

**FISHERIES DIVISION  
Federal Aid Job Progress Report**

**Montana Statewide Fisheries Management**

**Federal Aid Project Number: F-113**  
July 1, 2011 – June 30, 2013

Project Title: Montana Statewide Fisheries Management

Job Title: Bitterroot River Drainage Fisheries Management

**ABSTRACT**

Results from field sampling in 2011 and 2012 indicate trout populations have declined in the Bitterroot River, but generally remain within the historic range. In the past few years rainbow trout have declined in the upper Bitterroot River, possibly due to whirling disease. Electrofishing surveys of all species in the Bitterroot River, indicate that mountain whitefish are the most abundant species collected.

Fish population monitoring on the Bitterroot National Forest indicates that population trends vary throughout the drainage. As a rule, westslope cutthroat trout populations are stable and bull trout populations are stable to declining.

Lake Como has been stocked with rainbow trout, westslope cutthroat trout and kokanee in recent years. Intensive gillnetting in recent years has allowed us to assess the relative success of each species. Kokanee growth continues to be poor and westslope cutthroat are captured in smaller proportion to rainbow trout than their stocking rates. Painted Rocks Reservoir supports a population of native species. Bull trout are the most abundant species captured in gillnets.

Hieronymus Pond is located in Hamilton and has been managed as a fishing resource for local children. Stocking of rainbow trout and removal of yellow perch, longnose and largescale suckers and northern pikeminnows has been pursued to increase the size of desirable fish for the public. These removals appear to have allowed rainbow trout and yellow perch to increase in average size, but in recent years the average size has decreased.

## TABLE OF CONTENTS

|                                         |    |
|-----------------------------------------|----|
| BACKGROUND.....                         | 3  |
| METHODS.....                            | 4  |
| RESULTS AND DISCUSSION.....             | 7  |
| Bitterroot River Trout Populations..... | 7  |
| Bitterroot River Single Pass.....       | 10 |
| Bitterroot National Forest.....         | 12 |
| Genetic Testing.....                    | 12 |
| Lake Como.....                          | 16 |
| Painted Rocks Reservoir.....            | 17 |
| Hieronymus Pond.....                    | 18 |
| LITERATURE CITED.....                   | 19 |

## BACKGROUND

The Bitterroot River flows in a northerly direction from the confluence of the East and West Forks near Conner, Montana. The river flows 84 miles through irrigated crop and pastureland to its confluence with the Clark Fork River near Missoula, Montana. Five major diversions and numerous smaller canals remove substantial quantities of water from the river during the irrigation season (Spoon 1987). In addition, many of the tributaries, which originate on the Bitterroot National Forest (BNF) are diverted for irrigation during the summer months and contribute little streamflow to the river during that time. Therefore, many tributaries and the mainstem of the Bitterroot River are chronically dewatered during the irrigation season. Streamflow characteristics vary along the Bitterroot River, with the most critically dewatered reach between Hamilton and Stevensville (Spoon 1987). To help alleviate the mainstem dewatering, the MFWP annually supervises 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. The most dewatered reach of the river, north of Hamilton is the target for the Painted Rocks water. Urbanization and associated development of the floodplain is increasing in the Bitterroot Valley (Javorsky 1994).

The Bitterroot River is an important sport fishery for anglers in western Montana. Pressure estimates from the statewide survey indicate that the Bitterroot River routinely exceeds 100,000 angler days per year. Due to the high fishing pressure, fishing regulations became more restrictive in the 1980's and 1990's. The population estimates on the Bitterroot River focus on trout. Due to the length of the study sections and the large number of fish required to calculate population estimates, the other species of fish are not censused. It has been evident during electrofishing that several other species are present in the river, therefore, beginning in 2011, we began to sample all of the species in the river on a few occasions.

Streams within the BNF support widespread populations of native westslope cutthroat and bull trout. Due to the importance of streams within the BNF we have also monitored fish populations there. Within Montana, the BNF is the headwaters of the Bitterroot River.

Lake Como and Painted Rocks Reservoir are 2 large bodies of water that support some angling pressure. Both suffer from annual drawdowns that limit the productivity of the fishery.

Fisheries monitoring in the Bitterroot basin focuses on long term monitoring sites both on the Bitterroot River and tributaries, primarily on the Bitterroot National Forest.

.

## METHODS

Fish population estimates on the Bitterroot River were collected on several reaches over the past 30 years. Study reaches were selected based on historical data, streamflow patterns and fishing regulations. The reaches are 2.2-5.1 miles in length. The long term study reaches are illustrated in Figure 1. Electrofishing was conducted from a 14-foot long aluminum drift boat fitted with a boom shocking system. The system was powered by 5000-watt generator and current was modified through a Coffelt Mark XXII electrofishing unit. Smooth direct current was used to capture fish. The Peterson mark-recapture method using log likelihood was used to calculate population estimates as modified through the Montana Fish, Wildlife and Parks Fisheries Analysis + program. Several mark and recapture runs were required to obtain sufficient sample size to estimate fish populations in some reaches. While these methods are broadly accepted and can be accurate (Peterson and Cederholm 1984, Rosenberger and Dunham 2005) mark-recapture population estimates are not always accurate (Cone et. al. 1988, Nordwall 1999). In large rivers it can be difficult to detect trends in fish populations (Russell et al 2012). In recent years, most of the fish collections downstream of Hamilton have occurred at night to facilitate handling of more fish. The population estimates were collected during September and October each year. Brown trout may be migrating by October, therefore, their estimates may be inflated.

During the spring of 2011-2013 we electrofished four, 2 mile long reaches of the Bitterroot River to assess the status of as many species as we could capture (Figure 1). We used the same boat and technique as described above, and we netted all of the fish that we encountered that were capable of capture with 2 netters. All fish were measured and weighed.

We monitored fish populations in some streams on the BNF. Background work that went into selection of the study sites is described in previous reports (Clancy 1993, 1996). During 2011 and 2012, we concentrated on sites that in the past supported the more robust populations of bull trout.

Fish were captured by electrofishing using smooth direct current. On larger streams a bank electrofishing unit is used powered by a 4500 watt generator and current is controlled through a Coffelt Mark XXII unit. On smaller streams fish are captured using either a Coffelt Mark 10 or Smith Root LR-24 backpack electrofisher. We estimated trout populations on monitoring reaches using a mark-recapture technique. Monitoring sections are usually 1000 feet long. On the marking run, fish are released as close to their capture site as possible and approximately one week is allowed between mark and recapture. Population estimates are calculated using the Montana Department of Fish Wildlife and Parks Fisheries Analysis + program.

Lake Como and Painted Rocks Reservoir were sampled intensively with gillnets. Lake Como was sampled most years between 2006 and 2012. Painted Rocks Reservoir was sampled in 2007. The methods and some results are summarized in Berg, 2009

Northern pikeminnow, longnose and largescale sucker and yellow perch were removed from Hieronymus Pond during the spring of 2011 and 2012. Each time out, a drift boat with a boom shocker was rowed around the edge of the pond and fish were captured, measured and removed. Generally, two passes were made each day.

