THE DISTRIBUTION OF FISHES AND FISH HABITAT IN THE ELKHORN MOUNTAINS PORTION OF THE DEERLODGE NATIONAL FOREST

PREPARED FOR THE

MONTANA DEPARTMENT OF FISH, WILDLIFE & PARKS

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Forty-two localities on 16 streams and 1 lake were sampled. Twelve streams and the lake were found to be inhabited by fish. Trout occupied more than 16 miles of stream habitat. About 5 miles of stream with habitat suitable for trout were unoccupied.

Three species of fish were taken on the study area. Mottled sculpins were taken from about 1/2 mile of Queen Gulch. Cutthroat trout of the Yellowstone subspecies were found in .5 mile of Queen Gulch and in Leslie Lake. Brook trout inhabited more than 16 miles of stream. They were present in 12 named streams.

A final management plan should address habitat manipulation, native cutthroat reintroduction and use/user analysis. Initial phases in the generation of that plan would require water quality studies and mine spoils reclamation feasibility assessment. The development of a Missouri cutthroat stock suitable for reintroduction would allow the expansion of extant stream fisheries by 28%. Basic use data as well as an in-depth evaluation of user perceptions and demographics are required to plan for future increases in demand for this resource.

INTRODUCTION

This report is an extension of a previous study on Elkhorn fisheries. The earlier report was limited to that portion of the Elkhorn Mountains administered by the Helena National Forest. The present report covers the remainder of the Elkhorns which is administered by the Deerlodge National Forest.

The Deerlodge Forest portion of the Elkhorns appears to have been much more heavily impacted by man than the Helena Forest area. Intensive mining activities and the associated environmental degradation have had a significant negative effect on water quality, watershed stability and stream morphology. While many of the early environmental insults have partially healed, the current increase in mining interest could subject the southern Elkhorn streams to additional environmental stress.

General treatment of the methodologies and historical fish faunal considerations are included in the first report and are not repeated here. The reader should consult that document for additional information.

Analysis of the study area fish distribution was complicated by the nature of the streams in the Elkhorn and Dry Creek drainages. These south-flowing systems encounter a very pervious substrate and, in many cases, disappear in their downstream reaches. Although the precipitation data for 1981 are available at this writing only for the months January through May, it was a wet year. The weather at Helena, Townsend and Boulder recorded 47%, 41% and 21% above normal precipitation for the first five months of 1981. The flow regimes observed during the field season were therefore considerably higher than the average.

HISTORICAL PERSPECTIVE

Data on southern Elkhorn streams included in the Helena offices of Fish, Wildlife & Parks are summarized below for study area waters.

Lakes

Leslie Lake. Fisherman log reports included brook trout in 1954 and 1967 and Yellowstone cutthroat in 1972. Stocking records show Yellowstone cutthroats were introduced in 1968, 1970, 1972 and 1978. Netting in 1972 found Yellowstone cutthroat averaging 9.4 inches. Prior to cutthroat stocking, this lake had a reputation for producing large brook trout.

Streams

The majority of streams in the study area are not represented by data in the Helena office. The streams listed below are those for which data exist.

McCarthy Creek. This stream was surveyed in 1952 and found to be barren.

Muskrat Creek. Angler log reports include both brook and cutthroat trout in 1952, 1953 and 1970. Brook trout were stocked in 1946, 1947, 1950, 1951, 1952 and 1953. Rainbows were reportedly planted in 1947.

Turnley Creek. A fish population estimate in 1978 found brook trout and mottled sculpins to be present in the lower reaches. Brook trout reached 5.6 inches and were present at a density of about 269/125 m.

RESULTS

The data collected during the study are presented below. Table 1 shows the collection numbers, dates, localities and species taken.

Figure 1 shows the study area streams which were considered likely to contain suitable fish habitat, either occupied or unoccupied.

In Figure 2, the approximate sites of the 42 collections are indicated on the stream system map.

The distribution of fishes and fish habitat in southern Elkhorn streams is summarized in Table 2. Several streams are included which were found to contain no suitable fish habitat. They are included for completeness.

Figures 3, 4, 5 and 6 show the distribution of brook trout, Yellowstone cutthroat trout, mottled sculpins and unoccupied suitable habitat on the study area.

Streams

Dry Creek. Collection WFH-81-13. This stream, throughout the portion of its course on the Forest, was barren of fish. At the time of this investigation it was dry over the majority of its length. A short section below the origin at the confluence of the West and East Forks had water, but the absence of aquatic insects suggested that this section might frequently go dry.

Table 1. Southern Elkhorn collection sites.

