MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATION

PROJECT NO: F-46-R-2 STUDY TITLE: SURVEY AND INVENTORY OF COLDWATER STREAMS

JOB NO: I-b, SEGMENT 3 JOB TITLE: WEST CENTRAL MONTANA COLDWATER STREAM INVESTIGATIONS

PROJECT PERIOD: JULY 1, 1988 THROUGH JUNE 30, 1989

Abstract

Cutthroat trout populations were sampled in five streams and specimens submitted for genetic analyses to the Genetics Laboratory at the University of Montana. Cutthroats from Baggs, North Fork of Cottonwood, and Peterson Creeks were found to have no non-native genetic material. Specimens from Gold and Dry Cottonwood Creeks showed evidence of hybridization with rainbow and Yellowstone cutthroats respectively. Data on cutthroat purity collected from the project area are summarized.

OBJECTIVES AND DEGREE OF ATTAINMENT

JOB OBJECTIVES:

1. Ensure within legal and hydrologic constraints that flows in trout streams do not fall below 1975-1985 averages.

A record breaking drought in 1988 prompted our notification of junior water right holders in the Blackfoot and Rock Creek that they needed to suspend use of their junior rights.

2. Maintain existing trout populations at or above the current densities in 5 to 10 test streams.

Field data collections necessary for evaluating attainment of this objective were not completed. A lack of man-power and equipment prevented completion of the field work.

3. Maintain 100% of the region's stream banks and channels in their present or better condition.

Stream bank and channel alteration permits submitted for Hydraulic Notices under the Stream Protection Act and 310 permits under the Natural Streambed and Land Preservation Act were responded to during the year. Seven conservation districts' 310 permits were addressed during the year.

4. Maintain water quality at current or improved conditions as reported in the 1986 Montana 305(b) Water Quality Report to the U. S. Environmental Protection Agency.

Development Projects detrimental to maintenance of water quality in Rock Creek, the Clark Fork River, and the Blackfoot River were addressed.

5. Maintain fish populations and habitat in streams affected by resource development at levels at least as good as current status.

Plum Creek, Champion, and USFS timber sales were reviewed for various fish habitat preservation concerns. We participated in interagency meetings for preservation of fish habitat on Rock Creek and the Clark Fork River.

6. Implement the Bitterroot River/Painted Rocks Water Management Plan and provide minimum instream flows at Bell Crossing consistent with the plan and water availability.

With record breaking drought conditions within this Western basin stream flows were maintained above 100 cfs at Bell Crossing. Although less than optimum for the Bitterroot River, a great success in reducing low flow impacts that could have been much more severe.

7. Maintain genetically pure WsCt populations with population structures at least as diverse as presently exists.

Blackfoot River cutthroat populations appear to be in need of additional protective management from over-harvest. Management strategies are being developed and protective measures will be in place by March 1990. Population simulation modeling indicates a long-term recovery period due to slow growth, low adult population, and environmental degradation.

Several stream populations of cutthroat were sampled and electrophoretic analysis completed on liver proteins to test for genetic purity.

8. Develop a voluntary catch and release program for westslope cutthroat trout in rivers and streams to maintain genetically pure populations at least at current levels wherever they exist.

Recommended placement of voluntary regulations on the Fishing regulations and helped I&E shoot video footage for promos.

9. Maintain bull trout populations at least at current levels.

Bull trout numbers appear to be declining in the Blackfoot and re-evaluation of the management program is in progress.

10. Increase the number of trout over 14 inches long in the Rock Creek population to at least 200 per mile.

In the spring of 1989 the Fish and Game section of Rock Creek was sampled and found to contain 178 $\pm$ 92 rainbow trout larger than 14 inches long.

11. Determine if a problem exists between floating and walking anglers on Rock Creek.

Float fishing increased in Rock Creek between 1986 and 1988. A thorough coverage of various aspects of the float fishing issue on Rock Creek are contained in this report.

12. Maintain the combined number of wild rainbow and brown trout 14 inches and larger in the Darby section of the Bitterroot River at 100 per mile and in the Tucker Section at 160 per mile. Maintain rainbow standing crop of 300, of all sizes, in the Poker Joe Section downstream from Stevensville.

We do not know if this objective was met. No field data collections were made to check success or failure due to lack of man-power and equipment.

13. Determine the extent of fry loss to irrigation ditches in key spawning tributaries in the Bitterroot. Determine time period during which ditches pose the greatest threat to migrating fry.

We did not accomplish this objective due to lack of man-power and equipment.

14. Increase the number of rainbows 12 inches and larger in the Johnsrud section of the Blackfoot River to at least 300 per mile.

Number of rainbow trout larger than 12 inches is below 300 per mile and management changes are being drafted for public review.

15. Maintain trout populations at least at current levels in the Blackfoot River upstream from Johnsrud Park.

Long term study objective addressed in Segment 1.

16. To develop, in cooperation with the U.S. Forest Service, a five-year management plan for Rock Creek.

Procedures

Samples of fish for genetic analysis were taken primarily by electrofishing. Samples were tagged with date, location, and collector information and placed in ice filled coolers. Collection notes were written and filed and fish specimens frozen upon return to the office. Frozen samples were usually hand delivered to the University of Montana Genetics Laboratory for freezer storage. Electrophoretic analyses were done by the Genetics Lab staff under the direction of Dr. Robb Leary. Results of the analyses were then sent by mail to FWP. Samples taken by U.S. Forest Service personnel under the supervision of Len Walch were handled similarly.

