INTERIM DATA COMPILATION AND UPDATE FOR STUDY SECTIONS OF THE BIG HOLE RIVER OF SOUTHWEST MONTANA
2002

By:

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Region Three
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Executive Summary

Fisheries data from the Big Hole River of southwest Montana were last compiled, presented, and discussed by Oswald (2002a) in a written report submitted in compliance with the Federal Aid in Fish and Wildlife Restoration Acts. The report covered the sampling period from 2000 through 2001 and Project Numbers F-78-R-6 through F-113-R-1. Similarly, fisheries data for lakes and reservoirs throughout the project area were also reported in detail in a full edited report for the 2000 - 2002 period (Oswald 2002b). Fisheries data collected during the 2000 - 2002 period for streams within the Beaverhead River Drainage were analyzed and reported in detail by Oswald (2003).

Data presented in graphic form in this report represent sampling conducted within the Big Hole River study sections in 2002 and will be fully discussed in an edited written report in 2004. At this time, the data should be considered as a preliminary addition to existing data sets and will not be fully interpreted until additional data has been gathered and presented in an edited written format.

Stream flow data were extracted from USGS records from the Melrose Gage Station which has been operated on the Big Hole River since 1923. There are many ways to analyze flow data in terms of its affect on aquatic habitats. Figures 1 - 3 in Appendix A utilize several different means of comparison. Annual water yield in acre - feet is compared to the averages for the period of record and for the 1982 - 2002 period presented in Figure 1. Summer mean base flow, as exemplified by the month of August, is compared with the upper and lower minimum flow inflection points in Figure 2 and minimum August flows are compared in Figure 3. The most recent study period has been characterized by low flow regimes in association with drought conditions which have been prevalent in southwest Montana.

Rainbow trout population data are presented in Appendix B, Figures 1 - 6 and 13 - 16, for the Jerry Creek and Melrose Study Sections. Population parameters analyzed include density, standing crop, recruitment, numbers of 13 inch and 16 inch and larger fish, and comparisons of the affects of special angling regulations on larger fish. Rainbow trout populations, under the current sampling period, have begun to evidence symptoms of decline under low flow regimes associated with drought. Low flow regimes and concern for compounding stress to trout populations at low flow have resulted in limited fall sampling efforts which have excluded the Maiden Rock Section and limited sampling effort in the Jerry Creek and Melrose Study Sections.

Brown trout population data are presented in Appendix C, Figures 17 - 29, for the Maiden Rock, Melrose, and Hog Back Study Sections. Brown trout population parameters presented include density, standing crop, numbers of 13 inch and larger and 18 inch and larger fish, and comparisons of the affects of special angling regulations on the numbers of larger fish in the populations. Data are symptomatic of the affects of low flow on brown trout populations.

LITERATURE CITED

Oswald, R.A. 2002a. Inventory and survey of the salmonid populations of the Big Hole River of southwest Montana. Job Prog. Rpt., Fed. Aid in Fish and Wildlife Restoration Acts. Mont. Proj. Nos. F-78-R-6 and F-113-R-1 27pp.

_____. 2002b. Inventory and survey of fisheries in lowland lakes and reservoirs of the Red Rock, Ruby, Beaverhead, and Big Hole River drainages of southwest Montana. Job Prog. Rpt., Fed. Aid in Fish and Wildlife Restoration Acts. Mont. Proj. Nos. F-78-R-6 and F-113-R-1 44pp.

_____. 2003. Inventory and survey of selected stream fisheries of the Red Rock, Ruby, and Beaverhead Rivers of southwest Montana; 2000 - 2002. Job Prog. Rpt., Fed. Aid in Fish and Wildlife Restoration Acts. Mont. Proj. Nos. F-78-R-6, F-113-R-1, and F-113-R-2 71pp.

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All Work Included in this Report in Conjunction with Federal Aid in Fish and Wildlife Restoration Acts:
Montana Project Number: F-113-R-2

Montana Fish, Wildlife & Parks Project Numbers 3320S and 3320T

APPENDIX A

Figure 1. Annual Water Yield (Acre Feet) for the Big Hole River at the USGS Melrose Gage 1982 - 2002.

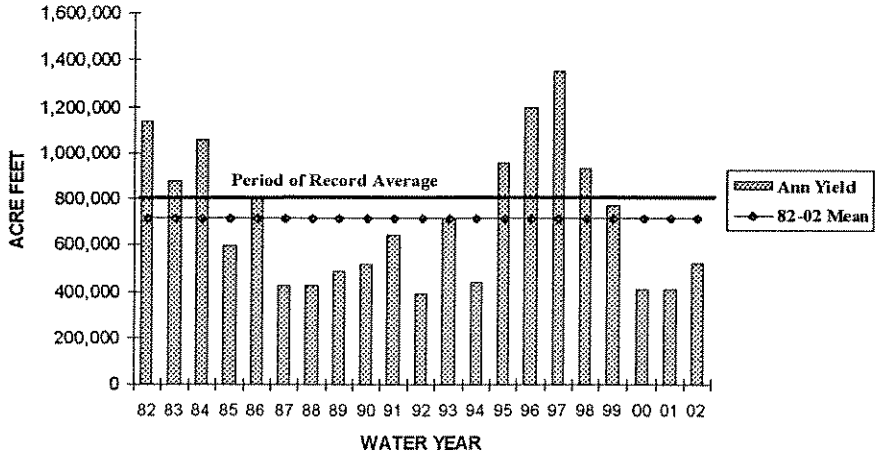


Figure 2. Mean August flow as compared with the FWP recommended optimum and minimum instream flow at the USGS Melrose Gage on the Big Hole River; 1982 - 2002.