Number	Date	Locality	Species
WFH-81-1	7/ 8/81	McCarthy Cr S30, T6N, R3W	Brook
WFH-81-2	7/ 8/81	McCarthy Cr S19, T6N, R3W	Brook
WFH-81-3	7/ 9/81	Elkhorn Cr S14, T6N, R3W	Barren
WFH-81-4	7/ 9/81	Turnley Cr S22, T6N, R3W	Brook
WFH-81-5	7/ 9/81	Queen Gulch S22,T6N, R3W	Brook
WFH-81-6	7/ 9/81	Queen Gulch S23,T6N, R3W	Barren
WFH-81-7	7/ 9/81	Elkhorn Cr S22, T6N, R3W	Brook
WFH-81-8	7/ 9/81	" " " "	Brook
WFH-81-9	7/14/81	Elkhorn Cr S34, T6N, R3W	Brook
WFH-81-10	7/14/81	Turman Cr S28, T6N, R2W	Brook
WFH-81-11	7/14/81	Turman Cr S20, T6N, R2W	Brook
WFH-81-12	7/14/81	East Fk Dry Cr S21,T6N,R2W	Brook
WFH-81-13	7/16/81	Dry Cr S32, T6N, R2W	Barren
WFH-81-14	7/16/81	East Fk Dry Cr S32,T6N,R2W	Brook
WFH-81-15	7/16/81	East Fk Dry Cr S28,T6N,R2W	Brook
WFH-81-16	7/16/81	Sand Cr S28, T6N, R2W	Brook
WFH-81-17	7/16/81	Turman Cr S28, T6N, R2W	Brook
WFH-81-18	7/16/81	West Fk Dry Cr S29,T6N,R2W	Barren
WFH-81-19	7/19/81	Turnley Cr S16, T6N, R3W	Brook
WFH-81-20	7/19/81	Turnley Cr S9, T6N, R3W	Brook
WFH-81-21	7/19/81	Turnley Cr S4, T6N, R3W	Brook
WFH-81-22	7/20/81	Sourdough Cr S10,T6N,R3W	Brook
WFH-81-23	7/20/81	Sourdough Cr S3,T6N,R3W	Brook
WFH-81-24	7/20/81	Trib. to Sourdough Cr S10, T6N, R3W	Brook
WFH-81-25	7/22/81	Muskrat Cr S6,T6N,R3W	Brook
WFH-81-26	7/22/81	Nursery Cr S6,T6N,R3W	Brook
WFH-81-27	7/22/81	Nursery Cr S31,T7N,R3W	Brook
WFH-81-28	7/22/81	Muskrat Cr S6,T6N,R3W	Brook
WFH-81-29	7/22/81	Rawhide Cr S7,T6N,R3W	Brook
WFH-81-30	7/22/81	Rawhide Cr S6,T6N,R3W	Brook
WFH-81-31	7/23/81	Leslie Lake S8,T6N,R2W	Cutthroat
WFH-81-32	7/27/81	Ninety Cent G. S9,T6N,R3W	Brook
WFH-81-33	7/28/81	Sourdough Cr S3,T6N,R3W	Barren
WFH-81-34	7/30/81	Queen G. S8, T6N, R2W	M. Sculpin
WFH-81-35	7/30/81	Queen G. S8, T6N, R2W	Cutthroat, Sculpin
WFH-81-36	7/30/81	Queen G. S13, T6N, R3W	Barren
WFH-81-37	7/30/81	Slaughterhouse G. S11, T6N, R3W	Barren
WFH-81-38	7/30/81	Slaughterhouse G. S14, T6N, R3W	Barren
WFH-81-39	7/31/81	Elkhorn Cr S12,T6N,R3W	Barren
WFH-81-40	7/31/81	Twentyone G. S27,T6N,R3W	Barren
WFH-81-41	8/ 4/81	Muskrat Cr S31,T7N,R3W	Brook
WFH-81-42	8/ 4/81	Muskrat Cr S33,T7N,R3W	Barren

