoula. There are five major diversions and numerous smaller canals that remove large amounts of water from the river during the irrigation season (Spoon 1987). In addition, many of the tributaries that originate on the Bitterroot National Forest (BNF) are diverted for irrigation during the summer months and contribute relatively little if any streamflow to the river during this time. Streamflow characteristics vary along the Bitterroot River, with the most critically dewatered reach being between Hamilton and Stevensville (Spoon 1987). To help lessen mainstem dewatering, Montana Fish, Wildlife & Parks (FWP) annually oversees the release of 15,000 acre-feet of water from Painted Rocks Reservoir on the West Fork of the Bitterroot River, and 3,000 acre-feet of water from Lake Como located near Darby. The most dewatered section of the river north of Hamilton is the target reach for the Painted Rocks instream flow water. In addition to dewatering, urbanization and development of the floodplain is also increasing in the Bitterroot Valley putting further pressures on the Bitterroot River (Javorsky 1994). These pressures come primarily in the form of bank stabilization and armoring, and woody riparian vegetation clearing.

The Bitterroot River is managed as a wild trout fishery, emphasizing natural reproduction of native and non-native trout. The Bitterroot drainage is currently home to ten native and ten non-native fish species. Native fish species include bull trout, westslope cutthroat trout, mountain whitefish, northern pike minnow, longnose sucker, largescale sucker, longnose dace, redside shiner, peamouth, and Columbia slimy sculpin. Non-native fish species inhabiting the drainage include rainbow trout, brown trout, brook trout, northern pike, largemouth bass, pumpkinseed, yellow perch, black bullhead, brook stickleback, and smallmouth bass, which were documented in 2023 in the lower Bitterroot River. Dominant sportfish species vary by location in the drainage. Westslope cutthroat trout are abundant in many headwater tributaries and mountain lakes and are also common in the mainstem Bitterroot River above Hamilton. Rainbow trout, brown trout, and mountain whitefish are common throughout the entire length of the Bitterroot River as well as in the lower reaches of larger tributaries such as the East and West Forks. Brook trout are present in many smaller tributaries to the Bitterroot but are rare in the main river.

The Bitterroot River is an important sport fishery in western Montana. Annual pressure estimates from the statewide angler survey indicate that the Bitterroot River and its upper forks routinely exceed 100,000 angler days per year. Recent combined survey results from 2020 showed the highest pressure on record at nearly 167,000 angler days (FWP 2022). Due to increasing fishing pressure and observed declines in some fish species, harvest regulations became more restrictive in the Bitterroot River drainage beginning around 1990. Native westslope cutthroat trout, which were susceptible to high angling harvest prior to this time, were protected under catch-and-release regulations throughout the Bitterroot River and the upper forks. Rainbow trout harvest opportunity was also removed in the lower West Fork and East Fork around 2012 in response to declining populations possibly related to the impacts of whirling disease in the upper Bitterroot drainage. Catch-and-release sections for all trout were established in the upper and lower reaches of the Bitterroot River in 1992. While it appeared that rainbow trout numbers increased in the lower catch-and-release section between Stevensville and Florence because of the regulation, no apparent change was detected in the upper section near Darby, and it was eliminated around 2012. Currently, only one catch-and-release section for all trout species exists on the Bitterroot River. This section runs between the Florence Bridge Fishing Access Site near Florence upstream to the Woodside Bridge Fishing Access Site near Corvallis. This reach of the river appears to be recruitment limited and sees low flows and warm temperatures during periods of drought. In addition to being catch-and-release for all trout, this reach also limits tackle to artificial lures only. The remainder of the Bitterroot River is open to the use of bait.

Fish population monitoring in the Bitterroot River provides valuable information to inform management strategies to maximize angling opportunity while maintaining the quality of the fishery and protecting native species. Regular electrofishing population estimate data has been collected at several reaches beginning in the late 1980's. Study reaches were selected based on historical data, streamflow patterns and fishing regulation differences. Fish population estimates on the Bitterroot River have primarily been done in the fall (September and October) and focus only on trout. Due to the length of the study sections and the large number of fish required to calculate population estimates, other species of fish present in the river were not included. However, beginning in 2011 efforts were made to monitor a more diverse array of species using more basic sampling techniques. While this sampling does not result in a population estimate, it does provide a sense of relative abundance that allows us to monitor major changes in certain species. It is most beneficial for the more common species such as mountain whitefish, which are the most abundant fish in the river.

Tributaries to the Bitterroot River, many originating on the BNF, support widespread populations of native westslope cutthroat trout and bull trout. Westslope cutthroat trout are classified as a Species of Concern in Montana due to declining numbers, and bull trout are Federally listed as a Threatened Species under the Endangered Species Act. Due to the importance of these native fish species, monitoring has been conducted on many tributary streams to assess fishery health through time. Sections are located throughout

the basin and are sampled on a rotating basis with a frequency typically between 1 and 5 years, although some sections see a longer duration between sample events.

Lake Como is one of the most accessible flat water angling opportunities in the Bitterroot drainage. The lake is stocked annually with rainbow trout as well as westslope cutthroat trout. Kokanee were stocked frequently from 1997 to 2012 but are no longer due to poor performance. Due to severe annual drawdown for irrigation and instream flow, as well as the low productivity of the lake, fish density and growth continues to be low, and fishing is only fair. Typically, annual gillnet sampling is done in Lake Como to assess basic survival and performance of stocked fish.

# METHODS

## Fish Sampling

Rivers:

Sampling on the Bitterroot mainstem was done using a 14-foot drift boat electrofishing unit with two fixed booms. The system was powered by a 4,000 or 5,000-watt generator and current was controlled with a Smith-Root VVP-15B rectifying unit. Smooth direct current was always used. Crews consisted of two or three people, one rowing the boat and the other(s) standing in the bow capturing fish with a dip net. Estimates were produced using three marking passes completed over approximately a one-week period and two recapture passes completed about one week later. Estimate sample sections varied by year and ranged in length from 3.9 to 5.1 miles. Figure 1 shows the general location of the mainstem Bitterroot River estimate sections covered in this report. For all-species sampling conducted in the spring, a single electrofishing pass was made through the sections. These sections were shorter than estimate sections but were located within the same reaches. Length of the 1-pass sections varied from 1.8 to 2.0 miles.

For smaller, shallower reaches (e.g., East Fork Bitterroot River and upper West Fork Bitterroot River) a small barge electrofishing unit was utilized. This system was powered by a 4000-watt generator and current was controlled with a Smith-Root VVP-15B rectifying unit. Smooth direct current was always used. Crews consisted of four people, one controlling the barge, one throwing and retrieving a mobile electrode, and two people dip netting fish. Estimates were made using one marking run and one recapture run completed approximately one week apart. Section lengths varied from 0.8 to 1.0 miles.

All fish captured during electrofishing efforts were identified to species, measured, weighed, given a small fin clip (if part of an estimate), examined for hook scars (obvious wounds or mouth trauma from being previously hooked by an angler) and other items of note, and then released. In each sample reach, multiple stops were made to process fish and make sure they were well distributed throughout the section.

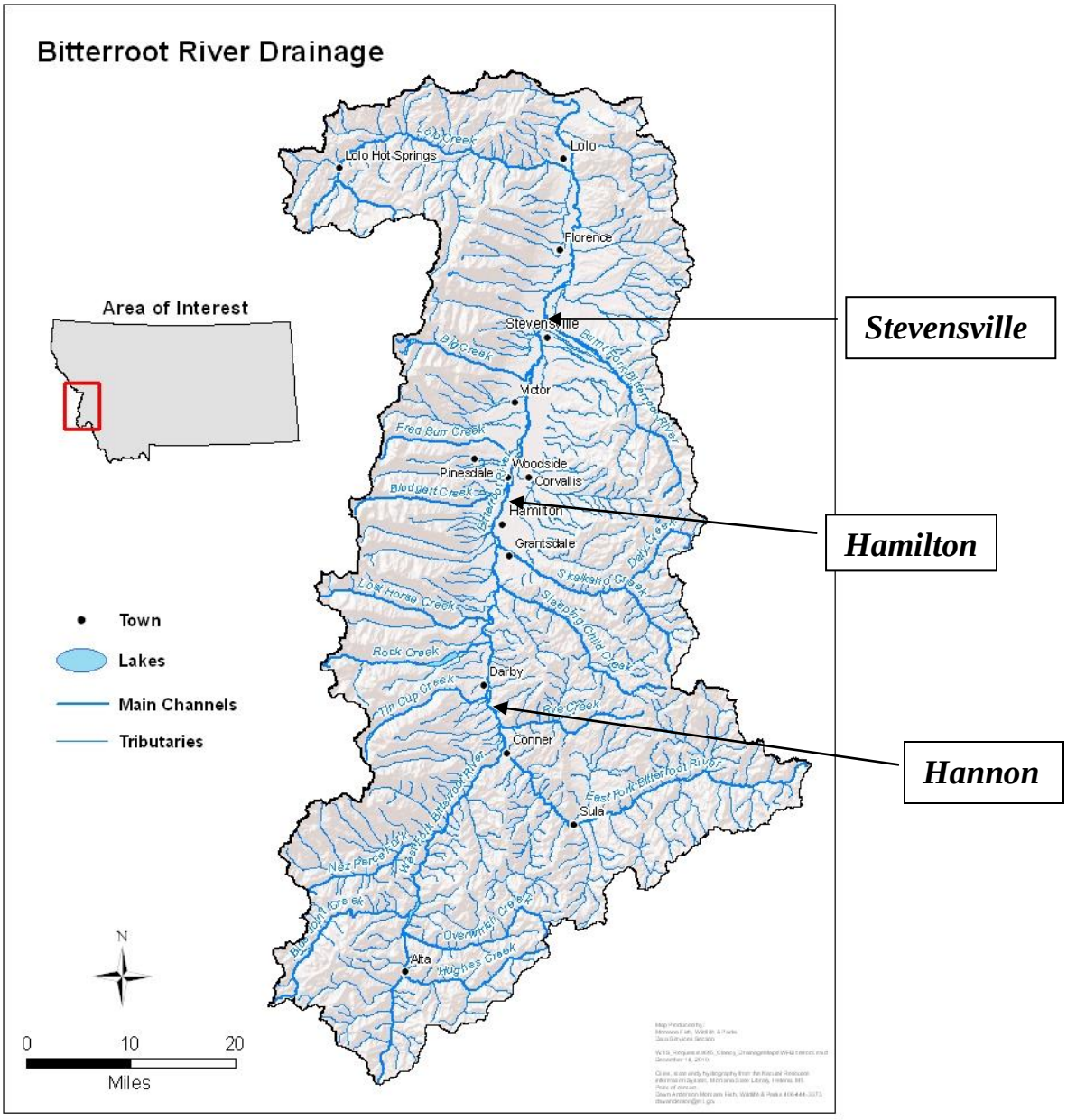


Figure1. Map of Bitterroot basin showing location of Bitterroot River trout estimate sections.

Tributaries:

Sampling at most long-term tributary sections was completed with a bank electrofishing setup. This consisted of a 4000-watt generator (placed at the midpoint of the section), a Smith-Root VVP-15B rectifying unit, and a 500-foot spool of coated wire connected to a mobile, throwable electrode. This setup required four to five people to sample effectively. In smaller streams, a backpack electrofishing unit (Smith-Root LR-24 and/or Coffelt

Mark 10) was used to collect fish. Crew size was typically limited to two or three people in these instances. Mark and recapture population estimates were completed at many of the sample sites. Sampled reaches varied in length but were typically 500 to 1000 feet long. Estimates were generally made using one marking run and one recapture run completed approximately one week apart. All fish captured during tributary electrofishing efforts were identified to species, measured, weighed, given a small fin clip (if part of an estimate), examined for items of note, and then released near their capture location.

Lakes:

Monofilament gillnets (125 ft long by 6 ft deep, experimental design) were utilized to sample fish in Lake Como in 2024. Two floating gillnets were set at previously sampled locations on the east end of the lake. The nets were set in mid-October out of a non-motorized boat. Nets were deployed in the afternoon and retrieved the following morning. All fish captured were identified to species and measured for total length.

## Data Summary

Rivers:

For estimate sections, the population estimate (standardized to the number of fish per mile), capture efficiency, the total number of fish handled during mark and recapture runs (not including recaptured fish), mean and range of fish lengths, and percent of species composition were all calculated. Population estimates were generated using a modified Peterson estimator (Bailey 1951) and were generally only reported for species with at least three recaptures. Estimates and capture efficiencies were only reported for trout greater than 175 mm (~7 in) in length due to low capture efficiency of smaller size classes. For single-pass sections, total number of fish handled, catch per mile, mean and range of fish lengths, and percent of species composition were calculated.

Tributaries:

Fish data was summarized for each sample location by species and included the number of fish captured (marking run or first pass only), catch per effort standardized to 1,000 feet of channel length, mean and range of fish lengths, and percent of species composition. Trout were the focus of these data summary efforts. At sites where population estimates were made, an estimate value with a 95% confidence interval was reported. Population estimates were calculated using a modified Peterson estimator (Chapman 1951) and were generally only reported for species with at least three recaptures. Estimates were produced for fish 100 mm (~4 in) in total length and larger, and values were reported as the number of fish per 1,000 feet of channel length. Sample locations were identified and named according to the closest river mile using a GIS and a routed stream layer maintained by the Bitterroot National Forest.

Lakes:

Gillnet data was compiled for all nets and was summarized by species including the number of fish captured, mean and range of fish lengths, and the mean number of fish per net.

# RESULTS & DISCUSSION

## *Bitterroot River Trout Populations*

### Bitterroot River

Population estimates were conducted at the Hamilton and Hannon sections in 2023 and the Stevensville and Hannon sections in 2024.

At the Hamilton section in 2023, rainbow trout dominated the trout community, followed by brown trout, and then westslope cutthroat trout (Table 1). Rainbow trout density was close to the long-term average for the section, and within the range of variability recorded in previous sample years (Figure 2). Brown trout numbers were also close to the long-term average and have been relatively stable in the Hamilton section for the period of record (Figure 3). The estimate obtained for westslope cutthroat trout in the Hamilton section in 2023 was below the long-term average but was possibly biased due to low numbers of fish handled (Figure 4). The proportion of trout (>175 mm) showing evidence of hook scars in the Hamilton section in 2021 was 8% for rainbow trout (includes rainbow x westslope cutthroat trout hybrids), 7.1% for brown trout, and 53.8% for westslope cutthroat trout. The rates for rainbow trout and brown trout were near long-term averages, while the rate for westslope cutthroat trout was a little over 10% above the period-of-record value (Figure 5).

Table 1. Electrofishing data collected on the Bitterroot River at the Hamilton Section during fall 2023. Population estimates and capture efficiencies are for trout greater than 175 mm (~7") in total length. Number following the population estimate (in parentheses) represents the 95 % confidence interval. Rainbow trout estimate includes any rainbow x westslope cutthroat trout hybrids. Asterisk following estimate value means estimate was computed using less than three recaptures.

| Trout Species | Population Estimate (fish/mile) | Capture Efficiency (%) | Total Fish Handled | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| Bull | - | - | 0 | - | - | - |
| Cutthroat | 4* (+/- 3) | 29 | 13 | 335 | 222-430 | 2 |
| Rainbow | 490 (+/- 203) | 10 | 512 | 233 | 66-521 | 72 |
| Brown | 130 (+/- 60) | 17 | 187 | 283 | 100-535 | 26 |
| Brook | - | - | 0 | - | - | - |

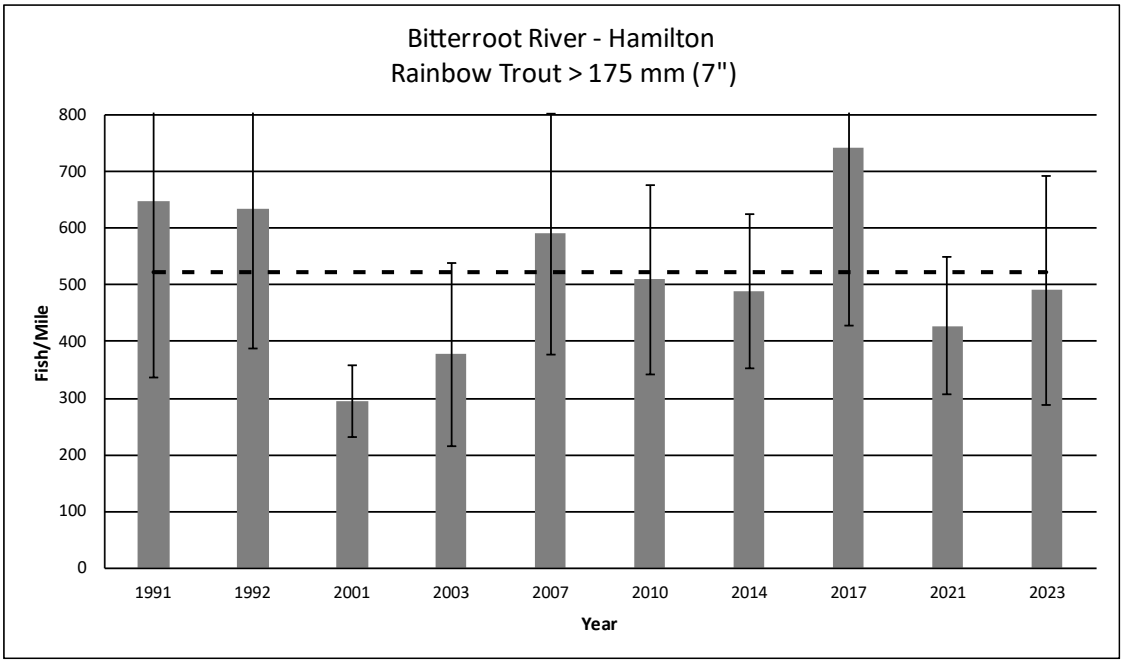


Figure 2. Population estimates for rainbow trout greater than 175 mm (~7") in total length in the Hamilton section for the period of record. Estimates include any rainbow x westslope cutthroat trout hybrids. Dashed line represents long-term average.

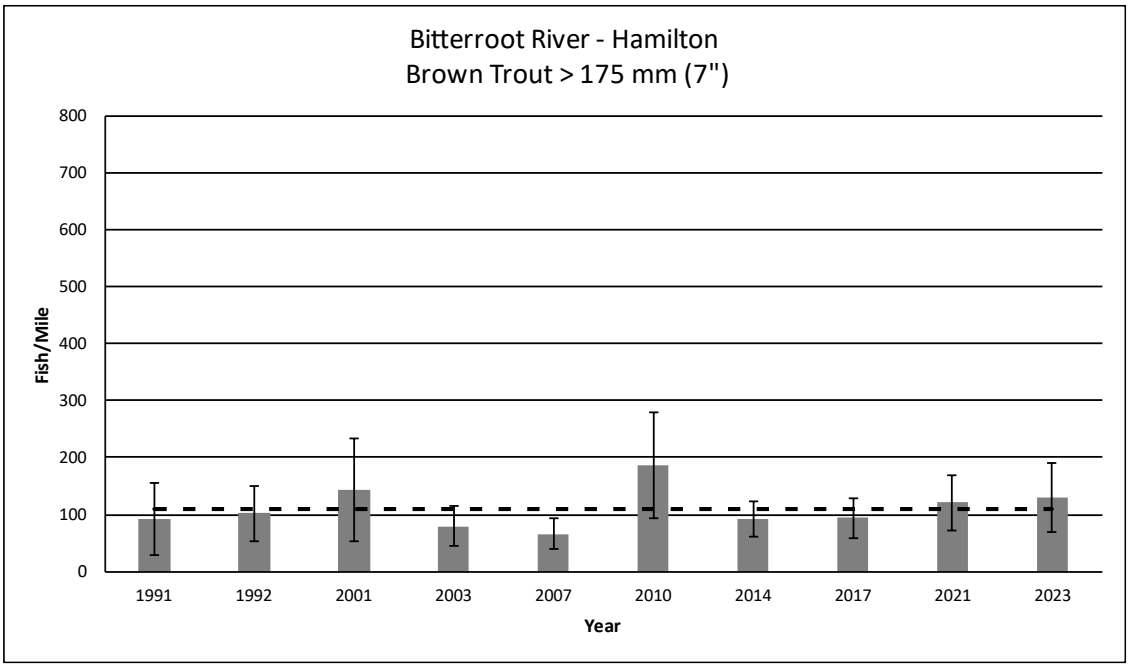


Figure 3. Population estimates for brown trout greater than 175 mm (~7") in total length in the Hamilton section for the period of record. Dashed line represents long-term average.

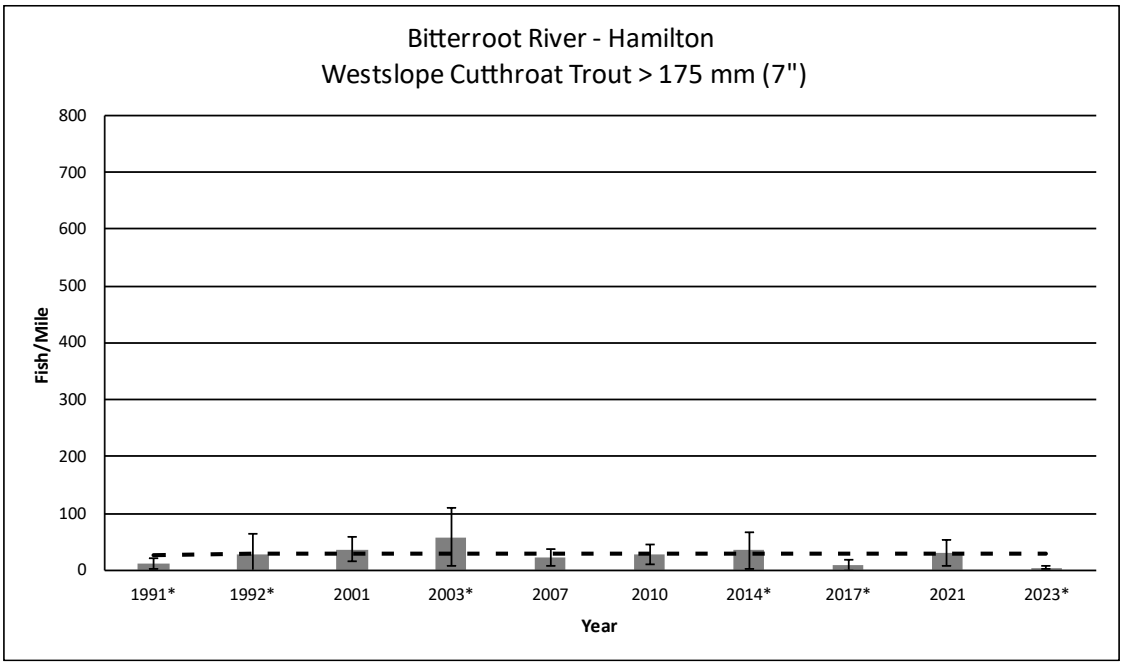


Figure 4. Population estimates for westslope cutthroat trout greater than 175 mm (~7") in total length in the Hamilton section for the period of record. Asterisk following year denotes estimate may be biased by low numbers of fish handled and/or poor recapture efficiency. Dashed line represents long-term average.