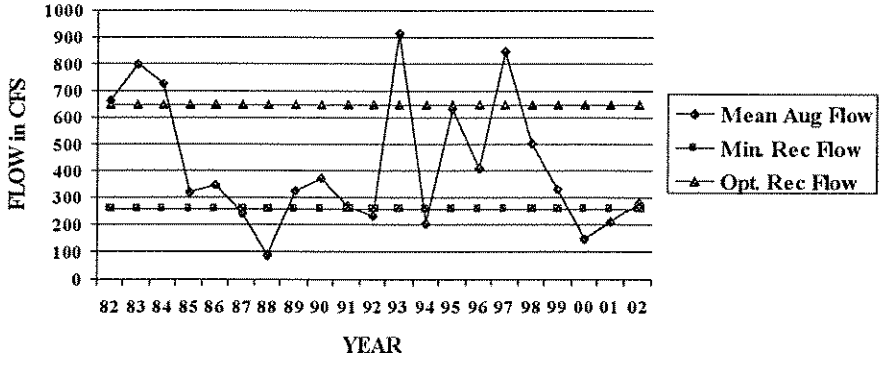
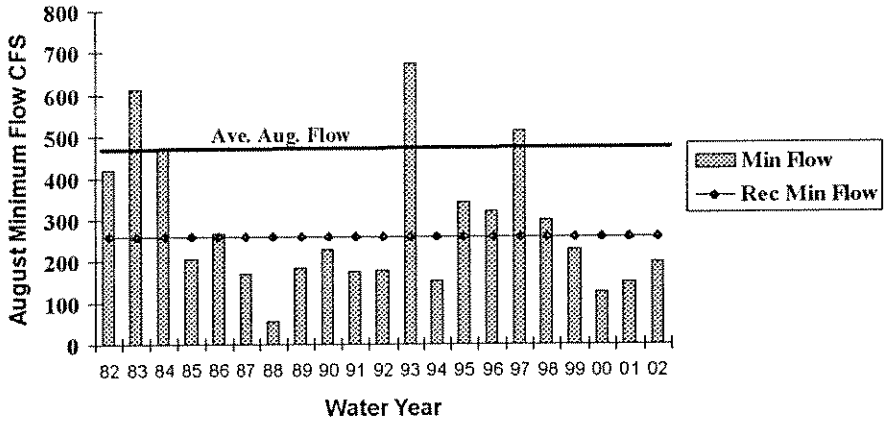


Figure 3. Minimum August flows (ADF) measured at the USGS Melrose Gage for the 1982 - 2002 period of record on the Big Hole River.



APPENDIX B

Figure 1. Estimated fall density and standing crop of Rainbow Trout in the Jerry Creek Section of the Big Hole River, 1986 - 2002.

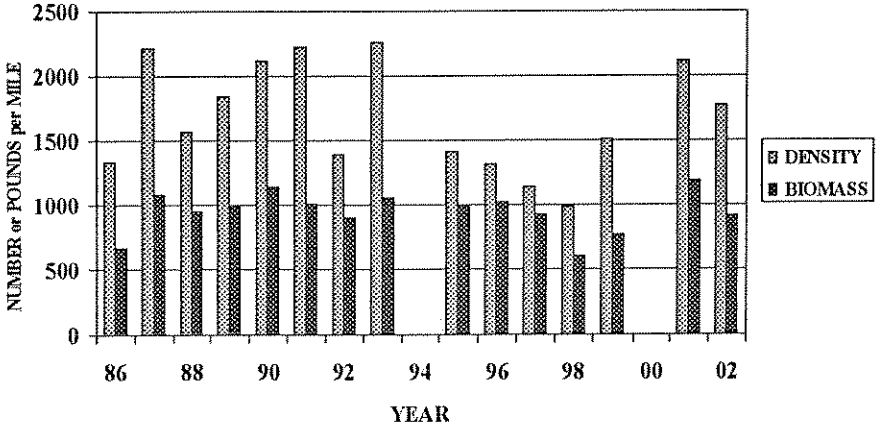


Figure 2. Estimated fall density of Age I Rainbow Trout in the Jerry Creek Section of the Big Hole River, 1986 - 2002.