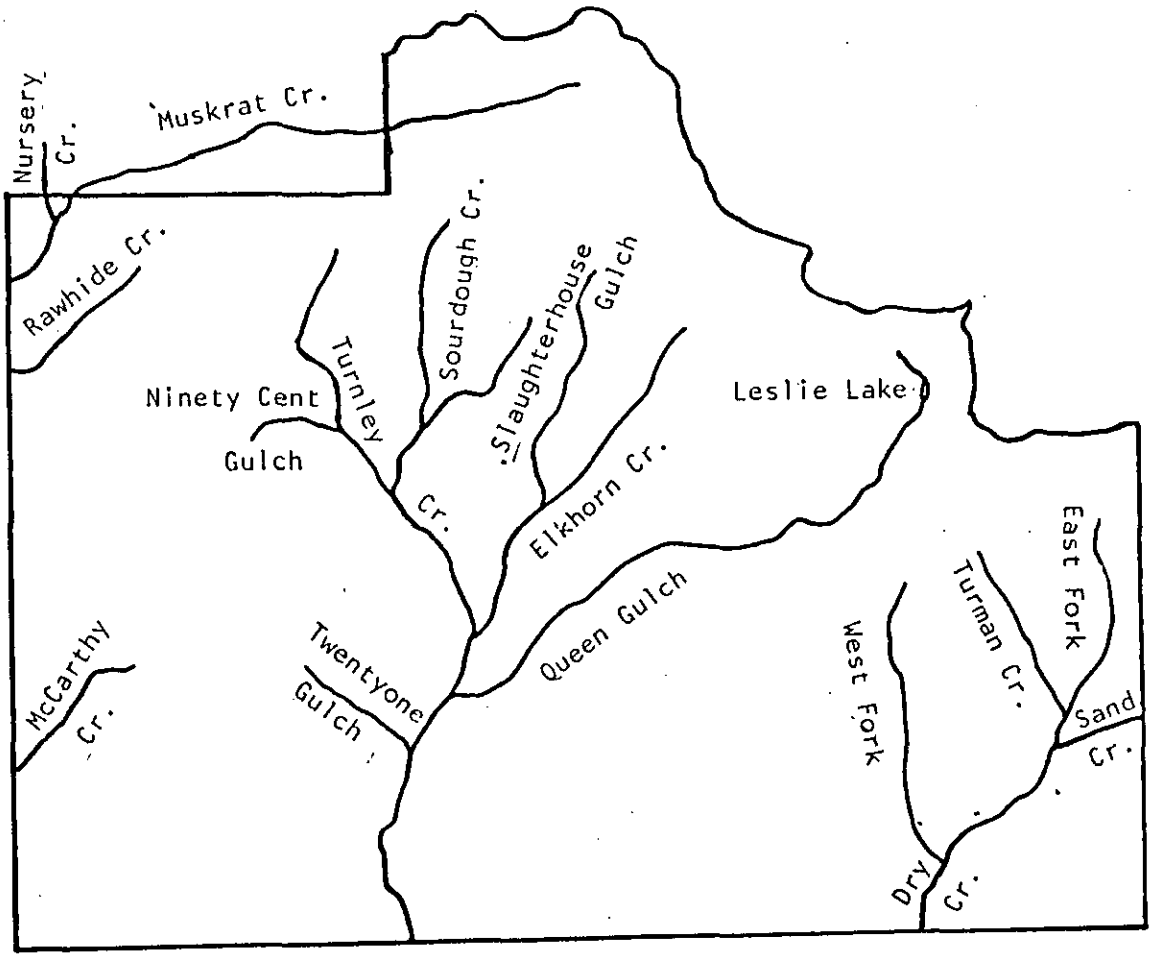

Figure 1. Study area drainages.

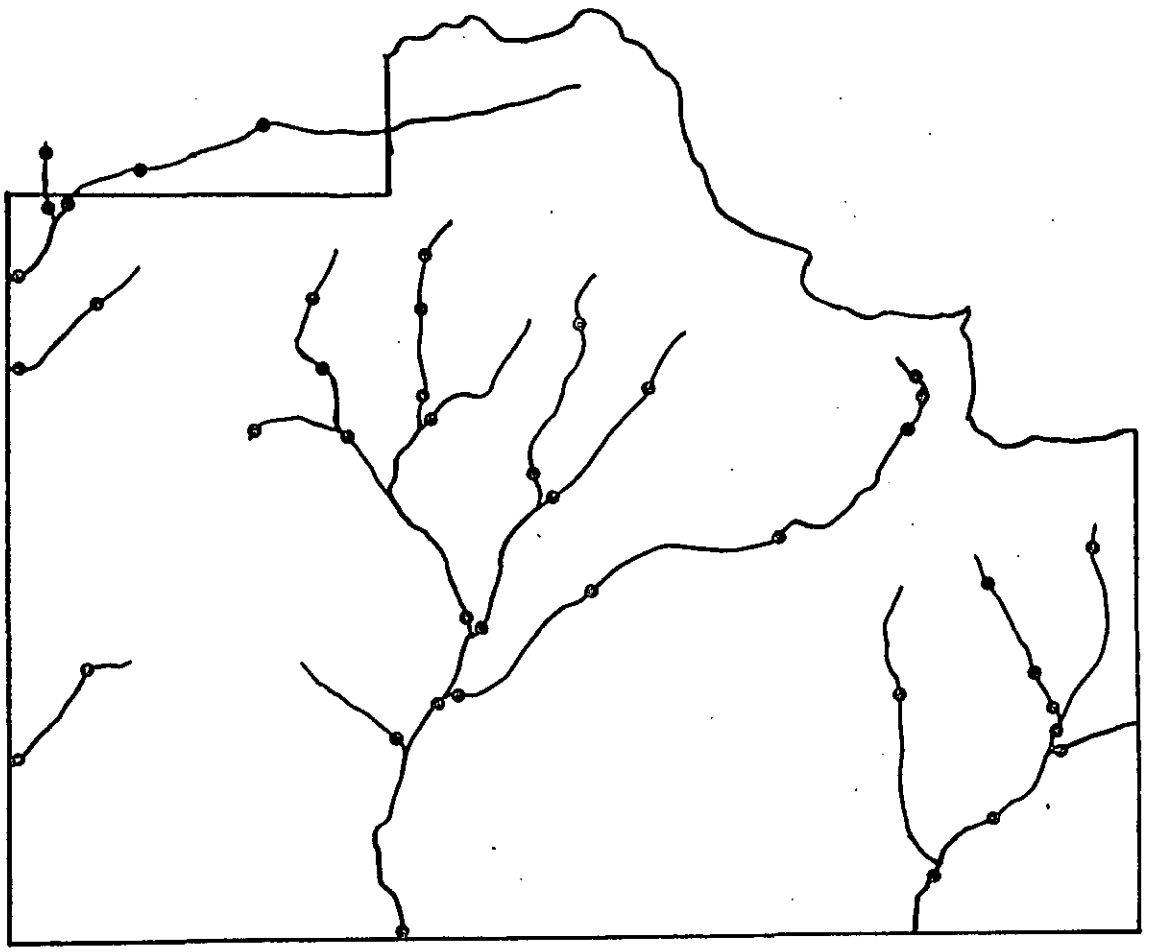

Figure 2. Study area collecting sites.

Table 2. Distribution of fishes and fish habitat in southern Elkhorn streams.