Dr. Leary has advised that the statistical reliability of the techniques utilized, assuming random gene distribution within the population sampled, was: N = 25 = 95% chance of detecting 1% rainbow genes, N = 10 = 95% chance of detecting 2.5% rainbow genes, N = 5 = 95% chance of detecting 5% rainbow genes; values for Yellowstone cutthroat hybridization were <1%, 1.5% and 3% for samples of 25, 10, and 5 specimens respectively.

Findings

Within the project area 37 streams have been sampled to determine genetic composition of cutthroat trout populations. Thirty-two of these populations have been determined to be of uncontaminated westslope cutthroat origin. Five populations showed evidence of hybridization with rainbows and/or Yellowstone cutthroats.

Results and Discussion

Thirty-seven streams within the project area have been sampled to ascertain the genetic status of native westslope cutthroat population. Twenty of these streams were sampled by Fish, Wildlife and Parks personnel (Table 1) and 17 were investigated by USFS employees (Table 2).

In the Clark Fork drainage proper 12 streams have been evaluated. Ten contained uncompromised westslope cutthroat (Table 1) while the populations in Dry Cottonwood and Gold Creeks contained intergrades between westslope and Yellowstone cutthroat (Dry Cottonwood) or rainbow (Gold Creek). These localities are presented graphically in Figures 1, 2 and 3. Major Clark Fork tributaries evaluated to date include Flint Creek (Figure 4) with 4 tributaries sustaining pure westslope cutthroats (Table 1) and the Little Blackfoot (Figure 5) where populations at all 7 localities sampled were uncontaminated (Tables 1 and 2).

In the Blackfoot River Drainage 10 tributaries sampled all

contained pure westslope populations (Figures 6 and 7; Table 2). Nevada Creek, a major Blackfoot tributary (Figure 8) had 3 tributaries sampled (Tables 1 and 2) and was itself sampled in the headwaters. Only a single pure westslope population was found, in Douglas Creek. Samples from Nevada Creek, Jefferson Creek, and Cottonwood Creek were all composed of westslope X rainbow hybrids. The occurrence of three hybrid populations in a relatively restricted area seems most plausibly attributed to stocking.

Thus far, sampling and genetic analysis of cutthroat populations has been limited to a small minority of streams in the project area (Figures 1-9). The vast majority, 32 of 37, contained genetically unaltered westslope cutthroats. The preponderance of pure populations should not be interpreted as reflective of the general conditions in the area since streams considered most likely to support pure westslope populations were selected for sampling. Those streams with lesser chances of pure westslope have been deferred for later evaluation. Further, most samples have been taken in the upper reaches of streams where prospects for locating pure westslope populations were greater than in more downstream reaches where intergrades from upstream migrants were more likely to occur.

Conclusion

A significant number of pure westslope cutthroat populations have been identified within the project area. These populations, however, occupy only a fraction of the habitat formerly occupied. Additional evaluations are needed to fully document the distribution of westslope in this area.

Prepared by: Wayne F. Hadley

Date: August 1989

Waters referred to: (See Tables 1 & 2)

Fish Species: Westslope Cutthroat; Yellowstone Cutthroat; Rainbow

Table 1. Westslope Cutthroat Genetic Analyses: Montana Department of Fish, Wildlife and Parks Collections