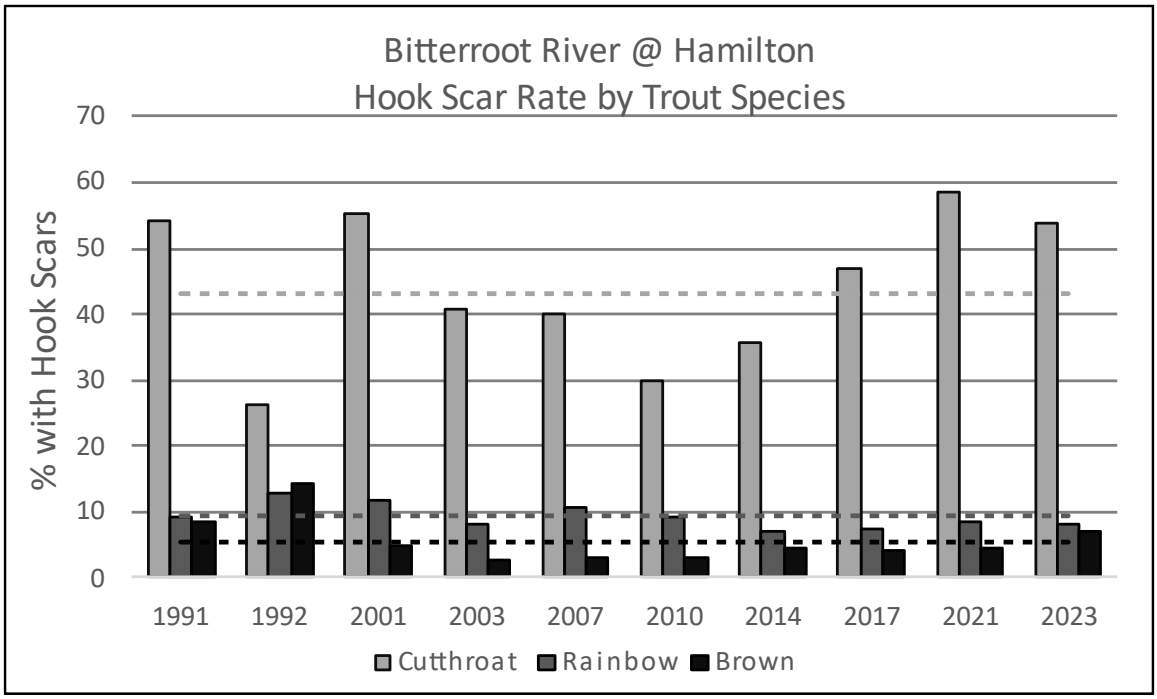


Figure 5. Hook scar rates for trout (>175 mm) in the Bitterroot River at the Hamilton section for the period of record. Rainbow trout value includes any rainbow x westslope cutthroat trout hybrids. Dashed lines represent long-term averages.

At the Hannon section in 2023, westslope cutthroat trout, rainbow trout, and brown trout were captured in relatively similar proportions (Table 2). The population estimate for Westslope cutthroat trout was a little above the long-term average and showed a small improvement to the previous estimate collected in 2021 (Figure 6). However, the increase was not significant. Rainbow trout population numbers were slightly below the long-term average for the site (Figure 7) but were within the range of variability. The declining trend in abundance since 2018 does not appear to be significant. Brown trout density at Hannon in 2023 appeared slightly better than the previous estimate collected in 2021 and was just a little below the long-term average (Figure 8). Brown trout numbers had been stable since the mid-2000s, but more recent estimates suggest numbers have declined (Figure 8). The proportion of trout (>175 mm) showing evidence of hook scars in the Hannon section in 2023 was 21.1% for rainbow trout (includes rainbow x westslope cutthroat trout hybrids), 4.9% for brown trout, and 59.9% for westslope cutthroat trout. The rate for brown trout was near the long-term average, while the rates for rainbow trout and westslope cutthroat trout were both above average, with the rainbow value being the highest ever recorded and the rate for cutthroat being the highest since 1990 when the species was relatively uncommon at the site due to high angler harvest rates (Figure 9).

Table 2. Electrofishing data collected on the Bitterroot River at the Hannon Section during fall 2023. Population estimates and capture efficiencies are for trout greater than 175 mm (~7") in total length. Number following the population estimate (in parentheses) represents the 95 % confidence interval. Rainbow trout estimate includes rainbow x westslope cutthroat trout hybrids.

| Trout Species | Population Estimate (fish/mile) | Capture Efficiency (%) | Total Fish Handled | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| Bull | - | - | 0 | - | - | - |
| Cutthroat | 350 (+/- 164) | 13 | 289 | 275 | 127-450 | 29 |
| Rainbow | 338 (+/- 154) | 13 | 383 | 225 | 70-478 | 38 |
| Brown | 272 (+/- 102) | 15 | 325 | 251 | 81-532 | 33 |
| Brook | n/a | - | 3 | 266 | 232-326 | <1 |

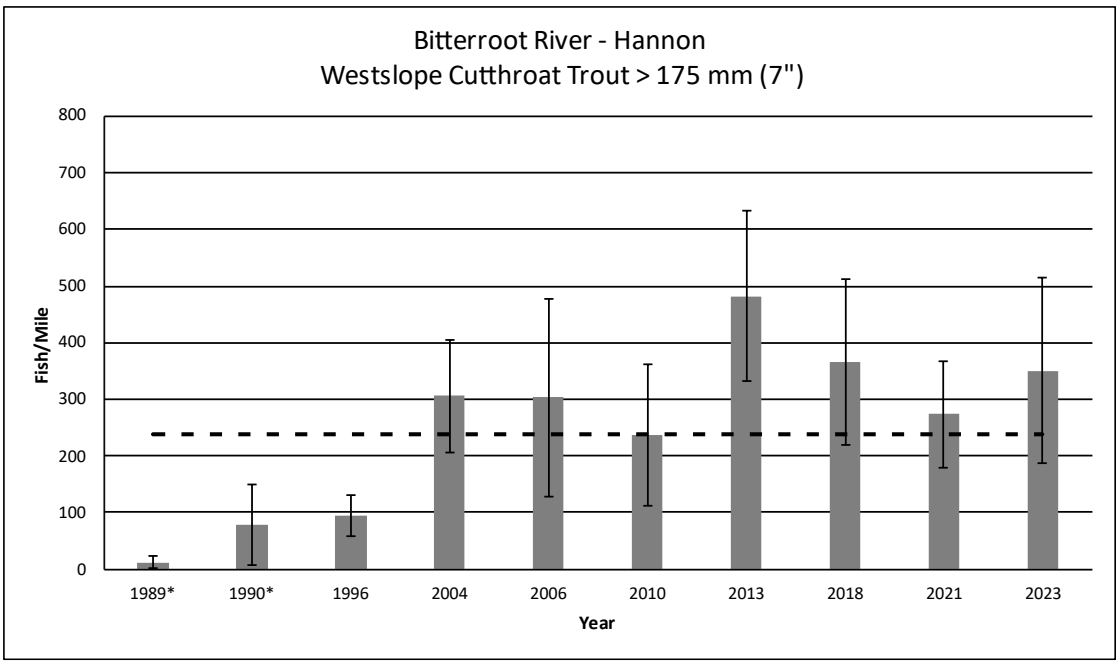


Figure 6. Population estimates for westslope cutthroat trout greater than 175 mm (~7") in total length in the Hannon section for the period of record. Asterisk following year denotes estimate may be impacted by low recaptures. Dashed line represents long-term average.

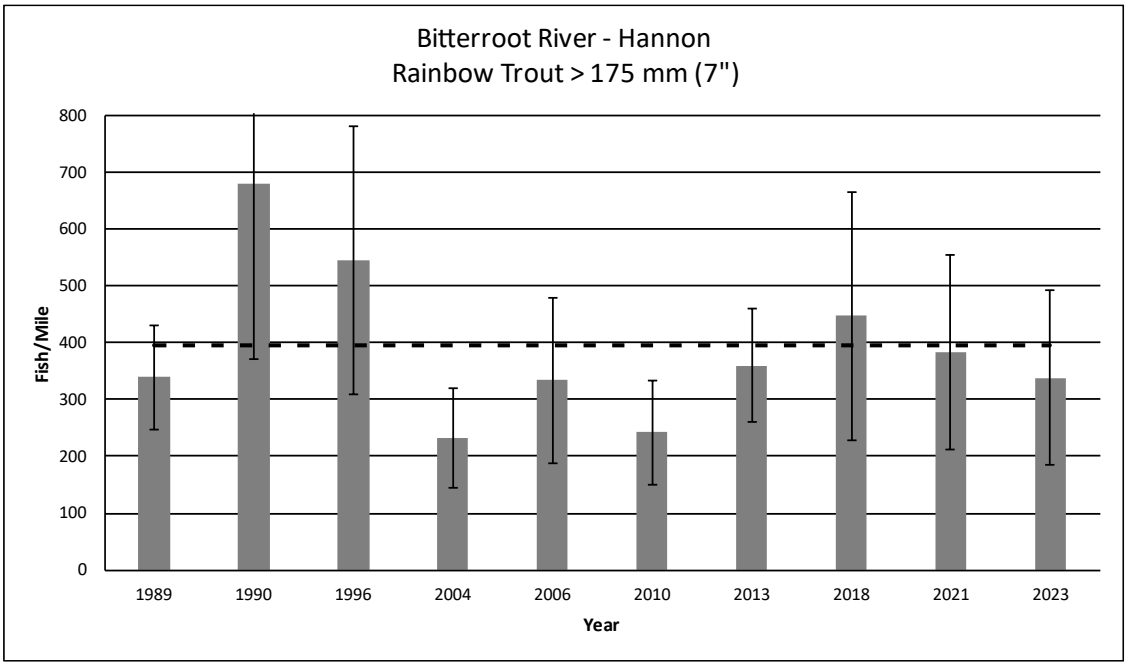


Figure 7. Population estimates for rainbow trout greater than 175 mm (~7") in total length in the Hannon section for the period of record. Estimates include any rainbow x westslope cutthroat trout hybrids. Dashed line represents long-term average.

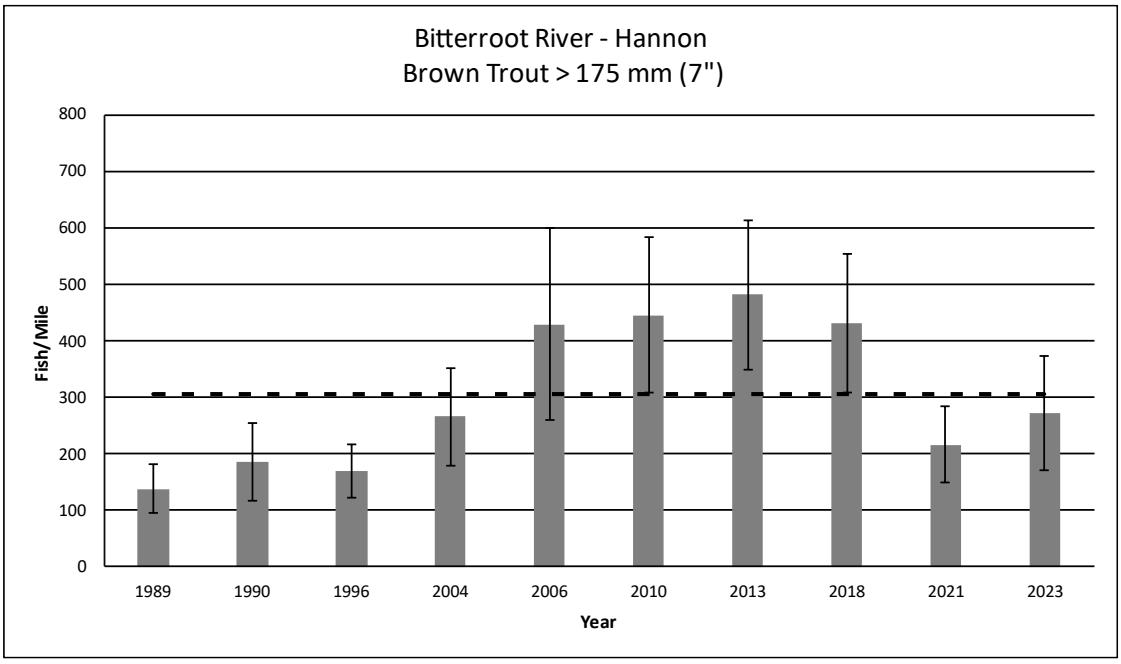


Figure 8. Population estimates for brown trout greater than 175 mm (~7") in total length in the Hannon section for the period of record. Dashed line represents long-term average.

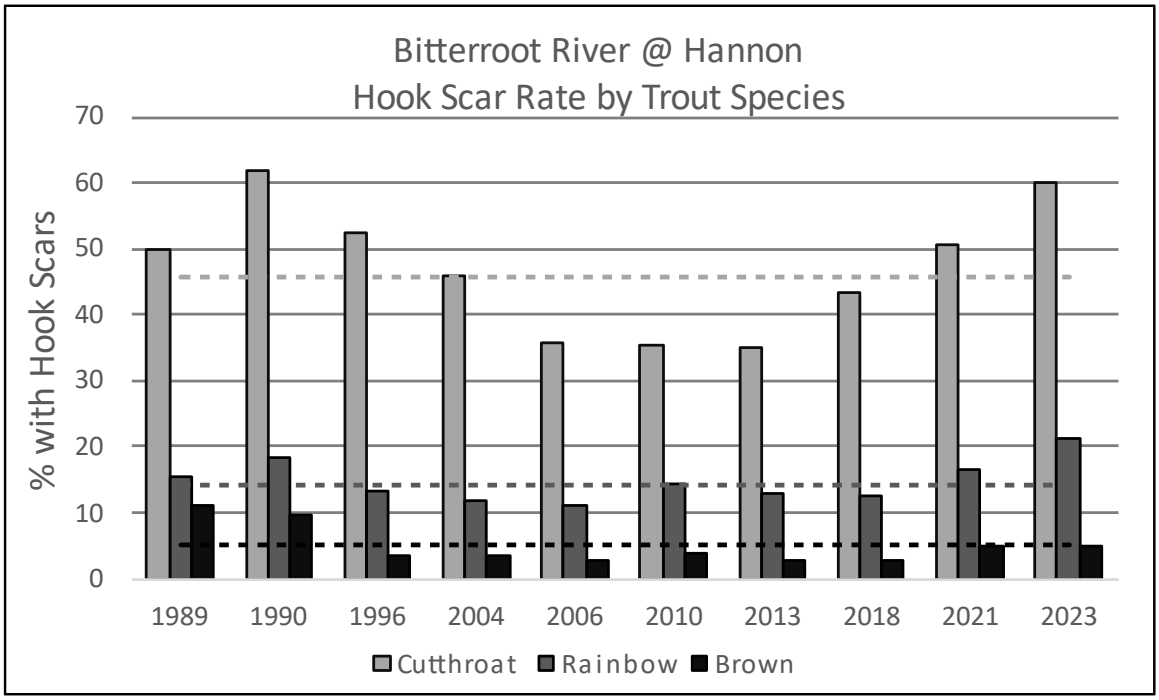


Figure 9. Hook scar rates for trout (>175 mm) in the Bitterroot River at the Hannon section for the period of record. Rainbow trout value includes rainbow x westslope cutthroat trout hybrids. Dashed lines represent long-term averages.

At the Stevensville section in 2024, rainbow trout dominated the trout community comprising 70% of the fish handled, followed by brown trout at 29%. Westslope cutthroat trout and brook trout were also observed, but in very low numbers (Table 3). Rainbow trout density was up from the previous sample in 2022, which was the lowest value ever recorded, but was still below the long-term average for the site (Figure 10). Brown trout density was also below the long-term average for the section, but only slightly and was within the range of previously recorded values (Figure 11). Brown trout density has been low and relatively stable in the Stevensville section since the mid-1990s (Figure 11). No estimate was obtained for westslope cutthroat trout or brook trout due to insufficient numbers of fish handled. The proportion of trout (>175 mm) showing evidence of hook scars in the Stevensville section in 2024 was 15.3% for rainbow trout and 13.5% for brown trout. The rates for both species were above long-term averages with the rainbow trout value being the highest recorded in 30 years and the brown trout value being the highest ever documented (Figure 12).

Table 3. Electrofishing data collected on the Bitterroot River at the Stevensville Section during fall 2024. Population estimates and capture efficiencies are for trout greater than or equal to 175 mm (~7") in total length. Number following the population estimate (in parentheses) represents the 95 % confidence interval. Rainbow Trout estimate includes any rainbow x westslope cutthroat trout hybrids.

| Trout Species | Population Estimate (fish/mile) | Capture Efficiency (%) | Total Fish Handled | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| Bull | - | - | 0 | - | - | - |
| Cutthroat | n/a | - | 5 | 400 | 347-440 | 1 |
| Rainbow | 239 (+/- 90) | 14 | 313 | 298 | 81-525 | 70 |
| Brown | 49 (+/- 22) | 27 | 130 | 314 | 105-575 | 29 |
| Brook | n/a | - | 1 | 325 | - | <1 |

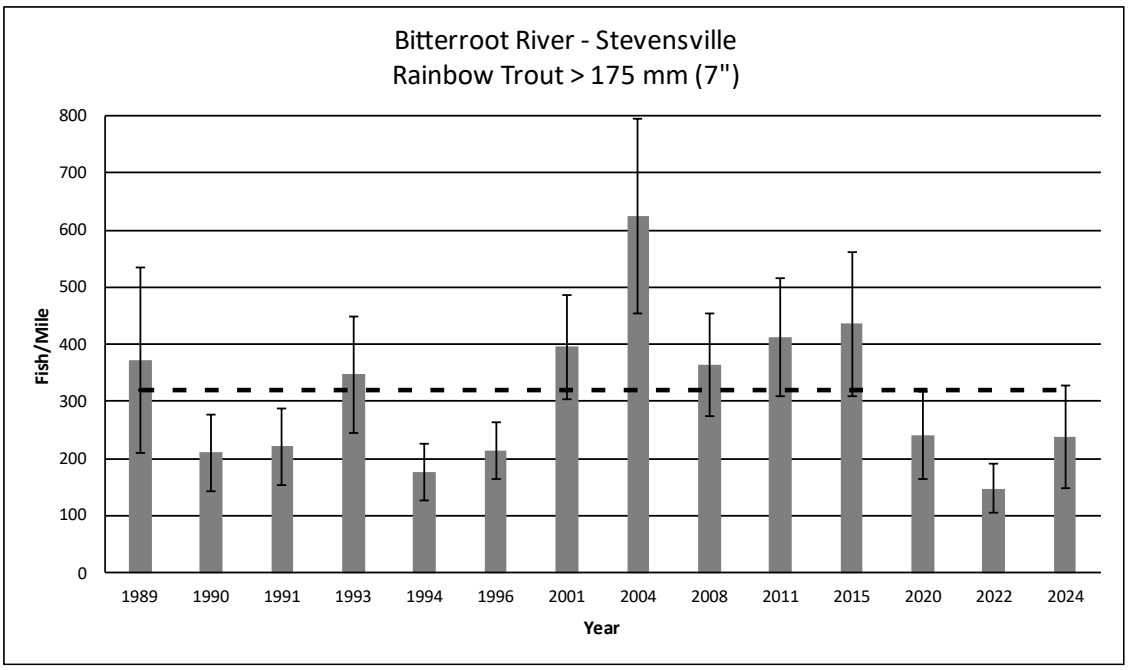


Figure 10. Population estimates for rainbow trout greater than 175 mm (~7") in total length in the Stevensville section for the period of record. Estimates include any rainbow x westslope cutthroat hybrids. Dashed line represents long-term average.

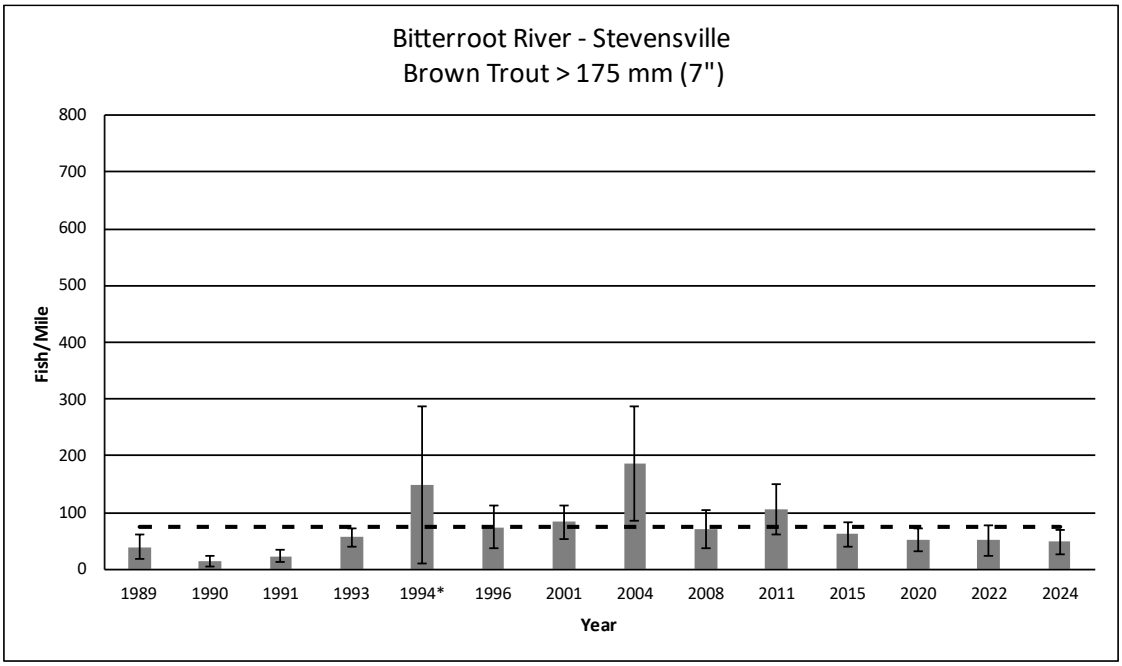


Figure 11. Population estimates for brown trout greater than 175 mm (~7") in total length in the Stevensville section for the period of record. Dashed line represents long-term average.

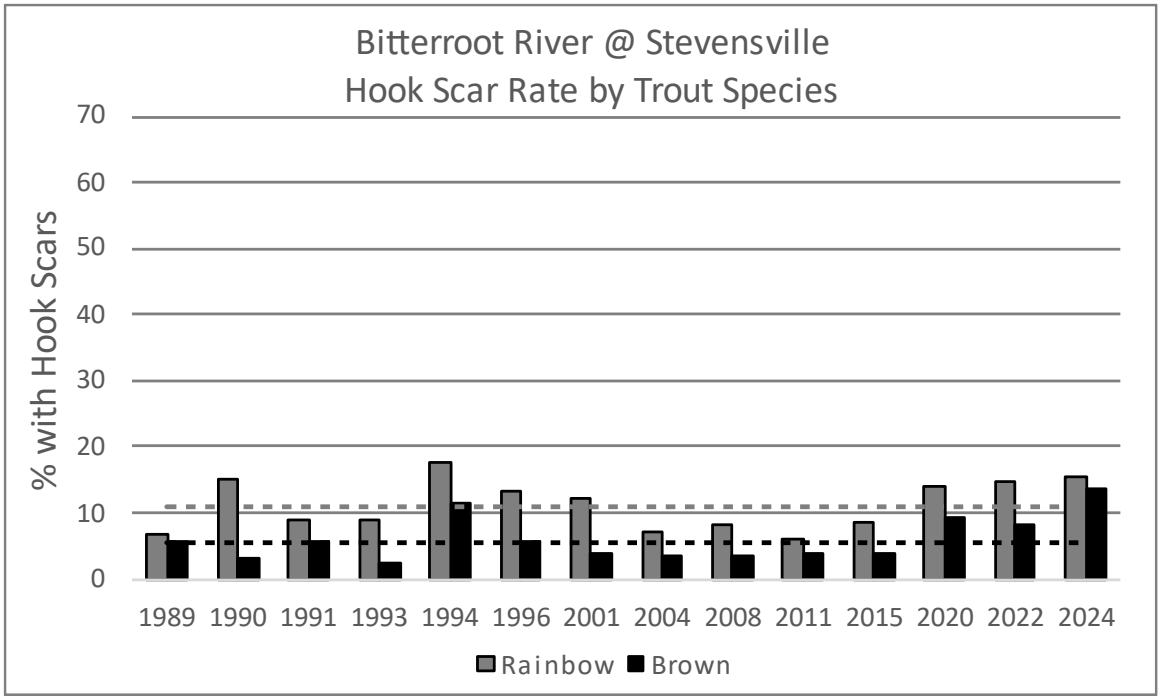


Figure 12. Hook scar rates for trout (>175 mm) in the Bitterroot River at the Stevensville section for the period of record. Rainbow trout value includes rainbow x westslope cutthroat trout hybrids. Dashed lines represent long-term averages.