Stream	Miles of Habitation by Fish Species			Total Miles of Occupied Habitat	Miles of Unoccupied Suitable Habitat	Total
	Brook Trout	Cut-throat Trout	Mottled Sculpin			
Dry Creek						
East Fk Dry Creek	2.4			2.4		2.4
West Fk Dry Creek						
Turman Creek	1.4			1.4		1.4
Sand Creek	.1			.1		.1
Elkhorn Creek	3.0			3.0	.5	3.5
Queen Gulch	.1	.5	.5	.6		.6
Twentyone Gulch						
Ninety Cent Gulch	.8			.8		.8
Slaughterhouse Gulch						
Turnley Creek	3.4			3.4		3.4
Sourdough Creek	1.7			1.7	.8	2.5
McCarthy Creek	1.2			1.2		1.2
Muskrat Creek	1.1			1.1	3.9	5.0
Nursery Creek	.2+.4			.2		.2
Rawhide Creek	.8			.8		.8
Total	16.2	.5	.5	16.7	4.7	21.9

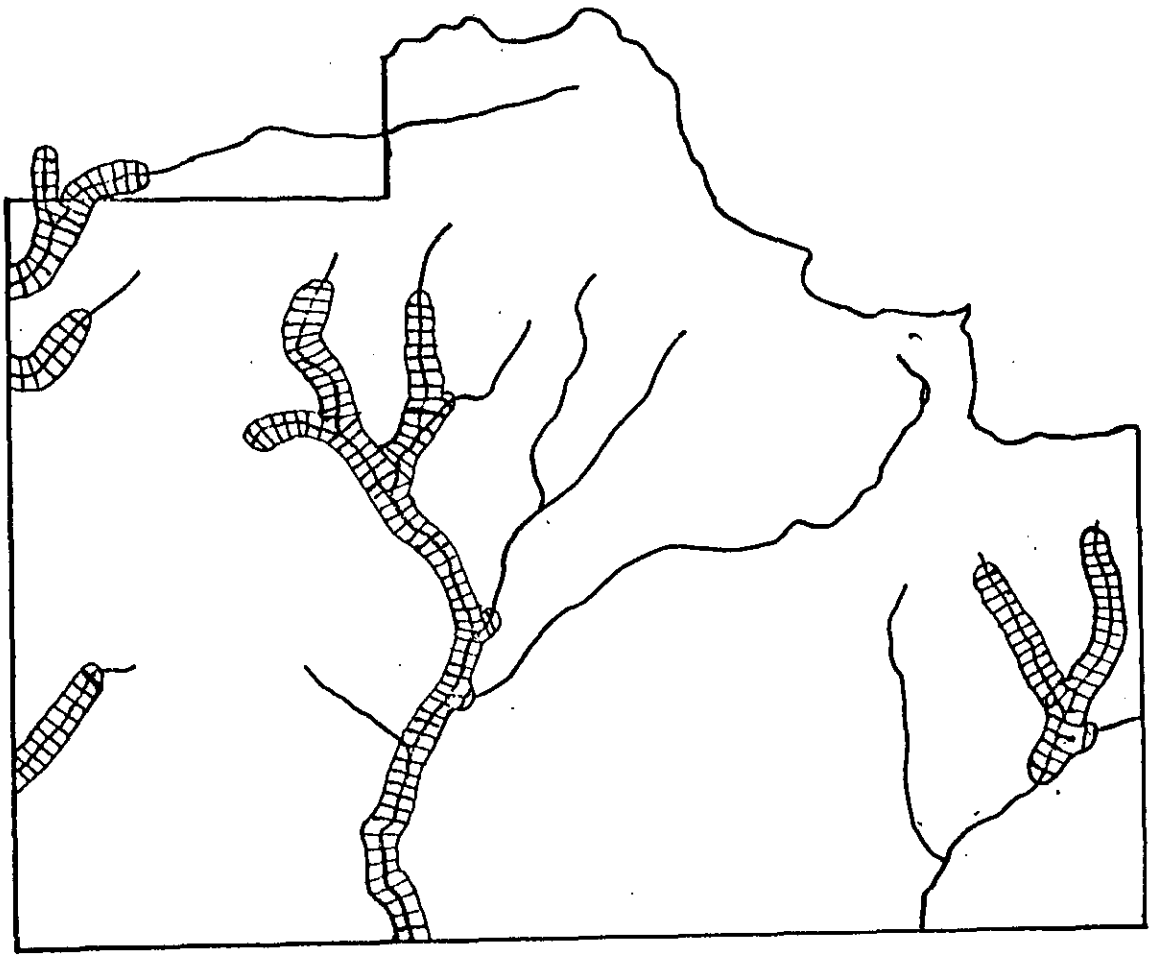

Figure 3. Distribution of brook trout on the study area.