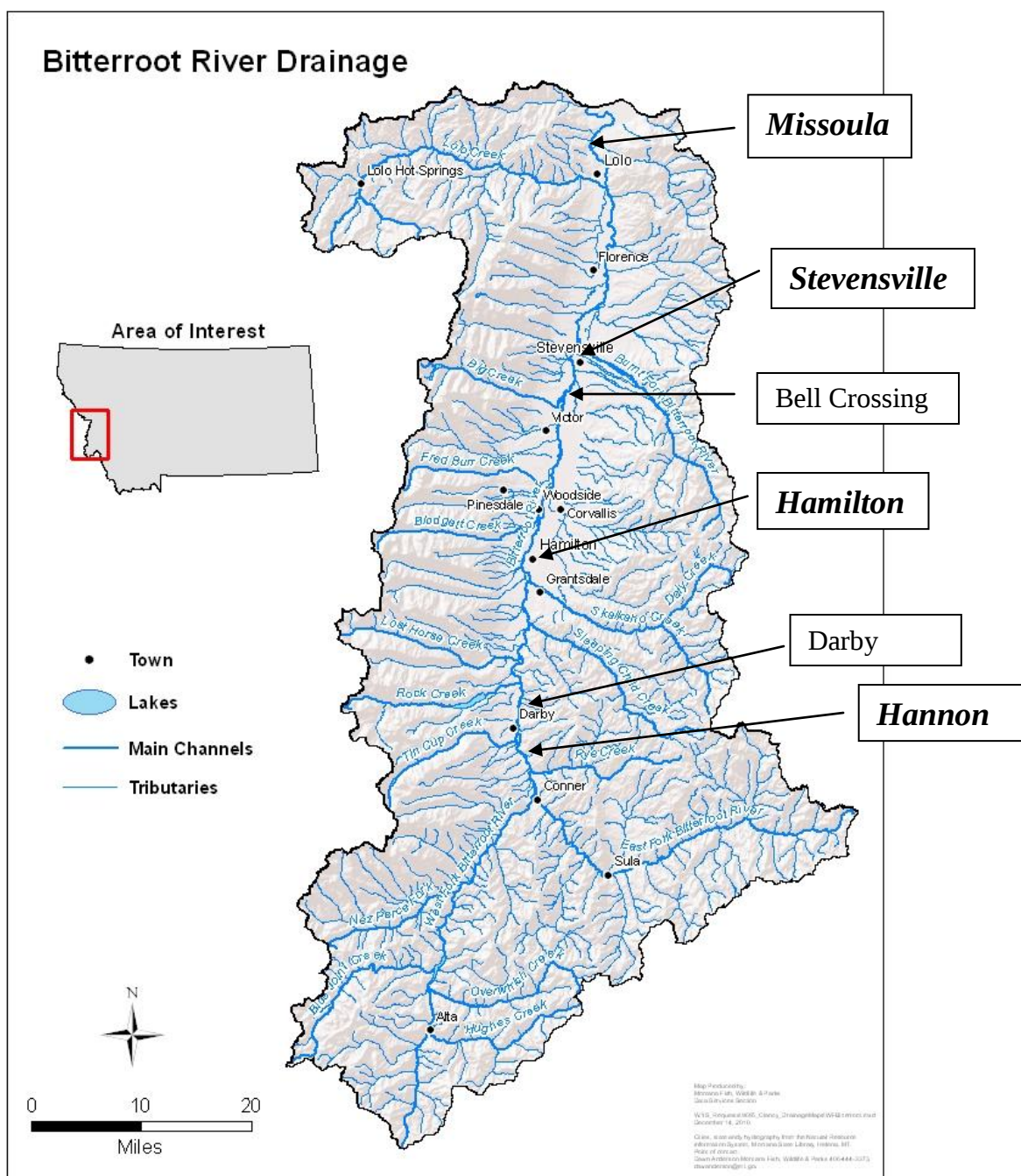


Figure 1. Map of study areas with study sections labeled. The bolded, italicized reaches are sampled during routine population estimates and single pass sampling for all species.

## RESULTS AND DISCUSSION

### **Bitterroot River Trout Populations**

The earliest trout population estimates on the Bitterroot River were collected in 1982. We generally monitor 2 long term sections of the Bitterroot River and/ or West Fork Bitterroot during early fall each year. In recent years, another crew has been monitoring trout populations on the Missoula section each spring. During 2011, the Stevensville and West Fork Bitterroot/Conner section were sampled and in 2012 the Darby section was sampled. During 2012 we planned to sample the West Fork Bitterroot/below Painted Rocks section, however, a hazardous boulder reach was judged to be unsafe for the electrofishing boat.

The population estimates collected in the past 2 years indicate declining trends for all species of trout (Figures 2-6). While the trend is declining, the populations are within the normal range of historic population estimates. It is difficult to identify a specific reason for these trends. Rainbow trout have been declining for the last decade in the Upper River, most likely due to whirling disease. However, the population of rainbow trout in the lower river had been increasing until the past 3 years.

Brown Trout population estimates have historically indicated a relatively stable population, but recent estimates indicated a decline, except for the Conner section where they are increasing.

Westslope Cutthroat population estimates indicate declining populations throughout the Upper Bitterroot River, but the populations are higher than prior to 1995.

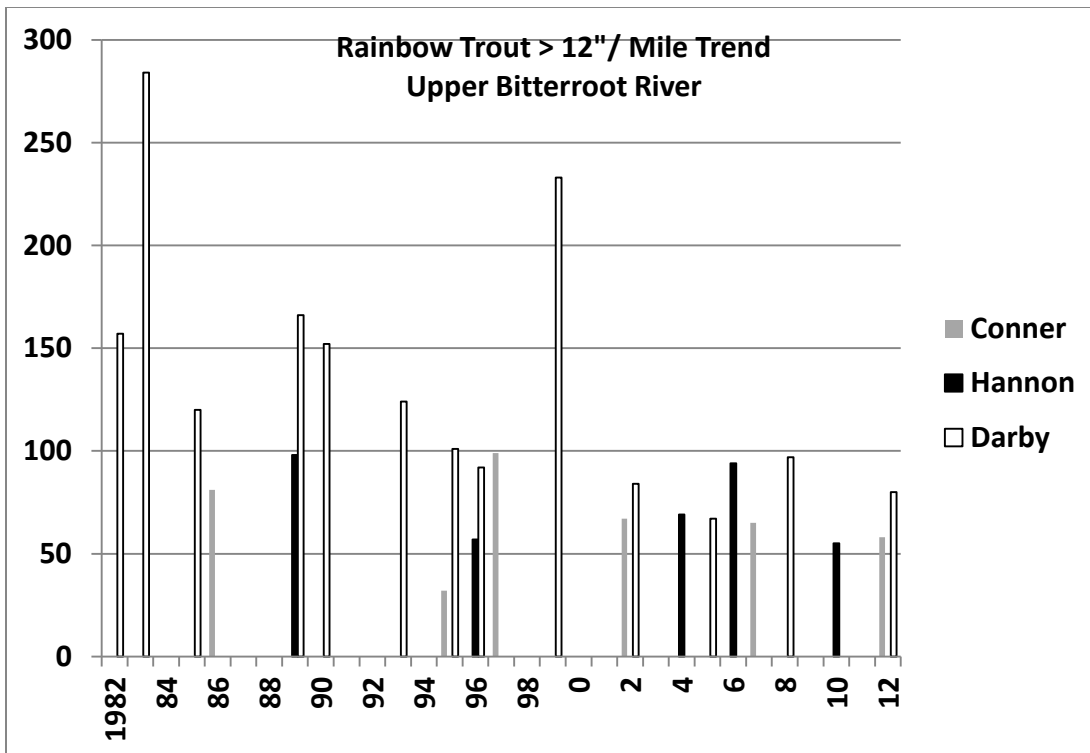


Figure 2. Population trends of rainbow trout in the Conner, Hannon and Darby sections.