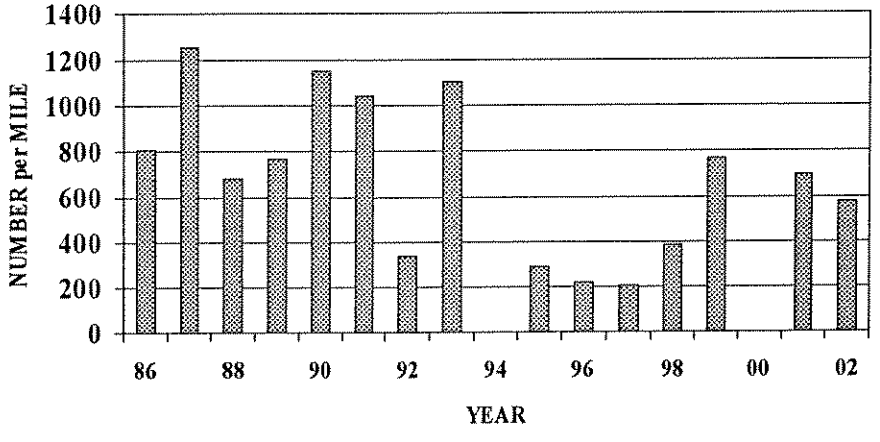


Figure 3. Estimated fall density of 13 inch and larger Rainbow Trout in the Jerry Creek Section of the Big Hole River 1986 - 2002.

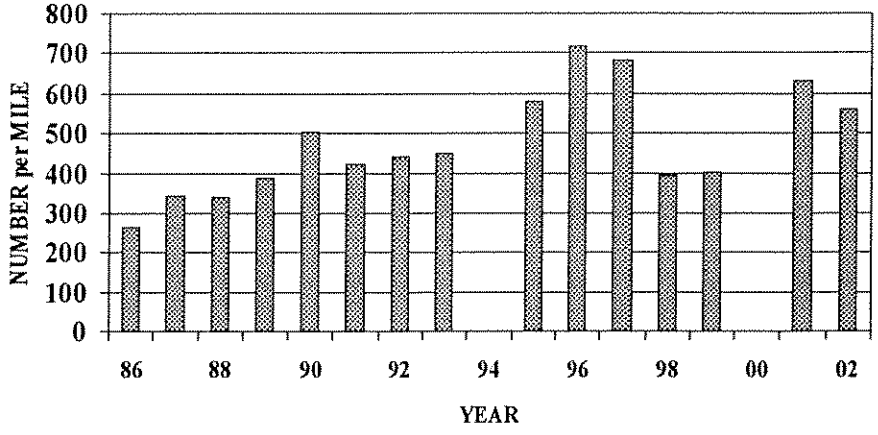


Figure 4. Estimated fall density of 16 inch and larger Rainbow Trout in the Jerry Creek Section of the Big Hole River, 1986 - 2002.

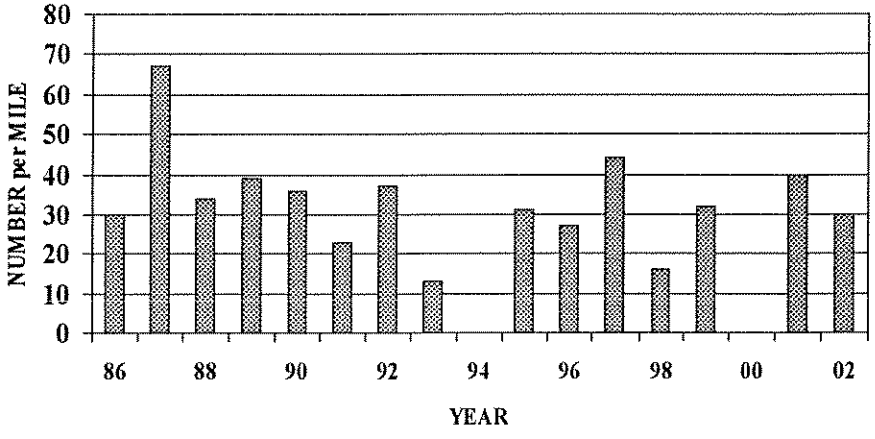


Figure 5. Biomass of 13 inch and larger Rainbow Trout as a percent of the total Rainbow Trout biomass for the Jerry Creek and Melrose Sections of the Big Hole River, 1981 - 2002.