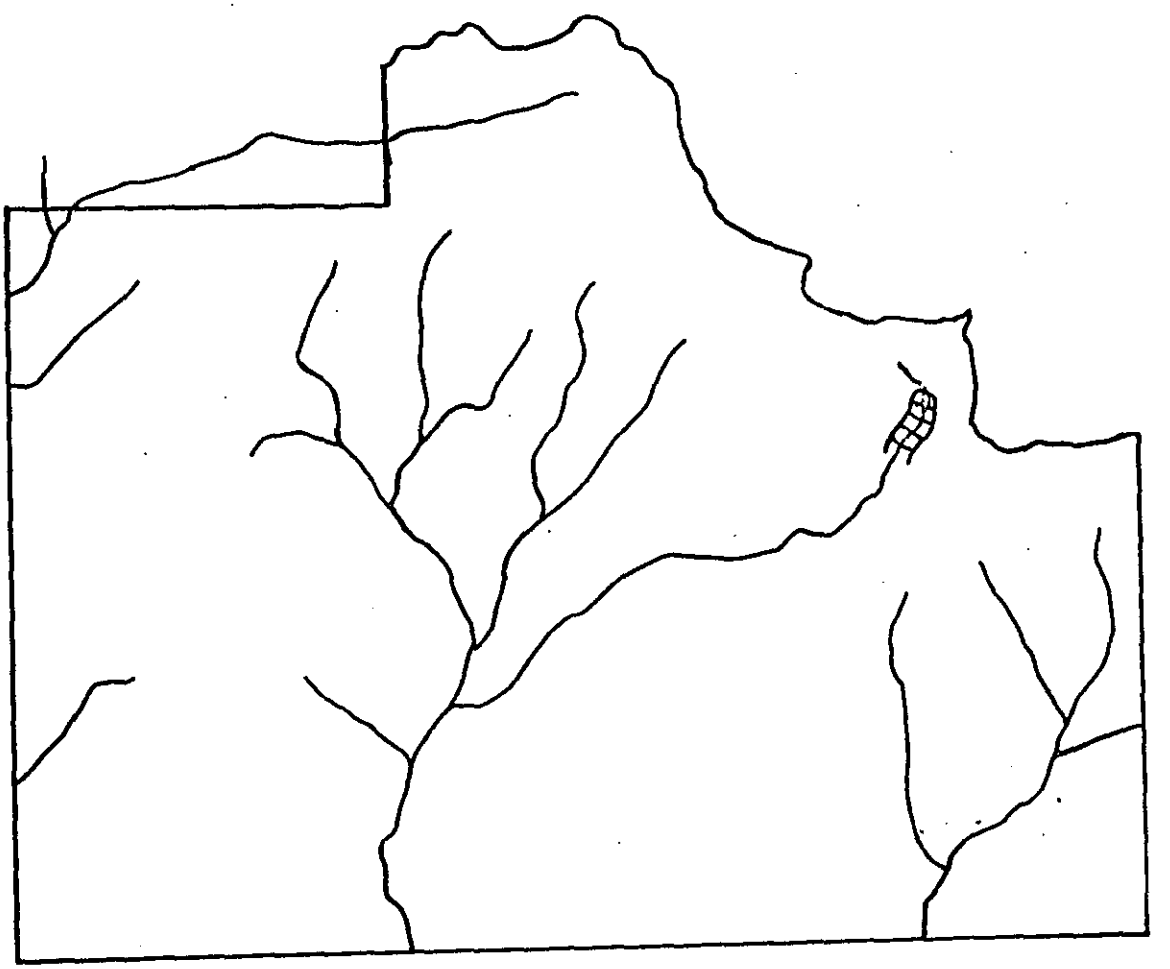

Figure 4. Distribution of cutthroat trout on the study area.