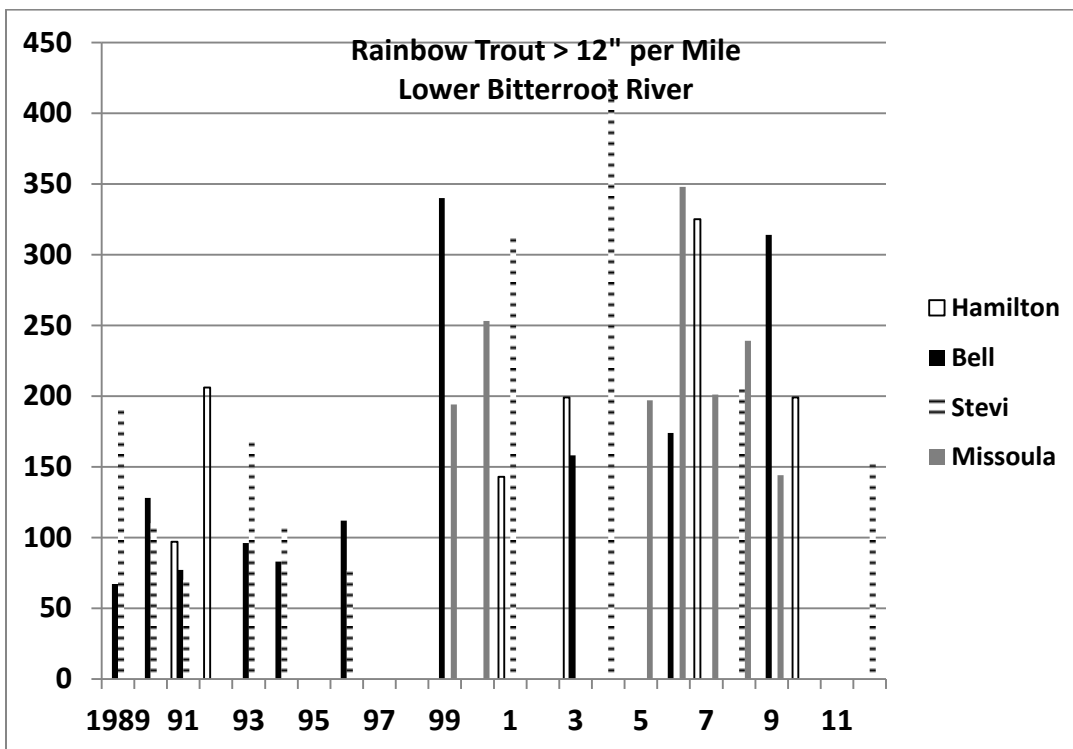


Figure 3. Population trends of rainbow trout in the Hamilton, Bell Crossing, Stevensville and Missoula sections.

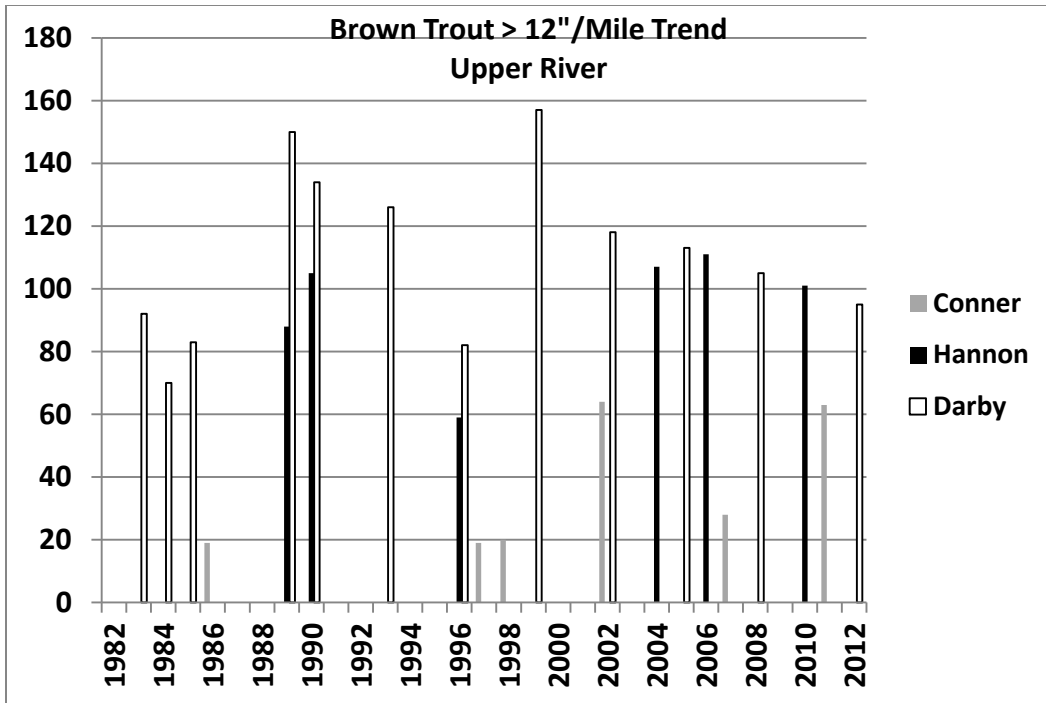


Figure 4. Population trends of brown trout in the Conner, Hannon and Darby sections.