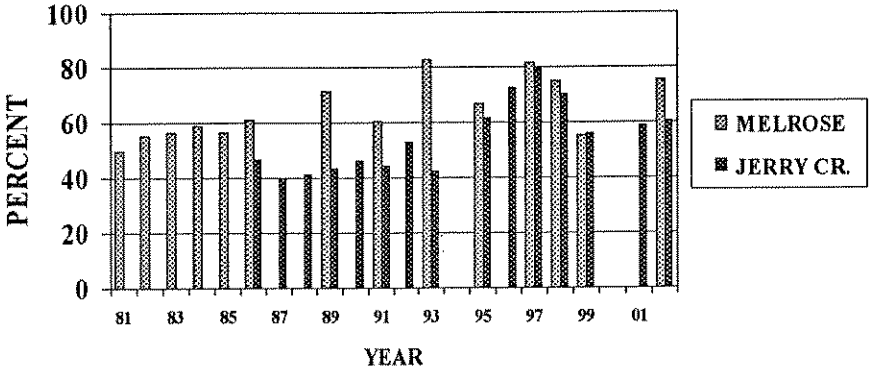


Figure 6. Biomass of 16 inch and larger Rainbow Trout as a percent of the total Rainbow Trout biomass for the Jerry Creek and Melrose Sections of the Big Hole River, 1981 - 2002.

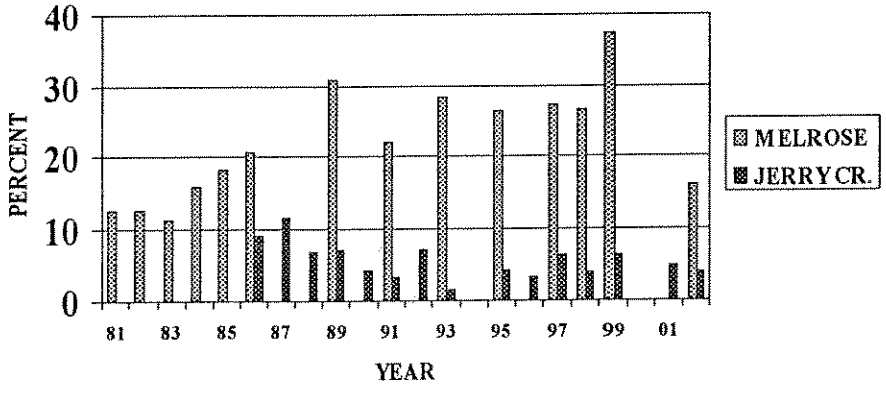


Figure 13. Estimated fall density and standing crop of Rainbow Trout in the Melrose Section of the Big Hole River, 1981 - 2002.

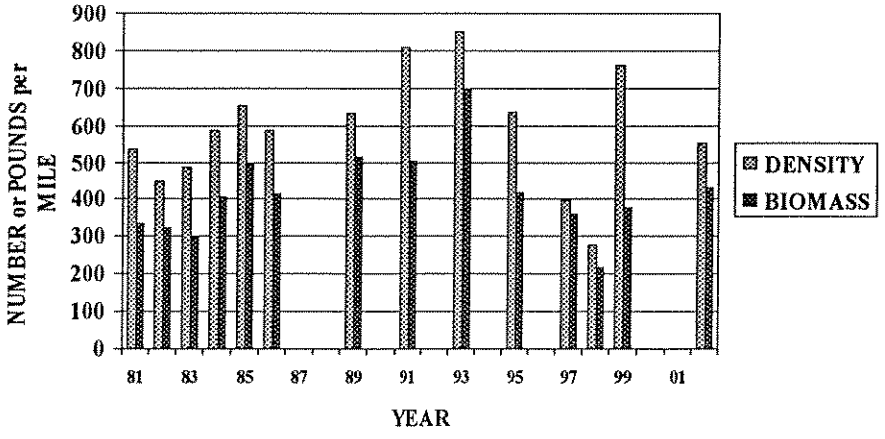


Figure 14. Estimated fall density of Age I and older Rainbow Trout in the Melrose Section of the Big Hole River, 1981 - 2002.

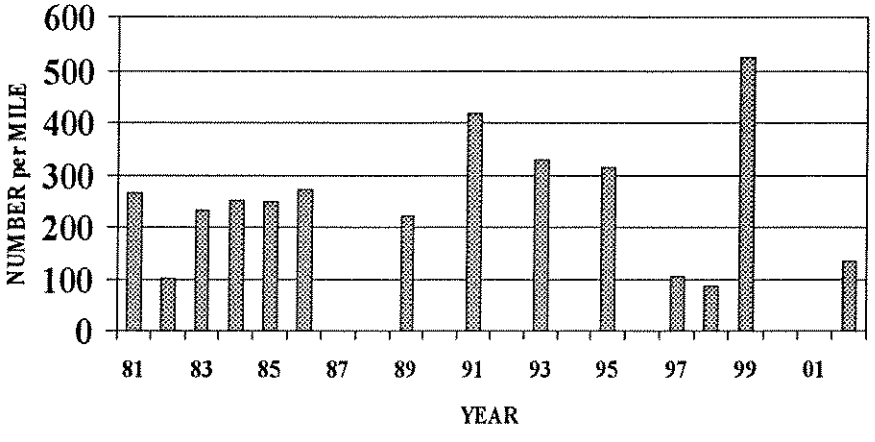


Figure 15. Estimated fall density of 13 inch and larger Rainbow Trout in the Melrose Section of the Big Hole River, 1981 - 2002.