Drainage	County	Locality	Date	Sample Number	Results
Clark Fork					
Baggs Creek	Powell	7N 8W S23	10/6/88	26	Pure
Dempsey Creek (SF)	Powell	7N 11W S29	10/22/86	25	Pure
Dry Cottonwood Cr	Powell	5N 9W S1	8/26/88	27	Ws X YsCt
Gold Creek	Powell	8N 12W S11	10/18/88	25	WsCt X Rb
No. Fk. Cottonwood	Powell	7N 8W S15	8/10/88	25	Pure
Peterson Creek	Powell	6N 8W S9	8/9/88	26	Pure
Upper Powell Res.	Powell	7N 10W S16	9/25/85	22	Pure
Warm Springs Creek	Deer Lodge	6N 13W S25	7/16/86	21	Pure
Carten Creek	Powell	10N 10W S17	6/24/86	12	Pure
Antelope Creek	Granite	11N 14W S24	5/18/88	29	Pure
Wood Creek	Granite	11N 14W S22	5/18/88	29	Pure
Little Blackfoot					
Harvey Creek	Granite	10N 15W S23	6/30/86	25	Pure
Telegraph Creek	Powell	8N 6W S34	11/4/86	26	Pure
Flint Creek					
Douglas Creek	Granite	9N 12W S32	5/2/86	21	Pure
Lower Willow Cr.	Granite	9N 14W S25	6/24/86	23	Pure
No. Fk. Lower Willow	Granite	10N 15W S35	6/30/86	25	Pure
Wyman Gul.	Granite	8N 13W S22	6/30/86	23	Pure
Nevada Creek					
Douglas Creek	Powell	12N 13W S14	6/11/86	23	Pure
Jefferson Creek	Powell	12N 9W S11	7/11/86	22	WsCt X Rb
Cottonwood Creek	Powell	12N 11W S23	10/5/87	27	WsCt X Rb
Nevada Creek	Powell	12N 8W S15	Sum 88	10	WsCt X Rb
Little Blackfoot River					
Bison Creek	Powell	8N 6W S28	Sum 88	10	Pure
Hat Creek	Powell	8N 6W S18	Sum 88	10	Pure
Little Blackfoot	Powell	8N 7W S21	Sum 88	10	Pure
No. Fk. Opheim Cr.	Powell	11N 7W S17	Sum 88	5	Pure
Ontario Creek	Powell	8N 6W S18	Sum 88	10	Pure
Snowshoe Creek	Powell	11N 7W S22	Sum 88	14	Pure
Blackfoot River					
Alice Creek	Lewis & Clk	15N 7W S23	Sum 88	11	Pure
Arrastra Creek	Powell	15N 10W S24	Sum 88	9	Pure
Bear Trap Creek	Lewis & Clk	15N 6W S27	Sum 88	12	Pure
Beaver Creek	Lewis & Clk	15N 9W S33	Sum 88	10	Pure
Copper Creek	Lewis & Clk	15N 8W S22	Sum 88	11	Pure
Davis Gulch	Powell	13N 7W S17	Sum 88	10	Pure
Liverpool Creek	Lewis & Clk	15N 7W S13	Sum 88	10	Pure
Park Creek	Lewis & Clk	15N 9W S36	Sum 88	10	Pure
Poorman Creek	Powell	13N 8W S22	Sum 88	10	Pure
Stonewall Creek	Lewis & Clk	15N 9W S34	Sum 88	10	Pure

Table 2. Westslope Cutthroat Genetic Analyses: Helena National Forest Collections

Drainage	County	Locality	Date	Sample Number	Results
Nevada Creek					
Nevada Creek	Powell	12N 8W S15	Sum 88	10	WsCt X Rb
Little Blackfoot River					
Bison Creek	Powell	8N 6W S28	Sum 88	10	Pure
Hat Creek	Powell	8N 6W S18	Sum 88	10	Pure
Little Blackfoot	Powell	8N 7W S21	Sum 88	10	Pure
North Fork Ophir Cr	Powell	11N 7W S17	Sum 88	5	Pure
Ontario Creek	Powell	8N 6W S18	Sum 88	10	Pure
Snowshoe Creek	Powell	11N 7W S22	Sum 88	14	Pure
Blackfoot River					
Alice Creek	Lewis & Clk	16N 7W S23	Sum 88	11	Pure
Arrastra Creek	Powell	15N 10W S24	Sum 88	9	Pure
Bear Trap Creek	Lewis & Clk	15N 6W S27	Sum 88	12	Pure
Beaver Creek	Lewis & Clk	15N 9W S33	Sum 88	10	Pure
Copper Creek	Lewis & Clk	15N 8W S22	Sum 88	11	Pure
Davis Gulch	Powell	13N 7W S17	Sum 88	10	Pure
Liverpool Creek	Lewis & Clk	15N 7W S13	Sum 88	10	Pure
Park Creek	Lewis & Clk	15N 9W S36	Sum 88	10	Pure
Poorman Creek	Powell	13N 8W S22	Sum 88	10	Pure
Stonewall Creek	Lewis & Clk	15N 9W S34	Sum 88	10	Pure

