MONTANA DEPARTMENT OF FISH WILDLIFE AND PARKS
FISHERIES DIVISION
JOB COMPLETION REPORT

State:Montana Title:Statewide Fisheries Investigations
Project:F-46-R-3 Title:Bitterroot Forest Inventory
Job: Ij
Period Covered:July 1, 1989 to June 30, 1990

ABSTRACT

Trout populations and habitat measurements on the Bitterroot National Forest are discussed. Trout populations on the Bitterroot River have increased in some areas since 1982. Bitterroot River rainbow trout spawn heavily in tributary streams during the Spring and the Lake Como fishery continues to be marginal.

BACKGROUND

As of June 1989, the Bitterroot National Forest (BNF) and the Montana Department of Fish, Wildlife and Parks are jointly supporting a fisheries biologist position. The biologist has responsibilities both on and off of the BNF within the Bitterroot drainage. The position was created to address fisheries issues of the two agencies and study the Bitterroot drainage as a complete unit free of administrative boundaries. This report documents the results of the first year of research on the objectives listed.

OBJECTIVES AND DEGREE OF ATTAINMENT

1. Collect fish habitat information from selected Bitterroot River tributaries, enter data on computer and maps. Data included in this report.

2. Electrofish selected Bitterroot River tributaries to determine trout population numbers in relation to habitat. Collect trout samples for genetic testing. Data included in this report.

3. Collect sediment data from the same stream sections identified for the work in the previous two tasks. Data included in this report.

4. Electrofish 3 sections of the main Bitterroot River to determine trout population numbers. Data included in this report.

5. Monitor spawning tributaries for emigration of young-of-the-year trout to the main river. Monitor losses of young trout to irrigation ditches. Data to be included in a later report.

6. Collect information on Lake Como fishery. Data included in this report.

METHODS

Fish habitat on the stream sections of the BNF was analyzed using the transect method. Most of the specific measurements were measured visually or with the use of a yardstick (Platts 1983 and Platts et.al. 1987). Sediment data was collected visually. Percent composition and substrate score were the most commonly used methods.

Fish populations were enumerated on all streams using the Petersen mark and recapture method (Vincent 1971). A gas powered backpack electrofisher was used on small streams and a bank electrofishing unit was used on larger creeks. Trout from two streams were collected and sent to the University of Montana for electrophoretic analysis. Bitterroot River sampling was done with a boom shocking unit mounted on a drift boat. Trout population estimates on the Bitterroot River were collected on four study sections. The Darby and Stevensville study sections are within special regulation reaches of the river and the Hannon and Bell Crossing sections are outside of the special regulation sections. The Bell Crossing section represents a dewatered reach of the river and the Stevensville section lies downstream where some return flows have increased water levels.

Rainbow trout (Oncorhynchus mykiss) redds were counted weekly in the lowest one mile of selected spawning tributaries of the Bitterroot River. Each redd was marked with a painted rock and measured.

Como Lake was gill netted with 125 foot experimental gillnets during 1989 to assess the success of rainbow trout stocking.

RESULTS

Bitterroot National Forest

The following stream sections were analyzed during the study:

1. Daly near the mouth
2. Divide near the mouth
3. Meadow at Elk Ridge trailhead
4. Meadow at Sagebrush road bridge
5. Rye at upper bridge crossing
6. North Rye below Darby lumber activity
7. Skalkaho near Daly junction
8. Skalkaho below forest boundary
9. Sleeping Child above white stallion sale
10. Sleeping Child at Divide junction
11. Sleeping Child at gage
12. Tolan above proposed sale
13. Tolan below proposed sale

The relationship between fish population and habitat on the BNF was analyzed using simple linear regressions since the study is in the early stages. The regressions were analyzed for only a selected group of habitat parameters. The parameters that most frequently correlated with higher numbers of westslope cutthroat trout were percent hookscars, substrate score, alkalinity, conductivity and hardness of the water in the stream. The parameters that most frequently correlated with low numbers of westslope cutthroat trout (Oncorhynchus clarki lewisi) were percent fines on the streambottom, overhead cover and gradient.

Population estimates for westslope cutthroat in the BNF study sections vary significantly between streams (Figure 1). Skalkaho Creek supported the highest number of westslope cutthroat trout and Tolan Creek supported low numbers of westslope cutthroat trout. Bull trout (Salvelinus confluentus) population estimates were more difficult to collect (Figure 2).