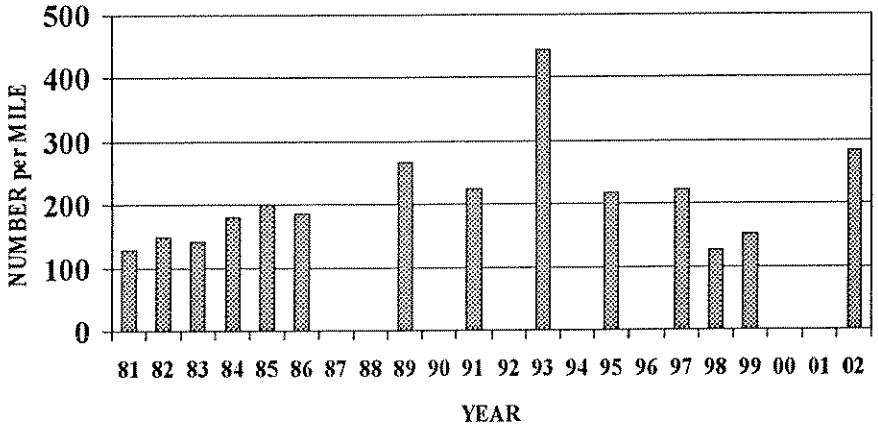
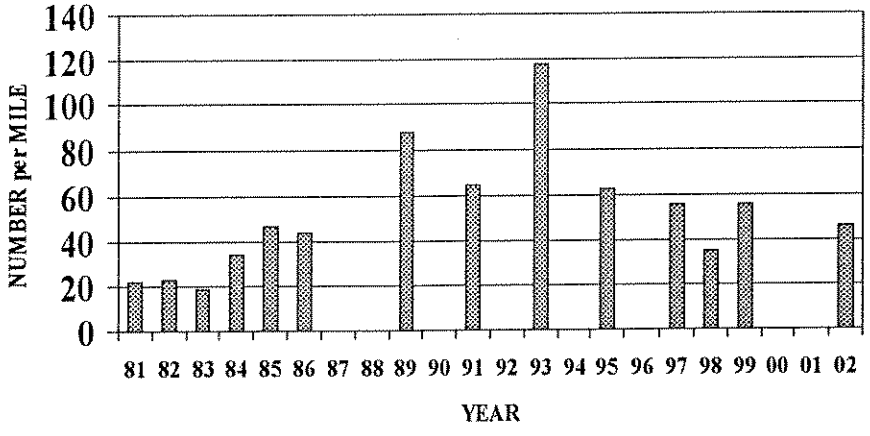


Figure 16. Estimated fall density of 16 inch and larger Rainbow Trout in the Melrose Section of the Big Hole River, 1981 - 2002.



APPENDIX C

Figure 17. Estimated spring density and standing crop of Brown Trout in the Maiden Rock Section of the Big Hole River 1981 - 2002.

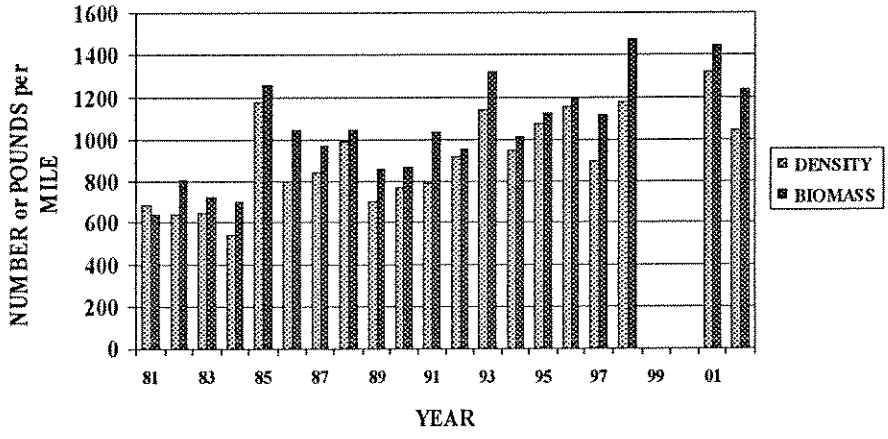


Figure 18. Estimated spring density of 13 inch and larger Brown Trout in the Maiden Rock Section of the Big Hole River, 1981 - 2002.