At the Hannon section in 2024, rainbow trout were a little more common than westslope cutthroat trout and brown trout (Table 4). The population estimate for rainbow trout was similar to the previous sample in 2023 and was still slightly below the long-term average, but well within the range of variability for the site (Figure 13). Westslope cutthroat trout density was slightly less than the previous year and was near the long-term average (Figure 14). Brown trout density at the Hannon section in 2024 showed the most notable change from the previous year (Figure 15). The density estimate for brown trout in 2024 was the lowest ever recorded and was more like values from the late 1980s than values estimated over the last 20 years. Brown trout numbers had been stable from 2006 through 2018 at the Hannon section, but the estimate obtained in 2021 suggested numbers had declined (Figure 15). A specific cause for the drop in brown trout density at the Hannon section is not well understood currently. The proportion of trout (>175 mm) showing evidence of hook scars in the Hannon section in 2024 was 22.7% for rainbow trout (includes rainbow x westslope cutthroat trout hybrids), 5.6% for brown trout, and 66.7% for westslope cutthroat trout. The rate for brown trout was near the long-term average, while the rates for westslope cutthroat trout and rainbow trout were both above average and were the highest values ever recorded (Figure 16).

Table 4. Electrofishing data collected on the Bitterroot River at the Hannon Section during fall 2024. Population estimates and capture efficiencies are for trout greater than 175 mm (~7") in total length. Number following the population estimate (in parentheses) represents the 95 % confidence interval. Rainbow trout estimate includes rainbow x westslope cutthroat trout hybrids.

| Trout Species | Population Estimate (fish/mile) | Capture Efficiency (%) | Total Fish Handled | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| Bull | n/a | - | 1 | 283 | - | <1 |
| Cutthroat | 283 (+/- 133) | 13 | 251 | 285 | 145-499 | 30 |
| Rainbow | 346 (+/- 164) | 11 | 377 | 228 | 66-495 | 45 |
| Brown | 113 (+/- 39) | 24 | 199 | 264 | 108-535 | 24 |
| Brook | n/a | - | 1 | 240 | - | <1 |

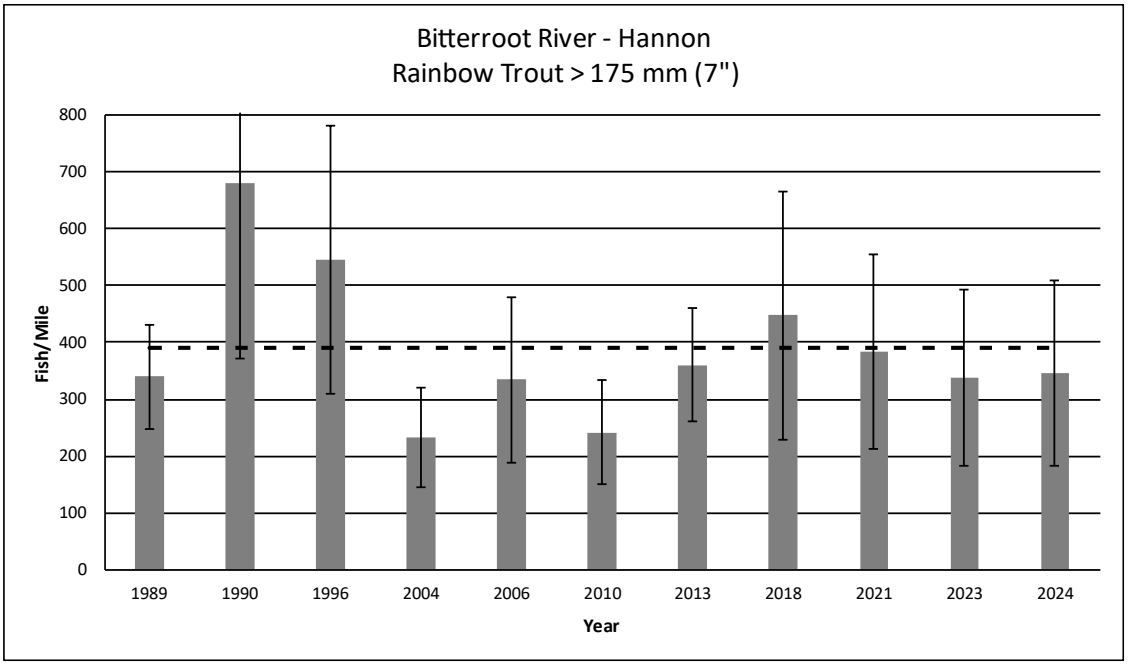


Figure 13. Population estimates for rainbow trout greater than 175 mm (~7") in total length in the Hannon section for the period of record. Estimates include any rainbow x westslope cutthroat trout hybrids. Dashed line represents long-term average.

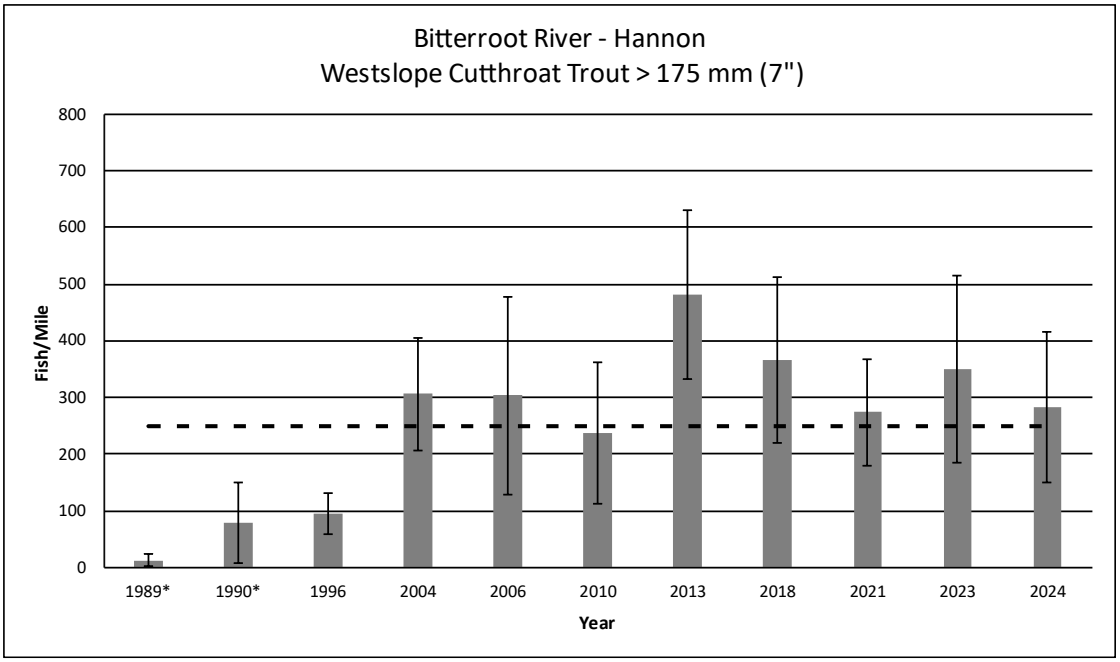


Figure 14. Population estimates for westslope cutthroat trout greater than 175 mm (~7") in total length in the Hannon section for the period of record. Asterisk following year denotes estimate may be impacted by low recaptures. Dashed line represents long-term average.

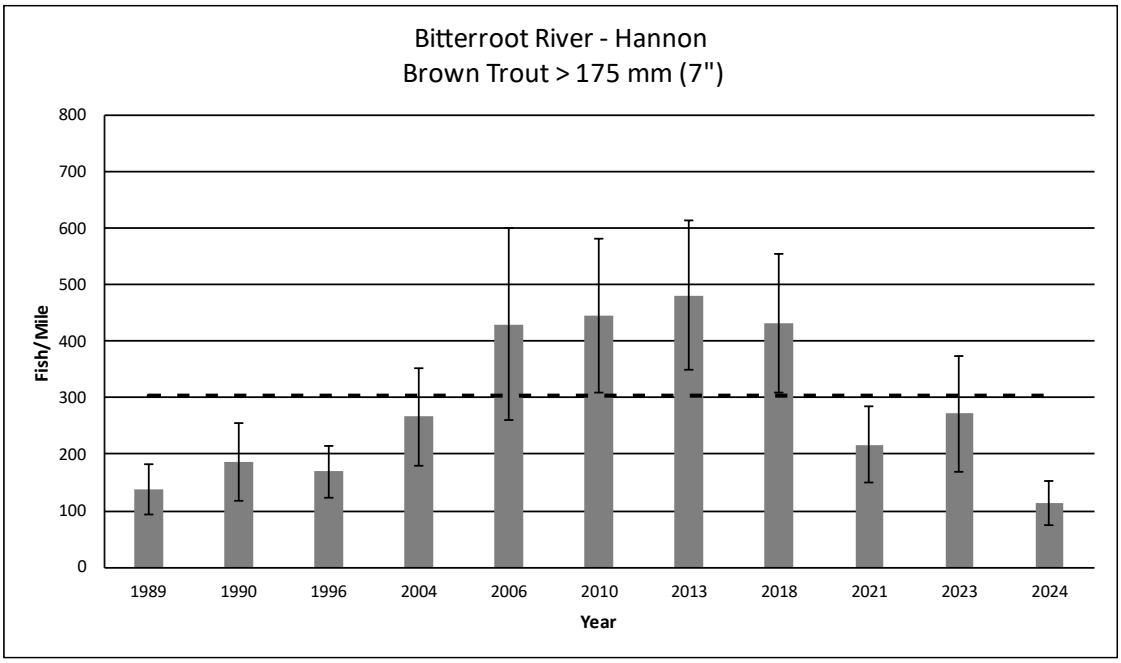


Figure 15. Population estimates for brown trout greater than 175 mm (~7") in total length in the Hannon section for the period of record. Dashed line represents long-term average.

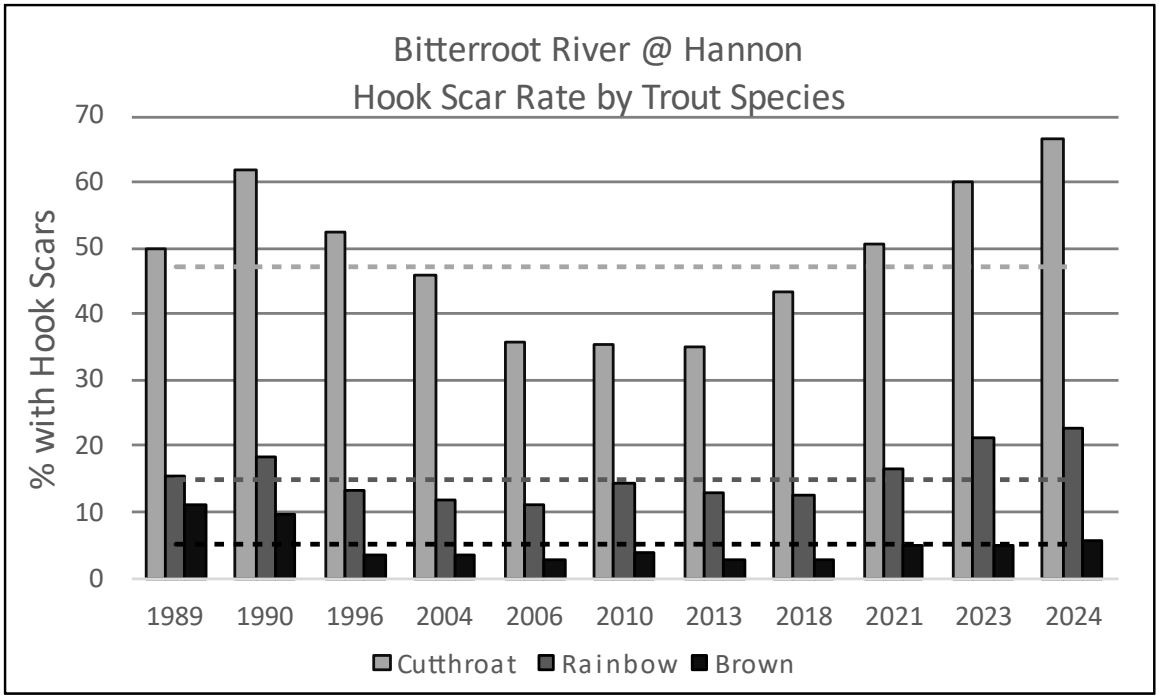


Figure 16. Hook scar rates for trout (>175 mm) in the Bitterroot River at the Hannon section for the period of record. Rainbow trout value includes rainbow x westslope cutthroat trout hybrids. Dashed lines represent long-term averages.

In general, trout population monitoring on the Bitterroot River in 2023 and 2024 indicated that trout population numbers are stable to declining depending on species and river location. Reduced trout populations throughout the mainstem Bitterroot River may be related to recent drought conditions and relatively poor flow years. Summer angling restrictions (often called "hoot owl" closures, which restrict angling from 2 p.m to midnight when in effect) were placed on the entirety of the Bitterroot River for a portion of the summer in both 2023 and 2024 due to elevated water temperatures and low flows. Mean August flow in both 2023 (329.5 cfs) and 2024 (241.1 cfs) at the USGS gauge station at Bell Crossing was below the long-term average (410 cfs from 1989-2022). Additionally, since 2015, mean August flow at Bell Crossing has been below average on eight out of ten years (Figure 17). This has likely resulted in poor spawning and recruitment success throughout this time, ultimately leading to the reduction in catchable fish numbers in the Bitterroot River.

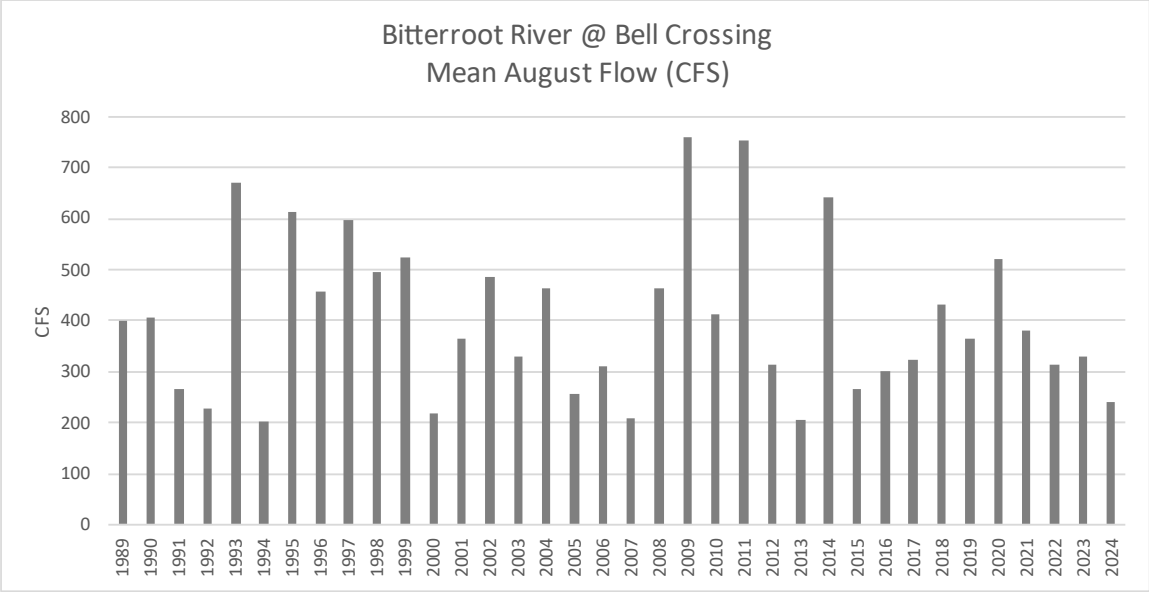

Figure 17. Mean August flow in the Bitterroot River at Bell Crossing near Victor, MT for the period of record. Flow data was obtained from USGS gauge station 12350250. Mean August flow from 1989-2022 is 410 cfs.

In addition to drought impacts, angler pressure has also risen to record levels in recent years on the Bitterroot River (Figure 18). Recent pressure estimates from 2020 estimated over 140,000 angler days. It is unknown if current pressure levels are having a measurable impact on trout populations. In general hook scar rates observed for rainbow trout and brown trout are relatively close to long-term averages and it appears unlikely that pressure or harvest is having a significant effect on the population dynamics of these species. However, westslope cutthroat trout, which are more susceptible to being caught by anglers, have seen above average hook scar rates over the last several years. While harvest of westslope cutthroat trout is not allowed in the Bitterroot River and the upper Forks, further investigation into the impact of catch-and-release mortality may be warranted. Catch-and-release related mortality has generally been assumed to be around 5% based on the current body of scientific literature (Schill and Scarpella 1997). However, little work has focused on westslope cutthroat trout that are caught repeatedly over a short amount of time and/or when conditions are stressful (warm water temperatures).

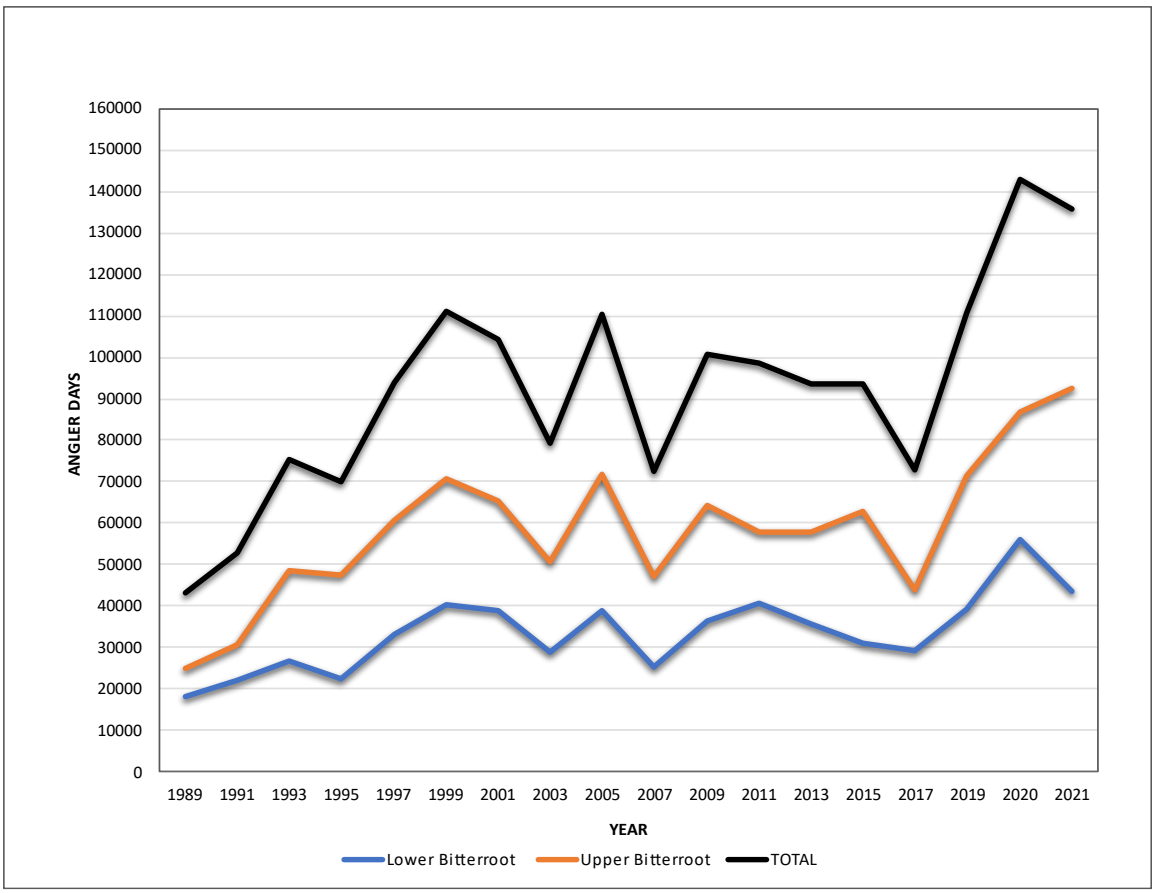

Figure 18. Bitterroot River angler days for the period of record. Data from FWP angler survey.

## West Fork Bitterroot River

Population estimates were completed at one section on the West Fork Bitterroot River below Painted Rocks Reservoir in both 2023 and 2024. The reach sampled was the recently established Bonnie Blue section located approximately 2.5 miles below Painted Rocks Dam. The Bonnie Blue section was first sampled in 2020 to expand our knowledge of species composition and abundance in this reach of the river.

In both 2023 and 2024, rainbow trout and brown trout comprised the bulk of the trout community at the Bonnie Blue section (Table 5). Westslope cutthroat trout, brook trout, and bull trout were also present in the reach but in far fewer numbers (Table 5). No estimates were generated for these species due to the low numbers handled. For rainbow trout, density appeared to be higher in 2023 than in 2024, but poorer rainbow capture efficiency in 2023 could have biased the estimate (Figure 19). Brown trout density in the Bonnie Blue section in 2023 and 2024 was similar in both years, and brown trout numbers have overall been relatively stable in the section since it was first sampled in 2020 (Figure 20). The number of westslope cutthroat handled in the reach in 2023 and 2024 showed a declining pattern in both years with 2024 being the fewest ever handled (Figure 21). The number of bull trout handled in the Bonnie Blue section has been relatively low in all sample years, although 2024 was the fewest observed (Figure 22).