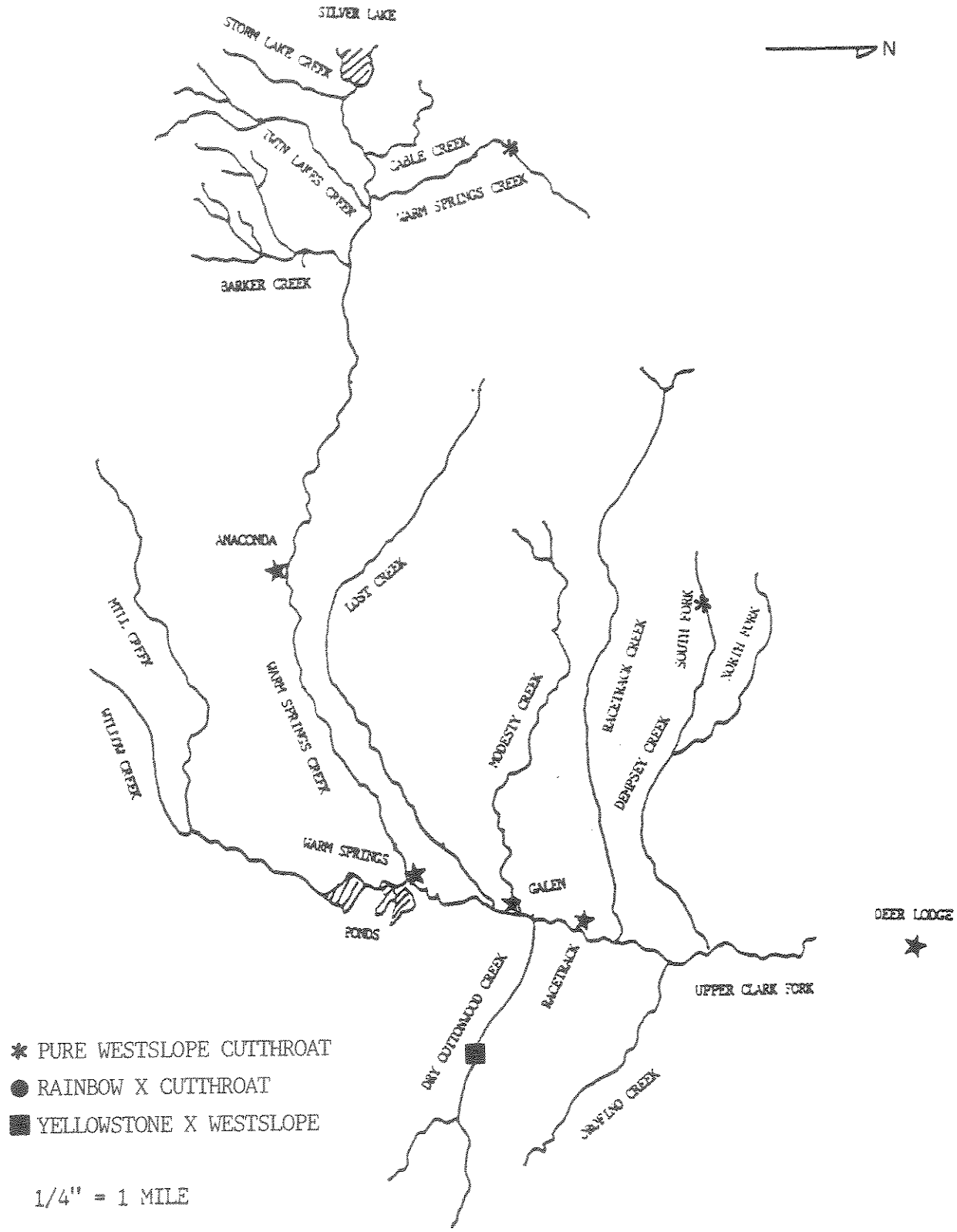

Figure 1. Upper Clark Fork Drainage.