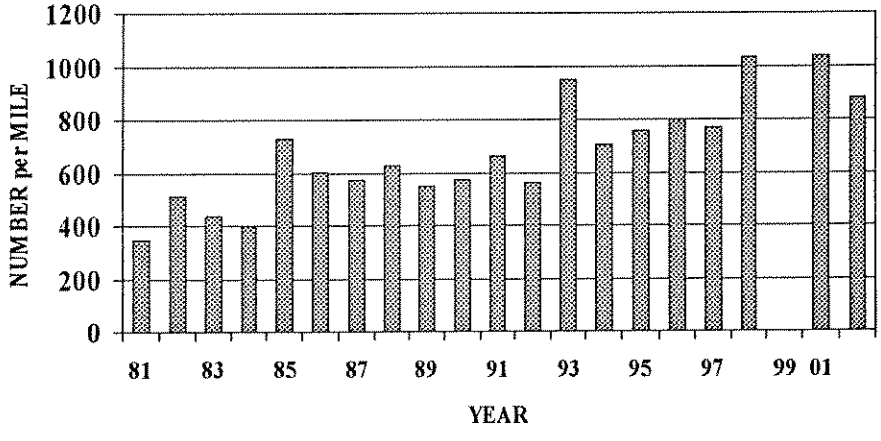


Figure 19. Estimated spring density of 18 inch and larger Brown Trout in the Maiden Rock Section of the Big Hole River, 1981 - 2002.

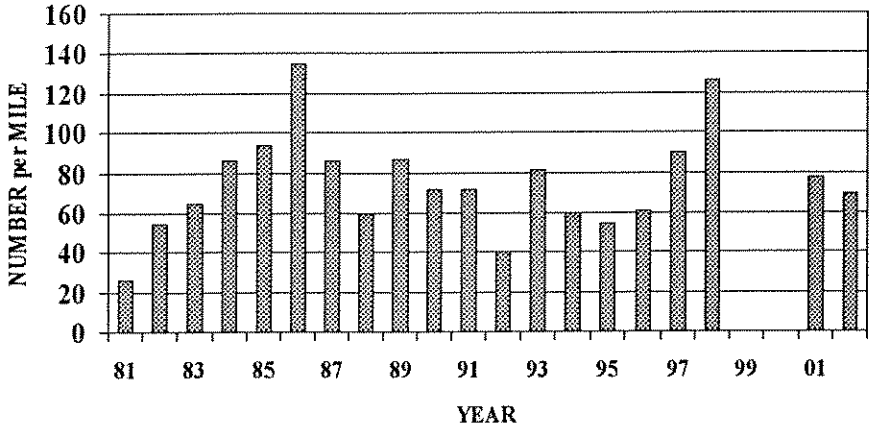


Figure 20. Biomass of 13 inch and larger Brown Trout as a percent of the total Brown Trout biomass for the Maiden Rock and Melrose Sections of the Big Hole River, 1981 - 2002.

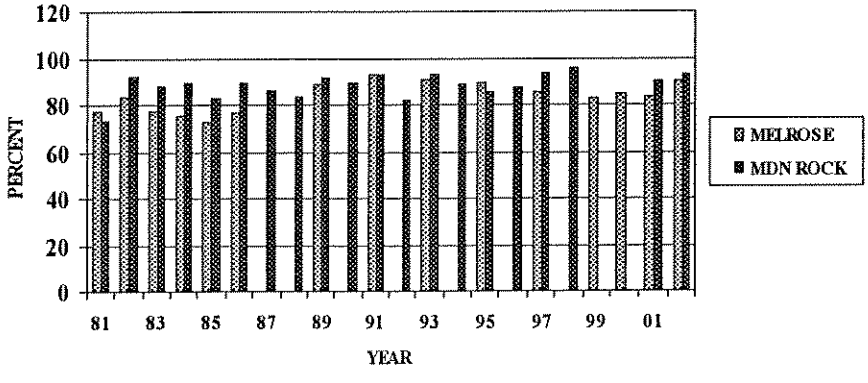


Figure 21. Biomass of 18 inch and larger Brown Trout as a percent of the total Brown Trout biomass for the Maiden Rock and Melrose Sections of the Big Hole River, 1981 - 2002.

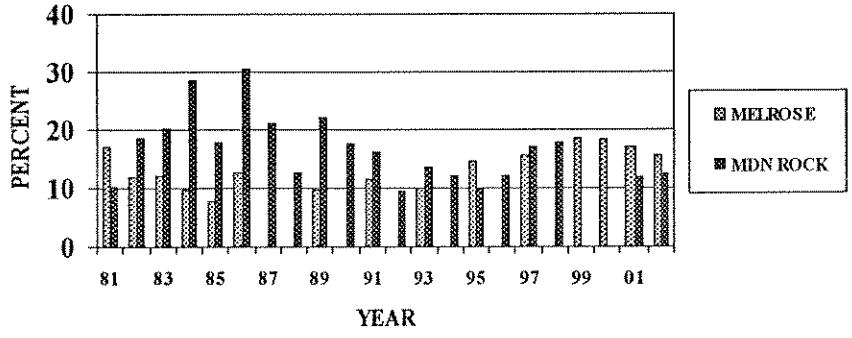


Figure 22. Estimated spring density and standing crop of Brown Trout in the Melrose Section of the Big Hole River, 1981 - 2002.