Daly Creek has been closed to fishing since the mid 1980's. Population estimates indicate that the population of bull and westslope cutthroat trout may not be responding to the closure (Figure 3).

Genetic analysis of samples of westslope cutthroat from Sleeping Child and Meadow Creeks indicate they are from pure strain populations.

Bitterroot River

Population estimates of rainbow and brown trout (Salmo trutta) in the Darby and Hannon Memorial sections are similar (Figure 4). The Darby section has been under a slot limit and artificial fly and lure restriction since the mid 1980's. There does appear to be a higher population of larger rainbow trout in this section than in the Hannon section which has been under the 5 fish regular limit during this time. Larger brown trout are similar in numbers in the

WESTSLOPE CUTTHROAT
> 5"/1000 FT.-1989

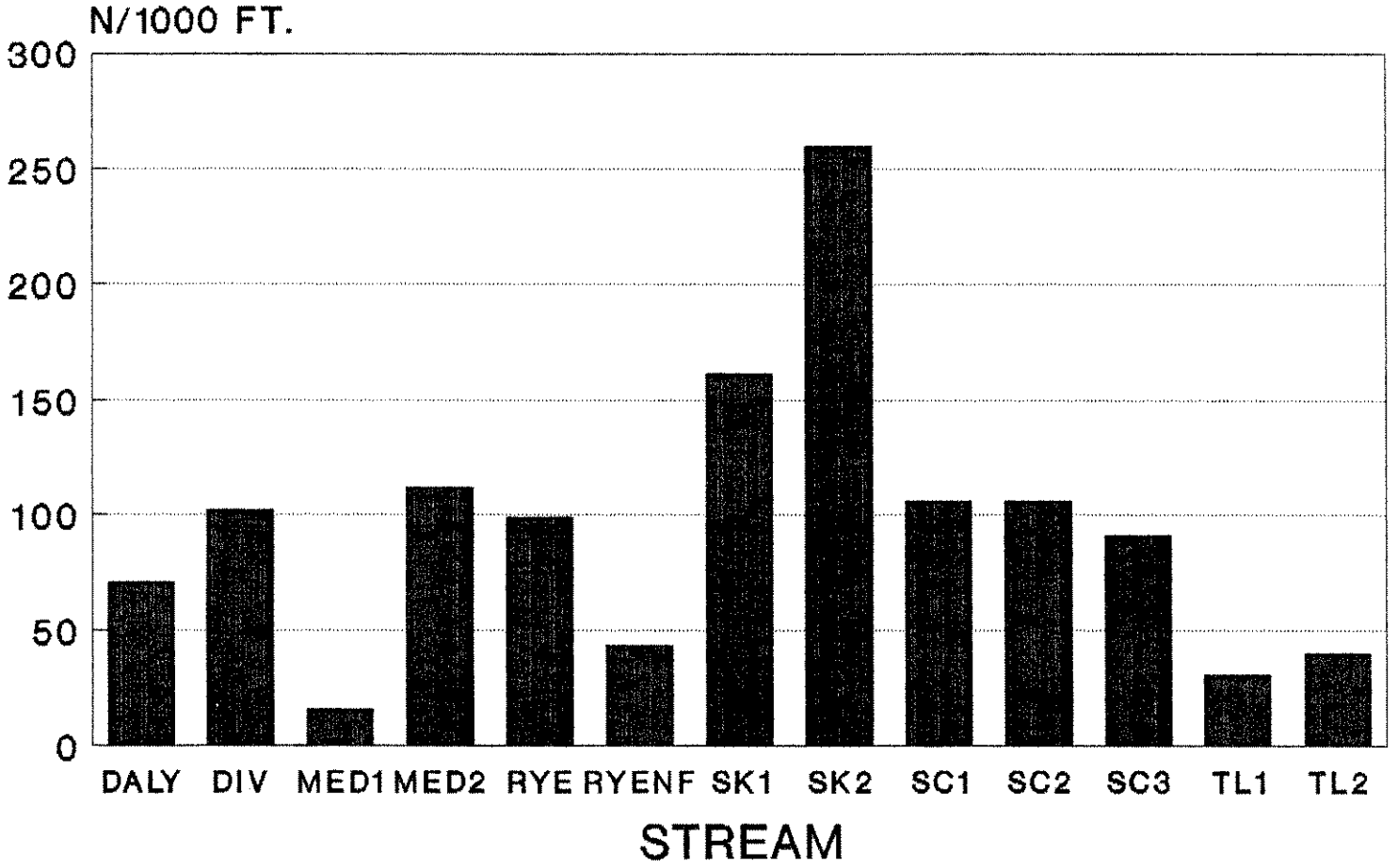


FIG 1. Populations on study streams

BULL TROUT > 5" / 1000 FEET
BITTERROOT NAT. FOREST 1989

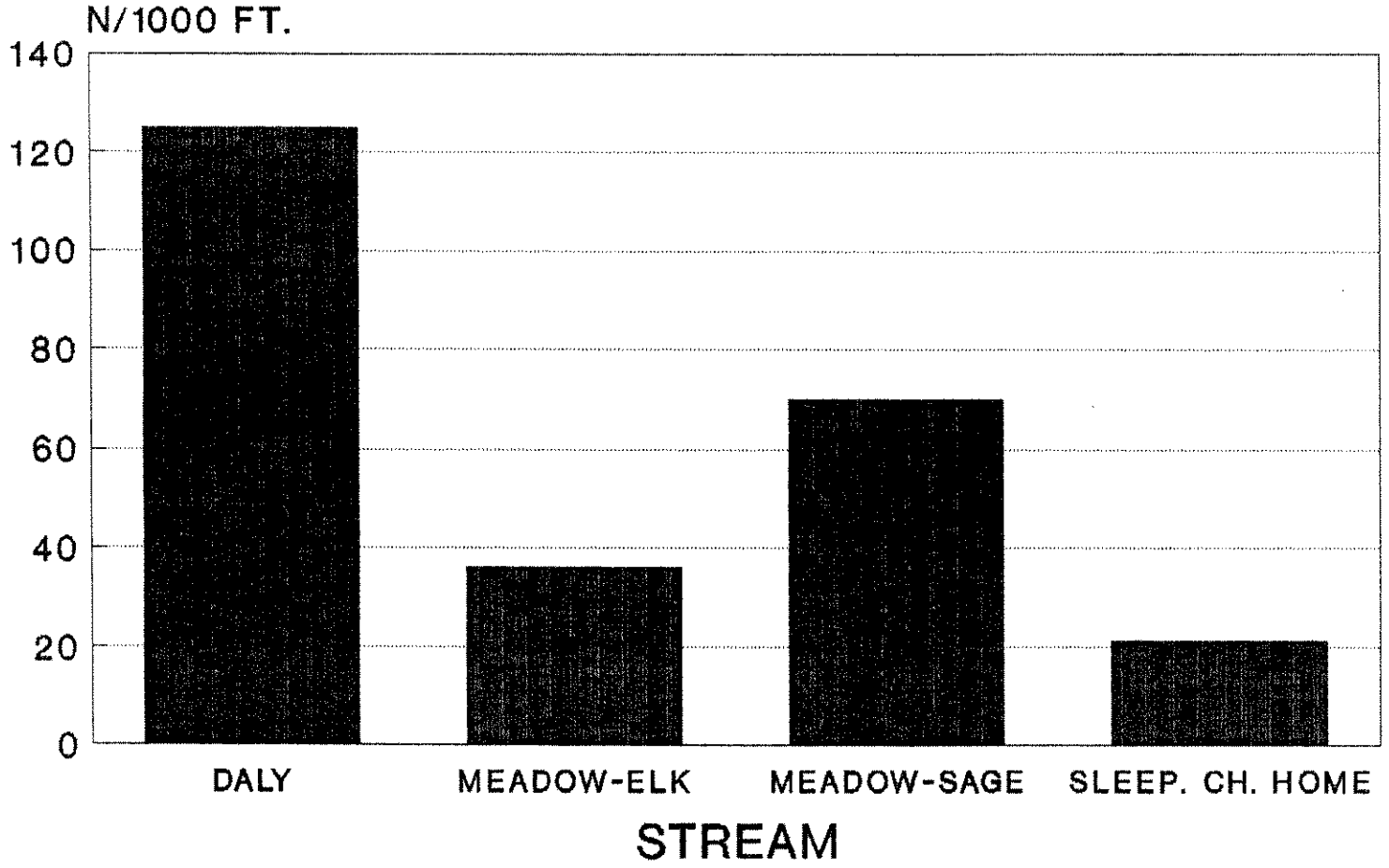


FIG. 2. POPULATIONS ON STUDY STREAMS

DALY CREEK
FISH POPULATIONS

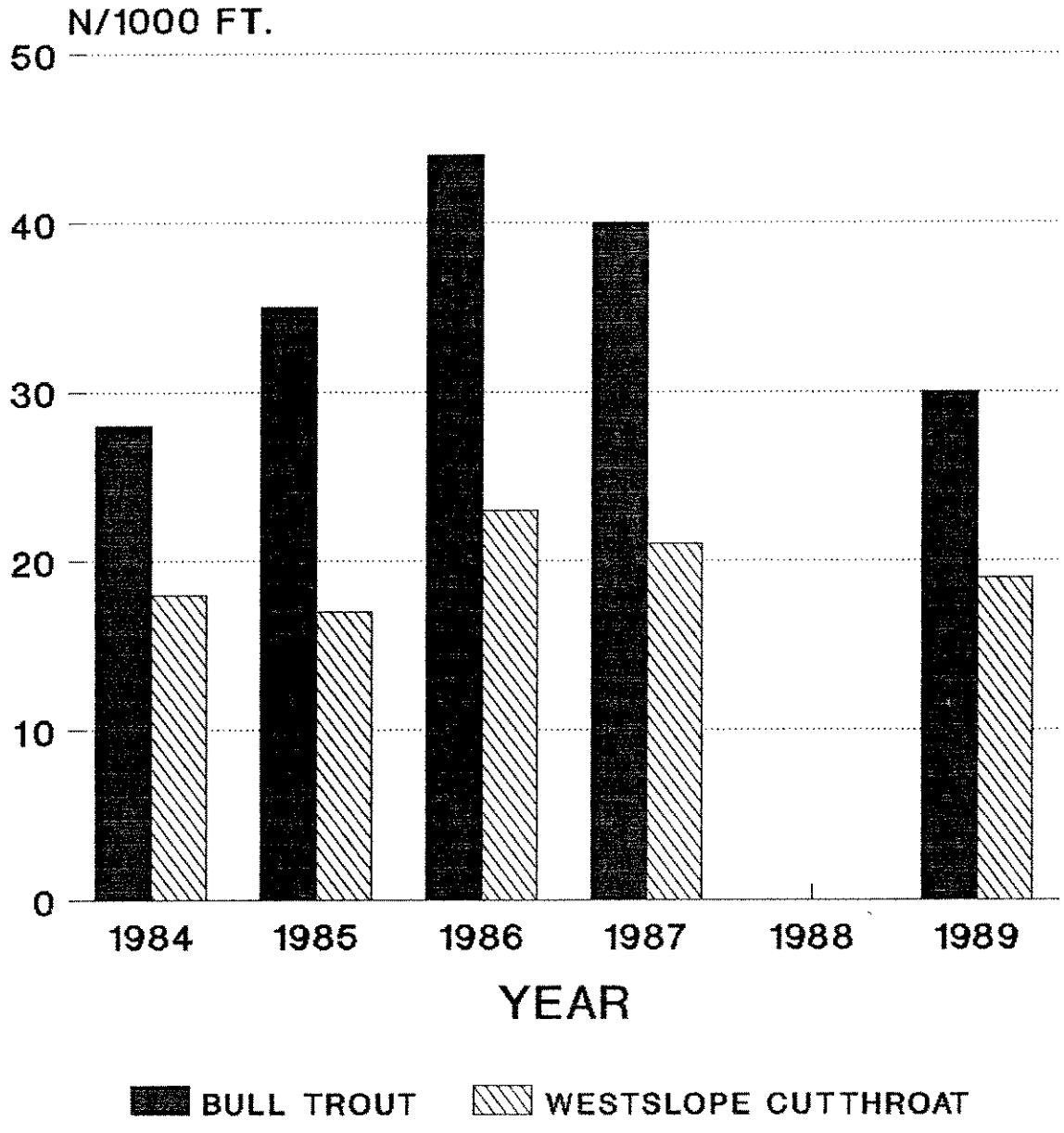
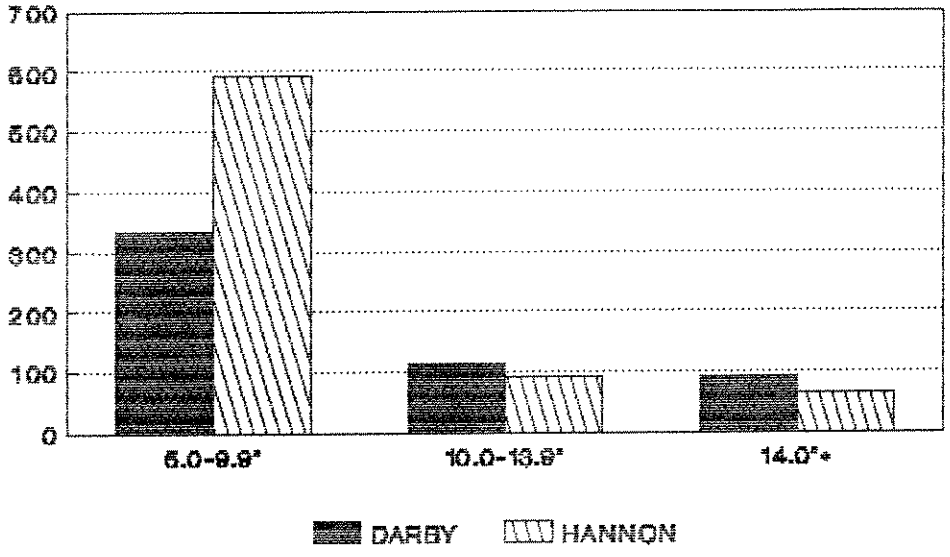