Table 5. Electrofishing data collected on the West Fork Bitterroot River at the Bonnie Blue Section during Fall 2023 and 2024. Population estimates and capture efficiencies are for trout greater than 175 mm (~7") in total length. Number following the population estimate (in parentheses) represents the 95% confidence interval. Rainbow trout numbers includes rainbow x westslope cutthroat trout hybrids. Brook trout numbers include any brook x bull trout hybrids.

| Trout Species/Year | Population Estimate (fish/mile) | Capture Efficiency (%) | Total Fish Handled | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| Bull/23 | n/a | - | 8 | 244 | 150-302 | 2 |
| Bull/24 | n/a | - | 2 | 311 | 281-341 | 1 |
| Cutthroat/23 | n/a | - | 41 | 225 | 124-418 | 8 |
| Cutthroat/24 | n/a | - | 20 | 196 | 124-410 | 5 |
| Rainbow/23 | 553 (+/- 298) | 13 | 256 | 217 | 74-562 | 52 |
| Rainbow/24 | 295 (+/- 126) | 25 | 195 | 229 | 64-570 | 49 |
| Brown/23 | 360 (+/- 159) | 19 | 170 | 240 | 126-517 | 35 |
| Brown/24 | 329 (+/- 117) | 25 | 176 | 245 | 78-495 | 44 |
| Brook/23 | n/a | - | 4 | 205 | 173-257 | 1 |
| Brook/24 | n/a | - | 13 | 191 | 146-268 | 3 |

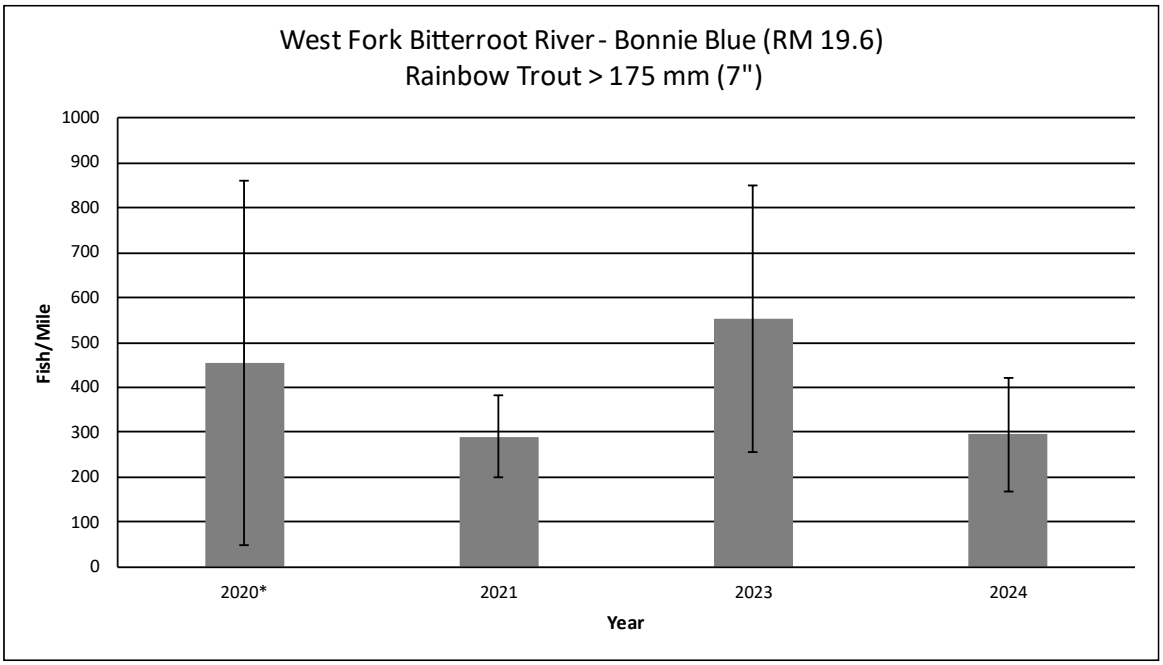


Figure 19. Population estimates for rainbow trout greater than 175 mm (~7") in total length in the Bonnie Blue section for the period of record. Estimates include rainbow x westslope cutthroat trout hybrids. Asterisk following year denotes estimate may be impacted by low recaptures.

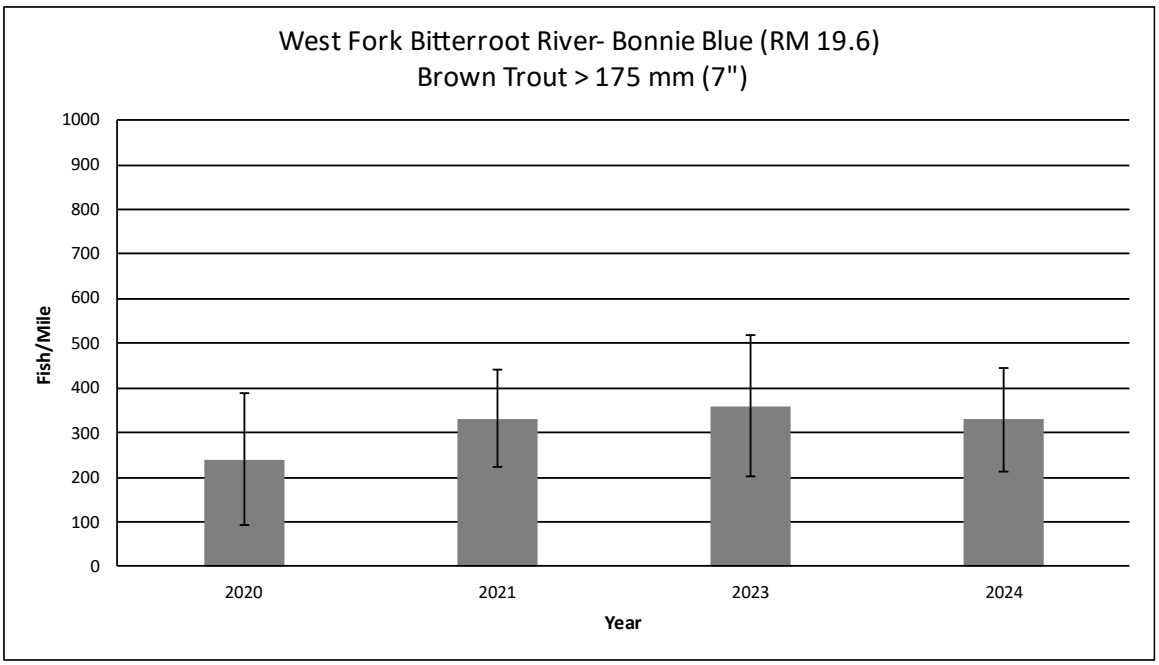


Figure 20. Population estimates for brown trout greater than 175 mm (~7") in total length in the Bonnie Blue section for the period of record.

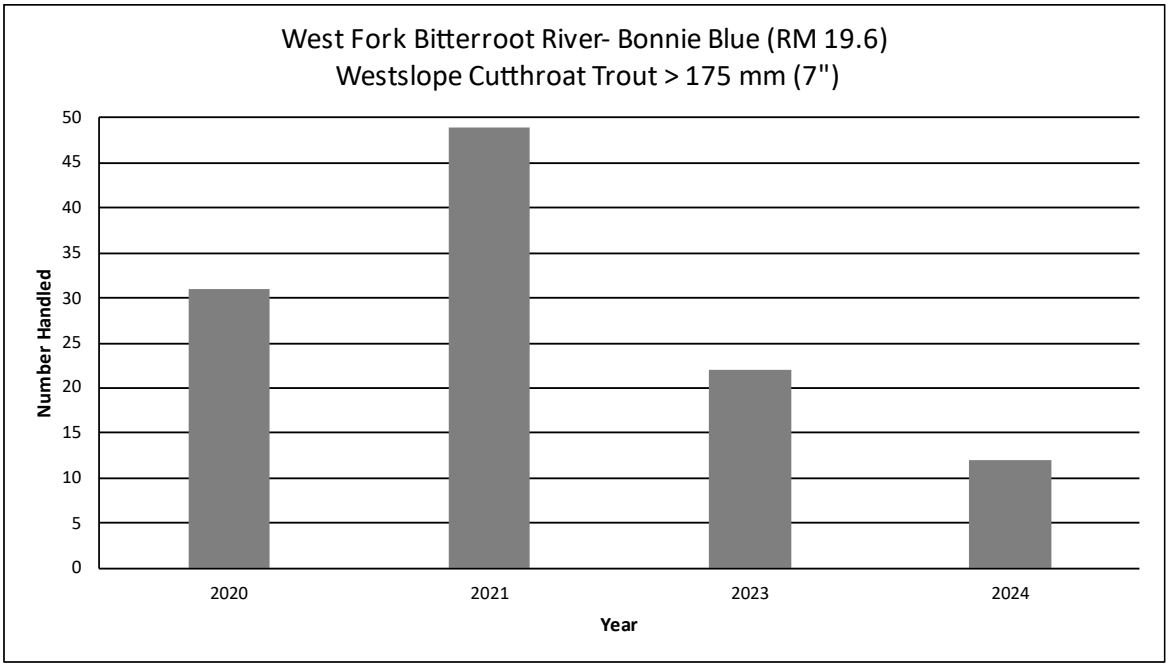


Figure 21. Number of westslope cutthroat trout greater than 175 mm (~7") in total length handled in the Bonnie Blue section for the period of record.

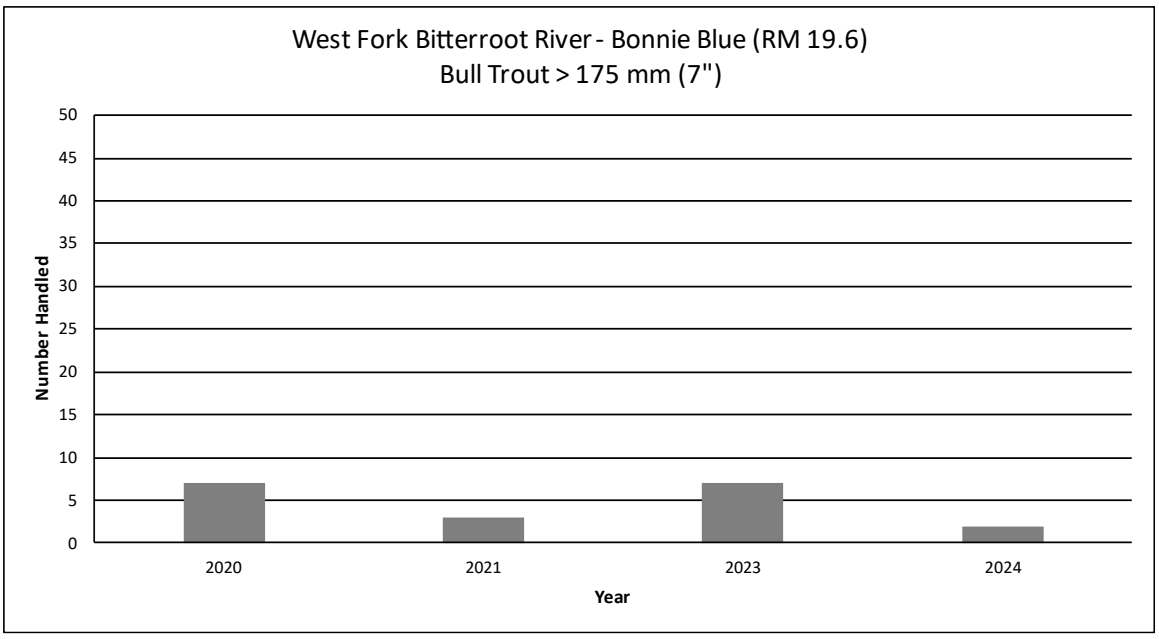

Figure 22. Number of bull trout greater than 175 mm (~7") in total length handled in the Bonnie Blue section for the period of record.

## East Fork Bitterroot River

Population samples were completed at two sections on the East Fork Bitterroot River during the sample period. Sections surveyed included the Jennings section (RM 25.6) in 2023, and the Trinity section (RM 2.5) in 2024.

At the Jennings section in 2023, westslope cutthroat trout comprised most of the fish community, with brown trout also present in numbers not previously seen (Table 6). Bull trout, rainbow trout, and brook were also observed in the reach in low numbers (Table 6). Westslope cutthroat trout density was down from the record high estimate from 2018 but was still slightly above the long-term average (Figure 23). Despite being able to generate an abundance estimate for bull trout in 2023, the species was not overly common in the Jennings section (Table 6). However, the number of bull trout handled in the reach has remained relatively stable since it was first sampled in 1992 (Figure 24). Brown trout density appeared to be up from previous sample years, and the number of brown trout handled in the Jennings section in 2023 was a new record high (Figure 25).

Table 6. Electrofishing data collected on the East Fork Bitterroot River at the Jennings section during fall 2023. Population estimates and capture efficiencies are for trout greater than 175 mm (~7") in total length. Number following the population estimate (in parentheses) represents the 95% confidence interval. Rainbow trout estimate includes any rainbow x westslope cutthroat trout hybrids.

| Trout Species | Population Estimate (fish/mile) | Capture Efficiency (%) | Total Fish Handled | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| Bull | 21 (+/- 13) | 40 | 11 | 221 | 182-326 | 4 |
| Cutthroat | 250 (+/- 56) | 39 | 197 | 214 | 70-385 | 67 |
| Rainbow | n/a | - | 10 | 188 | 117-260 | 3 |
| Brown | 169 (+/- 124) | 15 | 73 | 198 | 76-413 | 25 |
| Brook | n/a | - | 1 | 152 | - | <1 |

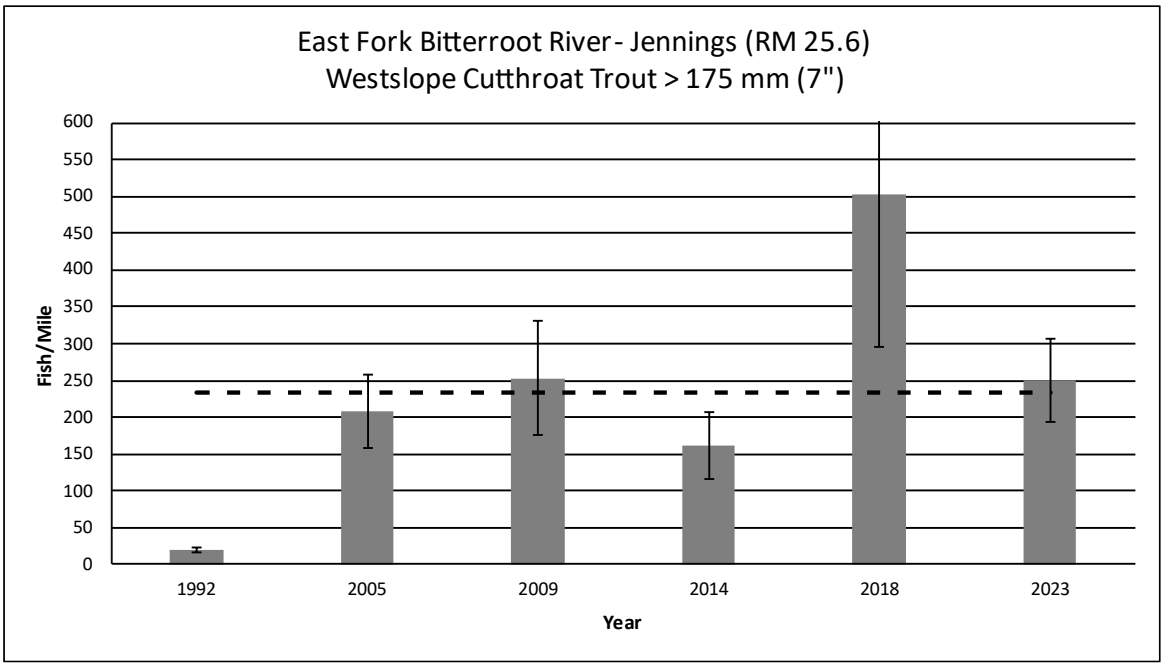


Figure 23. Population estimates for westslope cutthroat trout greater than 175 mm (~7") in total length in the Jennings section for the period of record. Dashed line represents long-term average.

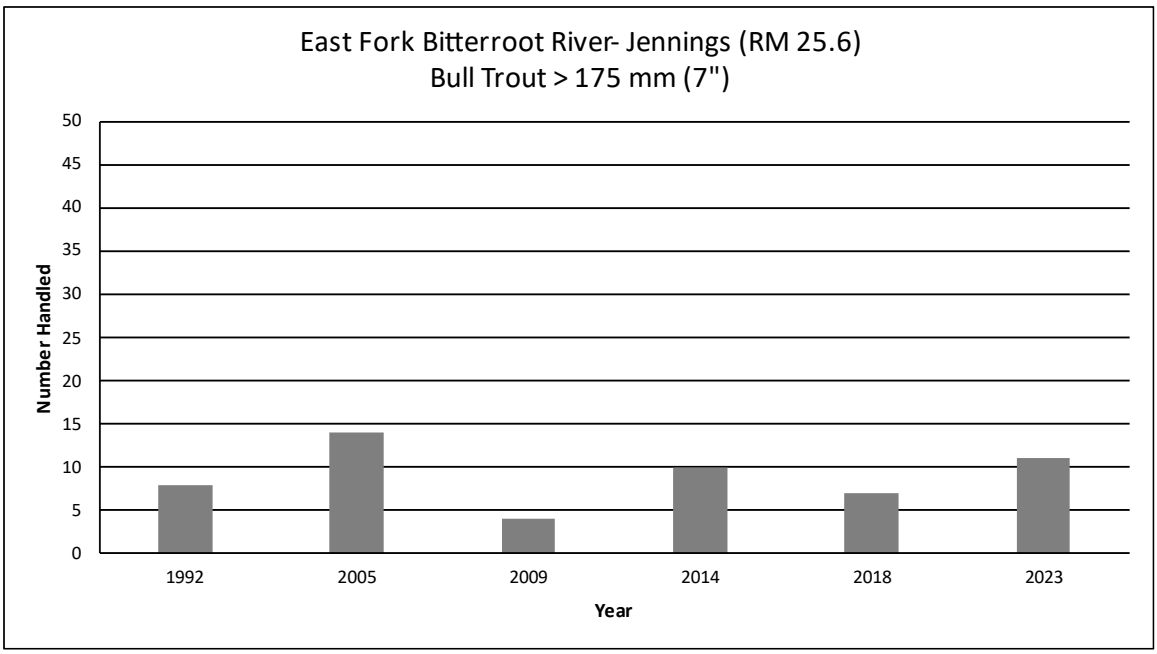


Figure 24. Number of bull trout greater than 175 mm (~7") in total length handled in the Jennings section for the period of record.

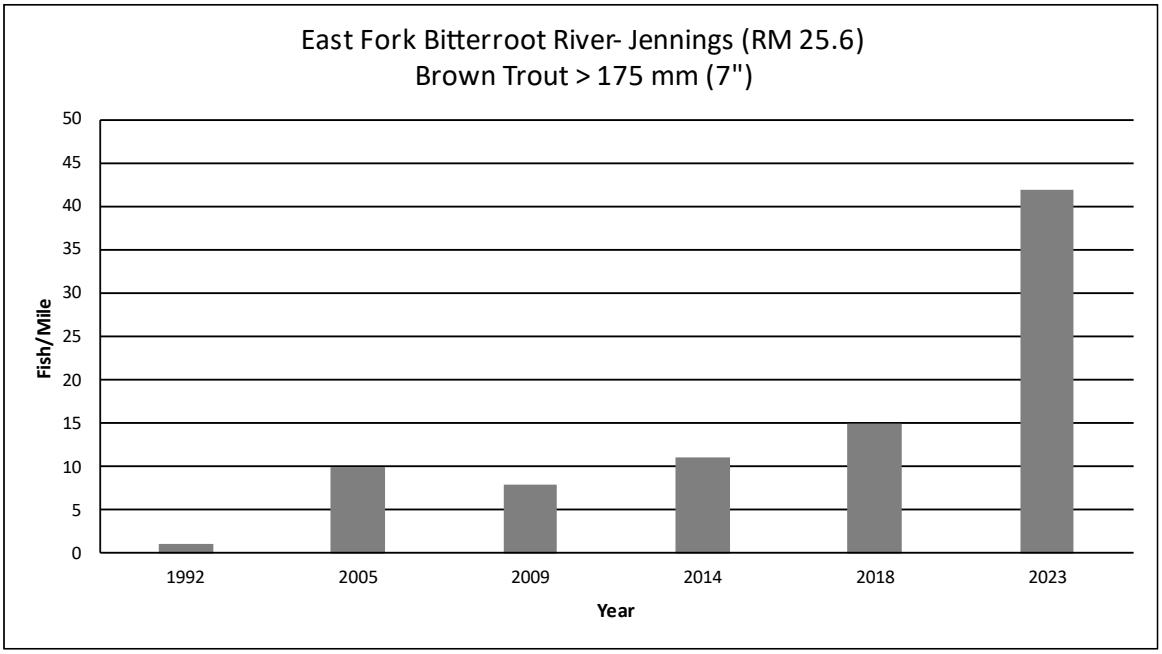


Figure 25. Number of brown trout greater than 175 mm (~7") in total length handled in the Jennings section for the period of record.

At the Trinity section (RM 2.5) in 2024, brown trout comprised almost 60% of the trout community with rainbow trout making up much of the rest (Table 7). This was a change from the previous sample in 2021 where rainbow trout comprised over half of the trout in the reach (Lindstrom 2023). Westslope cutthroat trout, while present, comprised less than 10% of the fish handled (Table 7). Rainbow trout density in the Trinity section in 2024 showed a significant decline from the previous sample and was well below the long-term average (Figure 26). Whirling disease has impacted rainbow trout densities in the lower East Fork since the 1990s when it was first discovered, but it is unknown if a spike in the disease is responsible for the drop in rainbow numbers observed in 2024 since infection monitoring has not been conducted for many years. Brown trout density was slightly below the long-term average but was similar to estimates collected over the last decade (Figure 27). The number of westslope cutthroat trout handled in the Trinity section in 2024 was within the range of variability observed in previous years, although it was the fewest fish sampled in the last decade (Figure 28). Physical habitat conditions in the sample reach are relatively simple and there is currently few downed trees or woody debris accumulations in this segment of channel. Downed wood is an important habitat component that is lacking throughout much of the lower East Fork and it is likely that this is negatively impacting fish densities, particularly in drought years that limits available habitat even further.

Table 7. Electrofishing data collected on the East Fork Bitterroot River at the Trinity section during fall 2024. Population estimates and capture efficiencies are for trout greater than 175 mm (~7") in total length. Number following the population estimate (in parentheses) represents the 95% confidence interval. Rainbow trout estimate includes any rainbow x westslope cutthroat trout hybrids

| Trout Species | Population Estimate (fish/mile) | Capture Efficiency (%) | Total Fish Handled | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| Bull | - | - | 0 | - | - | - |
| Cutthroat | 19 (+/- 2) | 90 | 15 | 345 | 175-418 | 7 |
| Rainbow | 82 (+/- 19) | 60 | 71 | 215 | 86-430 | 34 |
| Brown | 181 (+/- 50) | 50 | 121 | 216 | 88-550 | 59 |
| Brook | - | - | 0 | - | - | - |

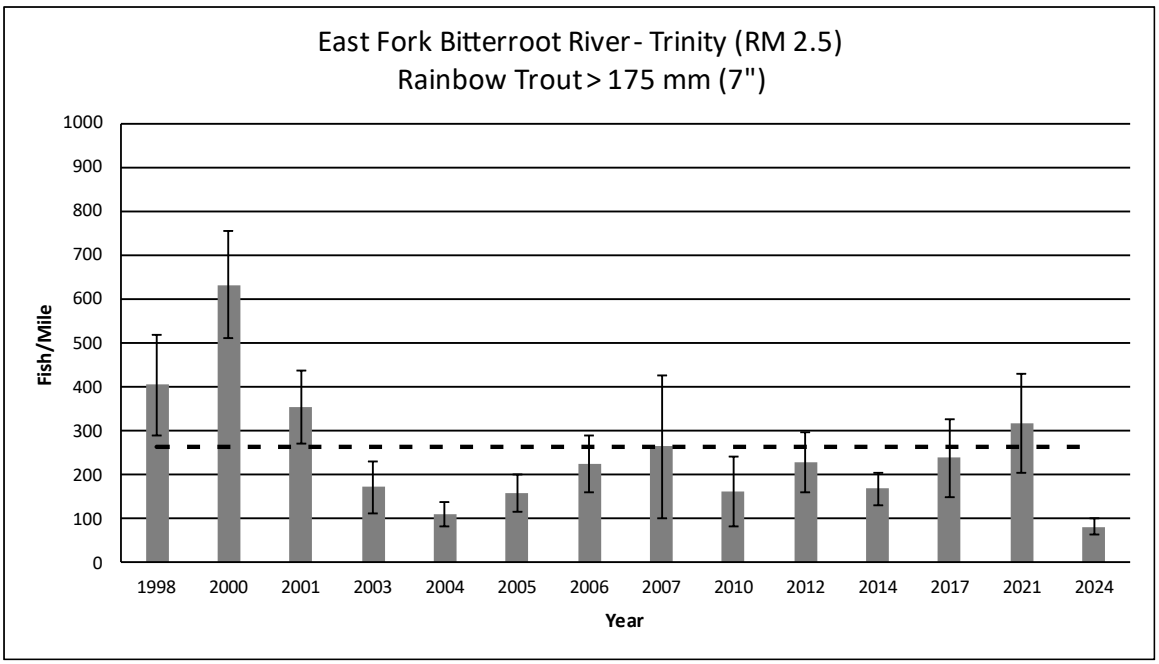


Figure 26. Population estimates for rainbow trout greater than 175 mm (~7") in total length in the Trinity section for the period of record. Estimates include any rainbow x westslope cutthroat trout hybrids. Dashed line represents long-term average.