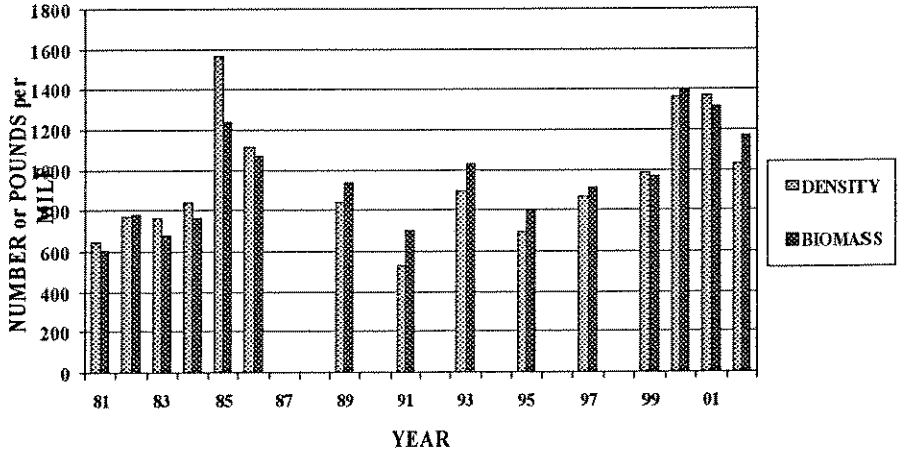


Figure 23. Estimated spring density of 13 inch and larger Brown Trout in the Melrose Section of the Big Hole River 1981 - 2002.

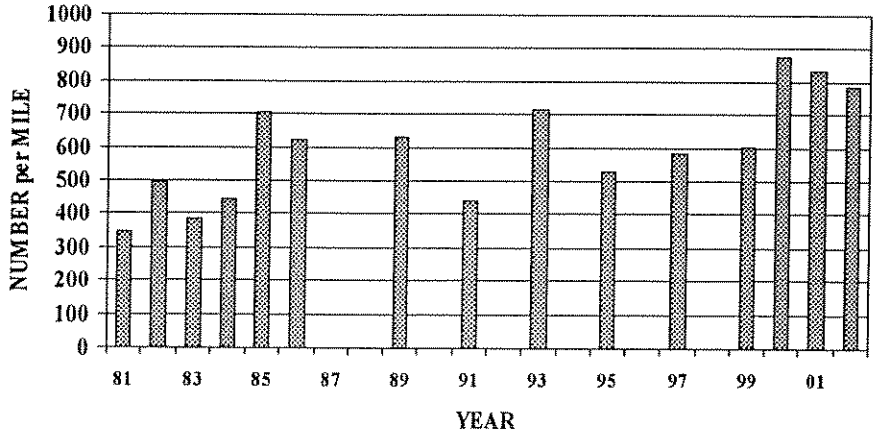


Figure 24. Estimated spring density of 18 inch and larger Brown Trout in the Melrose Section of the Big Hole River, 1981 - 2002.

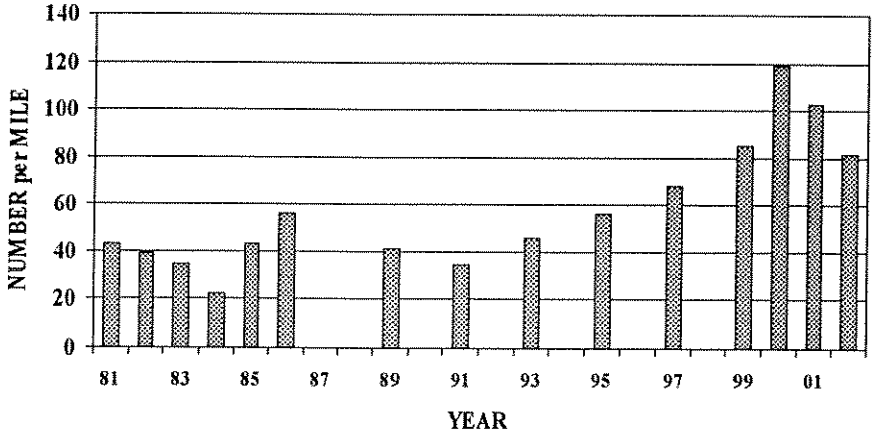


Figure 25. Biomass of 13 inch and larger Brown Trout as a percent of the total Brown Trout biomass for the Melrose and Hog Back Sections of the Big Hole River, 1981 - 2002.