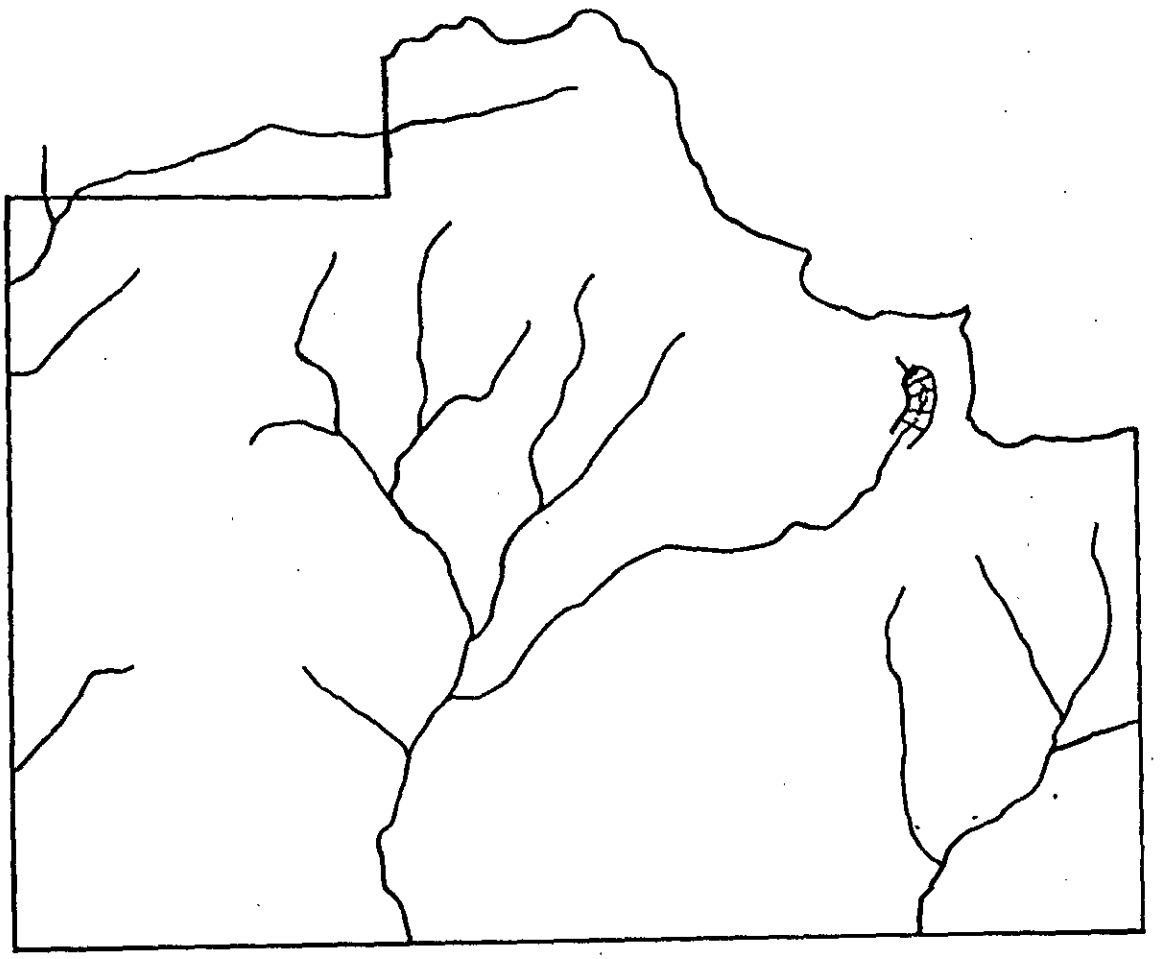

Figure 5. Distribution of mottled sculpin on the study area.

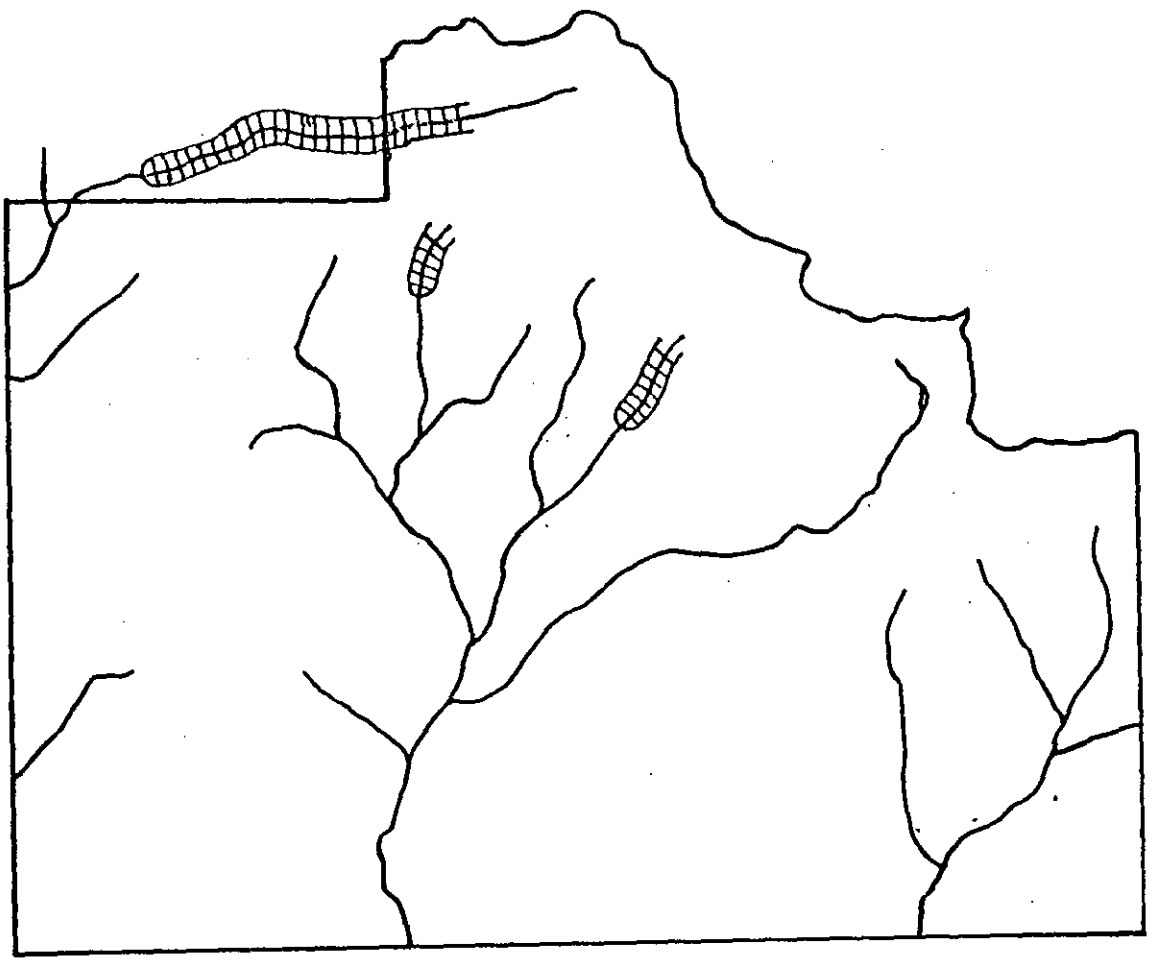

Figure 6. Distribution of unoccupied habitat on the study area.

East Fork of Dry Creek. Collections WFH-81-12, 14, 15. The East Fork carried a substantial waterflow during the study period. Its 2.4-mile course from just below the mouth of Sand Creek to the headwaters supported a good population of small brook trout. The portion below Sand Creek to the junction with the West Fork was barren, apparently due to periodic, natural dewatering. It seems unlikely that much angling use occurs.