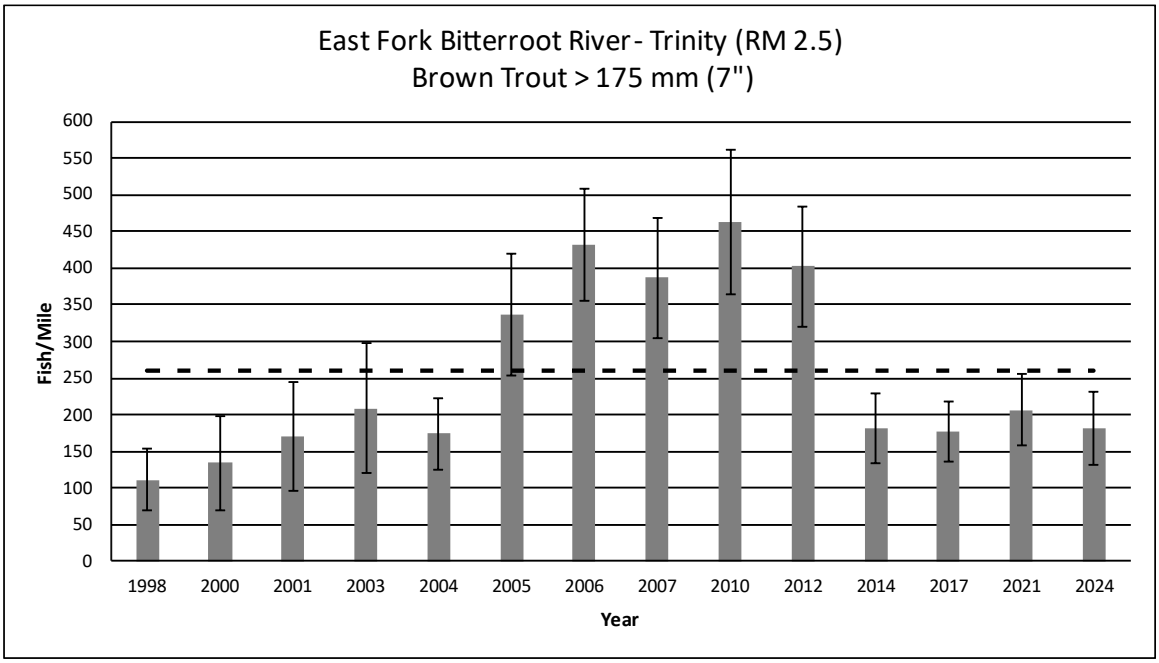


Figure 27. Population estimates for Brown Trout greater than 175 mm (~7") in total length in the Trinity section for the period of record. Dashed line represents long-term average.

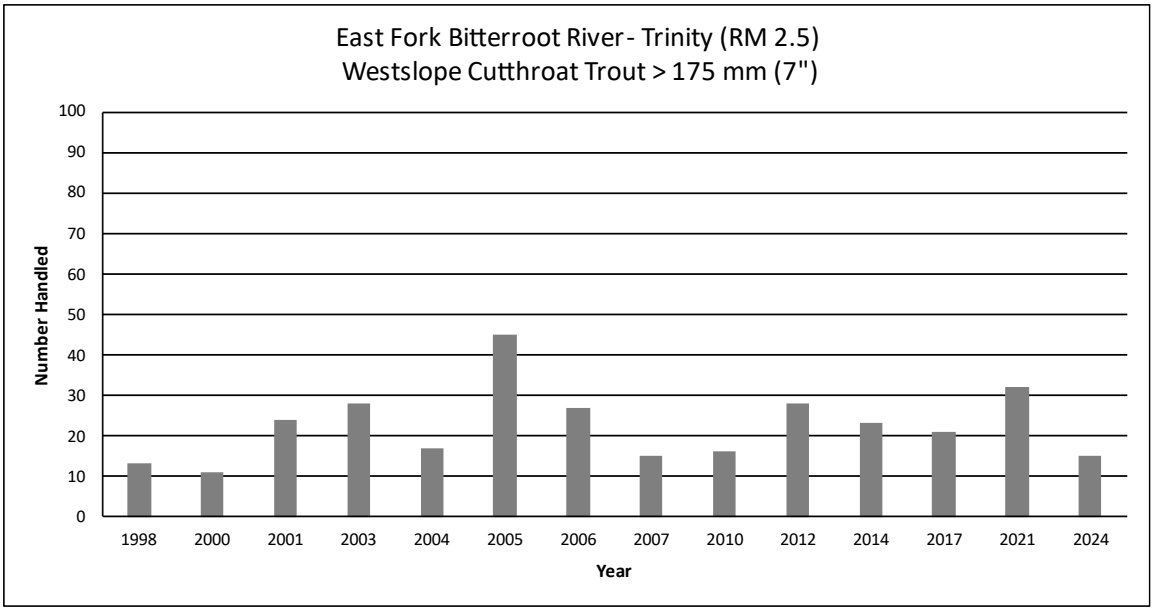

Figure 28. Number of westslope cutthroat trout greater than 175 mm (~7”) in total length handled in the Trinity section for the period of record.

## *Bitterroot River Multi-Species Single-Pass Sampling*

During spring of 2023, the Stevensville, Hamilton, and Hannon single-pass sections were sampled. Mountain whitefish were the most common fish captured at all sites, comprising between 71% and 86% of the total catch (Table 8). The number of whitefish captured in 2023 was within the range of variability observed at all the sections over the period of record (Figures 29, 30, and 31). This pattern was largely true for the less common species observed in the three reaches as well.

Table 8. Electrofishing data collected at the Stevensville, Hamilton, and Hannon single-pass sections in the spring of 2023. Small bodied species (redside shiner, longnose dace, and slimy sculpin) are not included due to the inherently poor capture efficiency of these fish with a boat electrofisher. Species abbreviations are as follows: MWF = Mountain Whitefish, RB = Rainbow Trout, LL = Brown Trout, WCT = Westslope Cutthroat Trout, BULL = Bull Trout, EB = Brook Trout, LNSU = Longnose Sucker, LSSU = Largescale Sucker, NPMN = Northern Pikeminnow, NP = Northern Pike. Rainbow trout numbers include rainbow x westslope cutthroat trout hybrids.

| Section | Species | Total Fish Handled / Catch per Mile | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|
| **Stevensville** | MWF | 497 / 249 | 311 | 120-442 | 82 |
| | RB | 19 / 10 | 349 | 80-485 | 3 |
| | LL | 8 / 4 | 451 | 375-585 | 1 |
| | LNSU | 12 / 6 | 421 | 356-462 | 2 |
| | LSSU | 53 / 27 | 487 | 141-600 | 9 |
| | NPMN | 19 / 10 | 417 | 387-481 | 3 |
| **Hamilton** | MWF | 472 / 248 | 295 | 121-407 | 86 |
| | RB | 22 / 12 | 295 | 86-416 | 4 |
| | LL | 18 / 9 | 273 | 120-469 | 3 |
| | WCT | 3 / 2 | 348 | 230-420 | 1 |
| | LNSU | 4 / 2 | 419 | 368-450 | 1 |
| | LSSU | 20 / 11 | 490 | 380-580 | 4 |
| | NPMN | 7 / 4 | 395 | 319-513 | 1 |
| **Hannon** | MWF | 215 / 119 | 335 | 107-461 | 71 |
| | RB | 16 / 9 | 374 | 163-482 | 5 |
| | LL | 27 / 15 | 283 | 110-471 | 9 |
| | EB | 1 / <1 | 205 | - | <1 |
| | WCT | 17 / 9 | 360 | 180-418 | 6 |
| | LSSU | 25 / 14 | 491 | 425-540 | 8 |

During spring of 2024, the Stevensville, Hamilton, and Hannon single-pass sections were again sampled. Like previous observations, mountain whitefish were the most common fish captured at all sites, comprising between 53% and 89% of the total catch (Table 9). The number of whitefish handled in 2024 was up a little compared to the last few years in both the Stevensville and Hamilton sections but was the lowest ever observed at the Hannon section (Figures 29, 30, and 31). Whitefish catch-per-effort has been decreasing at the Hannon section since the highest value on record was recorded in 2020. Other species sampled in 2024 showed no clear population trends, which is likely due to the low numbers of individuals handled.

Table 9. Electrofishing data collected at the Stevensville, Hamilton, and Hannon single-pass sections in the spring of 2024. Small bodied species (redside shiner, longnose dace, and slimy sculpin) are not included due to the inherently poor capture efficiency of these fish with a boat electrofisher. Species abbreviations are as follows: MWF = Mountain Whitefish, RB = Rainbow Trout, LL = Brown Trout, WCT = Westslope Cutthroat Trout, BULL = Bull Trout, EB = Brook Trout, LNSU = Longnose Sucker, LSSU = Largescale Sucker, and NPMN = Northern Pikeminnow. Rainbow trout numbers include rainbow x westslope cutthroat trout hybrids.

| Section | Species | Total Fish Handled / Catch per Mile | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|
| **Stevensville** | MWF | 794 / 397 | 299 | 90-426 | 87 |
| | RB | 45 / 23 | 305 | 92-470 | 5 |
| | LL | 17 / 9 | 367 | 11-488 | 2 |
| | WCT | 1 / <1 | 423 | - | <1 |
| | LNSU | 1 / <1 | 393 | - | <1 |
| | LSSU | 50 / 25 | 462 | 80-586 | 5 |
| | NPMN | 2 / 1 | 408 | 375-440 | <1 |
| **Hamilton** | MWF | 530 / 279 | 297 | 101-400 | 89 |
| | RB | 15 / 8 | 260 | 85-431 | 3 |
| | LL | 11 / 6 | 369 | 214-480 | 2 |
| | WCT | 4 / 2 | 303 | 233-434 | 1 |
| | LNSU | 2 / 1 | 413 | 410-415 | <1 |
| | LSSU | 18 / 9 | 477 | 156-550 | 3 |
| | NPMN | 13 / 7 | 407 | 370-460 | 2 |
| **Hannon** | MWF | 94 / 52 | 324 | 103-459 | 53 |
| | RB | 15 / 8 | 326 | 88-493 | 8 |
| | LL | 15 / 8 | 325 | 108-533 | 8 |
| | WCT | 20 / 11 | 350 | 112-431 | 11 |
| | EB | 1 / <1 | 158 | - | 1 |
| | LSSU | 32 / 18 | 468 | 121-556 | 18 |

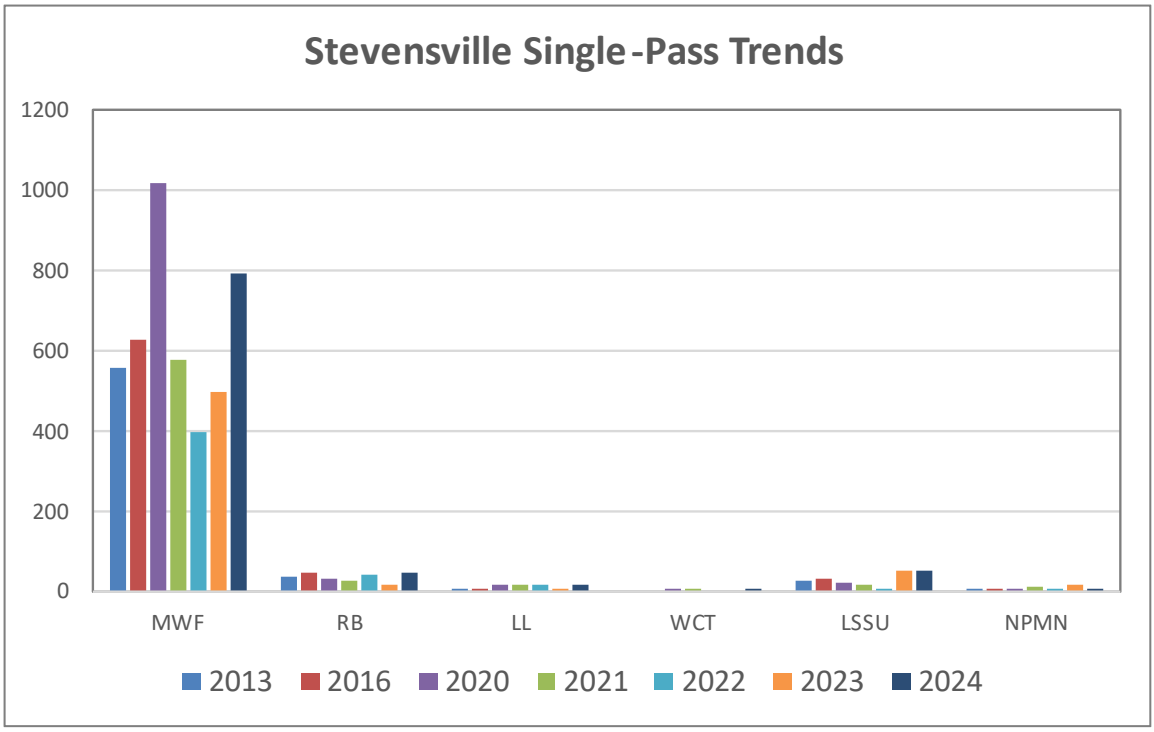


Figure 29. Number of fish handled for the most common species observed in the Stevensville single-pass section for the period of record. Species abbreviations are as follows: MWF = Mountain Whitefish, RB = Rainbow Trout, LL = Brown Trout, WCT = Westslope Cutthroat Trout, LSSU = Largescale Sucker, and NPMN = Northern Pikeminnow. Rainbow trout numbers include any rainbow x westslope cutthroat trout hybrids.

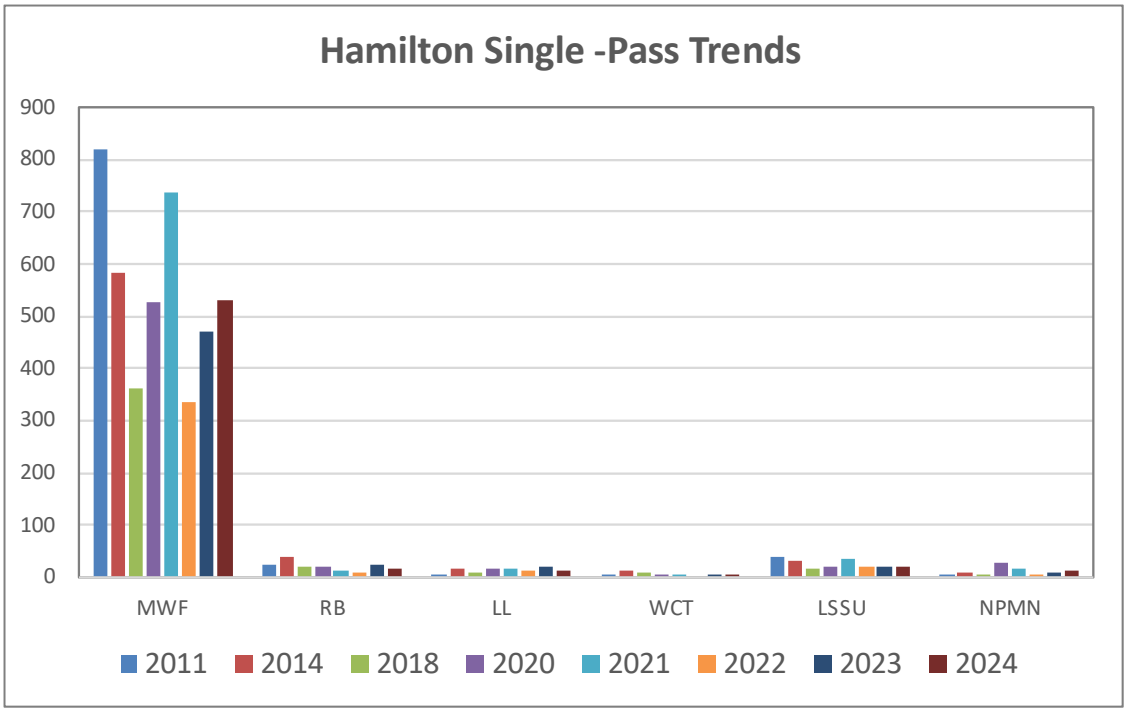


Figure 30. Number of fish handled for the most common species observed in the Hamilton single-pass section for the period of record. Species abbreviations are as follows: MWF = Mountain Whitefish, RB = Rainbow Trout, LL = Brown Trout, WCT = Westslope Cutthroat Trout, LSSU = Largescale Sucker, and NPMN = Northern Pikeminnow. Rainbow trout numbers include any rainbow x westslope cutthroat trout hybrids.

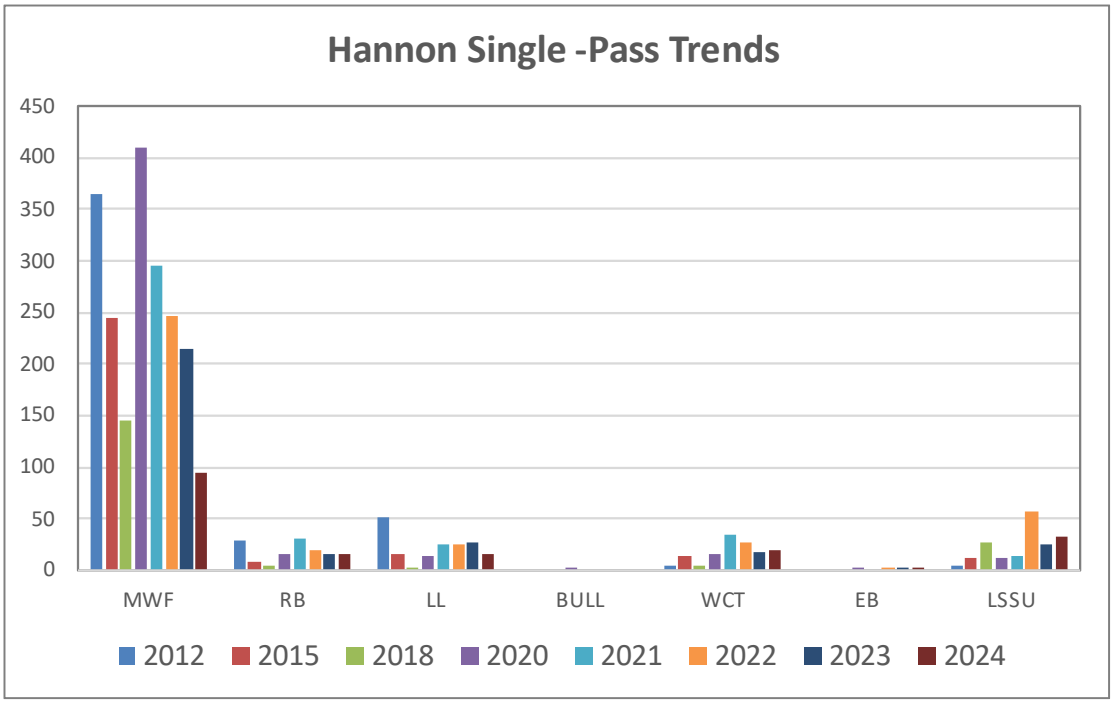

Figure 31. Number of fish handled for the most common species observed in the Hannon single-pass section for the period of record. Species abbreviations are as follows: MWF = Mountain Whitefish, RB = Rainbow Trout, LL = Brown Trout, BULL = Bull Trout, WCT = Westslope Cutthroat Trout, and LSSU = Largescale Sucker. Rainbow trout numbers include any rainbow x westslope cutthroat trout hybrids.

## *Tributary Fish Sampling*

Skalkaho Creek Drainage

### Skalkaho Creek

During the summers of 2023 and 2024, a mark-recapture population estimate was conducted on Skalkaho Creek at the long-term site located near FSRM 16.8. This reference site has generally been sampled annually since 1989. Table 10 contains a summary of fish captured during the marking runs in each year. Westslope cutthroat trout comprised the bulk of the fish community, with bull trout being less common. Brown trout were also observed in both years in the survey reach but were present in relatively low numbers. The population estimate for westslope cutthroat trout over 100 mm in length in 2023 was 180 per 1000 ft (95% confidence interval: +/- 60), and in 2024 was 132 per 1000 ft (95% confidence interval: +/- 24). These values were near the long-term average for the site, and within the range of variability (Figure 32). The population estimate for bull trout in 2023 was affected by poor capture efficiency and may be of marginal quality. The estimate obtained in 2024 was slightly more precise. The 2023 estimate for bull trout greater than 100 mm was 94 per 1000 ft (95% confidence interval: +/- 76), and in 2024 was 43 per 1000 ft (95% confidence interval: +/- 23). Although recent estimates indicate some slight improvement, bull trout density has generally been declining over the last decade in this section of Skalkaho Creek (Figure 33). Brown trout, on the other hand, have become more common, with the number handled in 2024 being the highest on record (Figure 34).

Table 10. Electrofishing data collected on Skalkaho Creek at FSRM 16.8 in 2023 and 2024. Data presented is from the marking run. Species abbreviations are as follows: WCT = Westslope Cutthroat Trout, BULL = Bull Trout, and LL = Brown Trout.

| Year | Species | Number of Fish Captured | Fish per 1000 ft (CPUE) | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| 2023 | WCT | 59 | 59 | 203 | 75-310 | 73 |
| | BULL | 18 | 18 | 182 | 112-251 | 22 |
| | LL | 4 | 4 | 161 | 146-170 | 5 |
| 2024 | WCT | 59 | 59 | 208 | 78-310 | 77 |
| | BULL | 13 | 18 | 200 | 85-245 | 17 |
| | LL | 5 | 5 | 195 | 170-220 | 6 |

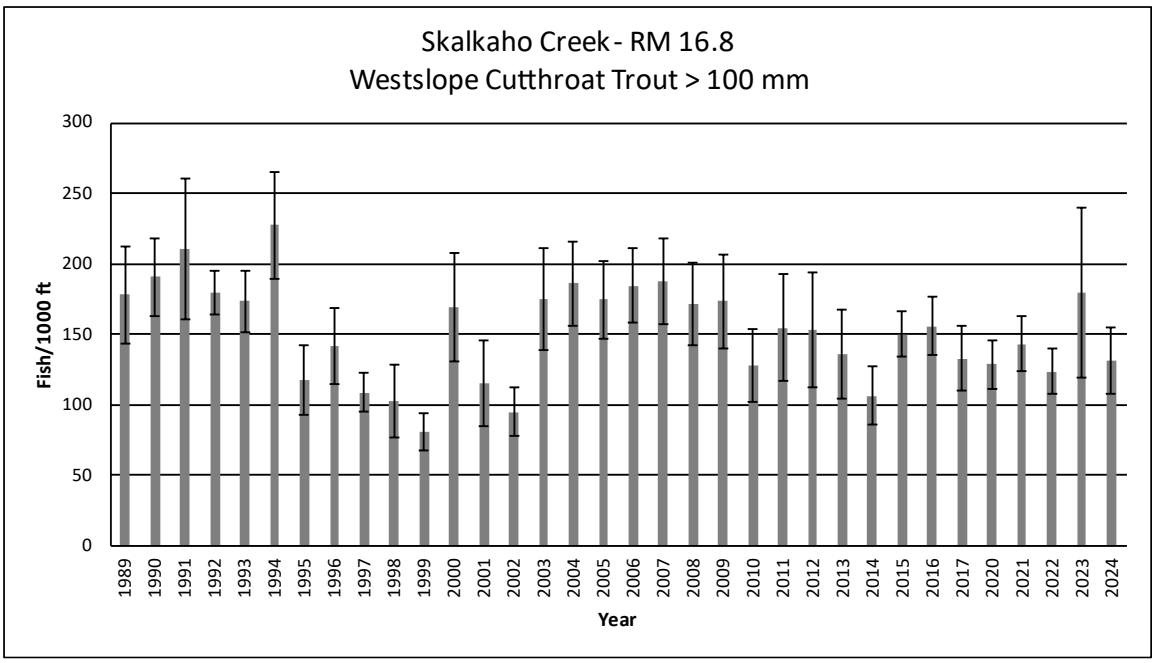


Figure 32. Population estimates for westslope cutthroat trout greater than 100 mm (~4") in total length in Skalkaho Creek at the FSRM 16.8 section for the period of record.