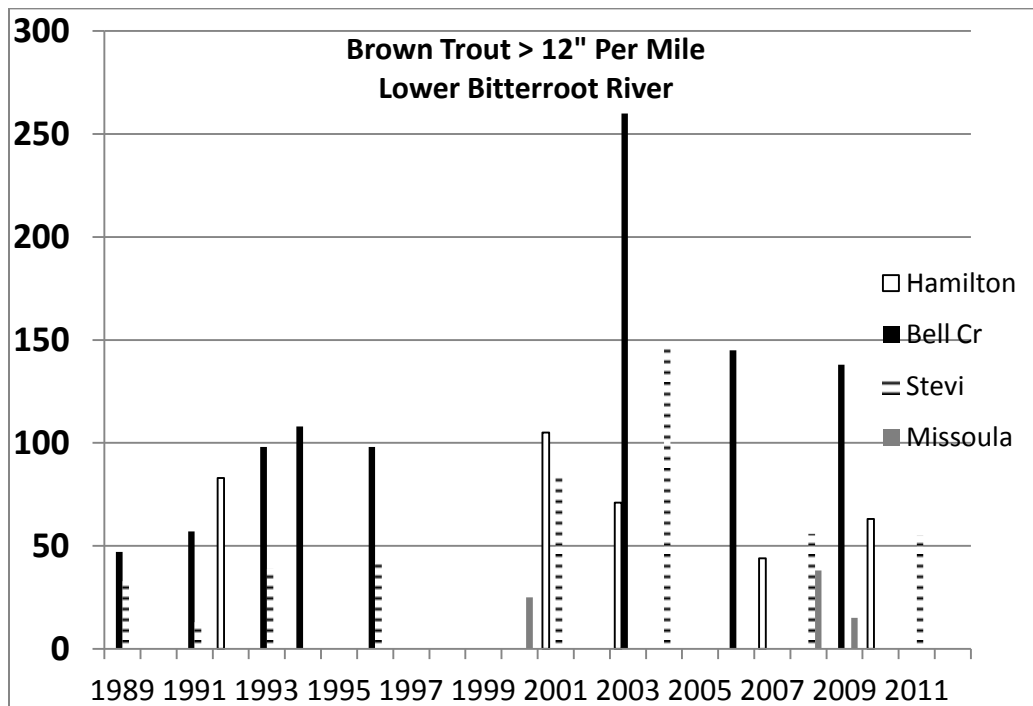


Figure 5. Population trends of brown trout in the Hamilton, Bell Crossing, Stevensville and Missoula sections.

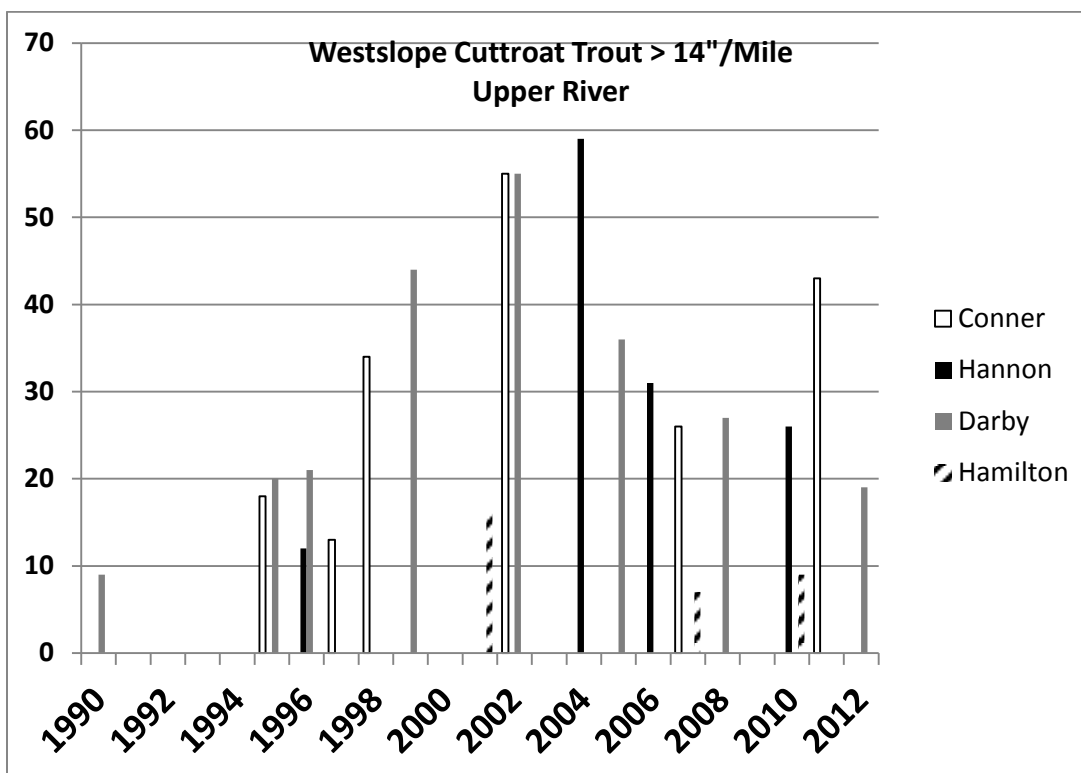


Figure 6. Population trends of westslope cutthroat in the Conner, Hannon, Darby and Hamilton sections

### Bitterroot River Single Pass

Beginning in 2011, we began to sample 2.0 mile reaches of the Bitterroot River for all species of fish. These single pass samples give us an indication the relative proportions and sizes of some species of fish. While electrofishing is selective for various sizes and species of fish, this data does allow us to compare data over time to get a general sense of the status of the population of the species and sizes that we can collect by electrofishing.

The data indicate that the mountain whitefish is the most common species captured in our sampling (Figure 7). The data was not collected on the same reaches as in 1984, but when the 1984 Darby data is compared to the 2012 Hannon data, the mountain whitefish are longer. Comparing the 1984 Tucker data to the 2013 Stevensville and 2011 Hamilton data, the results are mixed. The Tucker fish were about the same length as Stevensville but shorter than Hamilton (Figure 8). So, overall it is likely that mountain whitefish are longer in the upper river and similar to, or longer, in the middle river down to Stevensville when compared to 1984.

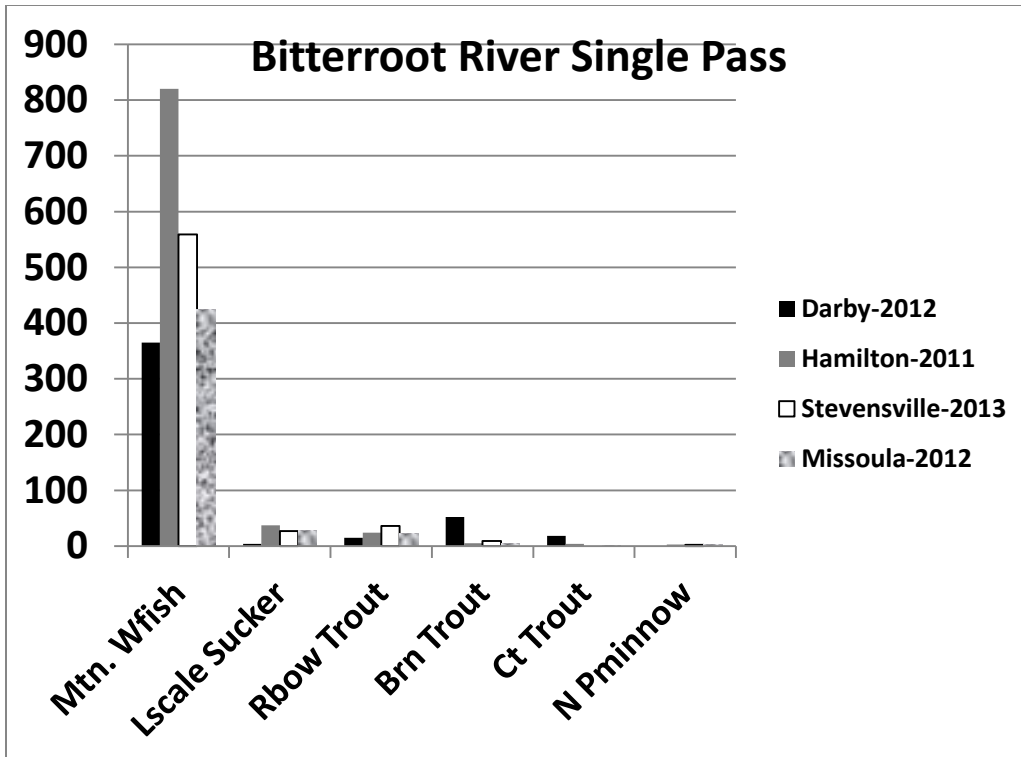


Figure 7. Relative abundance of species captured in single pass electrofishing at 4 sites in the Bitterroot River.