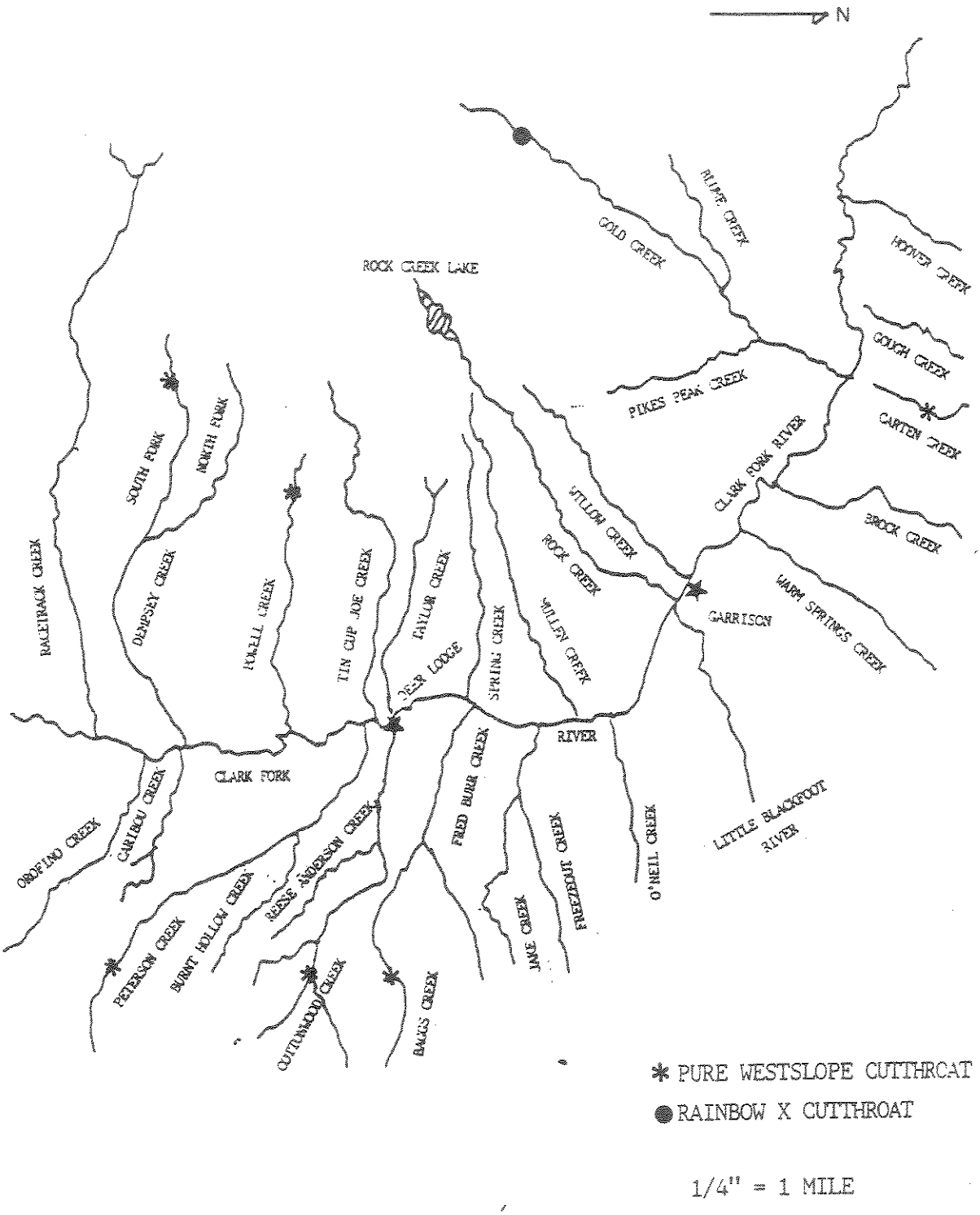

Figure 2. Clark Fork Drainage.

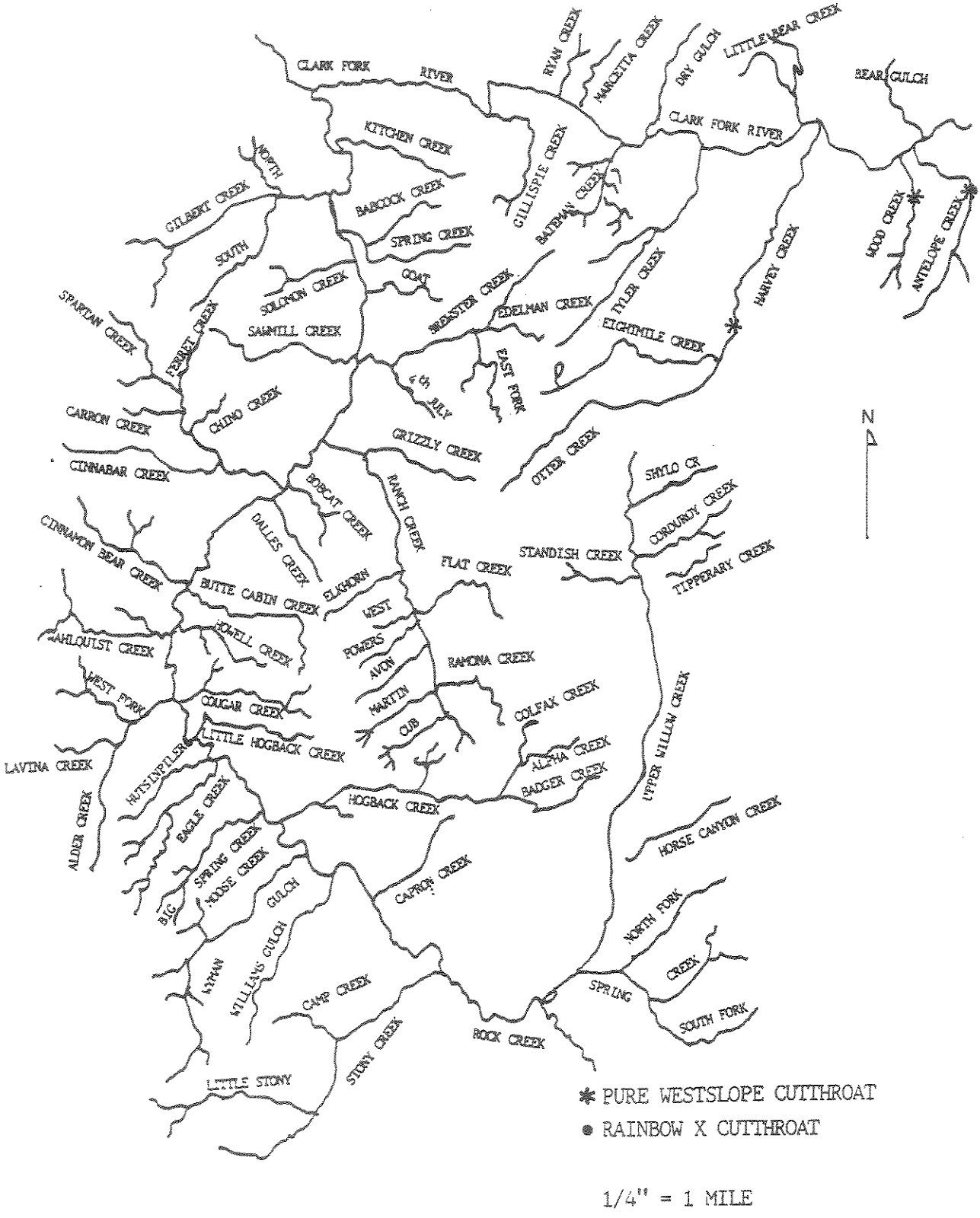

Figure 3. Lower Rock Creek Drainage.