FIG. 3. Populations since 1984.

DARBY/HANNON 1989
RAINBOW TROUT/MILE



DARBY/HANNON 1989
BROWN TROUT/MILE

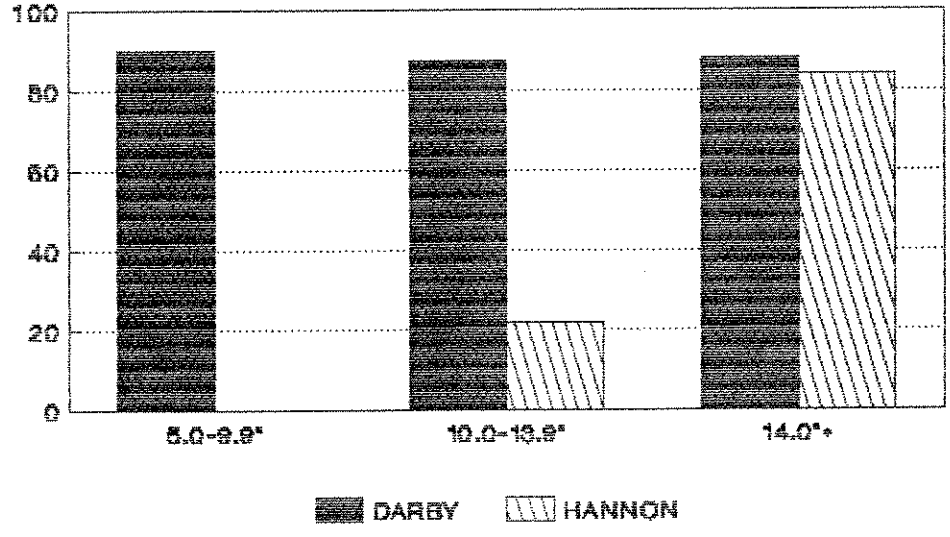


FIG 4. Trout per mile

two sections. Sampling began in 1982 on the Darby section (Spoon 1987). The population of rainbow and brown trout has increased since then (Figure 5).

The Stevensville and Bell Crossing sections support similar numbers of brown trout, but the Stevensville section supports higher numbers of rainbow trout (Figure 6).

Spawning tributaries

Rainbow trout redds were counted in the lower mile of 12 tributaries of the Bitterroot River. After the spawning commenced the counts were confined to the streams which appeared to receive significant use by rainbow trout. The number of redds and square feet of redds varied significantly between streams (Figure 7).

Rainbow trout ascended these tributaries during March, April and May. Big, Kootenai, Sweathouse, Mill, and Tincup Creeks supported the highest number of redds of the tributaries studied (Figure 7).

Lake Como

Overnight gillnet sets on Lake Como during 11/6 and 11/7 1989 resulted in the capture of 16 rainbow trout. Of these, 7 were from Spring 1989 stockings and 8 were from Fall, 1989 stockings. The Spring fish averaged 9.9 inches and the Fall fish averaged 17.2 inches.