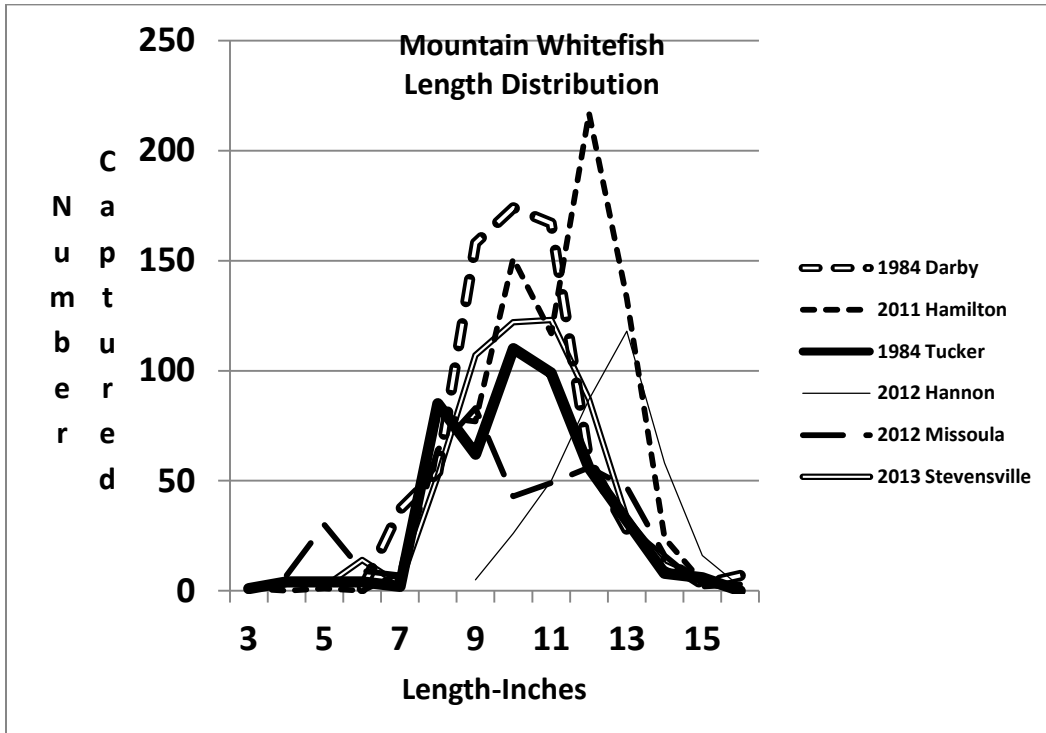


Figure 8. Mean length of mountain whitefish captured by electrofishing during the years indicated.

## Bitterroot National Forest

Each year, native trout populations are assessed on long term study sites on the Bitterroot National Forest. The native trout, westslope cutthroat and bull trout, are enumerated through mark-recapture population estimates. Each population estimate is compared to data collected in past years to assess the trend in trout populations. The data collected in 2011 and 2012, indicate that on the sections we sampled, westslope cutthroat trout have more positive trends than negative (Table 1). Bull trout trends are mostly negative. This data is consistent with data from past years that indicate that westslope cutthroat are stable and bull trout are declining on some reaches of the Bitterroot National Forest (Clancy 2009, 2011).

Table 1. Overall trends for westslope cutthroat and bull trout in the study sections on the Bitterroot National Forest sampled in 2010 and 2011.

|                                   | <b><u>POSITIVE</u></b> | <b><u>NEUTRAL</u></b> | <b><u>NEGATIVE</u></b> |
|-----------------------------------|------------------------|-----------------------|------------------------|
| <b><u>Westslope Cutthroat</u></b> | <b><u>6</u></b>        | <b><u>5</u></b>       | <b><u>1</u></b>        |
| <b><u>Bull Trout</u></b>          | <b><u>1</u></b>        | <b><u>1</u></b>       | <b><u>5</u></b>        |

## Genetic Testing

The genetic samples from the Bitterroot River westslope cutthroat trout have consistently indicated that the fish are a blend of westslope cutthroat/rainbow trout hybrids and possibly pure westslope cutthroat trout. Since the fish in the Bitterroot River are from different tributaries, the expectation would be that they reflect the genetics of the many tributary streams. All of the known genetic data collected for westslope cutthroat trout is compiled in Table 2.

Table 2. Genetic testing of westslope cutthroat through 2012 from stream sites indicated.

| <b>River</b>            | <b>Legal Description</b> | <b>Sample Size</b> | <b>Year</b> | <b>Status</b> |
|-------------------------|--------------------------|--------------------|-------------|---------------|
| <b>Bitterroot River</b> | T4N,R20W,S35             | 4                  | 1996        | 1**           |
|                         | T3N,R21W,S14             | 10                 | 1999        | 1**           |
|                         | T3N,R21W,S2              | 7                  | 1999        | 2*            |
|                         | T5N,R21W,S1,12           | 7                  | 2001        | 1             |
|                         | T7N,R20W,S30,31          | 3                  | 2001        | 2             |
|                         | T8N,R20W,S17             | 10                 | 2002        | 2*            |
|                         |                          | 12                 | 2003        | 2*            |
|                         | T3N,R21W,S36             | 25                 | 2010        | 2*            |
|                         |                          | 24                 | 2012        | 1,2           |
|                         | T6N,R20W,S24             | 25                 | 2010        | 2*            |