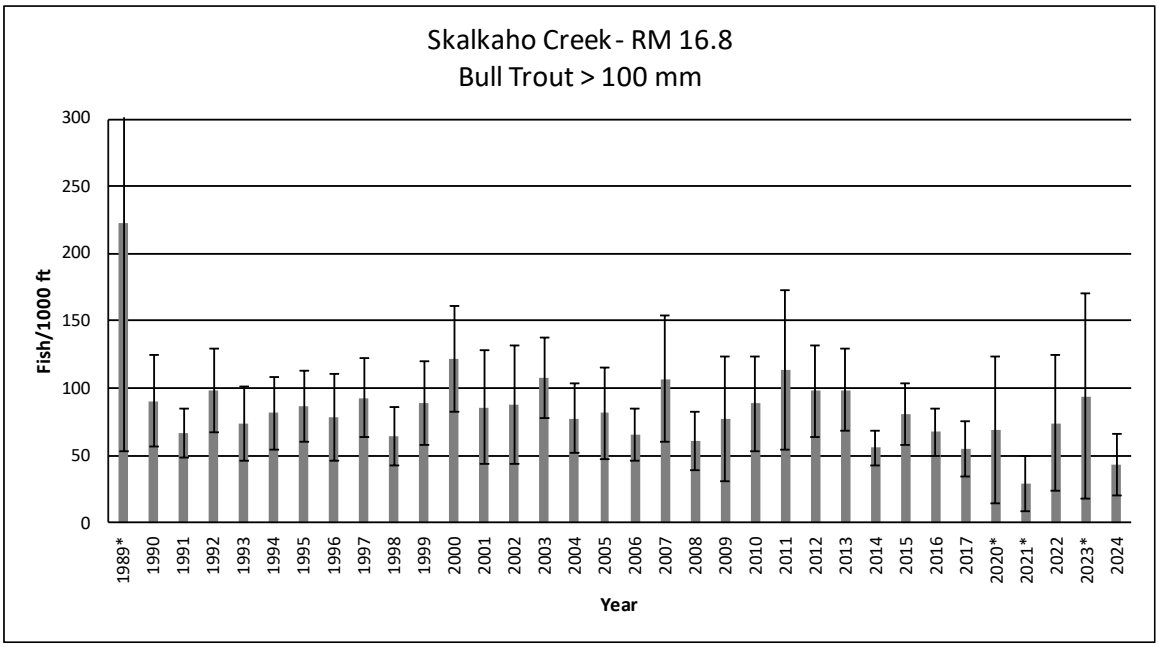


Figure 33. Population estimates for bull trout greater than 100 mm (~4") in total length in Skalkaho Creek at the FSRM 16.8 section for the period of record. Asterisk following year denotes estimate generated with fewer than three recaptures.

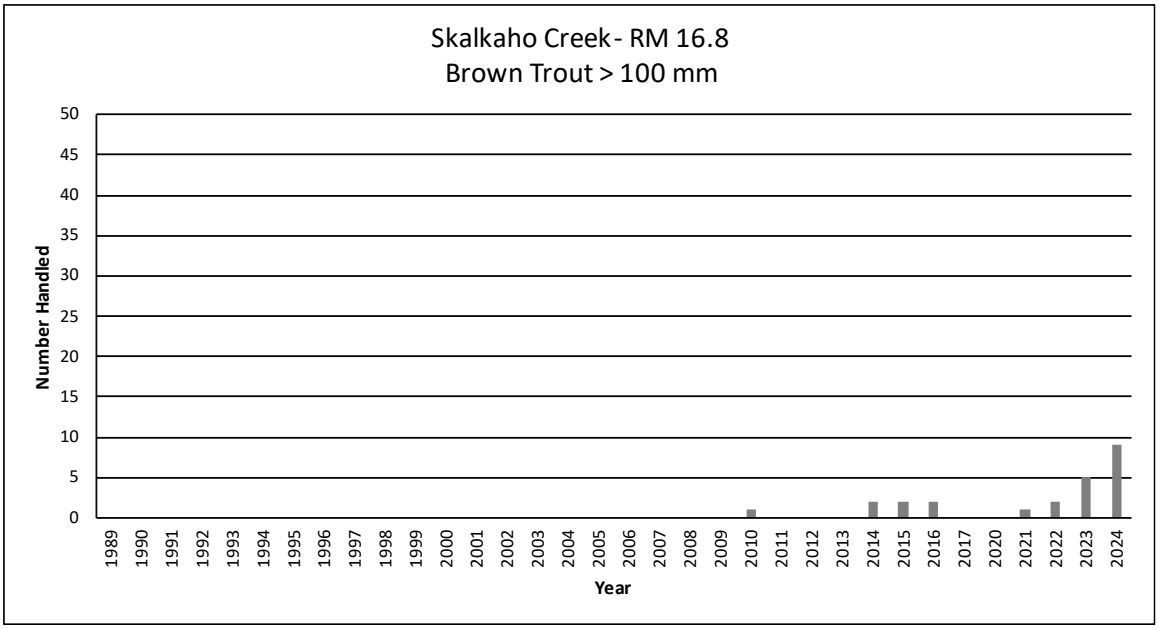

Figure 34. Number of brown trout greater than 100 mm (~4") in total length handled in Skalkaho Creek at the FSRM 16.8 section for the period of record.

## Sleeping Child Creek Drainage

### Sleeping Child Creek

During the summer of 2023 and 2024, a mark-recapture population estimate was conducted for trout on Sleeping Child Creek at the long-term site located near FSRM 10.2. This reference site has generally been sampled on an annual basis since 1985. Additionally, several single-pass electrofishing surveys were completed just upstream from the long-term section near FSRM 10.4 and 10.6. The purpose of these surveys was to look for Columbia slimy sculpin. This native species was present in most historical surveys at the FSRM 10.2 section but had not been observed in recent years. Unfortunately, no Columbia slimy sculpin were observed in any of the surveys completed in Sleeping Child Creek in 2023 or 2024. Environmental DNA samples collected in October 2023 also confirmed that Columbia slimy sculpin appear to have been extirpated from Sleeping Child Creek within the last decade.

At the FSRM 10.2 section in both 2023 and 2024, brown trout comprised a little over half of trout handled in the reach with westslope cutthroat trout also being relatively common (Table 11). Bull trout were observed in both years but were rare. Brown trout were first detected at the FSRM 10.2 section in 1997 but did not become established until approximately 2006. The 2023 population estimate for brown trout over 100 mm in length was 203 per 1000 ft (95% confidence interval: +/- 69), and in 2024 it was 179 per 1000 ft (95% confidence interval: +/- 38). Both values were above the long-term average from when brown trout became established in the section (2006), with the 2023 estimate being the second highest ever recorded (Figure 35). For westslope cutthroat trout, the

2023 estimate for fish over 100 mm in length was 110 per 1000 ft (95% confidence interval: +/- 46), and in 2024 it was 131 per 1000 ft (95% confidence interval: +/- 36). These values were a little below the long-term average but were improved over recent years (Figure 36). No estimates were made for bull trout given the low number present in the sample reach in both years. An evaluation of the total number captured through time showed that the 2023 and 2024 values were well below the long-term average. Bull trout numbers have been declining for three decades in this reach of Sleeping Child Creek (Figure 37).

Table 11. Electrofishing data collected at the FSRM 10.2 section of Sleeping Child Creek in 2023 and 2024. Data presented is from the marking run. Species abbreviations are as follows: WCT = Westslope Cutthroat Trout, BULL = Bull Trout, and LL = Brown Trout.

| Year | Species | Number of Fish Captured | Fish per 1000 ft (CPUE) | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| 2023 | WCT | 38 | 38 | 146 | 51-279 | 44 |
| | BULL | 1 | 1 | 176 | - | 1 |
| | LL | 48 | 48 | 176 | 62-327 | 55 |
| 2024 | WCT | 56 | 56 | 152 | 84-275 | 42 |
| | BULL | 1 | 1 | 152 | - | 1 |
| | LL | 77 | 77 | 183 | 112-286 | 57 |

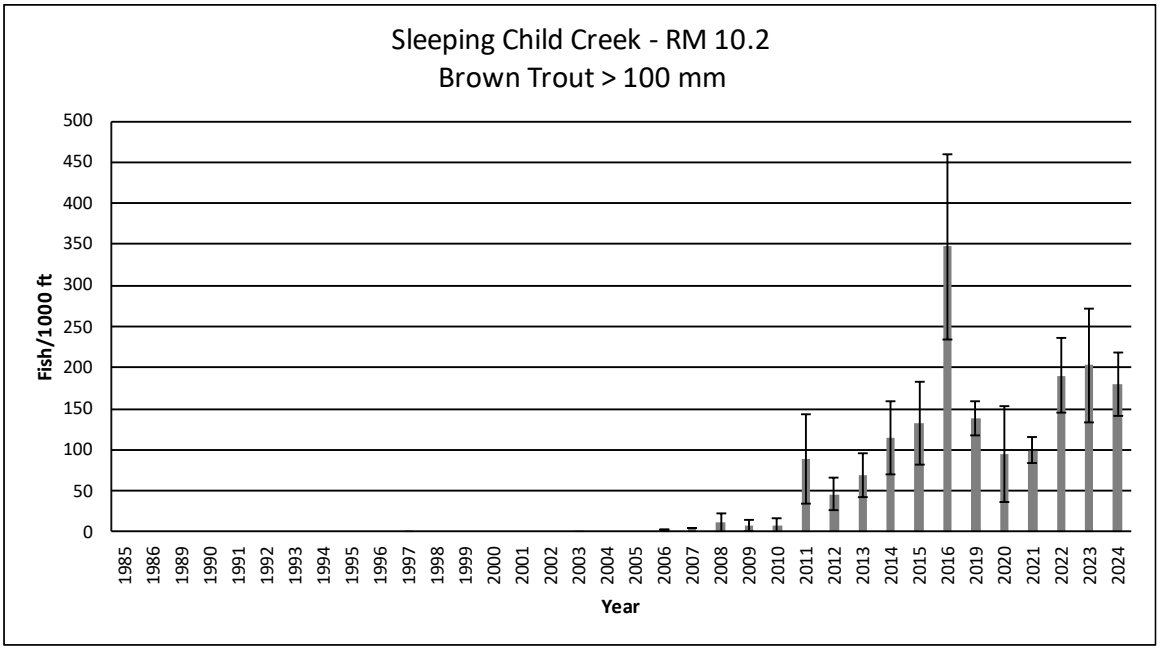


Figure 35. Population estimates for brown trout greater than 100 mm (~4") in total length in Sleeping Child Creek at the FSRM 10.2 section for the period of record.

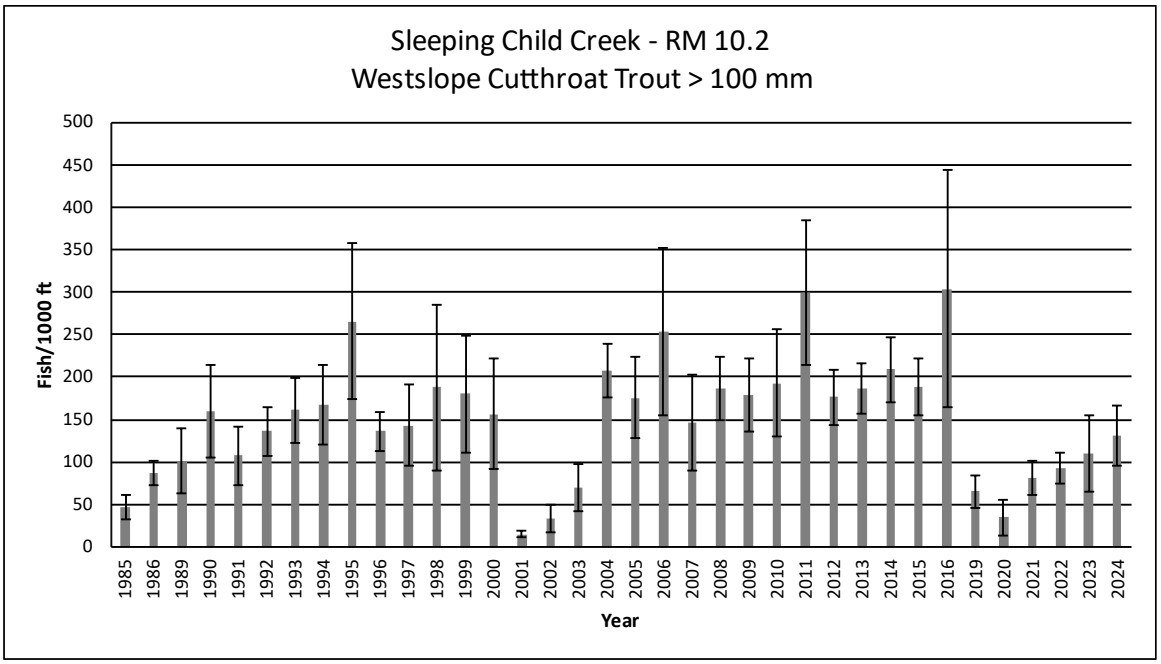


Figure 36. Population estimates for westslope cutthroat trout greater than 100 mm (~4") in total length in Sleeping Child Creek at the FSRM 10.2 section for the period of record.

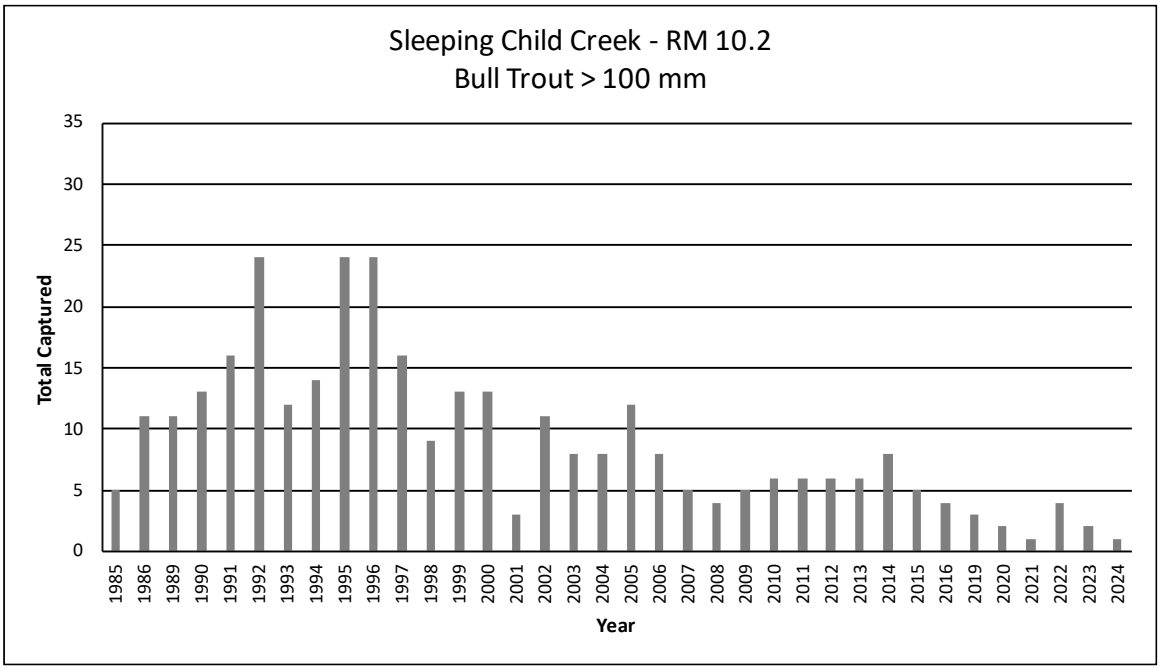


Figure 37. Number of bull trout greater than 100 mm (~4") in total length handled in the Sleeping Child Creek FSRM 10.2 section for the period of record.

## Chaffin Creek

One mark-recapture population estimate was completed in Chaffin Creek during the summer of 2023 at the established section located near FSRM 3.1. Table 12 contains a summary of fish collected during the marking run. Westslope cutthroat trout comprised most of the fish in the section, with brook trout also present, but in low numbers. While no bull trout were found in the section in 2023, two phenotypic brook trout x bull trout hybrids were observed. The population estimate for westslope cutthroat trout over 100 mm in length was 499 per 1000 ft (95% confidence interval: +/- 69), and for brook trout it was 9 per 1000 ft (95% confidence interval: +/- 2). The cutthroat estimate was the highest on record (Figure 38), while the number of brook trout handled was similar to previous years (Figure 39).

Table 12. Electrofishing data collected in one section of Chaffin Creek in 2023. Data presented is from the marking run. Species abbreviations are as follows: WCT = Westslope Cutthroat Trout, EB = Brook Trout, and EBxBULL = Brook Trout x Bull Trout hybrid.

| Section | Species | Number of Fish Captured | Fish per 1000 ft (CPUE) | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| FSRM 3.1 | WCT | 273 | 273 | 120 | 69-216 | 97 |
| | EB | 7 | 7 | 137 | 97-176 | 2 |
| | EBxBULL | 2 | 2 | 173 | 108-237 | 1 |

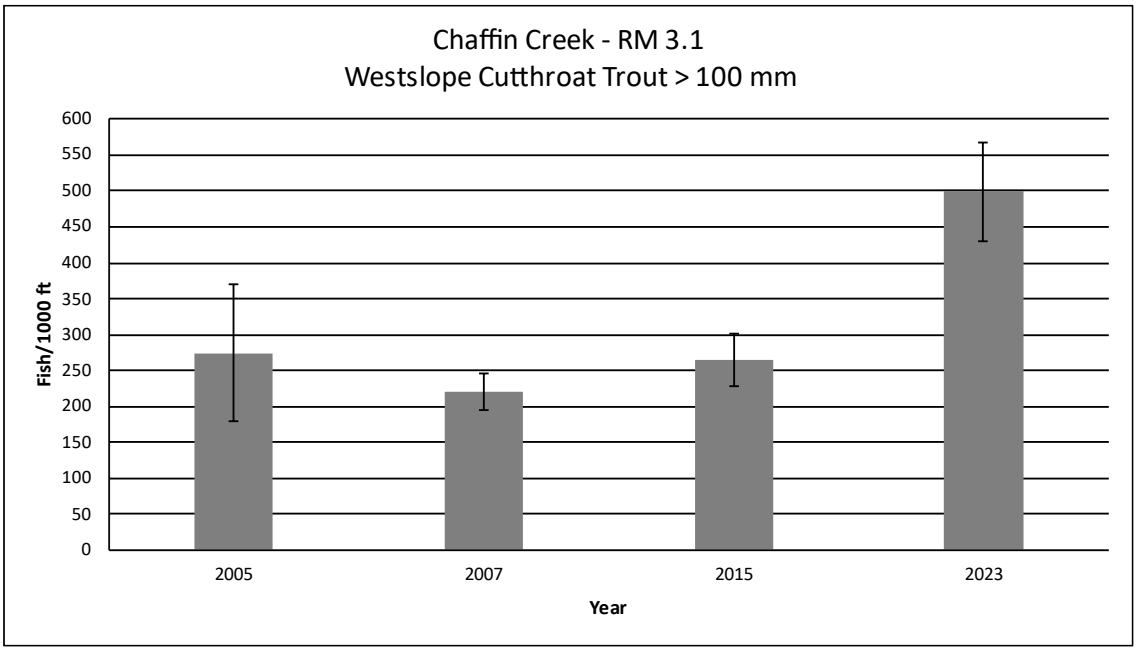


Figure 38. Population estimates for Westslope cutthroat trout greater than 100 mm (~4") in total length in Chaffin Creek at the FSRM 3.1 section for the period of record.

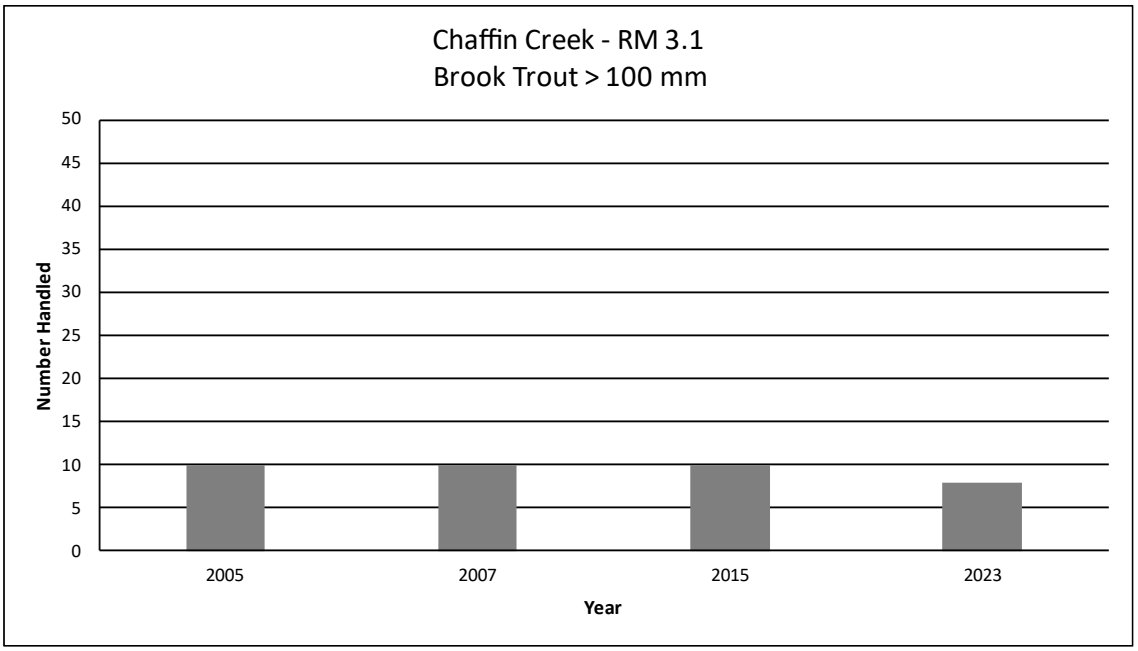

Figure 39. Number of brook trout greater than 100 mm (~4") in total length handled in Chaffin Creek at the FSRM 3.1 section for the period of record.

## West Fork Bitterroot River Drainage

### Overwhich Creek

One mark-recapture population estimate was completed in Overwhich Creek during the summer of 2023. The survey was conducted at the established section located near FSRM 2.0. Table 13 contains a summary of fish collected during the marking run at the site. Westslope cutthroat trout comprised most of the fish in the section, with brook trout also present, but in low numbers. Additionally, while none were captured in the initial marking run, two bull trout were observed in the recapture sample. The population estimate for westslope cutthroat trout over 100 mm in length was 146 per 1000 ft (95% confidence interval: +/- 47). Not enough brook trout or bull trout were handled to generate a valid estimate for these species. The cutthroat estimate was a little below the long-term average, but within the range of variability previously observed (Figure 40). Similarly, the number of brook trout and bull trout greater than 100 mm handled in the section were like prior samples and were within the range of observed values (Figures 41 and 42, respectively).