The fish stocked during the Spring averaged between 7 and 8 inches when stocked. The Fall fish averaged 17.0 inches when stocked. If catchability in the gillnets is similar, the data indicates that similar numbers of the Spring and Fall fish are present in Lake Como. Six days before sampling, the Fall stocking of 447 rainbow trout occurred. If a similar number of fish survived the Spring stocking of 5000 fish, only about 10% of the Spring stocking is still in the reservoir.

DISCUSSION

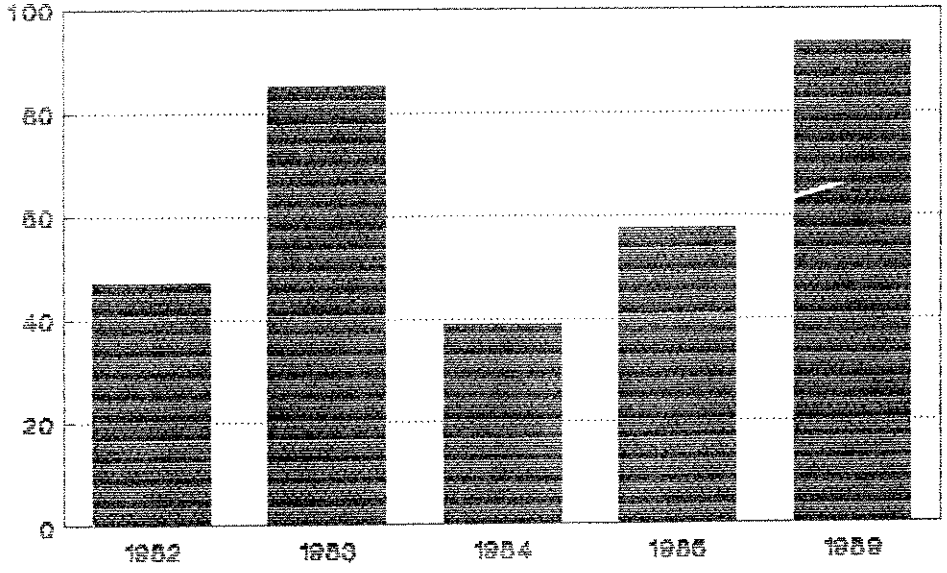
The relationship between trout on the BNF and habitat is complex. Several years of study will be required to begin to understand some of these relatioships. Streambottom substrate and overhead cover appear to be closely tied to population, therefore, they will be looked at in more detail in the future.

Skalkaho Creek supports the highest population of westslope cutthroat trout sampled. The section that supports the highest number of large westslope cutthroat has been managed by the landowner as a catch and release fishery for about 15 years.

The Darby section of the Bitterroot has the most historical data of all the sections studied. The fishery on this section has improved significantly since studies began in 1982. Some of the increase may be attributed to the augmentation of flows in the river from Painted Rocks Reservoir and some could be a result of restrictive regulations on the section.

The movement of rainbow trout out of the Bitterroot River

DARBY
RAINBOW TROUT>14"/MILE



DARBY
BROWN TROUT>14"/MILE

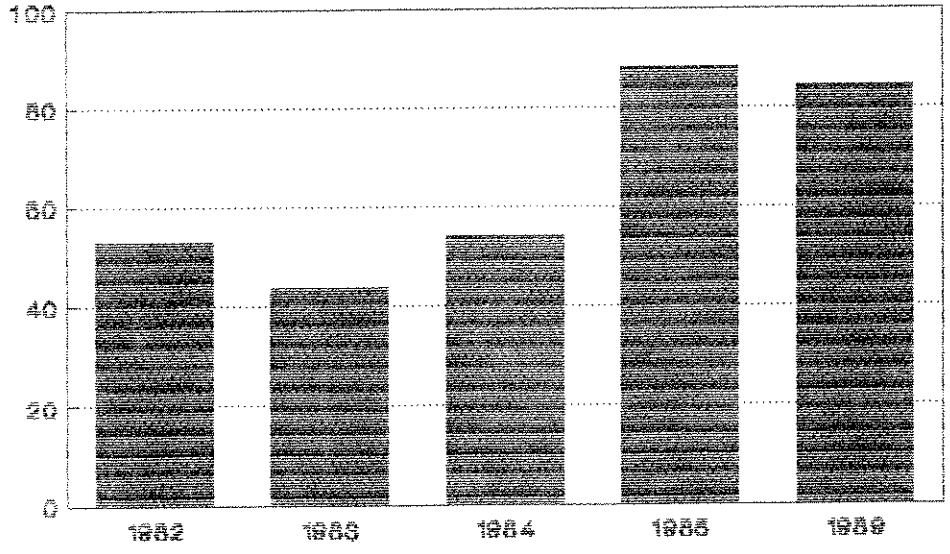


FIG 5. Darby population estimates.