|                                    |                 |    |      |      |
|------------------------------------|-----------------|----|------|------|
| <b>East Fork Bitterroot River</b>  | T2N,R18W,S24    | 6  | 1995 | 1*** |
|                                    | T2N,R17W,S22,23 | 10 | 1999 | 1    |
|                                    | T2N,R16W,S20    | 22 | 2001 | 1    |
|                                    | T2N,R16W,S11    | 7  | 2001 | 1    |
|                                    | T2N,R18W,S18    | 36 | 2012 | 1,2  |
|                                    | T2N,R18W,S7     | 25 | 2010 | 2*   |
| <b>West Fork Bitterroot River</b>  | T2S,R22W,S27    | 16 | 1994 | 1    |
|                                    | T1S,R22W,S23    | 9  | 1998 | 2,3  |
|                                    | T2N,R21W,S24    | 6  | 1998 | 1    |
|                                    | T2S,R22W,S15    | 17 | 2012 | 1    |
|                                    | T3S,R22W,S9     | 13 | 1991 | 1    |
|                                    | T3S,R22W,S9     | 3  | 1992 | 1    |
|                                    | T3S,R22W,S9     | 15 | 2010 | 1    |
| <b>CREEKS</b>                      |                 |    |      |      |
| <b>Ambrose Creek</b>               | T9N,R18W,S18    | 6  | 1994 | 1    |
| <b>Bass Creek</b>                  | T10N,R20W,S33   | 11 | 1984 | 3    |
|                                    | T10N,R21W,S34   | 2  | 1995 | 1,3* |
| <b>Bear Creek</b>                  | T7N,R21W,S34    | 11 | 1991 | 2    |
| <b>Beaver</b>                      | T4S,R22W,S4     | 4  | 1992 | 1    |
|                                    | T5S,R22W,S5     | 11 | 1995 | 1**  |
| <b>Big</b>                         | T8N,R21W,S10    | 5  | 1992 | 2    |
| <b>Blodgett</b>                    | T6N,R21W,S17    | 6  | 1994 | 2    |
|                                    | T6N,R22W,S13    | 9  | 1994 | 2    |
|                                    | T6N,R22W,S16    | 12 | 1994 | 2    |
| <b>Blue Joint</b>                  |                 | 5  | 1987 | 1    |
|                                    | T2S,R23W,S2     | 10 | 1994 | 1    |
|                                    | T1S,R22W,S32    | 6  | 1994 | 1    |
|                                    | T2S,R23W,S1     | 15 | 2010 | 1    |
| <b>Boulder</b>                     | T1N,R21W,S18    | 12 | 1994 | 1**  |
|                                    | T1N,R22W,S3     | 17 | 1996 | 1**  |
| <b>Burnt Fork Bitterroot River</b> | T8N,R19W,S14    | 8  | 1994 | 1    |
|                                    | T7N,R18W,S5     | 14 | 1994 | 1    |
| <b>Camas</b>                       | T5N,R21W,S32    | 10 | 1998 | 3    |
| <b>Cameron</b>                     | T2N,R19W,S11    | 7  | 1994 | 1    |
|                                    | T2N,R19W,S27    | 15 | 2010 | 2    |
| <b>Camp</b>                        | T1S,R19W,S21    | 5  | 1994 | 1    |
|                                    | T1N,R19W,S27    | 21 | 1999 | 2,3  |
| <b>Canyon</b>                      | T6N,R21W,S29    | 10 | 1994 | 3    |
|                                    | T6N,R21W,S29    | 9  | 1998 | 1    |
| <b>Carlton</b>                     | T11N,R20W,S33   | 10 | 1998 | 3    |
| <b>Chaffin</b>                     | T2N,R21W,S3     | 15 | 1990 | 1    |

|                               |              |    |      |     |
|-------------------------------|--------------|----|------|-----|
| <b>Chicken</b>                | T2S,R23W,S36 | 10 | 1995 | 1   |
|                               | T3S,R22W,S4  | 13 | 2012 | 1,2 |
|                               | T3S,R22W,S5  | 12 | 2012 | 1   |
| <b>Coal</b>                   | T2S,R22W,S16 | 15 | 1990 | 1   |
|                               | T2S,R22W,S16 | 11 | 1994 | 1   |
| <b>Daly</b>                   | T5N,R18W,S19 | 10 | 1994 | 1   |
| <b>Deer</b>                   | T3S,R22W,S9  | 18 | 1999 | 1   |
|                               | T3S,R22W,S9  | 13 | 2012 | 1   |
|                               | T3S,R22W,S18 | 12 | 2012 | 1   |
| <b>Eightmile</b>              | T10N,R21W,S2 | 10 | 1998 | 1   |
| <b>Fred Burr</b>              | T7N,R21W,S21 | 12 | 1991 | 1   |
|                               | T7N,R22W,S14 | 7  | 1991 | 1   |
| <b>Gash</b>                   | T8N,R22W,S32 | 5  | 1999 | 1   |
| <b>Gird</b>                   | T5N,R19W,S11 | 3  | 1998 | 1   |
| <b>Gold</b>                   | T7N,R19W,S1  | 26 | 1985 | 1   |
|                               | T7N,R19W,S1  | 4  | 1990 | 1   |
| <b>Hughes</b>                 | T3S,R22W,S2  | 12 | 1994 | 1   |
| <b>Kootenai</b>               | T9N,R21W,S14 | 10 | 1994 | 1   |
| <b>Laird</b>                  | T1N,R20W,S10 | 8  | 1995 | 1   |
| <b>Lick</b>                   | T4N,R2W,S21  | 1  | 1992 | 1   |
| <b>Little Blue Joint</b>      | T2S,R22W,S5  | 8  | 1994 | 1   |
|                               | T2S,R22W,S4  | 10 | 1995 | 1   |
| <b>Little Boulder</b>         | T1S,R22W,S26 | 4  | 1994 | 1   |
|                               | T1S,R22W,S25 | 15 | 2010 | 1   |
| <b>Little Rock</b>            | T3N,R22W,S1  | 4  | 1998 | 3   |
| <b>Lost Horse</b>             | T4N,R22W,S11 | 12 | 1994 | 2   |
| <b>Lost Horse, South Fork</b> | T4N,R22W,S14 | 12 | 1994 | 2   |
| <b>Martin</b>                 | T2N,R17W,S16 | 25 | 1985 | 1   |
| <b>Maynard</b>                | T1N,R19W,S18 | 10 | 1995 | 2   |
| <b>Meadow</b>                 | T1N,R18W,S35 | 25 | 1985 | 1   |
|                               | T1N,R18W,S10 | 21 | 1989 | 1   |
| <b>Mill</b>                   | T6N,R21W,S4  | 14 | 1991 | 2   |
| <b>Moose</b>                  | T2N,R17W,S17 | 25 | 1985 | 1   |
| <b>Nelson, West Fork</b>      | T1N,R22W,S26 | 22 | 1999 | 2   |
| <b>Nez Perce</b>              | T1S,R22W,S7  | 6  | 1994 | 1   |
|                               | T1S,R22W,S18 | 6  | 1994 | 1   |
| <b>One Horse</b>              | T10N,R20W,S9 | 6  | 1998 | 1   |
| <b>Overwhich</b>              | T2S,R20W,S34 | 9  | 1996 | 3   |
|                               | T1S,R20W,S34 | 8  | 2009 | 3   |
|                               |              | 29 | 2012 | 1   |
| <b>Piquett</b>                | T1N,R21W,S10 | 15 | 1990 | 1   |
| <b>Railroad</b>               | T5N,R18W,S29 | 1  | 1992 | 1   |
| <b>Reimel</b>                 | T1N,R19W,S15 | 2  | 1992 | 1   |