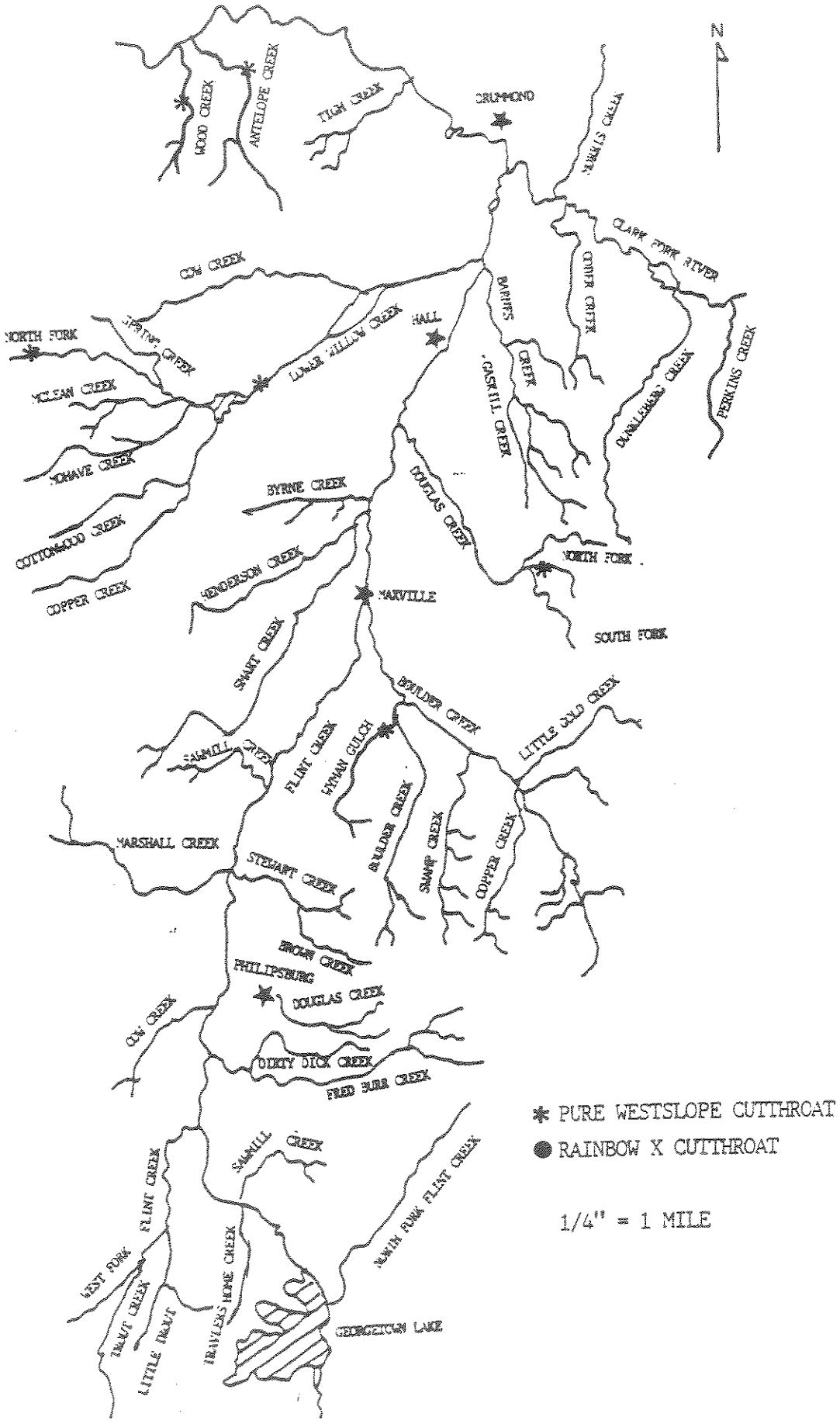

Figure 4. Flint Creek Drainage.

Figure 5. Little Blackfoot Drainage.

Figure 6. Blackfoot Drainage.