Table 13. Electrofishing data collected in one section of Overwhich Creek in 2023. Data presented is from the marking run. Species abbreviations are as follows: WCT = Westslope Cutthroat Trout, EB = Brook Trout, and BULL = Bull Trout. * Asterisk indicates data is from the recapture pass and not the initial marking run.

| Section | Species | Number of Fish Captured | Fish per 1000 ft (CPUE) | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| FSRM 2.0 | WCT | 78 | 78 | 125 | 43-318 | 91 |
| | EB | 8 | 8 | 153 | 95-257 | 9 |
| | BULL* | 2* | 2* | 161* | 157-165* | n/a* |

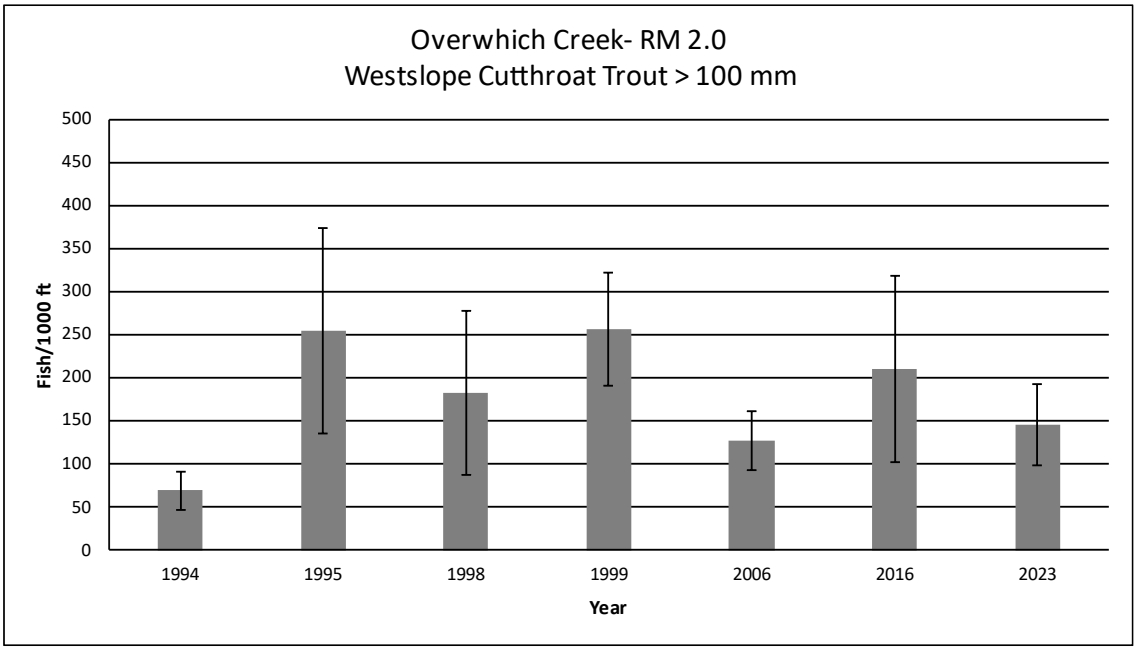


Figure 40. Population estimates for westslope cutthroat trout greater than 100 mm (~4") in total length in Overwhich Creek at the FSRM 2.0 section for the period of record.

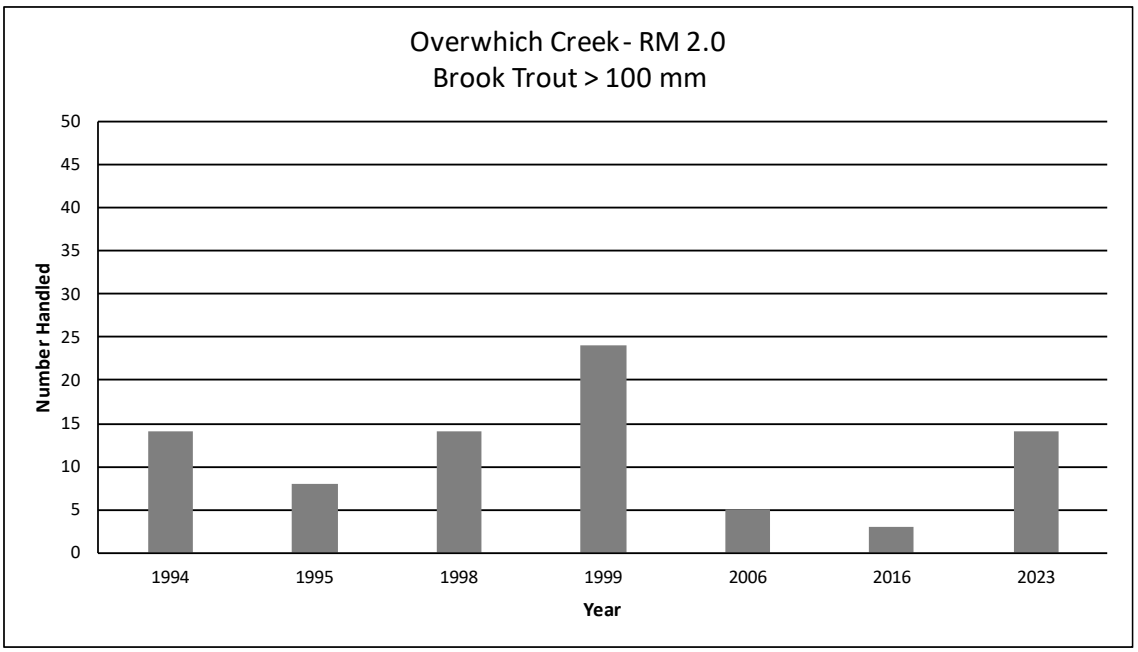


Figure 41. Number of brook trout greater than 100 mm (~4") in total length handled in Overwhich Creek at the FSRM 2.0 section for the period of record.

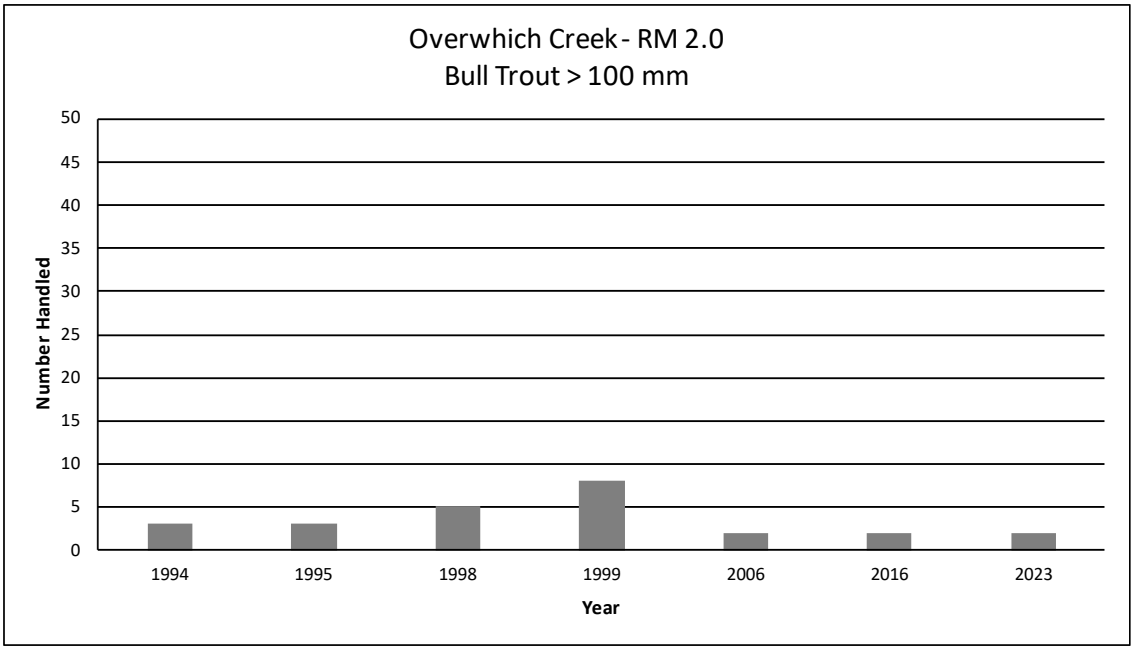


Figure 42. Number of bull trout greater than 100 mm (~4") in total length handled in Overwhich Creek at the FSRM 2.0 section for the period of record.

## Sheep Creek

A single mark-recapture population estimate was completed in Sheep Creek during the summer of 2023. The survey was conducted at the established section located near FSRM 0.2 just upstream from the confluence with the West Fork Bitterroot River. Table 14 contains a summary of fish collected during the marking run at the site. Westslope cutthroat trout comprised over half of the fish observed, with bull trout and phenotypic brook trout x bull trout hybrids comprising the remainder of the fish at the site. Despite the presence of hybrids, no brook trout were found in this section of Sheep Creek. The population estimate for westslope cutthroat trout over 100 mm in length was 42 per 1000 ft (95% confidence interval: +/- 12), while for bull trout it was 13 per 1000 ft (95% confidence interval: +/- 4). Cutthroat density was the highest ever recorded although only slightly above past estimate values (Figure 43). The number of bull trout greater than 100 mm handled in the section was similar to previous observations (Figure 44).

Table 14. Electrofishing data collected in one section of Sheep Creek in 2023. Data presented is from the marking run. Species abbreviations are as follows: WCT = Westslope Cutthroat Trout, BULL = Bull Trout, and EBxBULL = Brook Trout x Bull Trout hybrid.

| Section | Species | Number of Fish Captured | Fish per 1000 ft (CPUE) | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| FSRM 0.2 | WCT | 19 | 32 | 121 | 47-193 | 56 |
| | BULL | 13 | 22 | 106 | 80-180 | 38 |
| | EBxBULL | 2 | 3 | 135 | 126-144 | 6 |

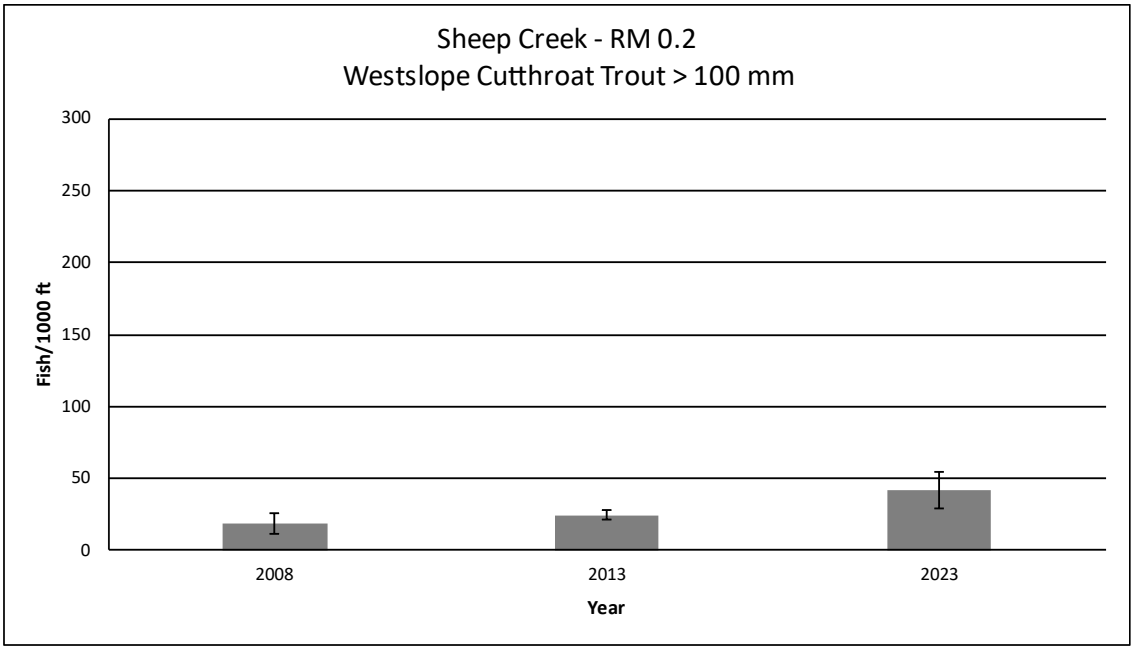


Figure 43. Population estimates for westslope cutthroat trout greater than 100 mm (~4") in total length in Sheep Creek at the FSRM 0.2 section for the period of record.

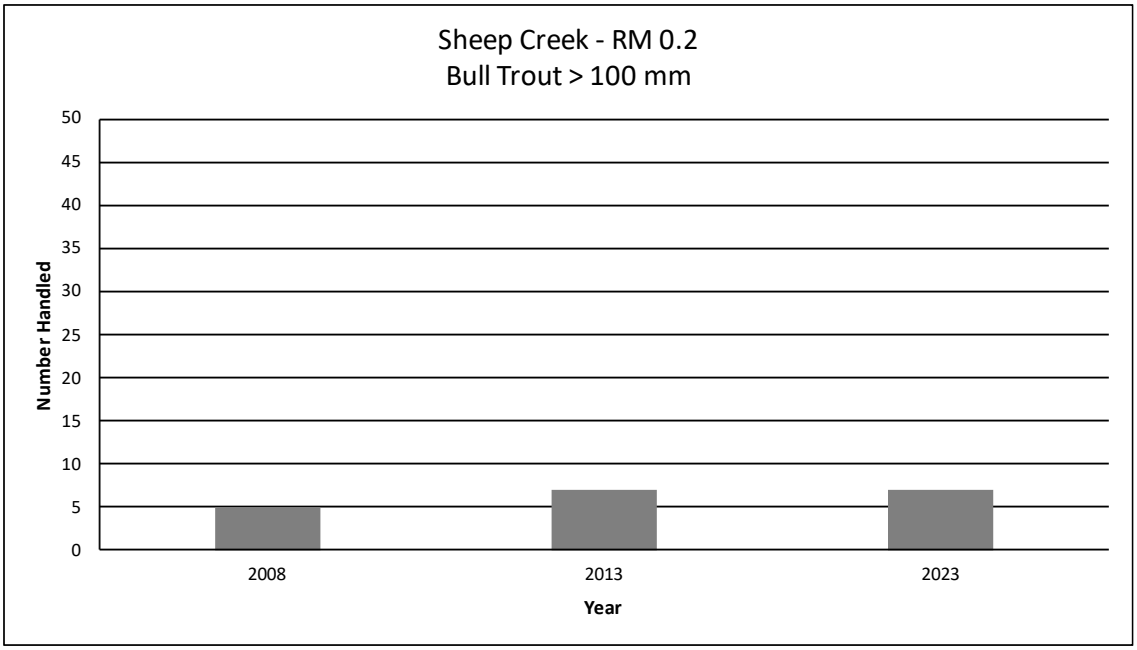

Figure 44. Number of bull trout greater than 100 mm (~4") in total length handled in Sheep Creek at the FSRM 0.2 section for the period of record.

## Upper West Fork Bitterroot River

One mark-recapture population estimate was completed in the upper West Fork Bitterroot River during the summer of 2023. The survey was conducted at the established section located near FSRM 40.0 not far upstream from the confluence with Sheep Creek. Table 15 contains a summary of fish collected during the marking run at the site. Westslope cutthroat trout comprised most of the fish observed, with bull trout and phenotypic brook trout x bull trout hybrids comprising the remainder of the fish at the site. Despite the presence of hybrids, no brook trout were found in this section of the West Fork in 2023. The population estimate for westslope cutthroat trout over 100 mm in length was 168 per 1000 ft (95% confidence interval: +/- 51), while for bull trout it was 100 per 1000 ft (95% confidence interval: +/- 69). The bull trout estimate was possibly biased by marginal capture efficiency and a minimum number of recaptures used to generate the estimate value. Cutthroat density was the highest ever recorded and approximately double the most recent value from two decades prior (Figure 45). Similarly, the bull trout estimate was the highest ever recorded and was also approximately double the most recent value from 2003 (Figure 46).

Table 15. Electrofishing data collected in one section of the upper West Fork Bitterroot River in 2023. Data presented is from the marking run. Species abbreviations are as follows: WCT = Westslope Cutthroat Trout, BULL = Bull Trout, and EBxBULL = Brook Trout x Bull Trout hybrid.

| Section | Species | Number of Fish Captured | Fish per 1000 ft (CPUE) | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| FSRM 40.0 | WCT | 58 | 73 | 121 | 59-225 | 70 |
| | BULL | 22 | 28 | 119 | 77-175 | 26 |
| | EBxBULL | 3 | 4 | 134 | 124-148 | 4 |

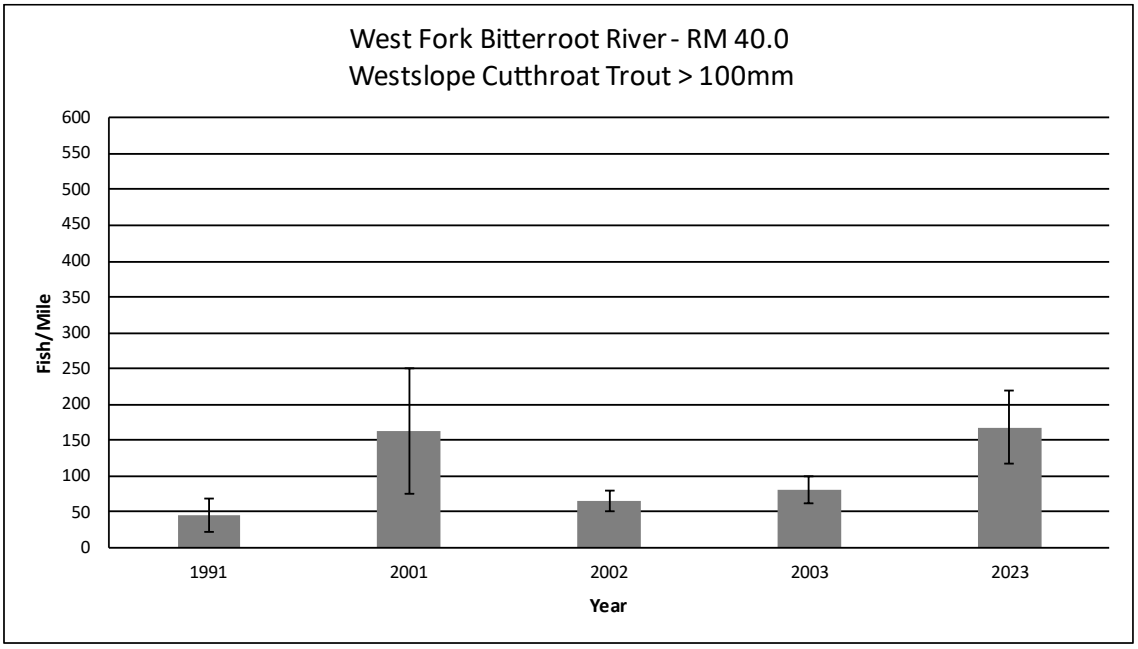


Figure 45. Population estimates for westslope cutthroat trout greater than 100 mm (~4") in total length in the upper West Fork Bitterroot River at the FSRM 40.0 section for the period of record.

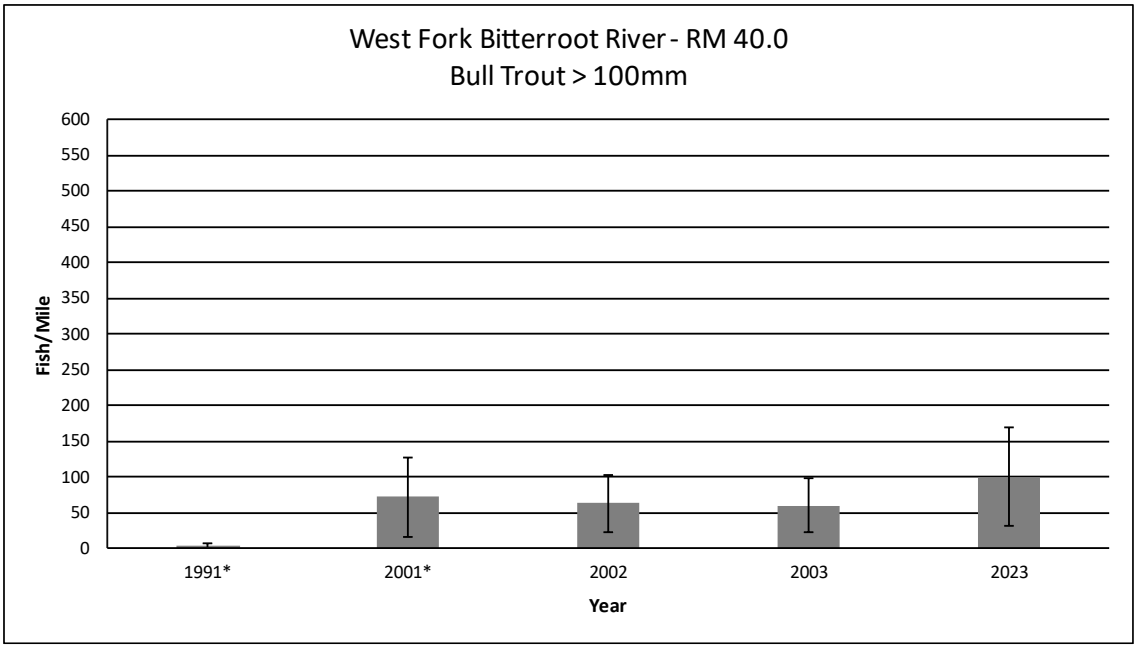

Figure 46. Population estimates for bull trout greater than 100 mm (~4") in total length in the upper West Fork Bitterroot River at the FSRM 40.0 section for the period of record. Asterisk following year denotes estimate generated with fewer than three recaptures.

## Upper West Fork Westslope Cutthroat Trout Genetic Sample Collection

In 2023 and 2024 an effort was made to update westslope cutthroat trout genetic purity data in the upper West Fork Bitterroot River and its tributaries located upstream of Painted Rocks Dam. This metapopulation is one the largest connected westslope cutthroat populations above a fish barrier (Painted Rocks Dam) in the state of Montana. It is a very important population from a westslope cutthroat trout conservation perspective. Past genetic sampling has indicated that most of the fish in the population are genetically unaltered. However, given historic stocking records of rainbow trout in Painted Rocks Reservoir and private ponds in the area, along with recent improvements in genetic technology that can detect low levels of hybridization, obtaining an updated snapshot of cutthroat trout genetics in this important metapopulation was deemed a priority.

Fish were collected from the mainstem West Fork Bitterroot River as well as many of the major tributaries using a backpack electrofisher and/or angling. Normally, 24-25 individual fish samples were collected and submitted for each stream. Fin clips were collected at two or three locations in each stream and the number of samples collected at each location were generally divided up equally among the sample sites. All collected samples were submitted for analysis at the time this report was written, although results were not available. Table 16 summarizes information for the samples collected.

Table 16. Westslope cutthroat trout genetic samples collected in the upper West Fork Bitterroot River and select tributaries above Painted Rocks Dam in 2023 and 2024. Note: River miles estimated from MT FWP river mile layer.

| Stream | Year Collected | # of Samples Collected | # of Locations Sampled | Locations Sampled (RMs) | Mean Range (mm) | Length Range (mm) |
|---|---|---|---|---|---|---|
| West Fork Bitterroot River | 2024 | 25 | 3 | 26.2, 33.4, 39.0 | 190 | 67-415 |
| Little Boulder Creek | 2024 | 25 | 2 | 0.6, 2.1 | 133 | 62-195 |
| Slate Creek | 2024 | 24 | 2 | 0.9, 2.6 | 160 | 67-243 |
| Blue Joint Creek | 2024 | 25 | 3 | 1.3, 4.5, 7.5 | 162 | 67-295 |
| Overwhich Creek | 2023 | 24 | 2 | 1.7, 4.9 | 162 | 52-318 |
| Hughes Creek | 2024 | 24 | 2 | 0.7, 8.7 | 145 | 62-260 |
| Chicken Creek | 2024 | 24 | 2 | 0.6, 2.7 | 125 | 77-195 |
| Deer Creek | 2024 | 24 | 2 | 0.5, 2.2 | 140 | 73-237 |

East Fork Bitterroot River Drainage

## Warm Springs Creek

One mark-recapture population estimate was completed in Warm Springs Creek during the summer of 2024. The survey was conducted at the established section located near FSRM 3.5. Table 17 contains a summary of fish collected during the marking run. A hybrid swarm of westslope cutthroat trout and rainbow trout comprised the bulk of the fish observed in the section, with brown trout also present but less common. Additionally, a single bull trout was also observed. The population estimate for rainbow trout x westslope cutthroat trout hybrids over 100 mm in length was 224 per 1000 ft (95% confidence interval: +/- 23), while for brown trout it was 46 per 1000 ft (95% confidence interval: +/- 13). The hybrid estimate showed slight improvement over the previous estimate from 2014 and was close to the long-term average for the site (Figure 47). The estimate for brown trout obtained in 2024 was the first since sampling was initiated in 1992. Prior to then too few brown trout were captured to obtain a population estimate. The number handled in 2024 was a record high for the reach (Figure 48). Bull trout have not been overly common in this section of Warm Springs Creek throughout the period of record however, the trend in catch per effort shows a declining trend through time (Figure 49).