|                              |                  |    |      |     |
|------------------------------|------------------|----|------|-----|
|                              | T1N,R19W,S35     | 3  | 1992 | 1   |
| <b>Roaring Lion</b>          | T5N,R21W,S16     | 11 | 1994 | 1   |
| <b>Rye Creek</b>             | T3N,R20W,S25     | 26 | 1985 | 1   |
|                              | T3N,R20W,S25     | 10 | 1994 | 1   |
|                              | T3N, R20W,S25    | 28 | 2006 | 1** |
| <b>Rye Creek, North Fork</b> | T3N,R20W,S24     | 8  | 1990 | 1   |
| <b>Sawtooth</b>              | T5N,R21W,S9      | 10 | 1994 | 1   |
| <b>Sheafman</b>              | T7N,R21W,S30     | 10 | 1991 | 3   |
| <b>Skalkaho</b>              | T5N,R18W,S19     | 15 | 1991 | 1   |
|                              | T5N,R19W,S27     | 10 | 1994 | 1   |
|                              | T5N,R20W,S16     | 25 | 2002 | 2   |
|                              | T5N,R19W,S30     | 31 | 2003 | 1*  |
|                              | T5N,R19W,S30     | 37 | 2004 | 2   |
| <b>Slate</b>                 | T2S,R22W,S1      | 2  | 1991 | 1   |
|                              | T2S,R22W,S1      | 11 | 1994 | 1   |
| <b>Sleeping Child</b>        | T4N,R19W,S28     | 25 | 1985 | 1   |
|                              | T4N,R19W,S28     | 17 | 1989 | 1   |
|                              | T4N,R19W,S28     | 3  | 1990 | 1   |
|                              | T4N,R19W,S7      | 15 | 2010 | 1   |
| <b>Smith</b>                 | T8N,R21W,S22     | 16 | 1999 | 1   |
| <b>Sweathouse</b>            | T8N,R21W,S19     | 23 | 1991 | 3   |
| <b>Sweeney</b>               | T10N,R20W,S20    | 11 | 1998 | 2,3 |
| <b>Threemile</b>             | T10N,R18W,S18    | 10 | 1994 | 1   |
|                              | T10N,R18W,S20    | 13 | 2012 | 1   |
|                              | T10N,R18W,S20    | 27 | 2012 | 1   |
|                              | T10N,R18W,S28    | 12 | 2012 | 1   |
|                              | T10N,R18W,S20,21 | 81 | 2013 | 1   |
| <b>Tincup</b>                | T3N,R21W,S17     | 50 | 1982 | 2   |
|                              | T3N,R22W,S32     | 10 | 1992 | 2,3 |
| <b>Tolan</b>                 | T1N,R19W,S24     | 26 | 1985 | 1   |
| <b>Trapper</b>               | T2N,R21W,S21     | 13 | 1992 | 2   |
| <b>Warm Springs</b>          | T1N,R20W,S14     | 5  | 1990 | 2   |
|                              | T1N,R20W,S27     | 11 | 1994 | 1   |
| <b>West</b>                  | T2S,R22W,S29     | 10 | 1995 | 1   |
|                              | T2S,R22W,S27     | 13 | 2012 | 1   |
|                              | T2S,R22W,S27     | 12 | 2012 | 1   |
| <b>Willow</b>                | T6N,R19W,S10     | 5  | 1990 | 1   |
| <b>Woods</b>                 | T3S,R22W,S21     | 10 | 1995 | 1   |

**Status:**

1 = pure westslope cutthroat  
2 = hybridized with rainbow trout  
3 = hybridized with Yellowstone cutthroat  
\* = Bass Creek 1995 – one pure westslope and one pure Yellowstone cutthroat  
\* = Bitterroot River and East Fork Bitterroot River samples indicate a mix of multiple populations  
\*\* = 1 locus characteristic of westslope and rainbow – assume pure westslope until further sampling  
\*\*\* = East Fork Bitterroot 1995 – 5 pure westslope and 1 pure rainbow  
\*Skalkaho Creek 2003, 2004 – Migratory cutthroat captured during MSU study (Gale 2005).

## **Lake Como**

Lake Como has been stocked in recent years with rainbow trout, westslope cutthroat and kokanee (Figure 9). Extensive gill netting was conducted during several years to assess the relative success of each species (Berg 2009). Kokanee seem to survive for a few years and reach an average size of approximately 8 inches. Due to the small size of kokanee, we will either decrease the number stocked or discontinue stocking.

The other two sportfish that are stocked in Lake Como are rainbow and westslope cutthroat trout. Most years there are 3 to 4 times as many rainbow trout stocked as westslope cutthroat (Figure 9). The average size of stocked rainbow trout is also larger than westslope cutthroat. The rainbow trout vary from 4-12 “ long, typically in the 7-9 inch range. The westslope cutthroat are usually about 5 inches long. Due to the larger number stocked and larger average size stocked, rainbow trout significantly outnumber westslope cutthroat in gillnet catches (Table 3).

Due to varying sizes at stocking and inconsistencies in stocking intervals, comparison of the success of rainbow trout and westslope cutthroat is difficult. The gillnet data for 2009 may be the best data set to examine because both rainbow and cutthroat trout were stocked the previous 2 years. The 2011 data follows a year when no westslope cutthroat were stocked. During 2007 and 2008, 22627 rainbow trout were stocked in Lake Como. Many of these fish were 9-10 inches long. During those same years, 7600 westslope cutthroat were stocked. These fish averaged about 5 inches long.

The ratio of rainbow trout/westslope cutthroat stocked in 2007 and 2008 is approximately 3:1. During 2009 the ratio of rainbow trout/westslope cutthroat captured in gillnets was approximately 4.6:1. This indicates a higher survival rate for rainbow trout. However, several variables such as angling harvest, vulnerability to gillnets and other factors could confound this conclusion. The average length of rainbow trout captured in gillnets was 11.5 inches in 2009. The average length of westslope cutthroat was 9.7 inches. The rainbow trout weighed about twice as much as the westslope cutthroat.

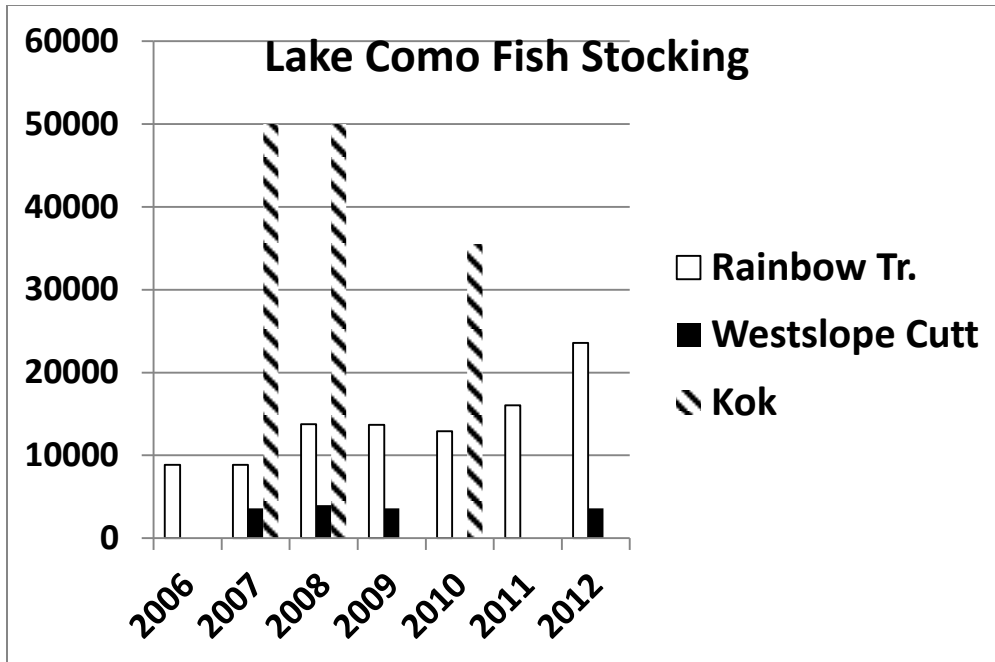


Figure 9. The number of fish stocked in Lake Como during the year indicated.