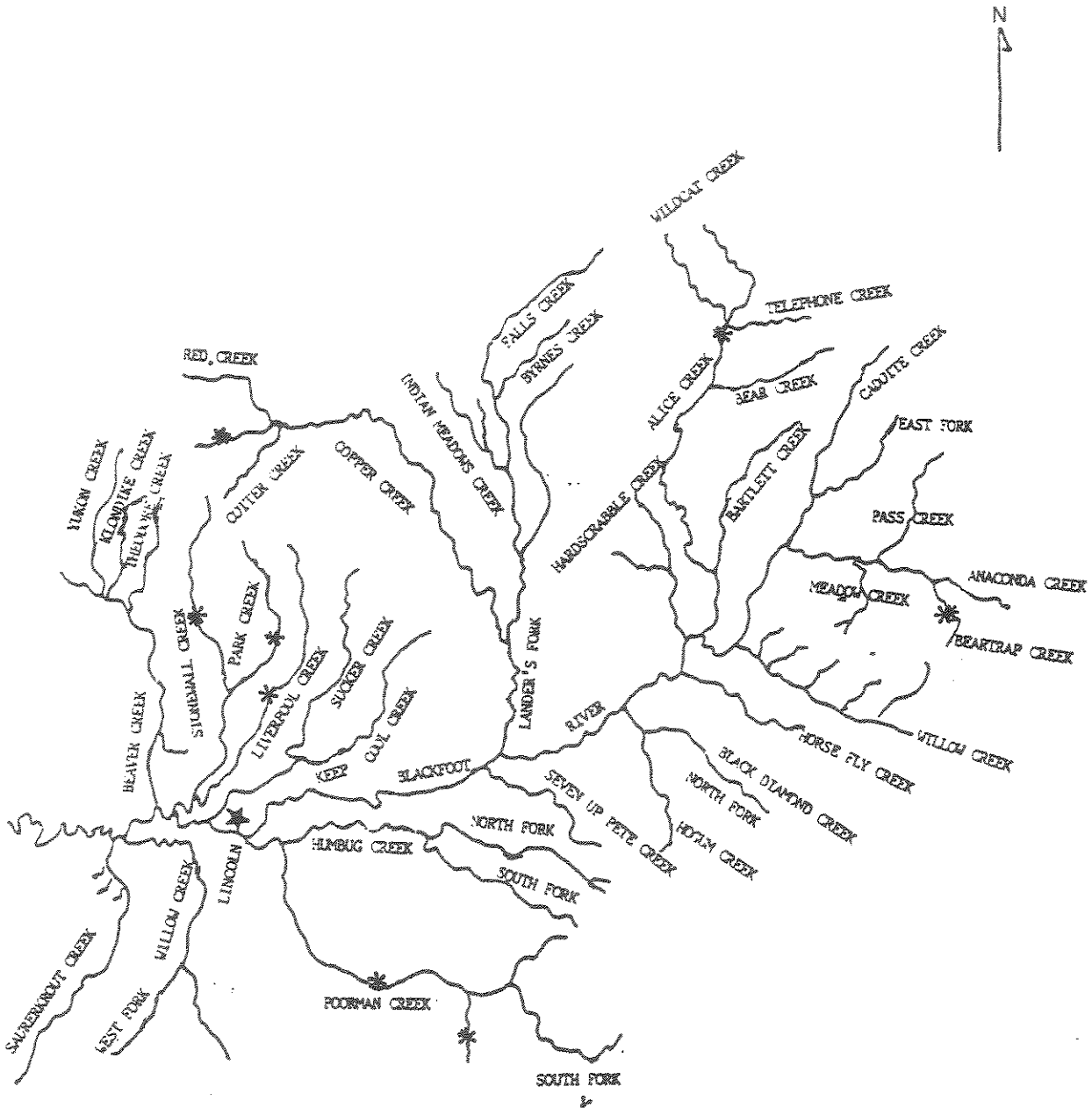

Figure 7. Upper Blackfoot Drainage.