West Fork of Dry Creek. Collection WFH-81-18. The West Fork had a waterflow only in its headwater reaches in the study period. No fish were found there, and it appeared that the majority of the headwater section would dry in a low precipitation year, or perhaps annually.

Turman Creek. Collections WFH-81-10, 11, 17. Although Turman Creek is small, it provided about 1.4 miles of good quality habitat, supporting brook trout up to 9 inches in length. It appeared to be perennial from its headwater springs to the mouth on the East Fork of Dry Creek. It probably is seldom fished.

Sand Creek. Collection WFH-81-16. Sand Creek is extremely small, and supported a few small brook trout only in its lower .1 mile above its junction with the East Fork of Dry Creek. It is too small for most anglers.

Elkhorn Creek. Collections WFH-81-3, 7, 8, 9, 39. Elkhorn Creek appears to be perennial in its upper reaches, to dry above the town of Elkhorn, and to reappear just below the town and regularly flow uninterrupted to the Forest boundary. Water quality in the section above the town of Elkhorn seemed to be good, and aquatic insects were common there. A section of Elkhorn Creek below the town flows through an extensive area of mine spoils and water quality degradation seems likely to occur. Only a short section above the mouth of Turnley Creek supported fish. The stream is quite small and the few small brook trout inhabiting that section may be limited by habitat size, water quality or both. Below the junction with Turnley Creek and on to the Forest boundary, the stream is much larger, since Turnley Creek carries a much greater flow. Although a fair number of brook trout to 8 inches in length inhabit the lower reaches of Elkhorn Creek, their density seemed less than that observed in the smaller flow of Turnley Creek. While no quantification was attempted, it is possible that the lower density could result from poor water quality. Elkhorn Creek has about 3 miles of brook trout habitation, which probably supports some angling due to its accessibility. A barren reach of about 1/2 mile above the town of Elkhorn may be suitable for trout.

Queen Gulch. Collections WFH-81-5, 6, 34, 35, 36. Like Elkhorn Creek, Queen Gulch goes dry after a perennial upper section. Queen Gulch feeds and drains Leslie Lake. During the study period, the lower .1 mile above its mouth on Elkhorn Creek was occupied by a few small brook trout. It is likely that these fish are migrants from Elkhorn Creek that have taken advantage of the extant high water flows. The stream appears to be dry in low precipitation cycles in its lower sections. Queen Gulch was barren above Leslie Lake except for a few mottled sculpins. Below Leslie Lake, both mottled sculpins and Yellowstone cutthroats inhabited about 1/2 mile of stream. The trout are probably downstream migrants from the lake. Angling pressure on Queen Gulch is probably not large, but its accessibility probably results in some activity when water is present.

Twentyone Gulch. Collection WFH-81-40. This is a very small stream which did not contain fish during this study.

Ninety Cent Gulch. Collection WFH-81-32. Ninety Cent Gulch is a small stream supporting a sparse population of small brook trout from its mouth on Turnley Creek upstream for about .8 mile. It might, on occasion, be fished near the mouth.

Slaughterhouse Gulch. Collections WFH-81-37, 38. While a flow was observed during the study throughout the length of this stream, it seemed likely to be dry in low water periods. No fish were taken.

Turnley Creek. Collections WFH-81-4, 19, 20, 31. Turnley Creek is the largest stream in the Elkhorn drainage. It appears to be perennial throughout its length. Brook trout were abundant, although small, in the lower reaches, and fewer in number in the sections above the mouth of Sourdough Creek. Turnley Creek provides some 3.4 miles of occupied habitat and probably receives some angling use in its lower portion due to easy access and several well used, undeveloped campsites. Knudson (unpubl. report) took mottled sculpins in the meadow stretch adjacent to the Galli cyanide leach bed. No sculpins were found in this study, which could have been the result of the breaching of the cyanide bed during flooding in April 1981.

Sourdough Creek. Collections WFH-81-22, 23, 24, 33. Sourdough Creek is a good-sized tributary to Turnley Creek. An unnamed tributary to Sourdough Creek is included in this discussion. About 1.7 miles of habitat from the mouth upstream to a boulder field barrier is occupied by brook trout up to 8 inches. The tributary shown on the map in Figure 3 supports about .2 mile of brook trout habitation. Habitat

quality in Sourdough Creek is high; the damage from old mining activities has largely healed. An impassable barrier to upstream fish migration is formed by an extensive, precipitous boulder field. Above this barrier at least .8 mile of good quality habitat is at present unoccupied.

McCarthy Creek. Collections WFH-81-1, 2. This very small stream supports a sparse population of brook trout over a distance of 1.2 miles from the Forest boundary upstream to its origin. It is probably seldom fished.

Muskrat Creek. Collections WFH-81-25, 28, 41, 42. Habitat in Muskrat Creek seems to be of good quality and water volumes are substantial. The 1.1 mile section from the Forest boundary upstream onto the BLM section is inhabited by brook trout up to 10 inches long. A cutthroat trout, apparently of the Missouri strain, was taken in Muskrat Creek during the study in 1980. Despite intensive efforts, no cutthroat specimens could be secured during the 1981 sampling. Above the brook trout area, Muskrat Creek appears to be barren, despite good habitat. An apparently effective barrier to upstream movement seems to be formed by a series of small falls and rapids. About 3.9 miles of stream above the brook trout area seem suitable for fish habitation, although currently barren. The portion of Muskrat Creek immediately above the Forest boundary seems subject to rather intensive angling pressure. Good road access and heavily used, undeveloped campsites contribute to angling intensity.