Table 3. The number of various species captured in 24 gillnet sets in Lake Como during May, 2009 and 2011.

|      | Rainbow Trout | Westslope Cutthroat | Yellowstone Cutthroat | Kokanee | Largescale Sucker | Mountain Whitefish |
|------|---------------|---------------------|-----------------------|---------|-------------------|--------------------|
| 2009 | 115           | 25                  | 5                     | 179     | 96                | 11                 |
| 2011 | 118           | 11                  | 5                     | 4       | 79                | 4                  |

### Painted Rocks Reservoir

Painted Rocks Reservoir has been sampled infrequently with gillnets. The reason for this is that a population of bull trout uses the Reservoir and gillnetting can cause significant mortality. During 2007, 24 gillnets were set in Painted Rocks Reservoir. Bull trout and westslope cutthroat were the most common species captured (Table 4). However, several other species were captured. The species captured in the nets indicate that the fishery in Painted Rocks is mostly native. Brook trout are found in several drainages that drain into Painted Rocks Reservoir but none were captured in the gillnets.

Table 4. The number of fish of each species captured in 24 gillnet sets in Painted Rocks Reservoir during May, 2007

|      | Bull Trout | Westslope Cutthroat | Mountain Whitefish | Longnose Sucker | Largescale Sucker | Redside Shiner | Longnose Dace |
|------|------------|---------------------|--------------------|-----------------|-------------------|----------------|---------------|
| 2007 | 71         | 55                  | 7                  | 6               | 3                 | 4              | 1             |

## Hieronymus Pond

We have been removing fish from Hieronymus Pond since 2007. The goal of the project is to remove fish to allow for higher growth and better fishing for the remaining species. Each Spring, we electrofish the pond 2 or 3 times and remove largescale and longnose suckers, northern pikeminnows and small yellow perch. We are attempting to increase the average size of rainbow trout, largemouth bass and yellow perch in the the pond. The size of these species had been increasing, but during sampling in 2011 and 2012, the average size declined (Figure 10). We may have to increase our effort in future years and remove more fish. This program has worked as in other areas (Flick and Webster 1992). We will continue to remove some fish in the future.

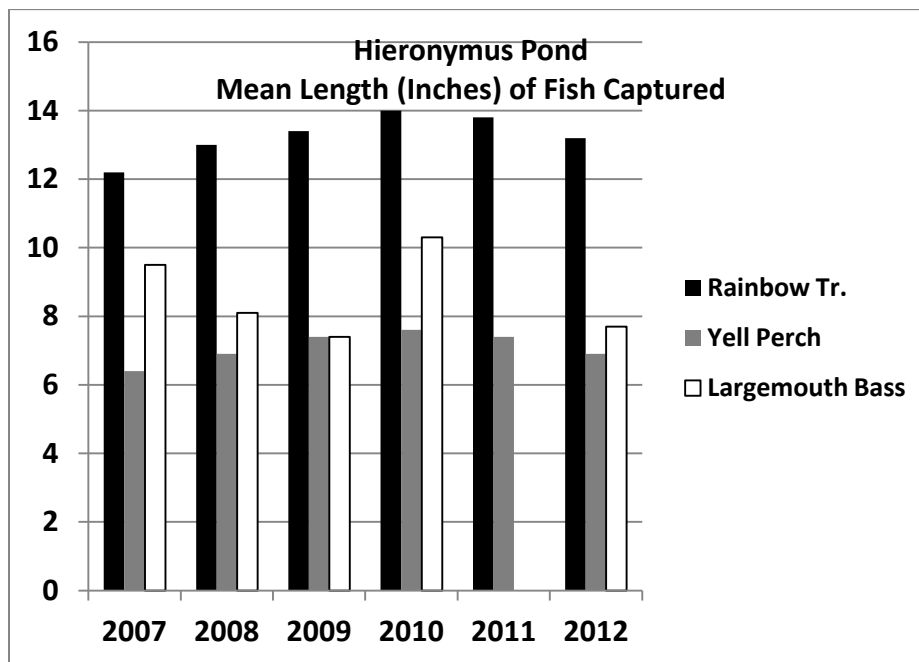


Figure 10. Mean length of fish captured during electrofishing surveys of Hieronymus Pond.

## LITERATURE CITED

- Berg, R.K. 2009. Fish population surveys of Browns Lake, Nevada Reservoir, Coopers Lake, Lake Como and Painted Rocks Reservoir since 2003. Montana Fish Wildlife and Parks. Federal Aid Project Numbers F-113-R1 & F-113-R2.
- Clancy, C.G. 1993. Statewide Fisheries Investigations. Bitterroot Forest Inventory. Project F-46-R-4. Montana Fish, Wildlife and Parks, Helena.
- Clancy, C.G. 1996. Statewide Fisheries Investigations. Bitterroot Forest Inventory. Project F-46-R-4. Montana Fish, Wildlife and Parks, Helena
- Clancy, C.G. 2009. Montana Statewide Fisheries Management. Bitterroot River Drainage. Federal Aid Project No. E-113.
- Clancy, C.G. 2011. Montana Statewide Fisheries Management. Bitterroot River Drainage. Federal Aid Project E-113.
- Cone, R.S., D.S. Robson and C.C. Krueger. 1988. Failure of Statistical Tests to Detect Assumption Violations in the Mark-Recapture Population Estimation of Brook Trout in Adirondack Ponds . North American Journal of Fisheries Management 8 (4):489-496.
- Flick, W.A. and D.A. Webster. 1992. Standing Crops of Brook Trout in Adirondack Waters before and after Removal of Non-trout Species. North American Journal of Fisheries Management 12(4): 783-796.
- Javorsky, L. 1994. The Bitterroot River floodplain: An historical analysis. Montana Department of Fish, Wildlife and Parks.
- Nordwall, F. 1999. Movements of Brown Trout in a Small Stream: Effects of Electrofishing and Consequences for Population Estimates. North American Journal of Fisheries Management 19(2):462-469.
- Peterson, N.P. and C.J. Cederholm. 1984. A Comparison of the Removal and Mark-Recapture Methods of Population Estimation for Juvenile Coho Salmon in a Small Stream. North American Journal of Fisheries Management 4(1):99-102.
- Rosenberger, A. E. and J.B. Dunham. 2005. Validation of Abundance Estimates from Mark-Recapture and Removal Techniques for Rainbow Trout Captured by Electrofishing in Small Streams. North American Journal of Fisheries Management Volume 25(4):1395 – 1410.
- Russell R.E, D.A. Schmetterling, C. S. Guy, B. B. Shepard, R. McFarland and D.Skaar.2012. Evaluating a Fish Monitoring Protocol Using State-Space Hierarchical Models. The Open Fish Science Journal (5) 1-8

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.

Prepared by: Christopher G. Clancy and Leslie G. Nyce. November 2013.

| <u>Stream</u>             | <u>Code Number</u> | <u>Key Words</u>                                                                                                                                                                                                                               |
|---------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bitterroot River drainage | 2-03-8865          | Trout populations<br>Whirling Disease<br>Fishing regulations<br>Westslope cutthroat<br>Rainbow trout<br>Brown trout<br>Bull trout<br>Bitterroot River<br>Bitterroot National Forest<br>Lake Como<br>Painted Rocks Reservoir<br>Hieronymus Pond |