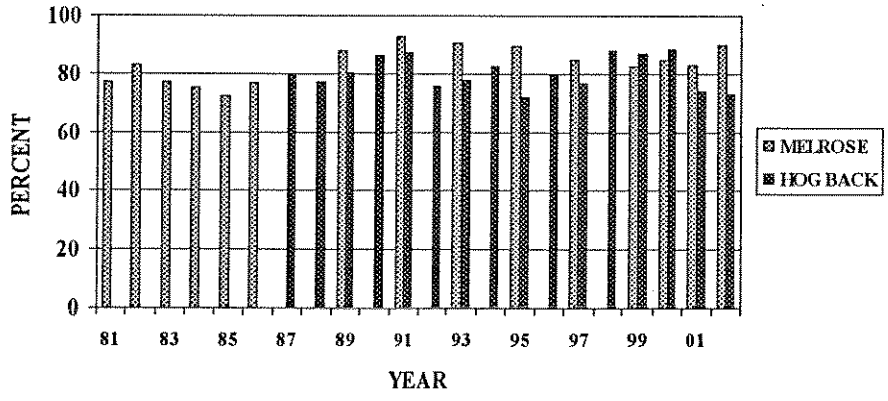


Figure 26. Biomass of 18 inch and larger brown trout as a percent of the total Brown Trout biomass for the Melrose and Hog Back Sections of the Big Hole River, 1981 - 2002.

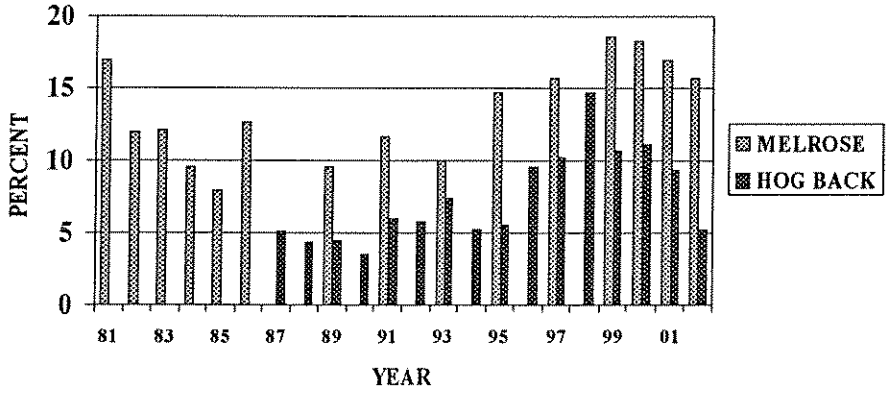


Figure 27. Estimated spring density and standing crop of Brown Trout in the Hog Back Section of the Big Hole River, 1987 - 2002.

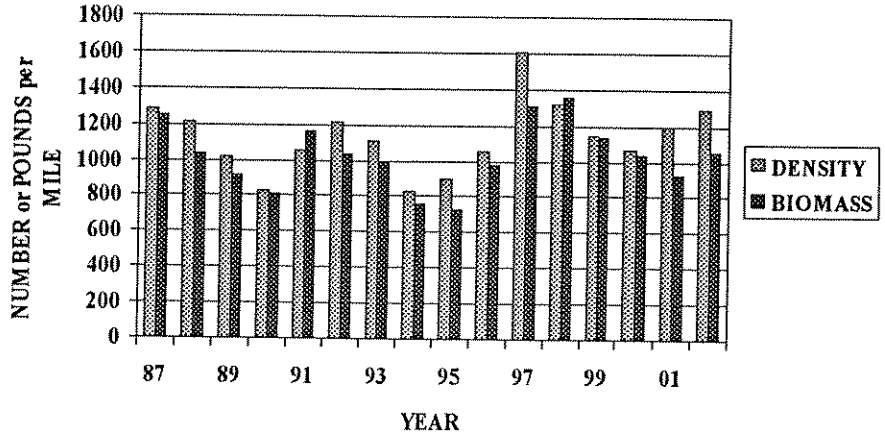


Figure 28. Estimated spring density of 13 inch and larger Brown Trout in the Hog Back Section of the Big Hole River, 1987 - 2002.

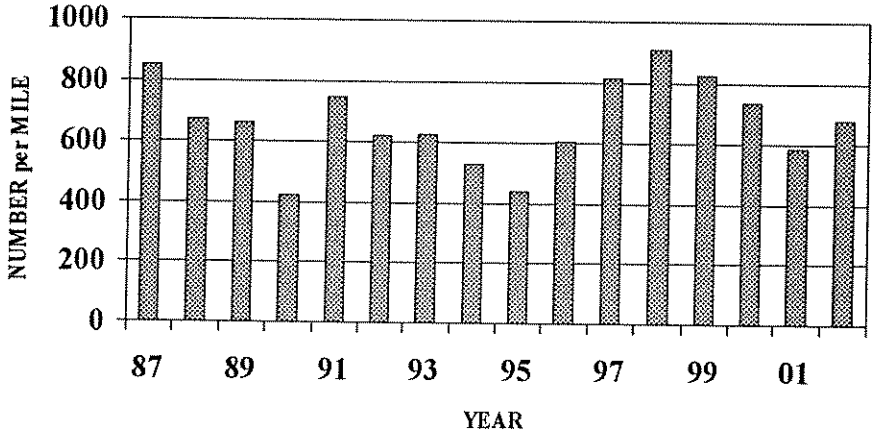


Figure 29. Estimated spring density of 18 inch and larger Brown Trout in the Hog Back Section of the Big Hole River, 1987 - 2002.