Nursery Creek. Collections WFH-81-26, 27. Despite the very limited streamflow, this creek supports a low density brook trout population over a distance of .2 mile on the Forest and an additional .4 mile on BLM land. The Nursery Creek mouth on Muskrat Creek is adjacent to the campsites mentioned above, and the creek therefore does support some angling activity.

Rawhide Creek. Collections WFH-81-29, 30. Rawhide Creek is inhabited by brook trout from the Forest boundary upstream for approximately .8 mile. The habitat is small and fishing is probably minimal, owing to the dense riparian vegetation.

Lakes

Leslie Lake. Collection WFH-81-31. The only lake in the study area is Leslie Lake. Gill net sampling took 16 Yellowstone cutthroats ranging in length from 7.3 to 9.4 inches. The average size was 8.5 inches. These fish presumably resulted from a 1978 plant of 2,000 fingerlings.

Growth was not good, and the scheduled stocking in 1981 is for 1,000 fish of this strain. Perhaps the reduced planting rate will result in more rapid growth and larger average size. Mottled sculpins inhabit Queen Gulch above and below Leslie Lake. Whether they are present in the lake itself is unknown. The inlet of Queen Gulch into the lake seems to have some potential as a spawning site, but the absence of evidence of successful reproduction, and the extirpation of the previously occurring brook trout population, suggest that it is presently unsuitable. Despite poor access via a rough fourwheel drive road, Leslie seems to be the object of considerable fishing pressure.

Species Distribution and Status

Mottled Sculpin. The distribution of this species on the study area (Figure 5) was restricted to Queen Gulch adjacent to Leslie Lake, about .5 stream mile. Mottled sculpins' presence in this locality must have resulted from some human activity. Presumably this was associated with attempts to introduce trout into the originally barren lake. Elkhorn Creek seems suitable for sculpin habitat, but their absence suggests that this is either not the case or they were somehow missed in the sampling.

Brook Trout. Figure 3 depicts brook trout distribution on the study area. This species provides the majority of stream fishing opportunity, in excess of 16 miles, due to its extensive occupation of stream environments. In some of the streams they reach desirable sizes--Turman Creek, East Fork of Dry Creek, Turnley Creek and Muskrat Creek. Other streams support brook trout of marginal angling value. If this species were introduced prior to the demise of native cutthroats, it probably contributed to the cutthroat's disappearance.

Cutthroat Trout. The only representatives of this species taken during the 1981 collections were the result of the Yellowstone subspecies introduced in Leslie Lake. Yellowstone cutthroats occupied Leslie Lake and about .5 mile of stream. A single specimen of the Missouri cutthroat taken in 1980 from Muskrat Creek was the only individual taken on the study area. Any native trout must have been Missouri cutthroats. The majority of streams were probably inhabited by this strain, but were presumably eliminated by mining degradation of their habitat and perhaps brook trout competition.

Available Habitats

Table 2 and Figure 6 display those habitats apparently suitable for trout that are currently barren. These unoccupied

habitats are the result of barriers to upstream fish passage. A total of 4.7 miles of this habitat exists in three streams. If these currently barren stream reaches were occupied, the available stream fishery on the study area would be increased by 28%.

RECOMMENDATIONS

Several practices should be initiated to assess and improve southern Elkhorn fisheries. These can be divided into three categories: habitat manipulation, Missouri cutthroat reintroduction, and use/user analysis. The design and implementation of these efforts must be a joint effort involving both Forest Service and Fish, Wildlife & Parks concurrence and cooperation. Designation of the Elkhorns as a fish and wildlife management area is of substance only if practices designed to protect and enhance these resources are mutually agreed upon and vigorously pursued.

Habitat Manipulation

Environmental quality for fisheries in the southern Elkhorns is available to substantial improvement. A comprehensive study of basic water quality parameters, as well as heavy metal evaluation, should be carried out. The information gathered could then be used to define areas in which corrective measures might be taken. Reclamation of spoils areas, particularly on Elkhorn Creek, would have a positive effect on downstream fisheries.

The existing exclosure of the East Fork of Dry Creek is a desirable effort. Expansion of this method to other heavily pastured streams would be useful in evaluating cattle grazing strategies. The existing grazing closures on Rawhide and Muskrat creeks should be continued.

Missouri Cutthroat Reintroduction

All means should be applied to reestablish self-sustaining populations of native cutthroats in the southern Elkhorns. If a sufficient source of fish could be taken from Helena Forest cutthroat populations, they could be introduced into the three stream sections that are currently barren. A detailed examination of the inlet and outlet streams to Leslie Lake might show an opportunity for feasible alterations resulting in satisfactory spawning conditions. Cessation of Yellowstone cutthroat stocking could then be followed by the establishment of Missouri cutthroats.

The construction of small reservoirs for the establishment of native cutthroat populations has been a successful technique in other areas. An examination of potential reservoir sites where brook trout incursions could be avoided would be worthwhile. Twentyone Gulch and McCarthy Creek might offer suitable sites for reservoirs.

Use/User Analysis

Basic use data should be gathered from anglers utilizing the resource. These would include catch number, size, rate, etc. An attitudinal survey of user perceptions should also be done. Among the important aspects of such a survey would be definition of the factors attracting anglers to the Elkhorns and the elucidation of factors contributing to angler satisfaction. Analysis of the user population demographics should be carried out.