RAINBOW-BROWN TROUT/MILE
Bell Crossing and Stevensville

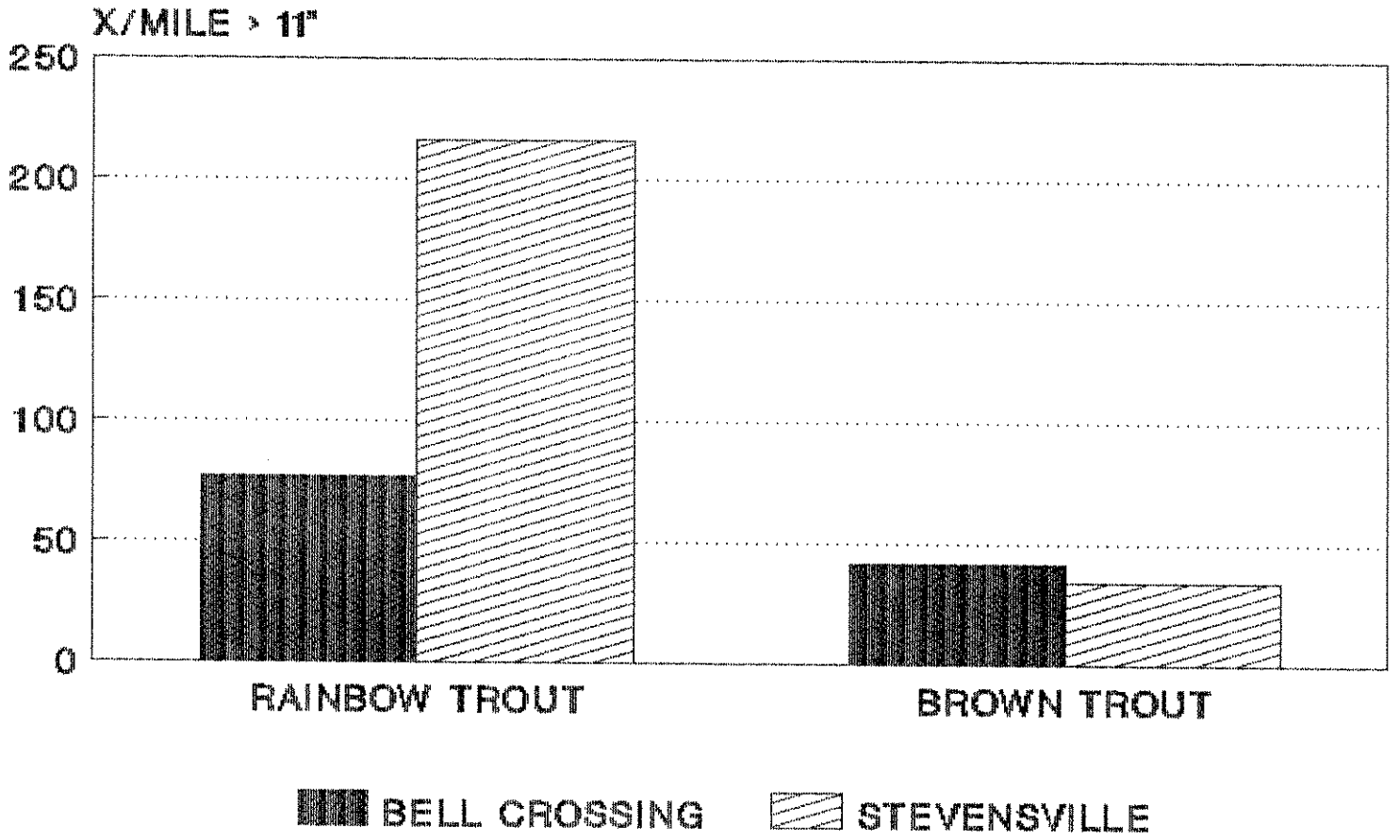


FIG 6. Trout per mile

RAINBOW REDDS
NUMBER AND AREA

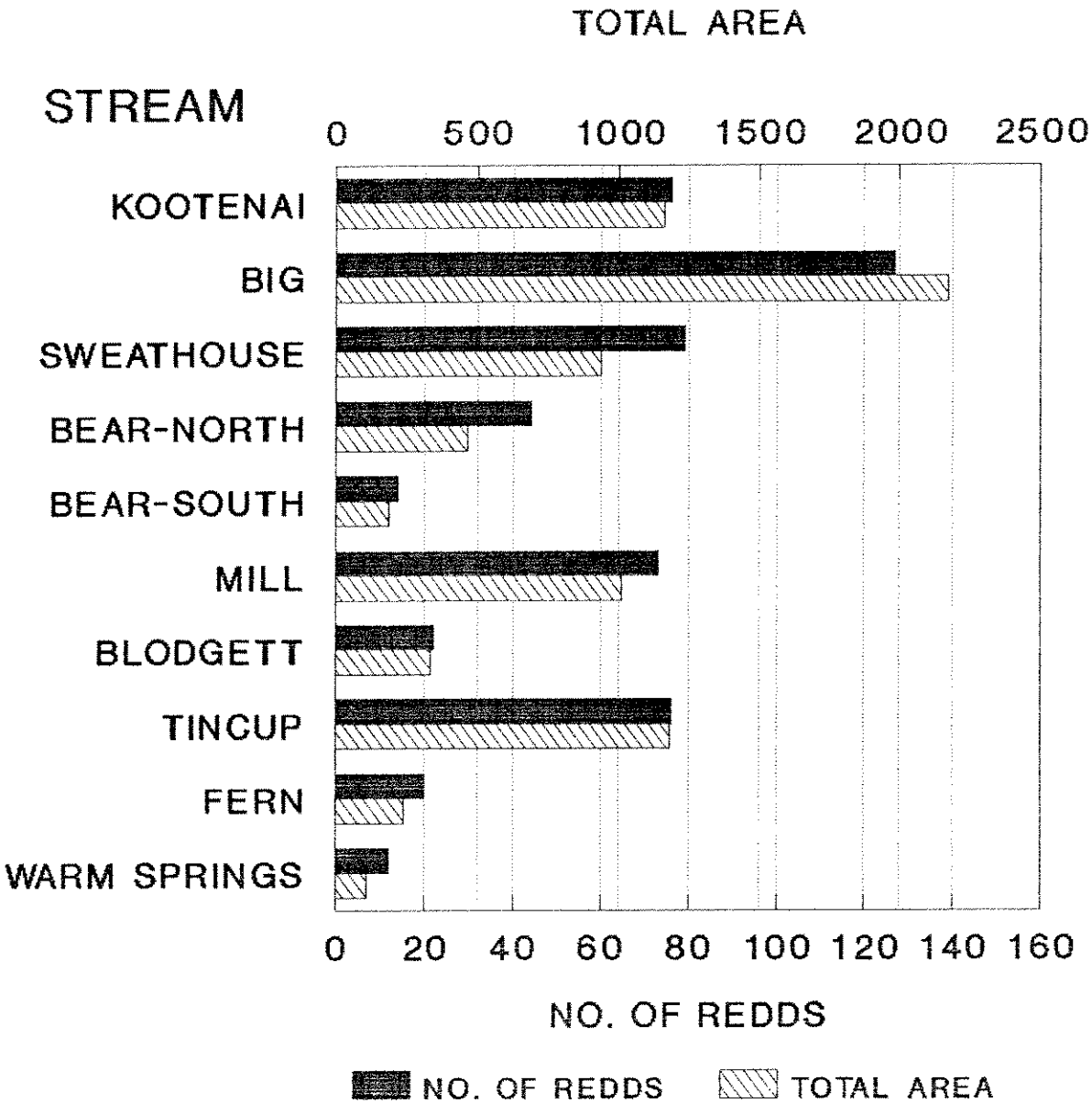


FIG 7. Redds per mile.

during the Spring for spawning purposes requires further study. Spoon, 1987 found recruitment of rainbow trout as a possible problem, therefore, the relationship between these spawning migrations and recruitment to the river must be studied.

Lake Como is stocked on a regular basis with rainbow trout broodstock and catchables. The reservoir suffers major drawdown problems during the summer for irrigation needs and therefore supports a marginal trout fishery.

LITERATURE CITED

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Stream	Code Number	Key Words
Bitterroot River drainage	2-03-8865	Trout populations Trout habitat Sediment Dewatering Fishingegulations