Table 17. Electrofishing data collected in Warm Springs Creek in 2024. Data presented is from the marking run. Species abbreviations are as follows: RBxWCT = Rainbow Trout x Westslope Cutthroat Trout hybrid, BULL = Bull Trout, and LL – Brown Trout.

| Section | Species | Number of Fish Captured | Fish per 1000 ft (CPUE) | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| FSRM 3.5 | RBxWCT | 141 | 141 | 160 | 45-332 | 87 |
| | BULL | 1 | 1 | 285 | - | 1 |
| | LL | 20 | 20 | 182 | 111-326 | 12 |

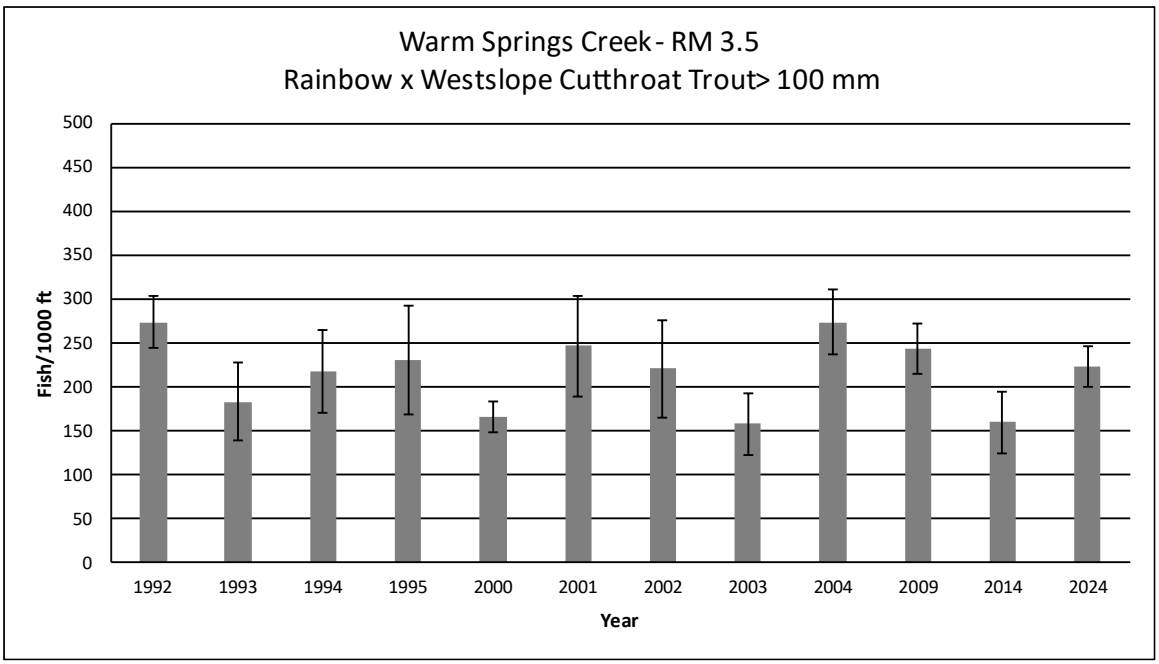


Figure 47. Population estimates for rainbow trout x westslope cutthroat trout hybrids greater than 100 mm (~4") in total length in Warm Springs Creek at the FSRM 3.5 section for the period of record.

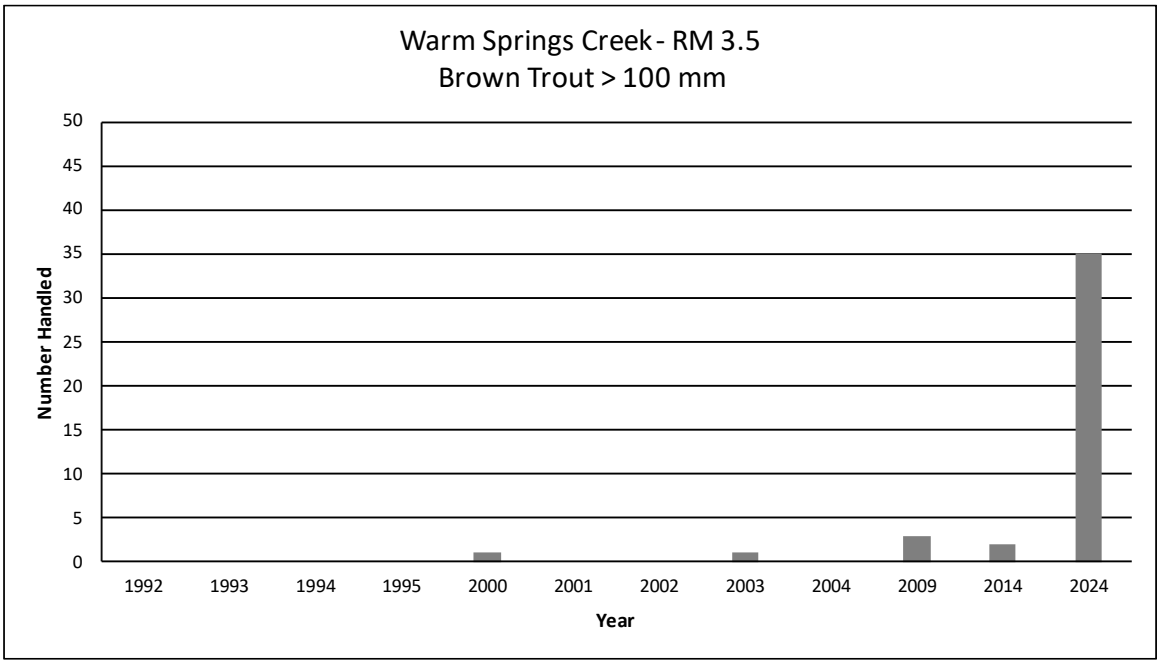


Figure 48. Number of brown trout greater than 100 mm (~4") in total length handled in the Warm Springs Creek FSRM 3.5 section for the period of record.

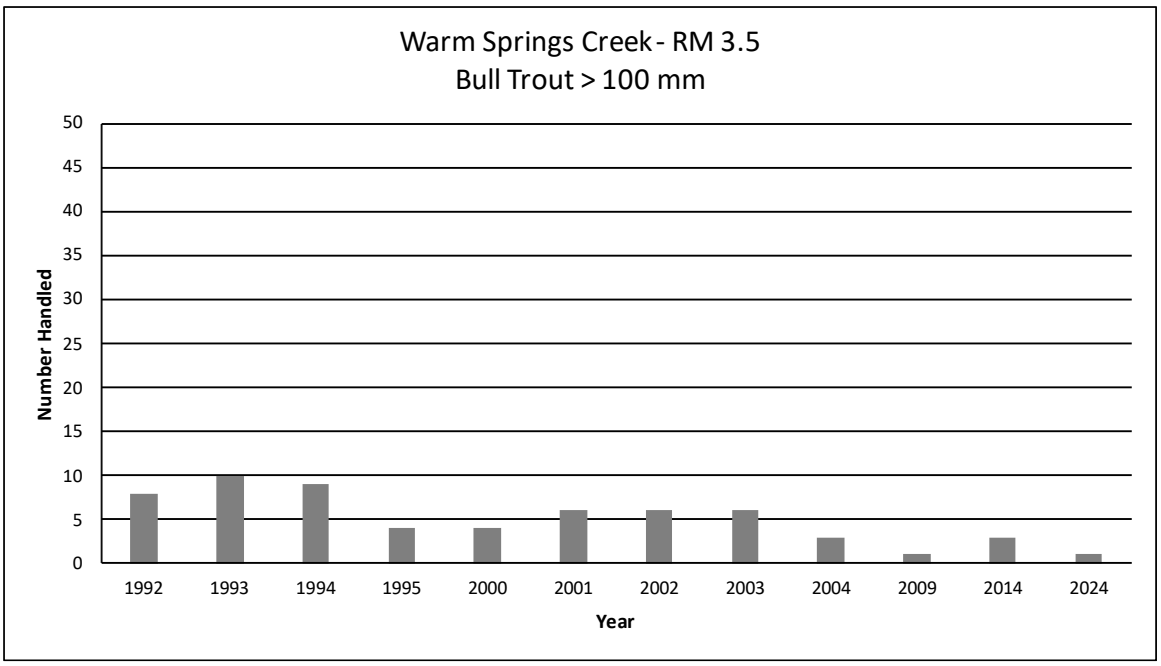

Figure 49. Number of bull trout greater than 100 mm (~4") in total length handled in the Warm Springs Creek FSRM 3.5 section for the period of record.

## Tolan Creek

In the late summer of 2022, the Trail Ridge Fire burned through much of the Tolan Creek watershed leaving a large portion of the drainage severely charred. The following summer of 2023 brought intense rainstorms dropping inches of rain on the Tolan drainage in a short amount of time. The combination of a severely burned watershed combined with high rainfall amounts on steep slopes led to severe flooding and several mass hillside failures in the drainage. Enormous amounts of sediment and woody debris were transported through the drainage. This led to debris jams and failed culverts at road crossings, channel relocation in many areas, channel incision and large head cuts in other locations, and high amounts of fine sediment deposited throughout much of the streambed. Fish habitat was negatively affected throughout most of the drainage. It was presumed that the flooding and degradation that occurred severely impacted the fishery.

In response to the events described, single pass electrofishing surveys were completed at established sections in Tolan Creek located near FSRM 5.1 and 7.3 in September 2023. No fish were captured at FSRM 5.1 but three westslope cutthroat trout (120-233 mm) and one bull trout (130 mm) were observed at FSRM 7.3 indicating that some fish did survive the severe flood events. Bitterroot National Forest fisheries staff completed more intensive sampling in the drainage in 2024 as well as initiated restoration planning efforts.

**Moose Creek**

One mark-recapture population estimate was completed in Moose Creek during the summer of 2024. The survey was conducted at the established section located near FSRM 1.4. Table 18 contains a summary of fish collected during the marking run. Westslope cutthroat trout comprised the bulk of the fish observed in the section, with bull trout also present but less common. Additionally, a single brown trout was also observed. The only other time this species had been detected in this section of Moose Creek was in 2002 when two individuals were collected. The population estimate for westslope cutthroat trout over 100 mm in length was 239 per 1000 ft (95% confidence interval: +/- 58). No estimate was made for bull trout due to the low number of fish handled and a lack of recaptures. Cutthroat density was like the previous estimate from 2017 and was above the long-term average for the site (Figure 50). The number of bull trout handled in 2024 was similar to recent samples, although the long-term trend in catch-per-effort shows signs of density declining (Figure 51).

Table 18. Electrofishing data collected in Moose Creek in 2024. Data presented is from the marking run. Species abbreviations are as follows: WCT = Westslope Cutthroat Trout, BULL = Bull Trout, and LL = Brown Trout.

| Section | Species | Number of Fish Captured | Fish per 1000 ft (CPUE) | Mean Length (mm) | Length Range (mm) | Species Composition (%) |
|---|---|---|---|---|---|---|
| FSRM 1.4 | WCT | 89 | 89 | 173 | 65-333 | 89 |
| | BULL | 10 | 10 | 171 | 146-252 | 10 |
| | LL | 1 | 1 | 260 | - | 1 |

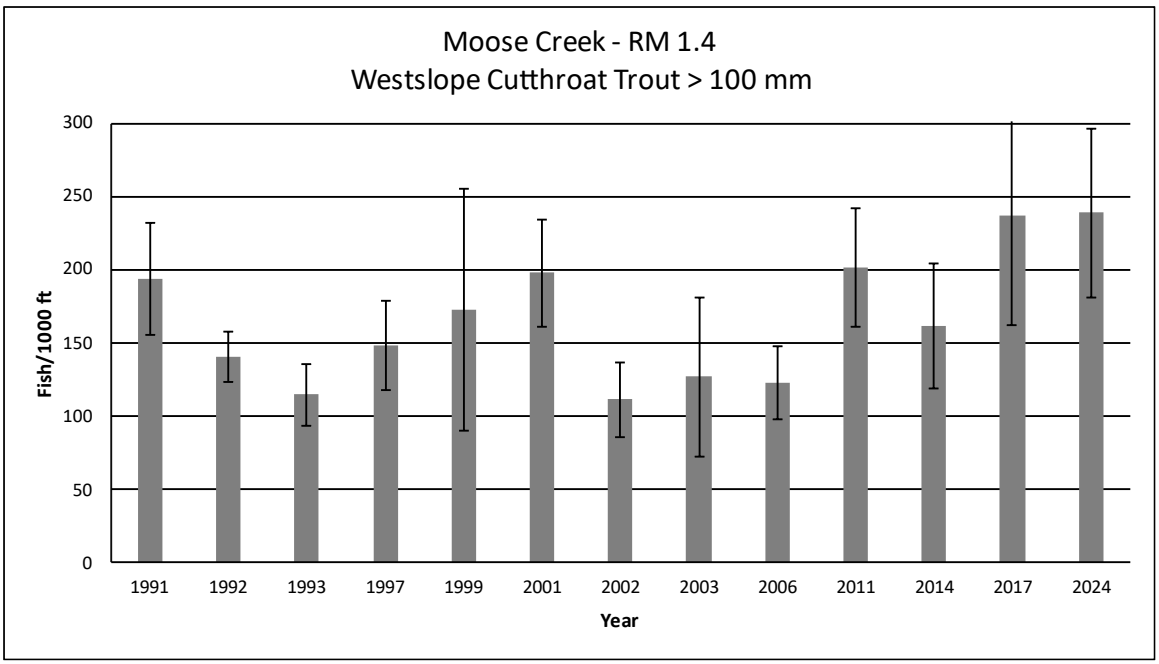


Figure 50. Population estimates for westslope cutthroat trout greater than 100 mm (~4") in total length in Moose Creek at the FSRM 1.4 section for the period of record.

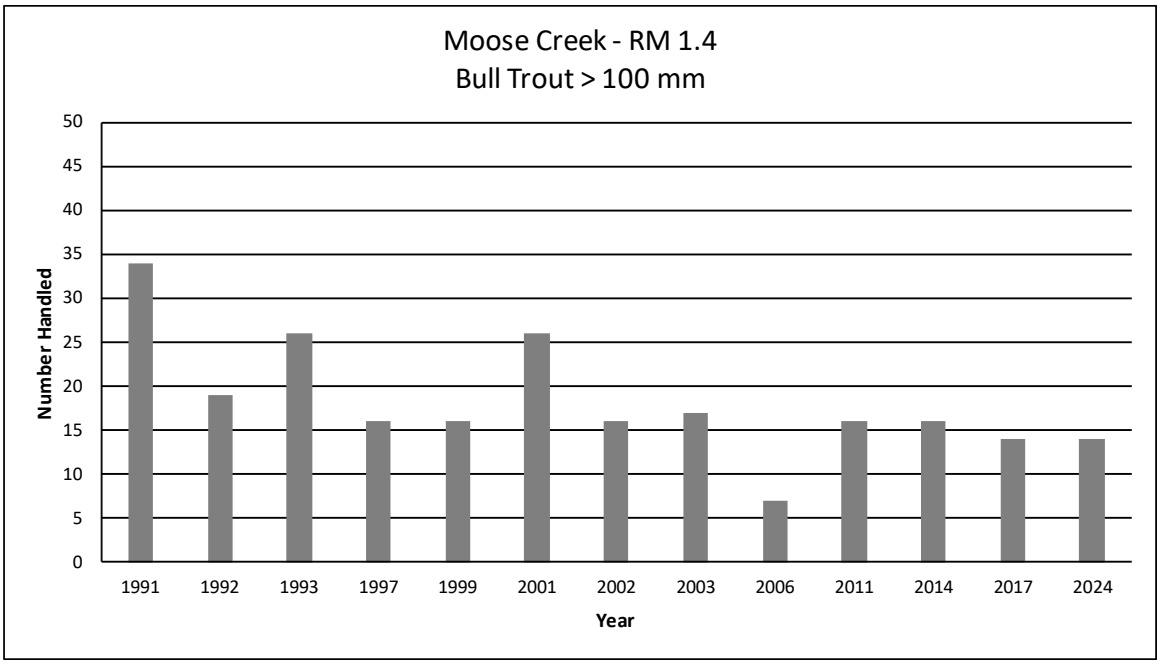


Figure 51. Number of bull trout greater than 100 mm (~4") in total length handled in the Moose Creek FSRM 1.4 section for the period of record.

## *Lake Fish Sampling*

### Lake Como

No gillnetting was completed in Lake Como in 2023 due to weather complications during the traditional survey period. However, sampling was completed in the fall of 2024. Two floating experimental gillnets were set at established locations on the east end of the lake. Table 19 contains a summary of the catch. In general, rainbow trout numbers were relatively low and showed a slight decline from the last sample in 2022 (Figure 52). Rainbow numbers in 2024 were slightly below the long-term average of 4.1 fish per net. In contrast, kokanee numbers were relatively high in the 2024 sample. The average number of kokanee captured per net was the third highest on record (Figure 52) and was well above the long-term average of 8.9 fish per net. The numbers observed in the 2024 sample were unexpected given that kokanee have not been planted into Lake Como in many years. Kokanee were stocked regularly from 1997 to 2002 and then again from 2007 to 2012. Monitoring during this time showed that stocked kokanee had relatively poor growth and performance, typically not attaining lengths over 250 mm (~10 in) (Clancy 2013, Clancy 2003). Kokanee appear to be self-sustaining in Lake Como at this time and despite typically low densities, have remained small. Low fish densities and small average fish size are likely a result of large annual drawdown and the naturally low productivity of Lake Como. No cutthroat trout were captured in the gillnets in 2024, which is not overly surprising since the long-term average for both westslope cutthroat trout and Yellowstone cutthroat trout is less than one fish per net.

Table 19. Gillnet data collected at Lake Como in 2024. Only the most common gamefish species are displayed. Species abbreviations are as follows: WCT = westslope cutthroat trout, YCT = Yellowstone cutthroat trout, RB = rainbow trout, and KOK = kokanee.

| Year | Species | Number Captured | Mean Length (mm) | Length Range (mm) | Mean Fish per Net |
|---|---|---|---|---|---|
| 2024 | WCT | 0 | - | - | - |
| | YCT | 0 | - | - | - |
| | RB | 5 | 267 | 217-355 | 2.5 |
| | KOK | 55 | 237 | 218-250 | 27.5 |

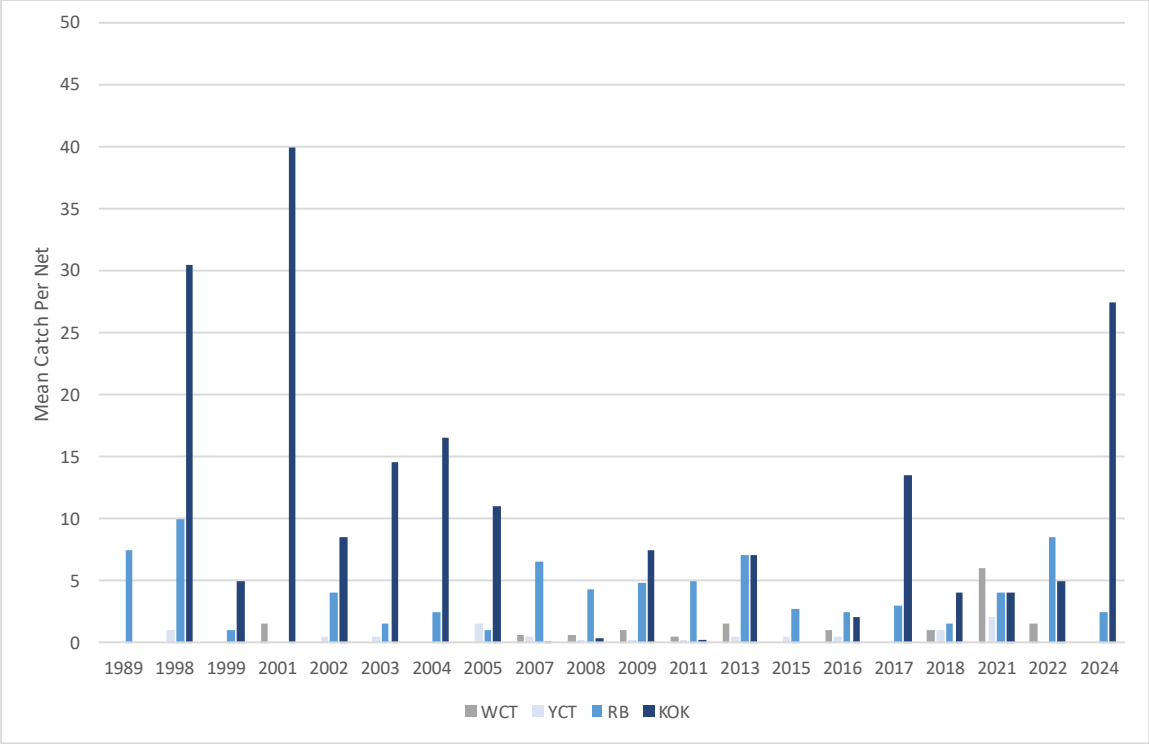


Figure 52. Average number of fish per net by species in Lake Como for the period of record. Only common gamefish species are displayed. Species abbreviations are as follows: WCT = westslope cutthroat trout, YCT = Yellowstone cutthroat trout, RB = rainbow trout, and KOK = kokanee.

# Literature Cited

Bailey, N. J. J. 1951. On estimating the size of mobile populations from recapture data. Biometrika 38:293-306.

Chapman, D. G. 1951. Some properties of the hypergeometric distribution with application to zoological sample census. University of California Publications in Statistics 1:131-160.

Clancy, C. 2013. Federal Aid Job Progress Report: Bitterroot River Drainage Fisheries Management. Fisheries Diversion. Montana Fish, Wildlife & Parks.

Clancy, C. 2003. Federal Aid Job Progress Report: Bitterroot River Drainage. Fisheries Diversion. Montana Fish, Wildlife & Parks.

Javorsky, L. 1994. The Bitterroot River floodplain: An historical analysis. Montana Department of Fish, Wildlife and Parks.

Lindstrom, J. 2023. Federal Aid Job Progress Report: Bitterroot River Drainage. Fisheries Diversion. Montana Fish, Wildlife & Parks.

Montana Fish, Wildlife & Parks (FWP). 2022. Montana statewide angling pressure 2021 summary report.

Schill, D. J., and R. L. Scarpella. 1997. Barbed hook restrictions in catch-and-release trout fisheries: a social issue. North American Journal of Fisheries Management 17:873–881.

Spoon, R.L. 1987. Evaluation of management of water releases for Painted Rocks Reservoir, Bitterroot River, Montana. Final Report. Montana Department of Fish, Wildlife and Parks. Bonneville Power Administration, contract report. Project 83-463, contract number DE-A179-83BP13076.