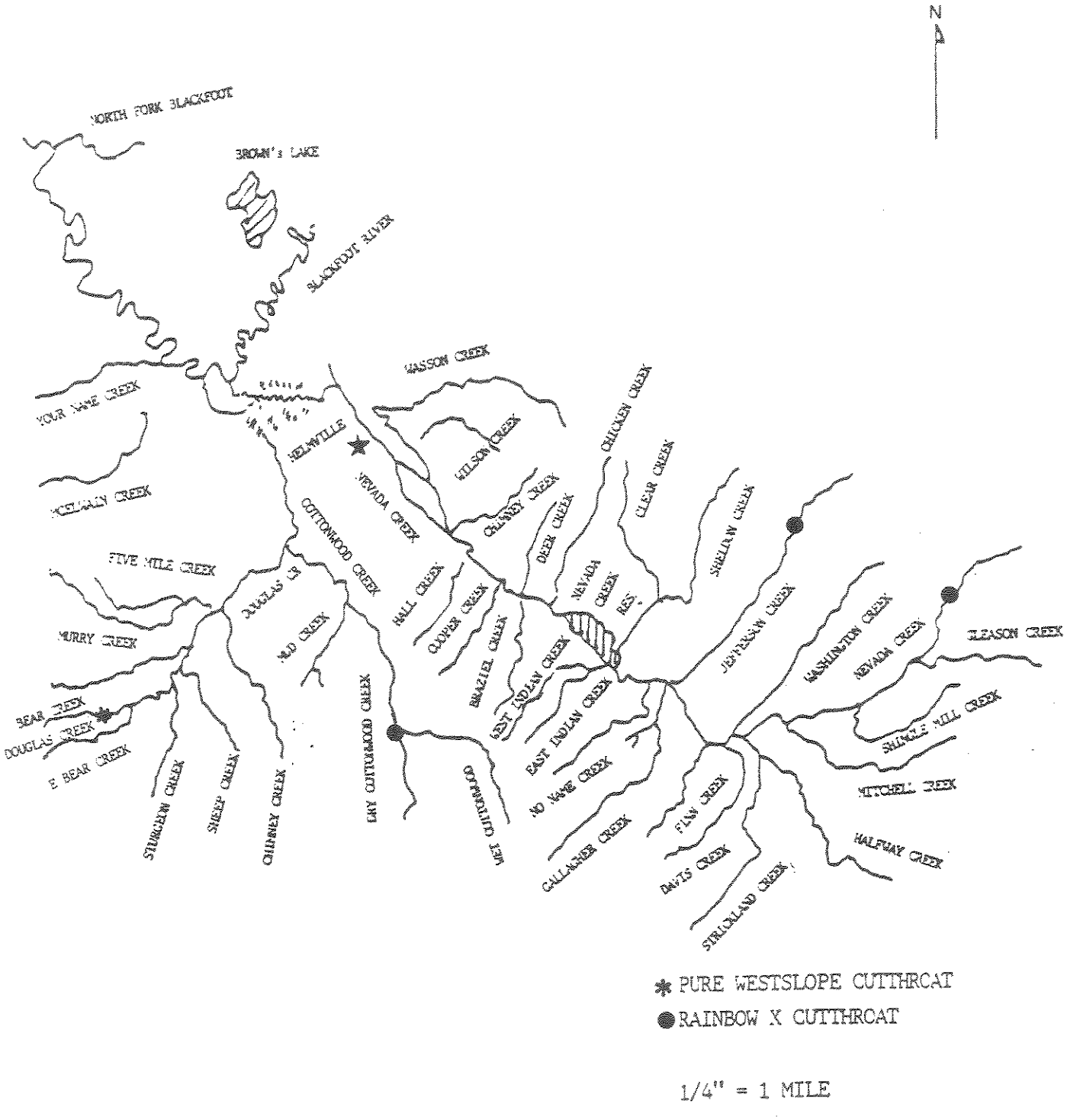

Figure 8. Nevada Creek Drainage.

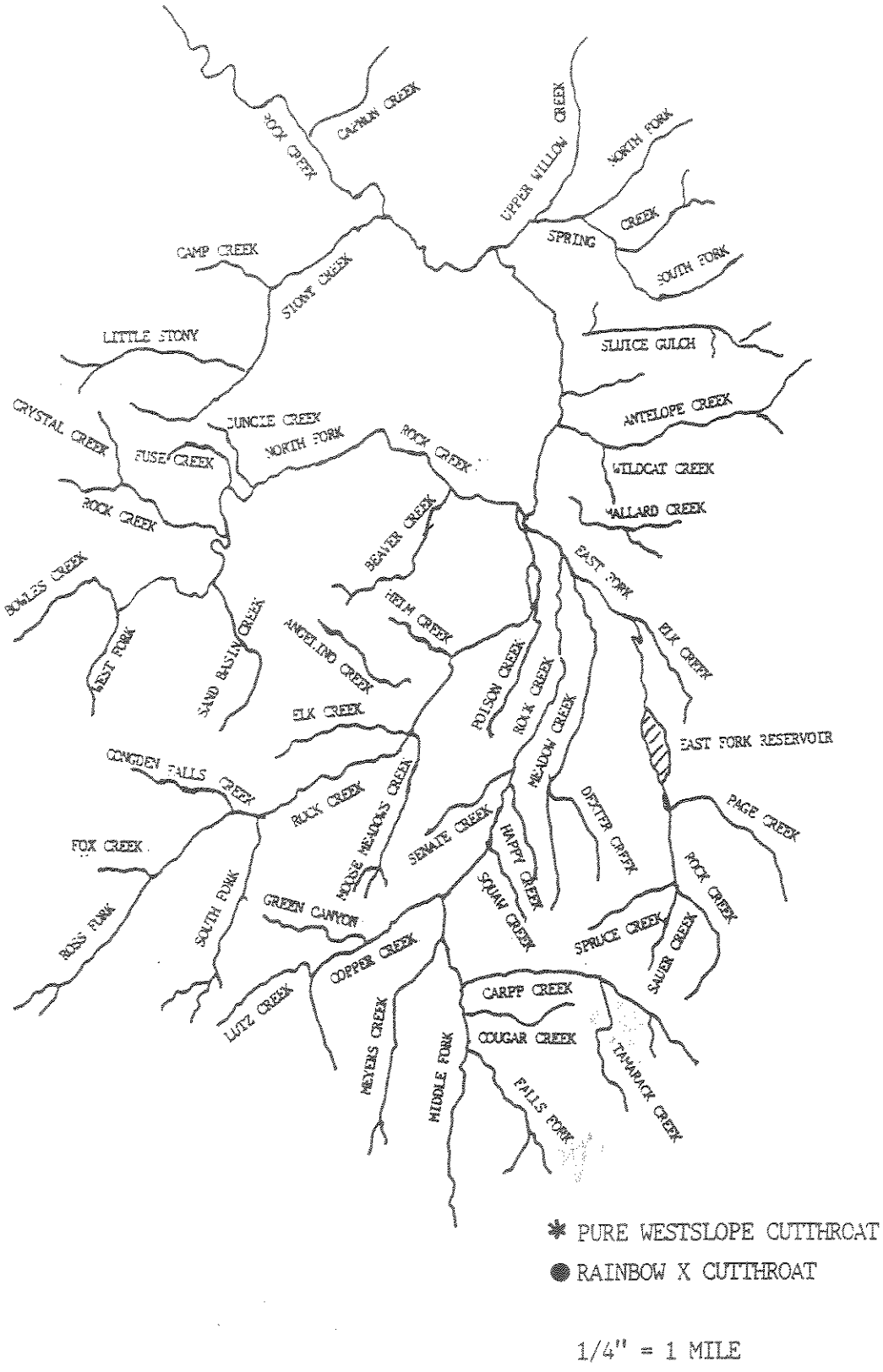

Figure 9. Upper Rock Creek Drainage.